SEQUENCE LISTING

<110> MEDIMMUNE, LLC
HUMABS BIOMED SA

<120> NEUTRALIZING ANTI-INFLUENZA A ANTIBODIES AND USES THEREOF

<130> FLUA-100WO1

<140> PCT/US2014/058652
<141> 2014-10-01

<150> 62/002,414
<151> 2014-05-23

<150> 61/885,808
<151> 2013-10-02

<160> 172

<170> PatentIn version 3.5

<210> 1
<211> 385
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 1
cagatacagc tgcaggagtc gggtccagga ctggtgaagc cctcgcagac cctctcactc 60

acctgtgcca tctccgggga cagtgtctct agcaacaatg ctgtttggaa ctggatcagg 120

cagtccccat cgagaggcct tgagtggctg ggaaggacat actacaggtc caagtggtat 180

aatgattatg cagaatctgt gaaaagtcga ataaccgtca atccagacac atccaagaac 240

cagttctccc tgcacctgaa gtctgtgact cccgaggaca cggctgtgtt ttactgtgta 300

cgatctggcc acattacggt ttttggagtg aatgttgacg cttttgatat gtggggccaa 360

gggacaatgg tcaccgtctc ttcag 385

<210> 2
<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 2
Gln Ile Gln Leu Gln Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Ser Val Ser Ser Asn
20 25 30

```
Asn Ala Val Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly Leu Glu
        35                  40                  45

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala
    50                  55                  60

Glu Ser Val Lys Ser Arg Ile Thr Val Asn Pro Asp Thr Ser Lys Asn
65                  70                  75                  80

Gln Phe Ser Leu His Leu Lys Ser Val Thr Pro Glu Asp Thr Ala Val
                85                  90                  95

Phe Tyr Cys Val Arg Ser Gly His Ile Thr Val Phe Gly Val Asn Val
            100                 105                 110

Asp Ala Phe Asp Met Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser
        115                 120                 125
```

<210> 3
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 3
```
Ser Asn Asn Ala Val Trp Asn
1               5
```

<210> 4
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 4
```
Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala Glu Ser Val
1               5                   10                  15

Lys Ser
```

<210> 5
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

peptide

<400> 5
Ser Gly His Ile Thr Val Phe Gly Val Asn Val Asp Ala Phe Asp Met
1 5 10 15

<210> 6
<211> 309
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 6
gacatccaga tcacccagtc gccatcctcc ctgtctgcat ctgtaggaga cagagtaacc 60

atcacttgcc ggacaagtca gagccttagt agctatttac attggtatca gcagaaacca 120

gggaaagccc ctaagctcct gatctatgct gcatccagtt tgcaaagtgg ggtcccatca 180

aggttcagtg gcagtggatc tgggacagat ttcactctca ccatcagtag tctgcaacct 240

gaagattttg caacttacta ctgtcaacag agtcggacgt tcggccaagg gaccaaggtg 300

gaaatcaaa 309

<210> 7
<211> 103
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 7
Asp Ile Gln Ile Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Thr Ser Gln Ser Leu Ser Ser Tyr
20 25 30

Leu His Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Ala Ala Ser Ser Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Arg Thr Phe Gly Gln
85 90 95

Gly Thr Lys Val Glu Ile Lys
100

<210> 8
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 8
Arg Thr Ser Gln Ser Leu Ser Ser Tyr Leu His
1 5 10

<210> 9
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 9
Ala Ala Ser Ser Leu Gln Ser
1 5

<210> 10
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 10
Gln Gln Ser Arg Thr
1 5

<210> 11
<211> 385
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 11
caggtacagc tgcaggagtc gggtccagga ctggtgaagc cctcgcagac cctctcactc 60

acctgtgcca tctccgggga cagtgtctct agcaacaatg ctgtttggaa ctggatcagg 120

cagtccccat cgagaggcct tgagtggctg ggaaggacat actacaggtc caagtggtat 180

aatgattatg cagaatctgt gaaaagtcga ataaccgtca atccagacac atccaagaac 240

cagttctccc tgcacctgaa gtctgtgact cccgaggaca cggctgtgtt ttactgtgta 300

cgatctggcc acattacggt ttttggagtg aatgttgacg cttttgatat gtggggccaa 360

gggacaatgg tcaccgtctc ttcag 385

<210> 12
<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 12
Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Ser Val Ser Ser Asn
20 25 30

Asn Ala Val Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly Leu Glu
35 40 45

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala
50 55 60

Glu Ser Val Lys Ser Arg Ile Thr Val Asn Pro Asp Thr Ser Lys Asn
65 70 75 80

Gln Phe Ser Leu His Leu Lys Ser Val Thr Pro Glu Asp Thr Ala Val
85 90 95

Phe Tyr Cys Val Arg Ser Gly His Ile Thr Val Phe Gly Val Asn Val
100 105 110

Asp Ala Phe Asp Met Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser
115 120 125

<210> 13
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 13
Ser Asn Asn Ala Val Trp Asn
1 5

<210> 14

<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 14
Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala Glu Ser Val
1 5 10 15

Lys Ser

<210> 15
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 15
Ser Gly His Ile Thr Val Phe Gly Val Asn Val Asp Ala Phe Asp Met
1 5 10 15

<210> 16
<211> 309
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 16
gacatccaga tgacccagtc gccatcctcc ctgtctgcat ctgtaggaga cagagtaacc 60

atcacttgcc ggacaagtca gagccttagt agctatttac attggtatca gcagaaacca 120

gggaaagccc ctaagctcct gatctatgct gcatccagtt tgcaaagtgg ggtcccatca 180

aggttcagtg gcagtggatc tgggacagat ttcactctca ccatcagtag tctgcaacct 240

gaagattttg caacttacta ctgtcaacag agtcggacgt tcggccaagg gaccaaggtg 300

gaaatcaaa 309

<210> 17
<211> 103
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 17

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                   10                  15


Asp Arg Val Thr Ile Thr Cys Arg Thr Ser Gln Ser Leu Ser Ser Tyr
            20                  25                  30


Leu His Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
        35                  40                  45


Tyr Ala Ala Ser Ser Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly
    50                  55                  60


Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65                  70                  75                  80


Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Arg Thr Phe Gly Gln
                85                  90                  95


Gly Thr Lys Val Glu Ile Lys
            100
```

<210> 18
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 18
```
Arg Thr Ser Gln Ser Leu Ser Ser Tyr Leu His
1               5                   10
```

<210> 19
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 19
```
Ala Ala Ser Ser Leu Gln Ser
1               5
```

<210> 20
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 20
Gln Gln Ser Arg Thr
1 5

<210> 21
<211> 384
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 21
caggtccagc tgcaggagag cggccccgga ctggtcaagc cttcacagac actgagcctg 60

acatgcgcca ttagcggaga tagcgtgagc tccaacaatg ccgtgtggaa ctggatcagg 120

cagtctccaa gtcgaggact ggagtggctg ggacgaacat actatagatc caagtggtac 180

aatgactatg ctgaatcagt gaaaagccga attactgtca accccgatac ctccaagaat 240

cagttctctc tgcacctgaa aagtgtgacc cctgaggaca cagccgtgtt ctactgcgtc 300

agaagcggcc atatcaccgt ctttggcgtc aatgtggatg ctttcgatat gtgggggcag 360

gggactatgg tcaccgtgtc aagc 384

<210> 22
<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 22
Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Ser Val Ser Ser Asn
20 25 30

Asn Ala Val Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly Leu Glu
35 40 45

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala
50 55 60

Glu Ser Val Lys Ser Arg Ile Thr Val Asn Pro Asp Thr Ser Lys Asn
65 70 75 80

Gln Phe Ser Leu His Leu Lys Ser Val Thr Pro Glu Asp Thr Ala Val
85 90 95

Phe Tyr Cys Val Arg Ser Gly His Ile Thr Val Phe Gly Val Asn Val
100 105 110

Asp Ala Phe Asp Met Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser
115 120 125

<210> 23
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 23
Ser Asn Asn Ala Val Trp Asn
1 5

<210> 24
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 24
Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala Glu Ser Val
1 5 10 15

Lys Ser

<210> 25
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 25
Ser Gly His Ile Thr Val Phe Gly Val Asn Val Asp Ala Phe Asp Met
1 5 10 15

<210> 26
<211> 309
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 26
gatattcaga tgacccagag cccttccagc ctgtccgctt cagtggggga tcgagtgacc 60

attacctgcc gaaccagcca gagcctgagc tcctacctgc actggtatca gcagaagccc 120

ggcaaagccc ctaagctgct gatctacgcc gcttctagtc tgcagtccgg agtgccaagc 180

cggttctccg gatctgggag tggaaccgac tttaccctga caatttcaag cctgcagccc 240

gaggatttcg ctacatacta ctgtcagcag agcagaactt tcgggcaggg cactaaggtg 300

gagatcaaa 309

<210> 27
<211> 103
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 27
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Thr Ser Gln Ser Leu Ser Ser Tyr
20 25 30

Leu His Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Ala Ala Ser Ser Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Arg Thr Phe Gly Gln
85 90 95

Gly Thr Lys Val Glu Ile Lys
100

<210> 28
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 28
Arg Thr Ser Gln Ser Leu Ser Ser Tyr Leu His
1 5 10

<210> 29
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 29
Ala Ala Ser Ser Leu Gln Ser
1 5

<210> 30
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 30
Gln Gln Ser Arg Thr
1 5

<210> 31
<211> 385
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 31
caggtccagc tgcagcagtc aggtccagga ctggtgaagc cctcgcagac cctctcactc 60

acctgtgcca tctccgggga cagagtctct agcaacagtg ctgtttggaa ctggatcagg 120

cagtccccat cgagaggcct cgagtggctg ggaaggacat attacaggtc caaatggtat 180

tatgattatg cagaatctgt gaaaagtcga atagttatcg acccagacac atccaagaac 240

caggtctccc tgcagttgaa ttctgtgact cccgaggact cggctatata ttactgtgca 300

agaggtggcc acattacggt gtttgggctg aatattgacg cttatgatat ttggggccaa 360

ggggcaaagg tcaccgtgtc ttcag 385

<210> 32
<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 32
Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Arg Val Ser Ser Asn
20 25 30

Ser Ala Val Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly Leu Glu
35 40 45

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Tyr Asp Tyr Ala
50 55 60

Glu Ser Val Lys Ser Arg Ile Val Ile Asp Pro Asp Thr Ser Lys Asn
65 70 75 80

Gln Val Ser Leu Gln Leu Asn Ser Val Thr Pro Glu Asp Ser Ala Ile
85 90 95

Tyr Tyr Cys Ala Arg Gly Gly His Ile Thr Val Phe Gly Leu Asn Ile
100 105 110

Asp Ala Tyr Asp Ile Trp Gly Gln Gly Ala Lys Val Thr Val Ser Ser
115 120 125

<210> 33
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 33
Ser Asn Ser Ala Val Trp Asn
1 5

<210> 34
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 34
Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Tyr Asp Tyr Ala Glu Ser Val
1 5 10 15

Lys Ser

<210> 35
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 35
Gly Gly His Ile Thr Val Phe Gly Leu Asn Ile Asp Ala Tyr Asp Ile
1 5 10 15

<210> 36
<211> 307
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 36
gacatccagg tgacccagtc tccgtcctcc ctgtctgcat ctgtaggaga cagagtcacc 60

atctcttgcc gggcacagag ccttagcagc tacttacatt ggtatcagca gaaaccaggg 120

caacccccta aactcctgat ctatgctgca accactttgc aaagtggggt cccatcacgg 180

ttcagtggta gtggatctgg gacagatttc actctcacca tcagtacttt ccaagctgaa 240

gatgttgcca cttactattg tcaacagagt cggacgttcg gccaagggac caaggttgaa 300

atcaaac 307

<210> 37
<211> 102
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 37
Asp Ile Gln Val Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Ser Cys Arg Ala Gln Ser Leu Ser Ser Tyr Leu
20 25 30

His Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro Lys Leu Leu Ile Tyr
35 40 45

Ala Ala Thr Thr Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly Ser
50 55 60

Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Thr Phe Gln Ala Glu
65 70 75 80

Asp Val Ala Thr Tyr Tyr Cys Gln Gln Ser Arg Thr Phe Gly Gln Gly
85 90 95

Thr Lys Val Glu Ile Lys
100

<210> 38
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 38
Arg Ala Gln Ser Leu Ser Ser Tyr Leu His
1 5 10

<210> 39
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 39
Ala Ala Thr Thr Leu Gln Ser
1 5

<210> 40
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 40
Gln Gln Ser Arg Thr
1 5

<210> 41
<211> 385
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 41

caggtacagc tgcagcagtc aggtccagga ctggtgaagc cctcgcagac cctctcactc 60

acctgtgcca tctccgggga cagagtctct agcaacagtg ctgtttggaa ctggatcagg 120

cagtccccat cgagaggcct cgagtggctg ggaaggacat attacaggtc caaatggtat 180

tatgattatg cagaatctgt gaaaagtcga atagttatcg acccagacac atccaagaac 240

caggtctccc tgcagttgaa ttctgtgact cccgaggact cggctatata ttactgtgca 300

agaggtggcc acattacggt gtttgggctg aatattgacg cttatgatat ttggggccaa 360

ggggcaatgg tcaccgtctc ttcag 385

<210> 42
<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 42
Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Arg Val Ser Ser Asn
20 25 30

Ser Ala Val Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly Leu Glu
35 40 45

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Tyr Asp Tyr Ala
50 55 60

Glu Ser Val Lys Ser Arg Ile Val Ile Asp Pro Asp Thr Ser Lys Asn
65 70 75 80

Gln Val Ser Leu Gln Leu Asn Ser Val Thr Pro Glu Asp Ser Ala Ile
85 90 95

Tyr Tyr Cys Ala Arg Gly Gly His Ile Thr Val Phe Gly Leu Asn Ile
100 105 110

Asp Ala Tyr Asp Ile Trp Gly Gln Gly Ala Met Val Thr Val Ser Ser
115 120 125

<210> 43
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

peptide

<400> 43
Ser Asn Ser Ala Val Trp Asn
1 5

<210> 44
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 44
Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Tyr Asp Tyr Ala Glu Ser Val
1 5 10 15

Lys Ser

<210> 45
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 45
Gly Gly His Ile Thr Val Phe Gly Leu Asn Ile Asp Ala Tyr Asp Ile
1 5 10 15

<210> 46
<211> 307
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 46
gacatccaga tgacccagtc tccgtcctcc ctgtctgcat ctgtaggaga cagagtcacc 60

atctcttgcc gggcacagag ccttagcagc tacttacatt ggtatcagca gaaaccaggg 120

caaccccta aactcctgat ctatgctgca accactttgc aaagtggggt cccatcacgg 180

ttcagtggta gtggatctgg gacagatttc actctcacca tcagtacttt ccaagctgaa 240

gatgttgcca cttactattg tcaacagagt cggacgttcg gccaagggac caaggtggag 300

atcaaac 307

<210> 47
<211> 102

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 47
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Ser Cys Arg Ala Gln Ser Leu Ser Ser Tyr Leu
20 25 30

His Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro Lys Leu Leu Ile Tyr
35 40 45

Ala Ala Thr Thr Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly Ser
50 55 60

Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Thr Phe Gln Ala Glu
65 70 75 80

Asp Val Ala Thr Tyr Tyr Cys Gln Gln Ser Arg Thr Phe Gly Gln Gly
85 90 95

Thr Lys Val Glu Ile Lys
100

<210> 48
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 48
Arg Ala Gln Ser Leu Ser Ser Tyr Leu His
1 5 10

<210> 49
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 49
Ala Ala Thr Thr Leu Gln Ser
1 5

<210> 50
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 50
Gln Gln Ser Arg Thr
1 5

<210> 51
<211> 385
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 51
caggtacagc tgcagcagtc aggtccagga ctggtgaagc cctcgcagac cctctcactc 60

acctgtgcca tctccgggga cagagtctct agcaacagtg ctgtttggaa ctggatcagg 120

cagtccccat cgagaggcct cgagtggctg ggaaggacat attacaggtc caaatggtat 180

tatgattatg cagaatctgt gaaaagtcga atagttatcg acccagacac atccaagaac 240

caggtctccc tgcagttgaa ttctgtgact cccgaggact cggctatata ttactgtgca 300

agaggtggcc acattacgga gtttgggctg aatattgacg cttatgatat ttggggccaa 360

ggggcaatgg tcaccgtctc ttcag 385

<210> 52
<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 52
Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Arg Val Ser Ser Asn
20 25 30

Ser Ala Val Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly Leu Glu
35 40 45

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Tyr Asp Tyr Ala
50 55 60

Glu Ser Val Lys Ser Arg Ile Val Ile Asp Pro Asp Thr Ser Lys Asn
65 70 75 80

Gln Val Ser Leu Gln Leu Asn Ser Val Thr Pro Glu Asp Ser Ala Ile
85 90 95

Tyr Tyr Cys Ala Arg Gly Gly His Ile Thr Glu Phe Gly Leu Asn Ile
100 105 110

Asp Ala Tyr Asp Ile Trp Gly Gln Gly Ala Met Val Thr Val Ser Ser
115 120 125

<210> 53
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 53
Ser Asn Ser Ala Val Trp Asn
1 5

<210> 54
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 54
Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Tyr Asp Tyr Ala Glu Ser Val
1 5 10 15

Lys Ser

<210> 55
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 55
Gly Gly His Ile Thr Glu Phe Gly Leu Asn Ile Asp Ala Tyr Asp Ile
1 5 10 15

<210> 56

<211> 307
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 56
gacatccaga tgacccagtc tccgtcctcc ctgtctgcat ctgtaggaga cagagtcacc 60

atctcttgcc gggcacagag ccttagcagc tacttacatt ggtatcagca gaaaccaggg 120

caaccccta aactcctgat ctatgctgca accactttgc aaagtggggt cccatcacgg 180

ttcagtggta gtggatctgg gacagatttc actctcacca tcagtacttt ccaagctgaa 240

gatgttgcca cttactattg tcaacagagt cggacgttcg gccaagggac caaggtggag 300

atcaaac 307

<210> 57
<211> 102
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 57
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Ser Cys Arg Ala Gln Ser Leu Ser Ser Tyr Leu
20 25 30

His Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro Lys Leu Leu Ile Tyr
35 40 45

Ala Ala Thr Thr Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly Ser
50 55 60

Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Thr Phe Gln Ala Glu
65 70 75 80

Asp Val Ala Thr Tyr Tyr Cys Gln Gln Ser Arg Thr Phe Gly Gln Gly
85 90 95

Thr Lys Val Glu Ile Lys
100

<210> 58
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 58
Arg Ala Gln Ser Leu Ser Ser Tyr Leu His
1 5 10

<210> 59
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 59
Ala Ala Thr Thr Leu Gln Ser
1 5

<210> 60
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 60
Gln Gln Ser Arg Thr
1 5

<210> 61
<211> 385
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 61
caggtacagc tgcagcagtc aggtccagga ctggtgaagc cctcgcagac cctctccctc 60

acctgtgtca tctccggaga cactgtctct agcaacagag ctacttggaa ttggatgagg 120

cagtccccat tgagaggcct tgagtggctg ggaaggacat actacaggtc caagtggtat 180

aatgattacg cagtttctgt gaaaagtcga gtagtcatca acccagacac atccaagaac 240

caagtctccc tgcagttgaa cactgtgact cccgatgact cgggtgtata cttttgtgca 300

agaggtggcc acatcacggt ctttggagtg aatattgacg cttttgacat ctggggcctc 360

gggacaaagg tcaccgtctc ttcag 385

<210> 62

<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 62
Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Val Ile Ser Gly Asp Thr Val Ser Ser Asn
20 25 30

Arg Ala Thr Trp Asn Trp Met Arg Gln Ser Pro Leu Arg Gly Leu Glu
35 40 45

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala
50 55 60

Val Ser Val Lys Ser Arg Val Val Ile Asn Pro Asp Thr Ser Lys Asn
65 70 75 80

Gln Val Ser Leu Gln Leu Asn Thr Val Thr Pro Asp Asp Ser Gly Val
85 90 95

Tyr Phe Cys Ala Arg Gly Gly His Ile Thr Val Phe Gly Val Asn Ile
100 105 110

Asp Ala Phe Asp Ile Trp Gly Leu Gly Thr Lys Val Thr Val Ser Ser
115 120 125

<210> 63
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 63
Ser Asn Arg Ala Thr Trp Asn
1 5

<210> 64
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 64
Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala Val Ser Val
1   5   10   15

Lys Ser

<210> 65
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 65
Gly Gly His Ile Thr Val Phe Gly Val Asn Ile Asp Ala Phe Asp Ile
1   5   10   15

<210> 66
<211> 310
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      polynucleotide

<400> 66
gacatccagg tgacccagtc tccatcctcc ctgtctgcat ctgtaggaga cagagttacc 60

atctcttgcc gggcaagtca gagacttaat agttatctac attggtatca gcagacacca 120

gggcaagccc cgaagctgct gatctatgca acgtccactt tgcaaagtgg ggtctcacca 180

agattcagtg gcagtggatc tgggacagat ttcactctca ccatcagcag tctccaacct 240

gaagatgttg caacttacta ctgtcaattg agtcggacgt tcggccacgg gaccaaggtt 300

gaaatcaaac   310

<210> 67
<211> 103
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      polypeptide

<400> 67
Asp Ile Gln Val Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1   5   10   15

Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Arg Leu Asn Ser Tyr
            20   25   30

Leu His Trp Tyr Gln Gln Thr Pro Gly Gln Ala Pro Lys Leu Leu Ile
        35   40   45

Tyr Ala Thr Ser Thr Leu Gln Ser Gly Val Ser Pro Arg Phe Ser Gly
    50   55   60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65   70   75   80

Glu Asp Val Ala Thr Tyr Tyr Cys Gln Leu Ser Arg Thr Phe Gly His
                85   90   95

Gly Thr Lys Val Glu Ile Lys
            100

<210> 68
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 68
Arg Ala Ser Gln Arg Leu Asn Ser Tyr Leu His
1   5   10

<210> 69
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 69
Ala Thr Ser Thr Leu Gln Ser
1   5

<210> 70
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 70
Gln Leu Ser Arg Thr
1   5

<210> 71
<211> 385

<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 71
caggtacagc tgcagcagtc aggtccagga ctggtgaagc cctcgcagac cctctccctc 60

acctgtgtca tctccggaga cactgtctct agcaacagag ctacttggaa ttggatgagg 120

cagtccccat tgagaggcct tgagtggctg ggaaggacat actacaggtc caagtggtat 180

aatgattacg cagtttctgt gaaaagtcga gtagtcatca acccagacac atccaagaac 240

caagtctccc tgcagttgaa cactgtgact cccgatgact cgggtgtata cttttgtgca 300

agaggtggcc acatcacggt ctttggagtg aatattgacg cttttgacat ctggggcctc 360

gggacaaagg tcaccgtctc ttcag 385

<210> 72
<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 72
Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Val Ile Ser Gly Asp Thr Val Ser Ser Asn
20 25 30

Arg Ala Thr Trp Asn Trp Met Arg Gln Ser Pro Leu Arg Gly Leu Glu
35 40 45

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala
50 55 60

Val Ser Val Lys Ser Arg Val Val Ile Asn Pro Asp Thr Ser Lys Asn
65 70 75 80

Gln Val Ser Leu Gln Leu Asn Thr Val Thr Pro Asp Asp Ser Gly Val
85 90 95

Tyr Phe Cys Ala Arg Gly Gly His Ile Thr Val Phe Gly Val Asn Ile
100 105 110

Asp Ala Phe Asp Ile Trp Gly Leu Gly Thr Lys Val Thr Val Ser Ser
115 120 125

<210> 73
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 73
Ser Asn Arg Ala Thr Trp Asn
1 5

<210> 74
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 74
Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala Val Ser Val
1 5 10 15

Lys Ser

<210> 75
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 75
Gly Gly His Ile Thr Val Phe Gly Val Asn Ile Asp Ala Phe Asp Ile
1 5 10 15

<210> 76
<211> 310
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 76
gacatccaga tgacccagtc tccatcctcc ctgtctgcat ctgtaggaga cagagttacc 60

atctcttgcc gggcaagtca gagacttaat agttatctac attggtatca gcagacacca 120

gggcaagccc cgaagctgct gatctatgca acgtccactt tgcaaagtgg ggtctcacca 180

agattcagtg gcagtggatc tgggacagat ttcactctca ccatcagcag tctccaacct 240

gaagatgttg caacttacta ctgtcaattg agtcggacgt tcggccacgg gaccaaggtg 300

gaaatcaaac 310

<210> 77
<211> 103
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 77
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Arg Leu Asn Ser Tyr
20 25 30

Leu His Trp Tyr Gln Gln Thr Pro Gly Gln Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Ala Thr Ser Thr Leu Gln Ser Gly Val Ser Pro Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Glu Asp Val Ala Thr Tyr Tyr Cys Gln Leu Ser Arg Thr Phe Gly His
85 90 95

Gly Thr Lys Val Glu Ile Lys
100

<210> 78
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 78
Arg Ala Ser Gln Arg Leu Asn Ser Tyr Leu His
1 5 10

<210> 79
<211> 7
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 79
Ala Thr Ser Thr Leu Gln Ser
1 5

<210> 80
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 80
Gln Leu Ser Arg Thr
1 5

<210> 81
<211> 385
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 81
caagtagagc tgcagcagtc aggtccagga ctggtgaagc cctcgcagac cctctcactc 60

acctgtgcca tctccgggga cagtgtctct agcaacagtg ctacttggaa ctggatcagg 120

cagtccccat cgagaggcct tgagtggctg ggaaggacat actacaggtc caagtggtat 180

aatgattatg cagattttct gaaaaggcga ataaccatca atccagacac atccaacaac 240

gaggtctccc tgcggctgac ctctgtgact cccgacgaca cggctttgta ttactgtgca 300

agaggtggcc acattacggt gtttggagtg aatattgacg cctttgacgt ctggggccaa 360

gggacaatgg ccaccgtctc ttcag 385

<210> 82
<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 82
Gln Val Glu Leu Gln Gln Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Ser Val Ser Ser Asn
20 25 30

Ser Ala Thr Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly Leu Glu
35 40 45

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala
50 55 60

Asp Phe Leu Lys Arg Arg Ile Thr Ile Asn Pro Asp Thr Ser Asn Asn
65 70 75 80

Glu Val Ser Leu Arg Leu Thr Ser Val Thr Pro Asp Asp Thr Ala Leu
85 90 95

Tyr Tyr Cys Ala Arg Gly Gly His Ile Thr Val Phe Gly Val Asn Ile
100 105 110

Asp Ala Phe Asp Val Trp Gly Gln Gly Thr Met Ala Thr Val Ser Ser
115 120 125

<210> 83
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 83
Ser Asn Ser Ala Thr Trp Asn
1 5

<210> 84
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 84
Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala Asp Phe Leu
1 5 10 15

Lys Arg

<210> 85
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

peptide

<400> 85
Gly Gly His Ile Thr Val Phe Gly Val Asn Ile Asp Ala Phe Asp Val
1 5 10 15

<210> 86
<211> 310
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 86
gacatccagg tgacccagtc tccatcctcc ctgtctgcat ctgtaggaga cagaatcacc 60

atctcttgcc ggacaagtca gagccttagg agctatttac attggtatca gcaaaaacca 120

gggaaagccc ctaagctcct gatctatgct tcatccactt tacaaagtgg ggtcccatca 180

aggttcagtg gcagtggatc tgggacagat ttcactctca ccatcagcaa tctccaacct 240

gaagattttg caacttacta ctgtcaactg agtcggacgt tcggccaagg gaccaaggtt 300

gaaatcaaac 310

<210> 87
<211> 103
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 87
Asp Ile Gln Val Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Ile Thr Ile Ser Cys Arg Thr Ser Gln Ser Leu Arg Ser Tyr
20 25 30

Leu His Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Ala Ser Ser Thr Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Asn Leu Gln Pro
65 70 75 80

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Leu Ser Arg Thr Phe Gly Gln
85 90 95

Gly Thr Lys Val Glu Ile Lys
100

<210> 88
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 88
Arg Thr Ser Gln Ser Leu Arg Ser Tyr Leu His
1 5 10

<210> 89
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 89
Ala Ser Ser Thr Leu Gln Ser
1 5

<210> 90
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 90
Gln Leu Ser Arg Thr
1 5

<210> 91
<211> 385
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 91
caggtacagc tgcagcagtc aggtccagga ctggtgaagc cctcgcagac cctctcactc 60

acctgtgcca tctccgggga cagtgtctct agcaacagtg ctacttggaa ctggatcagg 120

cagtccccat cgagaggcct tgagtggctg ggaaggacat actacaggtc caagtggtat 180

aatgattatg cagattttct gaaaaggcga ataaccatca atccagacac atccaacaac 240

gaggtctccc tgcggctgac ctctgtgact cccgacgaca cggctttgta ttactgtgca 300

agaggtggcc acattacggt gtttggagtg aatattgacg cctttgacgt ctggggccaa 360

gggacaatgg tcaccgtctc ttcag 385

<210> 92
<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 92
Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Ser Val Ser Ser Asn
20 25 30

Ser Ala Thr Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly Leu Glu
35 40 45

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala
50 55 60

Asp Phe Leu Lys Arg Arg Ile Thr Ile Asn Pro Asp Thr Ser Asn Asn
65 70 75 80

Glu Val Ser Leu Arg Leu Thr Ser Val Thr Pro Asp Asp Thr Ala Leu
85 90 95

Tyr Tyr Cys Ala Arg Gly Gly His Ile Thr Val Phe Gly Val Asn Ile
100 105 110

Asp Ala Phe Asp Val Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser
115 120 125

<210> 93
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 93
Ser Asn Ser Ala Thr Trp Asn
1 5

<210> 94

<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 94
Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala Asp Phe Leu
1 5 10 15

Lys Arg

<210> 95
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 95
Gly Gly His Ile Thr Val Phe Gly Val Asn Ile Asp Ala Phe Asp Val
1 5 10 15

<210> 96
<211> 310
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 96
gacatccaga tgacccagtc tccatcctcc ctgtctgcat ctgtaggaga cagaatcacc 60

atctcttgcc ggacaagtca gagccttagg agctatttac attggtatca gcaaaaacca 120

gggaaagccc ctaagctcct gatctatgct tcatccactt tacaaagtgg ggtcccatca 180

aggttcagtg gcagtggatc tgggacagat ttcactctca ccatcagcaa tctccaacct 240

gaagattttg caacttacta ctgtcaactg agtcggacgt tcggccaagg gaccaaggtg 300

gagatcaaac 310

<210> 97
<211> 103
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 97

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                   10                  15


Asp Arg Ile Thr Ile Ser Cys Arg Thr Ser Gln Ser Leu Arg Ser Tyr
            20                  25                  30


Leu His Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
        35                  40                  45


Tyr Ala Ser Ser Thr Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly
    50                  55                  60


Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Asn Leu Gln Pro
65                  70                  75                  80


Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Leu Ser Arg Thr Phe Gly Gln
                85                  90                  95


Gly Thr Lys Val Glu Ile Lys
            100
```

<210> 98
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 98
```
Arg Thr Ser Gln Ser Leu Arg Ser Tyr Leu His
1               5                   10
```

<210> 99
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 99
```
Ala Ser Ser Thr Leu Gln Ser
1               5
```

<210> 100
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 100
Gln Leu Ser Arg Thr
1 5

<210> 101
<211> 384
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 101
caggtccagc tgcagcagag cggccccgga ctggtcaagc cttcacagac actgagcctg 60

acatgcgcca ttagcggaga tagcgtgagc tcctacaatg ccgtgtggaa ctggatcagg 120

cagtctccaa gtcgaggact ggagtggctg ggacgaacat actatagatc cgggtggtac 180

aatgactatg ctgaatcagt gaaaagccga attactatca accccgatac ctccaagaat 240

cagttctctc tgcagctgaa cagtgtgacc cctgaggaca cagccgtgta ctactgcgcc 300

agaagcggcc atatcaccgt ctttggcgtc aatgtggatg ctttcgatat gtgggggcag 360

gggactatgg tcaccgtgtc aagc 384

<210> 102
<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 102
Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Ser Val Ser Ser Tyr
20 25 30

Asn Ala Val Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly Leu Glu
35 40 45

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Gly Trp Tyr Asn Asp Tyr Ala
50 55 60

Glu Ser Val Lys Ser Arg Ile Thr Ile Asn Pro Asp Thr Ser Lys Asn
65 70 75 80

Gln Phe Ser Leu Gln Leu Asn Ser Val Thr Pro Glu Asp Thr Ala Val
85 90 95

Tyr Tyr Cys Ala Arg Ser Gly His Ile Thr Val Phe Gly Val Asn Val
100 105 110

Asp Ala Phe Asp Met Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser
115 120 125

<210> 103
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 103
Ser Tyr Asn Ala Val Trp Asn
1 5

<210> 104
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 104
Arg Thr Tyr Tyr Arg Ser Gly Trp Tyr Asn Asp Tyr Ala Glu Ser Val
1 5 10 15

Lys Ser

<210> 105
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 105
Ser Gly His Ile Thr Val Phe Gly Val Asn Val Asp Ala Phe Asp Met
1 5 10 15

<210> 106
<211> 309
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 106
gatattcaga tgacccagag cccttccagc ctgtccgctt cagtggggga tcgagtgacc 60

attacctgcc gaaccagcca gagcctgagc tcctacacgc actggtatca gcagaagccc 120

ggcaaagccc ctaagctgct gatctacgcc gcttctagtc ggctgtccgg agtgccaagc 180

cggttctccg gatctgggag tggaaccgac tttaccctga caatttcaag cctgcagccc 240

gaggatttcg ctacatacta ctgtcagcag agcagaactt tcgggcaggg cactaaggtg 300

gagatcaaa 309

<210> 107
<211> 103
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 107
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Thr Ser Gln Ser Leu Ser Ser Tyr
20 25 30

Thr His Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Ala Ala Ser Ser Arg Leu Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Arg Thr Phe Gly Gln
85 90 95

Gly Thr Lys Val Glu Ile Lys
100

<210> 108
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 108
Arg Thr Ser Gln Ser Leu Ser Ser Tyr Thr His
1 5 10

<210> 109
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 109
Ala Ala Ser Ser Arg Leu Ser
1 5

<210> 110
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 110
Gln Gln Ser Arg Thr
1 5

<210> 111
<211> 384
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 111
caggtccagc tgcagcagag cggccccgga ctggtcaagc cttcacagac actgagcctg 60

acatgcgcca ttagcggaga tagcgtgagc tcctacaatg ccgtgtggaa ctggatcagg 120

cagtctccaa gtcgaggact ggagtggctg ggacgaacat actatagatc cgggtggtac 180

aatgactatg ctgaatcagt gaaaagccga attactatca accccgatac ctccaagaat 240

cagttctctc tgcagctgaa cagtgtgacc cctgaggaca cagccgtgta ctactgcgcc 300

agaagcggcc atatcaccgt ctttggcgtc aatgtggatg ctttcgatat gtgggggcag 360

gggactatgg tcaccgtgtc aagc 384

<210> 112
<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 112
Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Ser Val Ser Ser Tyr
20 25 30

Asn Ala Val Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly Leu Glu
35 40 45

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Gly Trp Tyr Asn Asp Tyr Ala
50 55 60

Glu Ser Val Lys Ser Arg Ile Thr Ile Asn Pro Asp Thr Ser Lys Asn
65 70 75 80

Gln Phe Ser Leu Gln Leu Asn Ser Val Thr Pro Glu Asp Thr Ala Val
85 90 95

Tyr Tyr Cys Ala Arg Ser Gly His Ile Thr Val Phe Gly Val Asn Val
100 105 110

Asp Ala Phe Asp Met Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser
115 120 125

<210> 113
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 113
Ser Tyr Asn Ala Val Trp Asn
1 5

<210> 114
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 114
Arg Thr Tyr Tyr Arg Ser Gly Trp Tyr Asn Asp Tyr Ala Glu Ser Val
1 5 10 15

Lys Ser

<210> 115
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 115
Ser Gly His Ile Thr Val Phe Gly Val Asn Val Asp Ala Phe Asp Met
1 5 10 15

<210> 116
<211> 309
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 116
gatattcaga tgacccagag cccttccagc ctgtccgctt cagtggggga tcgagtgacc 60

attacctgcc gaaccagcca gagcctgagc tcctacacgc actggtatca gcagaagccc 120

ggcaaagccc ctaagctgct gatctacgcc gcttctagtc gggggtccgg agtgccaagc 180

cggttctccg gatctgggag tggaaccgac tttaccctga caatttcaag cctgcagccc 240

gaggatttcg ctacatacta ctgtcagcag agcagaactt tcgggcaggg cactaaggtg 300

gagatcaaa 309

<210> 117
<211> 103
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 117
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Thr Ser Gln Ser Leu Ser Ser Tyr
20 25 30

Thr His Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Ala Ala Ser Ser Arg Gly Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Arg Thr Phe Gly Gln
85 90 95

Gly Thr Lys Val Glu Ile Lys
100

<210> 118
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 118
Arg Thr Ser Gln Ser Leu Ser Ser Tyr Thr His
1 5 10

<210> 119
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 119
Ala Ala Ser Ser Arg Gly Ser
1 5

<210> 120
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 120
Gln Gln Ser Arg Thr
1 5

<210> 121
<211> 384
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 121

caggtccagc tgcagcagag cggccccgga ctggtcaagc cttcacagac actgagcctg 60

acatgcgcca ttagcggaga tagcgtgagc tcctacaatg ccgtgtggaa ctggatcagg 120

cagtctccaa gtcgaggact ggagtggctg ggacgaacat actatagatc cgggtggtac 180

aatgactatg ctgaatcagt gaaaagccga attactatca accccgatac ctccaagaat 240

cagttctctc tgcagctgaa cagtgtgacc cctgaggaca cagccgtgta ctactgcgcc 300

agaagcggcc atatcaccgt ctttggcgtc aatgtggatg ctttcgatat gtgggggcag 360

gggactatgg tcaccgtgtc aagc 384

<210> 122
<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 122
Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Ser Val Ser Ser Tyr
20 25 30

Asn Ala Val Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly Leu Glu
35 40 45

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Gly Trp Tyr Asn Asp Tyr Ala
50 55 60

Glu Ser Val Lys Ser Arg Ile Thr Ile Asn Pro Asp Thr Ser Lys Asn
65 70 75 80

Gln Phe Ser Leu Gln Leu Asn Ser Val Thr Pro Glu Asp Thr Ala Val
85 90 95

Tyr Tyr Cys Ala Arg Ser Gly His Ile Thr Val Phe Gly Val Asn Val
100 105 110

Asp Ala Phe Asp Met Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser
115 120 125

<210> 123
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

peptide

<400> 123
Ser Tyr Asn Ala Val Trp Asn
1 5

<210> 124
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 124
Arg Thr Tyr Tyr Arg Ser Gly Trp Tyr Asn Asp Tyr Ala Glu Ser Val
1 5 10 15

Lys Ser

<210> 125
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 125
Ser Gly His Ile Thr Val Phe Gly Val Asn Val Asp Ala Phe Asp Met
1 5 10 15

<210> 126
<211> 309
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 126
gatattcaga tgacccagag cccttccagc ctgtccgctt cagtggggga tcgagtgacc 60

attacctgcc gaaccagcca gagcctgagc tcctacgacc actggtatca gcagaagccc 120

ggcaaagccc ctaagctgct gatctacgcc gcttctagtc ggctgtccgg agtgccaagc 180

cggttctccg gatctgggag tggaaccgac tttaccctga caatttcaag cctgcagccc 240

gaggatttcg ctacatacta ctgtcagcag agcagaactt tcgggcaggg cactaaggtg 300

gagatcaaa 309

<210> 127
<211> 103

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 127
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Thr Ser Gln Ser Leu Ser Ser Tyr
20 25 30

Asp His Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Ala Ala Ser Ser Arg Leu Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Arg Thr Phe Gly Gln
85 90 95

Gly Thr Lys Val Glu Ile Lys
100

<210> 128
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 128
Arg Thr Ser Gln Ser Leu Ser Ser Tyr Asp His
1 5 10

<210> 129
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 129
Ala Ala Ser Ser Arg Leu Ser
1 5

<210> 130
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 130
Gln Gln Ser Arg Thr
1 5

<210> 131
<211> 384
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 131
caggtccagc tgcagcagag cggccccgga ctggtcaagc cttcacagac actgagcctg 60

acatgcgcca ttagcggaga tagcgtgagc tccaacaatg ccgtgtggaa ctggatcagg 120

cagtctccaa gtcgaggact ggagtggctg ggacgaacat actatagatc caagtggtac 180

aatgactatg ctgaatcagt gaaaagccga attactatca accccgatac ctccaagaat 240

cagttctctc tgcagctgaa cagtgtgacc cctgaggaca cagccgtgta ctactgcgcc 300

agaagcggcc atatcaccgt ctttggcgtc aatgtggatg ctttcgatat gtgggggcag 360

gggaccacag tcaccgtctc ctca 384

<210> 132
<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 132
Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Ser Val Ser Ser Asn
20 25 30

Asn Ala Val Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly Leu Glu
35 40 45

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala
50 55 60

```
Glu Ser Val Lys Ser Arg Ile Thr Ile Asn Pro Asp Thr Ser Lys Asn
65                  70                  75                  80


Gln Phe Ser Leu Gln Leu Asn Ser Val Thr Pro Glu Asp Thr Ala Val
                85                  90                  95


Tyr Tyr Cys Ala Arg Ser Gly His Ile Thr Val Phe Gly Val Asn Val
            100                 105                 110


Asp Ala Phe Asp Met Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
        115                 120                 125
```

<210> 133
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 133
```
Ser Asn Asn Ala Val Trp Asn
1               5
```

<210> 134
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 134
```
Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala Glu Ser Val
1               5                   10                  15


Lys Ser
```

<210> 135
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 135
```
Ser Gly His Ile Thr Val Phe Gly Val Asn Val Asp Ala Phe Asp Met
1               5                   10                  15
```

<210> 136

<211> 309
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 136
gatattcaga tgacccagag cccttccagc ctgtccgctt cagtggggga tcgagtgacc 60

attacctgcc gaaccagcca gagcctgagc tcctacacgc actggtatca gcagaagccc 120

ggcaaagccc ctaagctgct gatctacgcc gcttctagtc ggctgtccgg agtgccaagc 180

cggttctccg gatctgggag tggaaccgac tttaccctga caatttcaag cctgcagccc 240

gaggatttcg ctacatacta ctgtcagcag agcagaactt tcgggcaggg cactaaggtg 300

gagatcaaa 309

<210> 137
<211> 103
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 137
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Thr Ser Gln Ser Leu Ser Ser Tyr
20 25 30

Thr His Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Ala Ala Ser Ser Arg Leu Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Arg Thr Phe Gly Gln
85 90 95

Gly Thr Lys Val Glu Ile Lys
100

<210> 138
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 138
Arg Thr Ser Gln Ser Leu Ser Ser Tyr Thr His
1 5 10

<210> 139
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 139
Ala Ala Ser Ser Arg Leu Ser
1 5

<210> 140
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 140
Gln Gln Ser Arg Thr
1 5

<210> 141
<211> 384
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 141
caggtccagc tgcagcagag cggccccgga ctggtcaagc cttcacagac actgagcctg 60

acatgcgcca ttagcggaga tagcgtgagc tccaacaatg ccgtgtggaa ctggatcagg 120

cagtctccaa gtcgaggact ggagtggctg ggacgaacat actatagatc caagtggtac 180

aatgactatg ctgaatcagt gaaaagccga attactatca accccgatac ctccaagaat 240

cagttctctc tgcagctgaa cagtgtgacc cctgaggaca cagccgtgta ctactgcgcc 300

agaagcggcc atatcaccgt ctttggcgtc aatgtggatg ctttcgatat gtgggggcag 360

gggaccacag tcaccgtctc ctca 384

<210> 142

<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 142
Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Ser Val Ser Ser Asn
20 25 30

Asn Ala Val Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly Leu Glu
35 40 45

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala
50 55 60

Glu Ser Val Lys Ser Arg Ile Thr Ile Asn Pro Asp Thr Ser Lys Asn
65 70 75 80

Gln Phe Ser Leu Gln Leu Asn Ser Val Thr Pro Glu Asp Thr Ala Val
85 90 95

Tyr Tyr Cys Ala Arg Ser Gly His Ile Thr Val Phe Gly Val Asn Val
100 105 110

Asp Ala Phe Asp Met Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
115 120 125

<210> 143
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 143
Ser Asn Asn Ala Val Trp Asn
1 5

<210> 144
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 144
Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala Glu Ser Val
1   5   10   15

Lys Ser

<210> 145
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 145
Ser Gly His Ile Thr Val Phe Gly Val Asn Val Asp Ala Phe Asp Met
1   5   10   15

<210> 146
<211> 309
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 146
gatattcaga tgacccagag cccttccagc ctgtccgctt cagtggggga tcgagtgacc 60

attacctgcc gaaccagcca gagcctgagy tcctacacgc actggtatca gcagaagccc 120

ggcaaagccc ctaagctgct gatctacgcc gcttctagtc gggggtccgg agtgccaagc 180

cggttctccg gatctgggag tggaaccgac tttaccctga caatttcaag cctgcagccc 240

gaggatttcg ctacatacta ctgtcagcag agcagaactt tcgggcaggg cactaaggtg 300

gagatcaaa 309

<210> 147
<211> 103
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 147
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1   5   10   15

Asp Arg Val Thr Ile Thr Cys Arg Thr Ser Gln Ser Leu Ser Ser Tyr
            20   25   30

Thr His Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Ala Ala Ser Ser Arg Gly Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Arg Thr Phe Gly Gln
85 90 95

Gly Thr Lys Val Glu Ile Lys
100

<210> 148
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 148
Arg Thr Ser Gln Ser Leu Ser Ser Tyr Thr His
1 5 10

<210> 149
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 149
Ala Ala Ser Ser Arg Gly Ser
1 5

<210> 150
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 150
Gln Gln Ser Arg Thr
1 5

<210> 151
<211> 384

<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 151
caggtccagc tgcagcagag cggccccgga ctggtcaagc cttcacagac actgagcctg 60

acatgcgcca ttagcggaga tagcgtgagc tccaacaatg ccgtgtggaa ctggatcagg 120

cagtctccaa gtcgaggact ggagtggctg ggacgaacat actatagatc caagtggtac 180

aatgactatg ctgaatcagt gaaaagccga attactatca accccgatac ctccaagaat 240

cagttctctc tgcagctgaa cagtgtgacc cctgaggaca cagccgtgta ctactgcgcc 300

agaagcggcc atatcaccgt ctttggcgtc aatgtggatg ctttcgatat gtgggggcag 360

gggaccacag tcaccgtctc ctca 384

<210> 152
<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 152
Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Ser Val Ser Ser Asn
20 25 30

Asn Ala Val Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly Leu Glu
35 40 45

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala
50 55 60

Glu Ser Val Lys Ser Arg Ile Thr Ile Asn Pro Asp Thr Ser Lys Asn
65 70 75 80

Gln Phe Ser Leu Gln Leu Asn Ser Val Thr Pro Glu Asp Thr Ala Val
85 90 95

Tyr Tyr Cys Ala Arg Ser Gly His Ile Thr Val Phe Gly Val Asn Val
100 105 110

Asp Ala Phe Asp Met Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
115 120 125

<210> 153
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 153
Ser Asn Asn Ala Val Trp Asn
1 5

<210> 154
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 154
Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala Glu Ser Val
1 5 10 15

Lys Ser

<210> 155
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 155
Ser Gly His Ile Thr Val Phe Gly Val Asn Val Asp Ala Phe Asp Met
1 5 10 15

<210> 156
<211> 309
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 156
gatattcaga tgacccagag cccttccagc ctgtccgctt cagtggggga tcgagtgacc 60

attacctgcc gaaccagcca gagcctgagc tcctacctgc actggtatca gcagaagccc 120

ggcaaagccc ctaagctgct gatctacgcc gcttctagtc tgcagtccgg agtgccaagc 180

cggttctccg gatctgggag tggaaccgac tttaccctga caatttcaag cctgcagccc 240

gaggatttcg ctacatacta ctgtcagcag agcagaactt tcgggcaggg cactaaggtg 300

gagatcaaa 309

<210> 157
<211> 103
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 157
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Thr Ser Gln Ser Leu Ser Ser Tyr
20 25 30

Leu His Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Ala Ala Ser Ser Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Arg Thr Phe Gly Gln
85 90 95

Gly Thr Lys Val Glu Ile Lys
100

<210> 158
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 158
Arg Thr Ser Gln Ser Leu Ser Ser Tyr Leu His
1 5 10

<210> 159
<211> 7
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 159
Ala Ala Ser Ser Leu Gln Ser
1 5

<210> 160
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 160
Gln Gln Ser Arg Thr
1 5

<210> 161
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<220>
<221> MOD_RES
<222> (2)..(2)
<223> Asn or Tyr

<220>
<221> MOD_RES
<222> (3)..(3)
<223> Asn, Ser or Arg

<220>
<221> MOD_RES
<222> (5)..(5)
<223> Val or Thr

<400> 161
Ser Xaa Xaa Ala Xaa Trp Asn
1 5

<210> 162
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<220>
<221> MOD_RES

<222> (7)..(7)
<223> Lys or Gly

<220>
<221> MOD_RES
<222> (10)..(10)
<223> Asn or Tyr

<220>
<221> MOD_RES
<222> (14)..(14)
<223> Glu, Val or Asp

<220>
<221> MOD_RES
<222> (15)..(15)
<223> Ser or Phe

<220>
<221> MOD_RES
<222> (16)..(16)
<223> Val or Leu

<400> 162
Arg Thr Tyr Tyr Arg Ser Xaa Trp Tyr Xaa Asp Tyr Ala Xaa Xaa Xaa
1 5 10 15

Lys

<210> 163
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<220>
<221> MOD_RES
<222> (1)..(1)
<223> Ser or Gly

<220>
<221> MOD_RES
<222> (6)..(6)
<223> Val or Glu

<220>
<221> MOD_RES
<222> (9)..(9)
<223> Val or Leu

<220>
<221> MOD_RES
<222> (11)..(11)
<223> Val or Ile

<220>
<221> MOD_RES

<222> (14)..(14)
<223> Phe or Tyr

<220>
<221> MOD_RES
<222> (16)..(16)
<223> Met, Ile or Val

<400> 163
Xaa Gly His Ile Thr Xaa Phe Gly Xaa Asn Xaa Asp Ala Xaa Asp Xaa
1 5 10 15

<210> 164
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<220>
<221> MOD_RES
<222> (2)..(2)
<223> Thr, Ala or absent

<220>
<221> MOD_RES
<222> (3)..(3)
<223> Ser or Ala

<220>
<221> MOD_RES
<222> (5)..(5)
<223> Ser or Arg

<220>
<221> MOD_RES
<222> (7)..(7)
<223> Ser, Asn or Arg

<220>
<221> MOD_RES
<222> (10)..(10)
<223> Leu, Thr or Asp

<400> 164
Arg Xaa Xaa Gln Xaa Leu Xaa Ser Tyr Xaa His
1 5 10

<210> 165
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<220>

<221> MOD_RES
<222> (2)..(2)
<223> Ala, Thr or Ser

<220>
<221> MOD_RES
<222> (3)..(4)
<223> Ser or Thr

<220>
<221> MOD_RES
<222> (5)..(5)
<223> Leu or Arg

<220>
<221> MOD_RES
<222> (6)..(6)
<223> Gln, Leu or Gly

<400> 165
Ala Xaa Xaa Xaa Xaa Xaa Ser
1 5

<210> 166
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<220>
<221> MOD_RES
<222> (2)..(2)
<223> Gln or Leu

<400> 166
Gln Xaa Ser Arg Thr
1 5

<210> 167
<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 167
Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Ser Val Ser Ser Asn
20 25 30

Asn Ala Val Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly Leu Glu
35 40 45

```
Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala
    50                  55                  60

Glu Ser Val Lys Ser Arg Ile Thr Ile Asn Pro Asp Thr Ser Lys Asn
65                  70                  75                  80

Gln Phe Ser Leu Gln Leu Asn Ser Val Thr Pro Glu Asp Thr Ala Val
                85                  90                  95

Tyr Tyr Cys Ala Arg Ser Gly His Ile Thr Val Phe Gly Val Asn Val
            100                 105                 110

Asp Ala Phe Asp Met Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser
        115                 120                 125

<210> 168
<211> 103
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      polypeptide

<400> 168
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                   10                  15

Asp Arg Val Thr Ile Thr Cys Arg Thr Ser Gln Ser Leu Ser Ser Tyr
            20                  25                  30

Leu His Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
        35                  40                  45

Tyr Ala Ala Ser Ser Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly
    50                  55                  60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65                  70                  75                  80

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Arg Thr Phe Gly Gln
                85                  90                  95

Gly Thr Lys Val Glu Ile Lys
            100

<210> 169
<211> 221
<212> PRT
<213> Influenza A virus
```

<400> 169
Gly Ile Phe Gly Ala Ile Ala Gly Phe Ile Glu Asn Gly Trp Glu Gly
1 5 10 15

Met Val Asp Gly Trp Tyr Gly Phe Arg His Gln Asn Ser Glu Gly Ile
20 25 30

Gly Gln Ala Ala Asp Leu Lys Ser Thr Gln Ala Ala Ile Asn Gln Ile
35 40 45

Asn Gly Lys Leu Asn Arg Leu Ile Gly Lys Thr Asn Glu Lys Phe His
50 55 60

Gln Ile Glu Lys Glu Phe Ser Glu Val Glu Gly Arg Ile Gln Asp Leu
65 70 75 80

Glu Lys Tyr Val Glu Asp Thr Lys Ile Asp Leu Trp Ser Tyr Asn Ala
85 90 95

Glu Leu Leu Val Ala Leu Glu Asn Gln His Thr Ile Asp Leu Thr Asp
100 105 110

Ser Glu Met Asn Lys Leu Phe Glu Arg Thr Lys Lys Gln Leu Arg Glu
115 120 125

Asn Ala Glu Asp Met Gly Asn Gly Cys Phe Lys Ile Tyr His Lys Cys
130 135 140

Asp Asn Ala Cys Ile Gly Ser Ile Arg Asn Gly Thr Tyr Asp His Asp
145 150 155 160

Val Tyr Arg Asp Glu Ala Leu Asn Asn Arg Phe Gln Ile Lys Gly Val
165 170 175

Glu Leu Lys Ser Gly Tyr Lys Asp Trp Ile Leu Trp Ile Ser Phe Ala
180 185 190

Ile Ser Cys Phe Leu Leu Cys Val Ala Leu Leu Gly Phe Ile Met Trp
195 200 205

Ala Cys Gln Lys Gly Asn Ile Arg Cys Asn Ile Cys Ile
210 215 220

<210> 170
<211> 221
<212> PRT
<213> Influenza A virus

<400> 170

```
Gly Ile Phe Gly Ala Ile Ala Gly Phe Ile Glu Asn Gly Trp Glu Gly
1               5                   10                  15

Met Val Asp Gly Trp Tyr Gly Phe Arg His Gln Asn Ser Glu Gly Thr
            20                  25                  30

Gly Gln Ala Ala Asp Leu Lys Ser Thr Gln Ala Ala Ile Asn Gln Ile
        35                  40                  45

Asn Gly Lys Leu Asn Arg Leu Ile Glu Lys Thr Asn Glu Lys Phe His
    50                  55                  60

Gln Ile Glu Lys Glu Phe Ser Glu Val Glu Gly Arg Ile Gln Asp Leu
65                  70                  75                  80

Glu Lys Tyr Val Glu Asp Thr Lys Ile Asp Leu Trp Ser Tyr Asn Ala
                85                  90                  95

Glu Leu Leu Val Ala Leu Glu Asn Gln His Thr Ile Asp Leu Thr Asp
            100                 105                 110

Ser Glu Met Asn Lys Leu Phe Glu Arg Thr Lys Lys Gln Leu Arg Glu
        115                 120                 125

Asn Ala Glu Asp Met Gly Asn Gly Cys Phe Lys Ile Tyr His Lys Cys
    130                 135                 140

Asp Asn Ala Cys Ile Gly Ser Ile Arg Asn Gly Thr Tyr Asp His Asp
145                 150                 155                 160

Val Tyr Arg Asp Glu Ala Leu Asn Asn Arg Phe Gln Ile Lys Gly Val
                165                 170                 175

Glu Leu Lys Ser Gly Tyr Lys Asp Trp Ile Leu Trp Ile Ser Phe Ala
            180                 185                 190

Ile Ser Cys Phe Leu Leu Cys Val Val Leu Leu Gly Phe Ile Met Trp
        195                 200                 205

Ala Cys Gln Lys Gly Asn Ile Arg Cys Asn Ile Cys Ile
    210                 215                 220


<210> 171
<211> 221
<212> PRT
<213> Influenza A virus

<400> 171
Gly Leu Phe Gly Ala Ile Ala Gly Phe Ile Glu Asn Gly Trp Glu Gly
1               5                   10                  15
```

```
Met Ile Asp Gly Trp Tyr Gly Phe Arg His Gln Asn Ser Glu Gly Thr
            20                  25                  30

Gly Gln Ala Ala Asp Leu Lys Ser Thr Gln Ala Ala Ile Asp Gln Ile
        35                  40                  45

Asn Gly Lys Leu Asn Arg Val Ile Glu Lys Thr Asn Glu Lys Phe His
    50                  55                  60

Gln Ile Glu Lys Glu Phe Ser Glu Val Glu Gly Arg Ile Gln Asp Leu
65                  70                  75                  80

Glu Lys Tyr Val Glu Asp Thr Lys Ile Asp Leu Trp Ser Tyr Asn Ala
                85                  90                  95

Glu Leu Leu Val Ala Leu Glu Asn Gln His Thr Ile Asp Leu Thr Asp
            100                 105                 110

Ser Glu Met Asn Lys Leu Phe Glu Lys Thr Arg Arg Gln Leu Arg Glu
        115                 120                 125

Asn Ala Glu Glu Met Gly Asn Gly Cys Phe Lys Ile Tyr His Lys Cys
    130                 135                 140

Asp Asn Ala Cys Ile Glu Ser Ile Arg Asn Gly Thr Tyr Asp His Asp
145                 150                 155                 160

Val Tyr Arg Asp Glu Ala Leu Asn Asn Arg Phe Gln Ile Lys Gly Val
                165                 170                 175

Glu Leu Lys Ser Gly Tyr Lys Asp Trp Ile Leu Trp Ile Ser Phe Ala
            180                 185                 190

Ile Ser Cys Phe Leu Leu Cys Val Val Leu Leu Gly Phe Ile Met Trp
        195                 200                 205

Ala Cys Gln Arg Gly Asn Ile Arg Cys Asn Ile Cys Ile
    210                 215                 220


<210> 172
<211> 221
<212> PRT
<213> Influenza A virus

<400> 172
Gly Leu Phe Gly Ala Ile Ala Gly Phe Ile Glu Asn Gly Trp Glu Gly
1               5                   10                  15
```

```
Met Ile Asp Gly Trp Tyr Gly Phe Arg His Gln Asn Ser Glu Gly Thr
            20                  25                  30

Gly Gln Ala Ala Asp Leu Lys Ser Thr Gln Ala Ala Ile Asp Gln Ile
        35                  40                  45

Asn Gly Lys Leu Asn Arg Val Ile Glu Lys Thr Asn Glu Lys Phe His
    50                  55                  60

Gln Ile Glu Lys Glu Phe Ser Glu Val Glu Gly Arg Ile Gln Asp Leu
65                  70                  75                  80

Glu Lys Tyr Val Glu Asp Thr Lys Ile Asp Leu Trp Ser Tyr Asn Ala
                85                  90                  95

Glu Leu Leu Val Ala Leu Glu Asn Gln His Thr Ile Asp Leu Thr Asp
            100                 105                 110

Ser Glu Met Asn Lys Leu Phe Glu Lys Thr Arg Arg Gln Leu Arg Glu
        115                 120                 125

Asn Ala Glu Asp Met Gly Asn Gly Cys Phe Lys Ile Tyr His Lys Cys
    130                 135                 140

Asp Asn Ala Cys Ile Glu Ser Ile Arg Asn Gly Thr Tyr Asp His Asp
145                 150                 155                 160

Val Tyr Arg Asp Glu Ala Leu Asn Asn Arg Phe Gln Ile Lys Gly Val
                165                 170                 175

Glu Leu Lys Ser Gly Tyr Lys Asp Trp Ile Leu Trp Ile Ser Phe Ala
            180                 185                 190

Ile Ser Cys Phe Leu Leu Cys Val Val Leu Leu Gly Phe Ile Met Trp
        195                 200                 205

Ala Cys Gln Arg Gly Asn Ile Arg Cys Asn Ile Cys Ile
    210                 215                 220
```