SEQUENCE LISTING

<110> Regeneron Pharmaceuticals, Inc.

<120> Inhibition Of HSD17B13 In The Treatment Of Liver Disease In Patients Expressing The PNPLA3 I148M Variation

<130> 189238.01002 (10390WO01)

<150> 62/570,985
<151> 2017-10-11

<160> 66

<170> PatentIn version 3.5

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<212> DNA
<213> Homo sapien

<400> 7
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auuacuggag cugggcaugg aauaggcagg cagacuacuu augaauuugc aaaacgacag 180

agcauauugg uucuguggga uauuaauaag cgcggugugg aggaaacugc agcugagugc 240

cgaaaacuag gcgucacugc gcaugcguau gugguagacu gcagcaacag agaagagauc 300

uaucgcucuc uaaaucaggu gaagaaagaa gugggugaug uaacaaucgu ggugaauaau 360

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gaagggauuc cuuaccucau cccauauugu uccagcaaau uugccgcugu uggcuuucac 660

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uuggagacag augaagucgu aagaagucug auagauggaa uacuuaccaa uaagaaaaug 840

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<210> 8
<211> 852
<212> DNA
<213> Homo sapien

<400> 8
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auuacuggag cugggcaugg aauaggcagg cagacuacuu augaauuugc aaaacgacag 180

agcauauugg uucuguggga uauuaauaag cgcggugugg aggaaacugc agcugagugc 240

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<210> 9
<211> 714
<212> DNA
<213> Homo sapien

<400> 9
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auuacuggag cugggcaugg aauaggcagg cagacuacuu augaauuugc aaaacgacag 180

agcauauugg uucuguggga uauuaauaag gugaagaaag aaguggguga uguaacaauc 240

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auuaccaaga cauuugaggu caacauccua ggacauuuuu ggaucacaaa agcacuucuu 360

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gaagggauuc cuuaccucau cccauauugu uccagcaaau uugccgcugu uggcuuucac 480

agaggucuga caucagaacu ucaggccuug ggaaaaacug guaucaaaac cucaugucuc 540

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uuggagacag augaagucgu aagaagucug auagauggaa uacuuaccaa uaagaaaaug 660

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<211> 894
<212> DNA
<213> Homo sapien

<400> 10
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cgaaaacuag gcgucacugc gcaugcguau gugguagacu gcagcaacag agaagagauc 300

uaucgcucuc uaaaucaggu gaagaaagaa gugggugaug uaacaaucgu ggugaauaau 360

gcugggacag uauauccagc cgaucuucuc agcaccaagg augaagagau uaccaagaca 420

uuugagguca acauccuagg acauuuuugg aauggaaagg acaucagaag uaauuacuug 480

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gaagggauuc cuuaccucau cccauauugu uccagcaaau uugccgcugu uggcuuucac 660

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uuggagacag augaagucgu aagaagucug auagauggaa uacuuaccaa uaagaaaaug 840

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<210> 11
<211> 813
<212> DNA
<213> Homo sapien

<400> 11
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auuacuggag cugggcaugg aauaggcagg cagacuacuu augaauuugc aaaacgacag 180

agcauauugg uucuguggga uauuaauaag cgcggugugg aggaaacugc agcugagugc 240

cgaaaacuag gcgucacugc gcaugcguau gugguagacu gcagcaacag agaagagauc 300

uaucgcucuc uaaaucaggu gaagaaagaa gugggugaug uaacaaucgu ggugaauaau 360

gcugggacag uauauccagc cgaucuucuc agcaccaagg augaagagau uaccaagaca 420

uuugagguca acauccuagg acauuuuugg aucacaaaag cacuucuucc aucgaugaug 480

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<210> 12
<211> 900
<212> DNA

<213> Homo sapien

<400> 12
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<210> 13
<211> 792
<212> DNA
<213> Homo sapien

<400> 13
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atcaaaatga aa 792

<210> 14
<211> 783
<212> DNA
<213> Homo sapien

<400> 14
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aaa 783

<210> 15
<211> 822
<212> DNA
<213> Homo sapien

<400> 15
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<210> 16
<211> 972
<212> DNA
<213> Homo sapien

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<211> 852
<212> DNA
<213> Homo sapien

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<210> 18
<211> 714
<212> DNA
<213> Homo sapien

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atttttgttc catcgtatat caatatcttt ctgagactac agaaggtttc ttcc 714

<210> 19
<211> 894
<212> DNA
<213> Homo sapien

<400> 19
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ttggagacag atgaagtcgt aagaagtctg atagatggaa tacttaccaa taagaaaatg 840

atttttgttc catcgtatat caatatcttt ctgagactac agaaggtttc ttcc 894

<210> 20
<211> 813
<212> DNA

<213> Homo sapien

<400> 20

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gtgaatactg ggttcaccaa aaatccaagc acaagattat ggcctgtatt ggagacagat 720

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tcgtatatca atatctttct gagactacag aag 813

<210> 21
<211> 300
<212> PRT
<213> Homo sapien

<400> 21

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20 25 30

Ser Val Ala Gly Glu Ile Val Leu Ile Thr Gly Ala Gly His Gly Ile

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Gly Arg Gln Thr Thr Tyr Glu Phe Ala Lys Arg Gln Ser Ile Leu Val
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Leu Trp Asp Ile Asn Lys Arg Gly Val Glu Glu Thr Ala Ala Glu Cys
65                  70                  75                  80

Arg Lys Leu Gly Val Thr Ala His Ala Tyr Val Val Asp Cys Ser Asn
                85                  90                  95

Arg Glu Glu Ile Tyr Arg Ser Leu Asn Gln Val Lys Lys Glu Val Gly
            100                 105                 110

Asp Val Thr Ile Val Val Asn Asn Ala Gly Thr Val Tyr Pro Ala Asp
        115                 120                 125

Leu Leu Ser Thr Lys Asp Glu Glu Ile Thr Lys Thr Phe Glu Val Asn
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Ile Leu Gly His Phe Trp Ile Thr Lys Ala Leu Leu Pro Ser Met Met
145                 150                 155                 160

Glu Arg Asn His Gly His Ile Val Thr Val Ala Ser Val Cys Gly His
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Glu Gly Ile Pro Tyr Leu Ile Pro Tyr Cys Ser Ser Lys Phe Ala Ala
            180                 185                 190

Val Gly Phe His Arg Gly Leu Thr Ser Glu Leu Gln Ala Leu Gly Lys
        195                 200                 205

Thr Gly Ile Lys Thr Ser Cys Leu Cys Pro Val Phe Val Asn Thr Gly
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Phe Thr Lys Asn Pro Ser Thr Arg Leu Trp Pro Val Leu Glu Thr Asp
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225 230 235 240

Glu Val Val Arg Ser Leu Ile Asp Gly Ile Leu Thr Asn Lys Lys Met
245 250 255

Ile Phe Val Pro Ser Tyr Ile Asn Ile Phe Leu Arg Leu Gln Lys Phe
260 265 270

Leu Pro Glu Arg Ala Ser Ala Ile Leu Asn Arg Met Gln Asn Ile Gln
275 280 285

Phe Glu Ala Val Val Gly His Lys Ile Lys Met Lys
290 295 300

<210> 22
<211> 264
<212> PRT
<213> Homo sapien

<400> 22

Met Asn Ile Ile Leu Glu Ile Leu Leu Leu Leu Ile Thr Ile Ile Tyr
1 5 10 15

Ser Tyr Leu Glu Ser Leu Val Lys Phe Phe Ile Pro Gln Arg Arg Lys
20 25 30

Ser Val Ala Gly Glu Ile Val Leu Ile Thr Gly Ala Gly His Gly Ile
35 40 45

Gly Arg Gln Thr Thr Tyr Glu Phe Ala Lys Arg Gln Ser Ile Leu Val
50 55 60

Leu Trp Asp Ile Asn Lys Val Lys Lys Glu Val Gly Asp Val Thr Ile
65 70 75 80

Val Val Asn Asn Ala Gly Thr Val Tyr Pro Ala Asp Leu Leu Ser Thr
85 90 95

```
Lys Asp Glu Glu Ile Thr Lys Thr Phe Glu Val Asn Ile Leu Gly His
            100                 105                 110

Phe Trp Ile Thr Lys Ala Leu Leu Pro Ser Met Met Glu Arg Asn His
        115                 120                 125

Gly His Ile Val Thr Val Ala Ser Val Cys Gly His Glu Gly Ile Pro
    130                 135                 140

Tyr Leu Ile Pro Tyr Cys Ser Ser Lys Phe Ala Ala Val Gly Phe His
145                 150                 155                 160

Arg Gly Leu Thr Ser Glu Leu Gln Ala Leu Gly Lys Thr Gly Ile Lys
                165                 170                 175

Thr Ser Cys Leu Cys Pro Val Phe Val Asn Thr Gly Phe Thr Lys Asn
            180                 185                 190

Pro Ser Thr Arg Leu Trp Pro Val Leu Glu Thr Asp Glu Val Val Arg
        195                 200                 205

Ser Leu Ile Asp Gly Ile Leu Thr Asn Lys Lys Met Ile Phe Val Pro
    210                 215                 220

Ser Tyr Ile Asn Ile Phe Leu Arg Leu Gln Lys Phe Leu Pro Glu Arg
225                 230                 235                 240

Ala Ser Ala Ile Leu Asn Arg Met Gln Asn Ile Gln Phe Glu Ala Val
                245                 250                 255

Val Gly His Lys Ile Lys Met Lys
            260
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<210> 23
<211> 261

<212> PRT
<213> Homo sapien

<400> 23

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Met Asn Ile Ile Leu Glu Ile Leu Leu Leu Leu Ile Thr Ile Ile Tyr
1               5                  10                  15

Ser Tyr Leu Glu Ser Leu Val Lys Phe Phe Ile Pro Gln Arg Arg Lys
            20                  25                  30

Ser Val Ala Gly Glu Ile Val Leu Ile Thr Gly Ala Gly His Gly Ile
        35                  40                  45

Gly Arg Gln Thr Thr Tyr Glu Phe Ala Lys Arg Gln Ser Ile Leu Val
    50                  55                  60

Leu Trp Asp Ile Asn Lys Arg Gly Val Glu Glu Thr Ala Ala Glu Cys
65                  70                  75                  80

Arg Lys Leu Gly Val Thr Ala His Ala Tyr Val Val Asp Cys Ser Asn
                85                  90                  95

Arg Glu Glu Ile Tyr Arg Ser Leu Asn Gln Val Lys Lys Glu Val Gly
            100                 105                 110

Asp Val Thr Ile Val Val Asn Asn Ala Gly Thr Val Tyr Pro Ala Asp
        115                 120                 125

Leu Leu Ser Thr Lys Asp Glu Glu Ile Thr Lys Thr Phe Glu Val Asn
    130                 135                 140

Ile Leu Gly His Phe Trp Ile Thr Lys Ala Leu Leu Pro Ser Met Met
145                 150                 155                 160

Glu Arg Asn His Gly His Ile Val Thr Val Ala Ser Val Cys Gly His
                165                 170                 175
```

```
Glu Gly Ile Pro Tyr Leu Ile Pro Tyr Cys Ser Ser Lys Phe Ala Ala
            180                 185                 190


Val Gly Phe His Arg Gly Leu Thr Ser Glu Leu Gln Ala Leu Gly Lys
        195                 200                 205


Thr Gly Ile Lys Thr Ser Cys Leu Cys Pro Val Phe Val Asn Thr Gly
    210                 215                 220


Phe Thr Lys Asn Pro Ser Thr Arg Phe Leu Pro Glu Arg Ala Ser Ala
225                 230                 235                 240


Ile Leu Asn Arg Met Gln Asn Ile Gln Phe Glu Ala Val Val Gly His
                245                 250                 255


Lys Ile Lys Met Lys
            260
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<210> 24
<211> 274
<212> PRT
<213> Homo sapien

<400> 24

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Met Asn Ile Ile Leu Glu Ile Leu Leu Leu Leu Ile Thr Ile Ile Tyr
1               5                   10                  15


Ser Tyr Leu Glu Ser Leu Val Lys Phe Phe Ile Pro Gln Arg Arg Lys
            20                  25                  30


Ser Val Ala Gly Glu Ile Val Leu Ile Thr Gly Ala Gly His Gly Ile
        35                  40                  45


Gly Arg Gln Thr Thr Tyr Glu Phe Ala Lys Arg Gln Ser Ile Leu Val
    50                  55                  60
```

```
Leu Trp Asp Ile Asn Lys Arg Gly Val Glu Glu Thr Ala Ala Glu Cys
65                  70                  75                  80


Arg Lys Leu Gly Val Thr Ala His Ala Tyr Val Val Asp Cys Ser Asn
                85                  90                  95


Arg Glu Glu Ile Tyr Arg Ser Leu Asn Gln Val Lys Lys Glu Val Gly
            100                 105                 110


Asp Val Thr Ile Val Val Asn Asn Ala Gly Thr Val Tyr Pro Ala Asp
        115                 120                 125


Leu Leu Ser Thr Lys Asp Glu Glu Ile Thr Lys Thr Phe Glu Val Asn
    130                 135                 140


Ile Leu Gly His Phe Trp Ile Thr Lys Ala Leu Leu Pro Ser Met Met
145                 150                 155                 160


Glu Arg Asn His Gly His Ile Val Thr Val Ala Ser Val Cys Gly His
                165                 170                 175


Glu Gly Ile Pro Tyr Leu Ile Pro Tyr Cys Ser Ser Lys Phe Ala Ala
            180                 185                 190


Val Gly Phe His Arg Gly Leu Thr Ser Glu Leu Gln Ala Leu Gly Lys
        195                 200                 205


Thr Gly Ile Lys Thr Ser Cys Leu Cys Pro Val Phe Val Asn Thr Gly
    210                 215                 220


Phe Thr Lys Asn Pro Ser Thr Arg Leu Trp Pro Val Leu Glu Thr Asp
225                 230                 235                 240


Glu Val Val Arg Ser Leu Ile Asp Gly Ile Leu Thr Asn Lys Lys Met
                245                 250                 255
```

```
Ile Phe Val Pro Ser Tyr Ile Asn Ile Phe Leu Arg Leu Gln Lys Val
            260                 265                 270


Ser Ser



<210>  25
<211>  324
<212>  PRT
<213>  Homo sapien

<400>  25

Met Asn Ile Ile Leu Glu Ile Leu Leu Leu Leu Ile Thr Ile Ile Tyr
1               5                   10                  15


Ser Tyr Leu Glu Ser Leu Val Lys Phe Phe Ile Pro Gln Arg Arg Lys
            20                  25                  30


Ser Val Ala Gly Glu Ile Val Leu Ile Thr Gly Ala Gly His Gly Ile
        35                  40                  45


Gly Arg Gln Thr Thr Tyr Glu Phe Ala Lys Arg Gln Ser Ile Leu Val
    50                  55                  60


Leu Trp Asp Ile Asn Lys Arg Gly Val Glu Glu Thr Ala Ala Glu Cys
65                  70                  75                  80


Arg Lys Leu Gly Val Thr Ala His Ala Tyr Val Val Asp Cys Ser Asn
                85                  90                  95


Arg Glu Glu Ile Tyr Arg Ser Leu Asn Gln Val Lys Lys Glu Val Gly
            100                 105                 110


Asp Val Thr Ile Val Val Asn Asn Ala Gly Thr Val Tyr Pro Ala Asp
        115                 120                 125


Leu Leu Ser Thr Lys Asp Glu Glu Ile Thr Lys Thr Phe Glu Val Asn
```

```
    130                 135                 140

Ile Leu Gly His Phe Trp Asn Gly Lys Asp Ile Arg Ser Asn Tyr Leu
145                 150                 155                 160

Asp Val Tyr Arg Ile Glu Asp Thr Phe Gly Arg Asp Ser Glu Ile Thr
                165                 170                 175

Lys Ala Leu Leu Pro Ser Met Met Glu Arg Asn His Gly His Ile Val
            180                 185                 190

Thr Val Ala Ser Val Cys Gly His Glu Gly Ile Pro Tyr Leu Ile Pro
        195                 200                 205

Tyr Cys Ser Ser Lys Phe Ala Ala Val Gly Phe His Arg Gly Leu Thr
    210                 215                 220

Ser Glu Leu Gln Ala Leu Gly Lys Thr Gly Ile Lys Thr Ser Cys Leu
225                 230                 235                 240

Cys Pro Val Phe Val Asn Thr Gly Phe Thr Lys Asn Pro Ser Thr Arg
                245                 250                 255

Leu Trp Pro Val Leu Glu Thr Asp Glu Val Val Arg Ser Leu Ile Asp
            260                 265                 270

Gly Ile Leu Thr Asn Lys Lys Met Ile Phe Val Pro Ser Tyr Ile Asn
        275                 280                 285

Ile Phe Leu Arg Leu Gln Lys Phe Leu Pro Glu Arg Ala Ser Ala Ile
    290                 295                 300

Leu Asn Arg Met Gln Asn Ile Gln Phe Glu Ala Val Val Gly His Lys
305                 310                 315                 320

Ile Lys Met Lys
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<210> 26
<211> 284
<212> PRT
<213> Homo sapien

<400> 26

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Met Asn Ile Ile Leu Glu Ile Leu Leu Leu Leu Ile Thr Ile Ile Tyr
1               5                  10                  15


Ser Tyr Leu Glu Ser Leu Val Lys Phe Phe Ile Pro Gln Arg Arg Lys
            20                  25                  30


Ser Val Ala Gly Glu Ile Val Leu Ile Thr Gly Ala Gly His Gly Ile
        35                  40                  45


Gly Arg Gln Thr Thr Tyr Glu Phe Ala Lys Arg Gln Ser Ile Leu Val
    50                  55                  60


Leu Trp Asp Ile Asn Lys Arg Gly Val Glu Glu Thr Ala Ala Glu Cys
65                  70                  75                  80


Arg Lys Leu Gly Val Thr Ala His Ala Tyr Val Val Asp Cys Ser Asn
                85                  90                  95


Arg Glu Glu Ile Tyr Arg Ser Leu Asn Gln Val Lys Lys Glu Val Gly
            100                 105                 110


Asp Val Thr Ile Val Val Asn Asn Ala Gly Thr Val Tyr Pro Ala Asp
        115                 120                 125


Leu Leu Ser Thr Lys Asp Glu Glu Ile Thr Lys Thr Phe Glu Val Asn
    130                 135                 140


Ile Leu Gly His Phe Trp Ile Thr Lys Ala Leu Leu Pro Ser Met Met
145                 150                 155                 160
```

```
Glu Arg Asn His Gly His Ile Val Thr Val Ala Ser Val Cys Gly His
                165                 170                 175


Glu Gly Ile Pro Tyr Leu Ile Pro Tyr Cys Ser Ser Lys Phe Ala Ala
            180                 185                 190


Val Gly Phe His Arg Gly Leu Thr Ser Glu Leu Gln Ala Leu Gly Lys
        195                 200                 205


Thr Gly Ile Lys Thr Ser Cys Leu Cys Pro Val Phe Val Asn Thr Gly
    210                 215                 220


Phe Thr Lys Asn Pro Ser Thr Arg Leu Trp Pro Val Leu Glu Thr Asp
225                 230                 235                 240


Glu Val Val Arg Ser Leu Ile Asp Gly Ile Leu Thr Asn Lys Lys Met
                245                 250                 255


Ile Phe Val Pro Ser Tyr Ile Asn Ile Phe Leu Arg Leu Gln Lys Leu
            260                 265                 270


Ser Thr Ala Gln Asn Thr Gln Ile Leu Lys His Gln
        275                 280


<210>  27
<211>  238
<212>  PRT
<213>  Homo sapien

<400>  27

Met Asn Ile Ile Leu Glu Ile Leu Leu Leu Leu Ile Thr Ile Ile Tyr
1               5                   10                  15


Ser Tyr Leu Glu Ser Leu Val Lys Phe Phe Ile Pro Gln Arg Arg Lys
            20                  25                  30
```

```
Ser Val Ala Gly Glu Ile Val Leu Ile Thr Gly Ala Gly His Gly Ile
        35                  40                  45

Gly Arg Gln Thr Thr Tyr Glu Phe Ala Lys Arg Gln Ser Ile Leu Val
    50                  55                  60

Leu Trp Asp Ile Asn Lys Val Lys Lys Glu Val Gly Asp Val Thr Ile
65                  70                  75                  80

Val Val Asn Asn Ala Gly Thr Val Tyr Pro Ala Asp Leu Leu Ser Thr
                85                  90                  95

Lys Asp Glu Glu Ile Thr Lys Thr Phe Glu Val Asn Ile Leu Gly His
            100                 105                 110

Phe Trp Ile Thr Lys Ala Leu Leu Pro Ser Met Met Glu Arg Asn His
        115                 120                 125

Gly His Ile Val Thr Val Ala Ser Val Cys Gly His Glu Gly Ile Pro
    130                 135                 140

Tyr Leu Ile Pro Tyr Cys Ser Ser Lys Phe Ala Ala Val Gly Phe His
145                 150                 155                 160

Arg Gly Leu Thr Ser Glu Leu Gln Ala Leu Gly Lys Thr Gly Ile Lys
                165                 170                 175

Thr Ser Cys Leu Cys Pro Val Phe Val Asn Thr Gly Phe Thr Lys Asn
            180                 185                 190

Pro Ser Thr Arg Leu Trp Pro Val Leu Glu Thr Asp Glu Val Val Arg
        195                 200                 205

Ser Leu Ile Asp Gly Ile Leu Thr Asn Lys Lys Met Ile Phe Val Pro
    210                 215                 220
```

```
Ser Tyr Ile Asn Ile Phe Leu Arg Leu Gln Lys Val Ser Ser
225                 230                 235


<210>  28
<211>  298
<212>  PRT
<213>  Homo sapien

<400>  28

Met Asn Ile Ile Leu Glu Ile Leu Leu Leu Leu Ile Thr Ile Ile Tyr
1               5                   10                  15


Ser Tyr Leu Glu Ser Leu Val Lys Phe Phe Ile Pro Gln Arg Arg Lys
            20                  25                  30


Ser Val Ala Gly Glu Ile Val Leu Ile Thr Gly Ala Gly His Gly Ile
        35                  40                  45


Gly Arg Gln Thr Thr Tyr Glu Phe Ala Lys Arg Gln Ser Ile Leu Val
    50                  55                  60


Leu Trp Asp Ile Asn Lys Arg Gly Val Glu Glu Thr Ala Ala Glu Cys
65                  70                  75                  80


Arg Lys Leu Gly Val Thr Ala His Ala Tyr Val Val Asp Cys Ser Asn
                85                  90                  95


Arg Glu Glu Ile Tyr Arg Ser Leu Asn Gln Val Lys Lys Glu Val Gly
            100                 105                 110


Asp Val Thr Ile Val Val Asn Asn Ala Gly Thr Val Tyr Pro Ala Asp
        115                 120                 125


Leu Leu Ser Thr Lys Asp Glu Glu Ile Thr Lys Thr Phe Glu Val Asn
    130                 135                 140
```

```
Ile Leu Gly His Phe Trp Asn Gly Lys Asp Ile Arg Ser Asn Tyr Leu
145                 150                 155                 160


Asp Val Tyr Arg Ile Glu Asp Thr Phe Gly Arg Asp Ser Glu Ile Thr
                165                 170                 175


Lys Ala Leu Leu Pro Ser Met Met Glu Arg Asn His Gly His Ile Val
            180                 185                 190


Thr Val Ala Ser Val Cys Gly His Glu Gly Ile Pro Tyr Leu Ile Pro
        195                 200                 205


Tyr Cys Ser Ser Lys Phe Ala Ala Val Gly Phe His Arg Gly Leu Thr
    210                 215                 220


Ser Glu Leu Gln Ala Leu Gly Lys Thr Gly Ile Lys Thr Ser Cys Leu
225                 230                 235                 240


Cys Pro Val Phe Val Asn Thr Gly Phe Thr Lys Asn Pro Ser Thr Arg
                245                 250                 255


Leu Trp Pro Val Leu Glu Thr Asp Glu Val Val Arg Ser Leu Ile Asp
            260                 265                 270


Gly Ile Leu Thr Asn Lys Lys Met Ile Phe Val Pro Ser Tyr Ile Asn
        275                 280                 285


Ile Phe Leu Arg Leu Gln Lys Val Ser Ser
    290                 295


<210>  29
<211>  271
<212>  PRT
<213>  Homo sapien

<400>  29

Met Asn Ile Ile Leu Glu Ile Leu Leu Leu Leu Ile Thr Ile Ile Tyr
```

```
1               5                   10                  15

Ser Tyr Leu Glu Ser Leu Val Lys Phe Phe Ile Pro Gln Arg Arg Lys
            20                  25                  30

Ser Val Ala Gly Glu Ile Val Leu Ile Thr Gly Ala Gly His Gly Ile
        35                  40                  45

Gly Arg Gln Thr Thr Tyr Glu Phe Ala Lys Arg Gln Ser Ile Leu Val
    50                  55                  60

Leu Trp Asp Ile Asn Lys Arg Gly Val Glu Glu Thr Ala Ala Glu Cys
65                  70                  75                  80

Arg Lys Leu Gly Val Thr Ala His Ala Tyr Val Val Asp Cys Ser Asn
                85                  90                  95

Arg Glu Glu Ile Tyr Arg Ser Leu Asn Gln Val Lys Lys Glu Val Gly
            100                 105                 110

Asp Val Thr Ile Val Val Asn Asn Ala Gly Thr Val Tyr Pro Ala Asp
        115                 120                 125

Leu Leu Ser Thr Lys Asp Glu Glu Ile Thr Lys Thr Phe Glu Val Asn
    130                 135                 140

Ile Leu Gly His Phe Trp Ile Thr Lys Ala Leu Leu Pro Ser Met Met
145                 150                 155                 160

Glu Arg Asn His Gly His Ile Val Thr Val Ala Ser Val Cys Gly His
                165                 170                 175

Glu Gly Ile Pro Tyr Leu Ile Pro Tyr Cys Ser Ser Lys Phe Ala Ala
            180                 185                 190

Val Gly Phe His Arg Gly Leu Thr Ser Glu Leu Gln Ala Leu Gly Lys
```

195 200 205

Thr Gly Ile Lys Thr Ser Cys Leu Cys Pro Val Phe Val Asn Thr Gly
210 215 220

Phe Thr Lys Asn Pro Ser Thr Arg Leu Trp Pro Val Leu Glu Thr Asp
225 230 235 240

Glu Val Val Arg Ser Leu Ile Asp Gly Ile Leu Thr Asn Lys Lys Met
245 250 255

Ile Phe Val Pro Ser Tyr Ile Asn Ile Phe Leu Arg Leu Gln Lys
260 265 270

<210> 30
<211> 23830
<212> DNA
<213> Homo sapien

<400> 30
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Gly Ala Leu His Cys Val Gly Val Leu Ser Gly Ile Pro Leu Glu Gln
50 55 60

Thr Leu Gln Val Leu Ser Asp Leu Val Arg Lys Ala Arg Ser Arg Asn
65 70 75 80

Ile Gly Ile Phe His Pro Ser Phe Asn Leu Ser Lys Phe Leu Arg Gln
85 90 95

Gly Leu Cys Lys Cys Leu Pro Ala Asn Val His Gln Leu Ile Ser Gly
100 105 110

Lys Ile Gly Ile Ser Leu Thr Arg Val Ser Asp Gly Glu Asn Val Leu
115 120 125

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Val Ser Asp Phe Arg Ser Lys Asp Glu Val Val Asp Ala Leu Val Cys
    130                 135                 140

Ser Cys Phe Ile Pro Phe Tyr Ser Gly Leu Ile Pro Pro Ser Phe Arg
145                 150                 155                 160

Gly Val Arg Tyr Val Asp Gly Gly Val Ser Asp Asn Val Pro Phe Ile
                165                 170                 175

Asp Ala Lys Thr Thr Ile Thr Val Ser Pro Phe Tyr Gly Glu Tyr Asp
            180                 185                 190

Ile Cys Pro Lys Val Lys Ser Thr Asn Phe Leu His Val Asp Ile Thr
        195                 200                 205

Lys Leu Ser Leu Arg Leu Cys Thr Gly Asn Leu Tyr Leu Leu Ser Arg
    210                 215                 220

Ala Phe Val Pro Pro Asp Leu Lys Val Leu Gly Glu Ile Cys Leu Arg
225                 230                 235                 240

Gly Tyr Leu Asp Ala Phe Arg Phe Leu Glu Glu Lys Gly Ile Cys Asn
                245                 250                 255

Arg Pro Gln Pro Gly Leu Lys Ser Ser Ser Glu Gly Met Asp Pro Glu
            260                 265                 270

Val Ala Met Pro Ser Trp Ala Asn Met Ser Leu Asp Ser Ser Pro Glu
        275                 280                 285

Ser Ala Ala Leu Ala Val Arg Leu Glu Gly Asp Glu Leu Leu Asp His
    290                 295                 300

Leu Arg Leu Ser Ile Leu Pro Trp Asp Glu Ser Ile Leu Asp Thr Leu
305                 310                 315                 320
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Ser Pro Arg Leu Ala Thr Ala Leu Ser Glu Glu Met Lys Asp Lys Gly
                325                 330                 335

Gly Tyr Met Ser Lys Ile Cys Asn Leu Leu Pro Ile Arg Ile Met Ser
            340                 345                 350

Tyr Val Met Leu Pro Cys Thr Leu Pro Val Glu Ser Ala Ile Ala Ile
        355                 360                 365

Val Gln Arg Leu Val Thr Trp Leu Pro Asp Met Pro Asp Asp Val Leu
    370                 375                 380

Trp Leu Gln Trp Val Thr Ser Gln Val Phe Thr Arg Val Leu Met Cys
385                 390                 395                 400

Leu Leu Pro Ala Ser Arg Ser Gln Met Pro Val Ser Ser Gln Gln Ala
                405                 410                 415

Ser Pro Cys Thr Pro Glu Gln Asp Trp Pro Cys Trp Thr Pro Cys Ser
            420                 425                 430

Pro Lys Gly Cys Pro Ala Glu Thr Lys Ala Glu Ala Thr Pro Arg Ser
        435                 440                 445

Ile Leu Arg Ser Ser Leu Asn Phe Phe Leu Gly Asn Lys Val Pro Ala
    450                 455                 460

Gly Ala Glu Gly Leu Ser Thr Phe Pro Ser Phe Ser Leu Glu Lys Ser
465                 470                 475                 480

Leu
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<210> 41
<211> 477
<212> PRT
<213> Homo sapien

<400> 41

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Met Tyr Asp Ala Glu Arg Gly Trp Ser Leu Ser Phe Ala Gly Cys Gly
1               5                  10                  15

Phe Leu Gly Phe Tyr His Val Gly Ala Thr Arg Cys Leu Ser Glu His
            20                  25                  30

Ala Pro His Leu Leu Arg Asp Ala Arg Met Leu Phe Gly Ala Ser Ala
        35                  40                  45

Gly Ala Leu His Cys Val Gly Val Leu Ser Glu Gln Thr Leu Gln Val
    50                  55                  60

Leu Ser Asp Leu Val Arg Lys Ala Arg Ser Arg Asn Ile Gly Ile Phe
65                  70                  75                  80

His Pro Ser Phe Asn Leu Ser Lys Phe Leu Arg Gln Gly Leu Cys Lys
                85                  90                  95

Cys Leu Pro Ala Asn Val His Gln Leu Ile Ser Gly Lys Ile Gly Ile
            100                 105                 110

Ser Leu Thr Arg Val Ser Asp Gly Glu Asn Val Leu Val Ser Asp Phe
        115                 120                 125

Arg Ser Lys Asp Glu Val Val Asp Ala Leu Val Cys Ser Cys Phe Ile
    130                 135                 140

Pro Phe Tyr Ser Gly Leu Ile Pro Pro Ser Phe Arg Gly Val Arg Tyr
145                 150                 155                 160

Val Asp Gly Gly Val Ser Asp Asn Val Pro Phe Ile Asp Ala Lys Thr
                165                 170                 175

Thr Ile Thr Val Ser Pro Phe Tyr Gly Glu Tyr Asp Ile Cys Pro Lys
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180 185 190

Val Lys Ser Thr Asn Phe Leu His Val Asp Ile Thr Lys Leu Ser Leu
195 200 205

Arg Leu Cys Thr Gly Asn Leu Tyr Leu Leu Ser Arg Ala Phe Val Pro
210 215 220

Pro Asp Leu Lys Val Leu Gly Glu Ile Cys Leu Arg Gly Tyr Leu Asp
225 230 235 240

Ala Phe Arg Phe Leu Glu Glu Lys Gly Ile Cys Asn Arg Pro Gln Pro
245 250 255

Gly Leu Lys Ser Ser Ser Glu Gly Met Asp Pro Glu Val Ala Met Pro
260 265 270

Ser Trp Ala Asn Met Ser Leu Asp Ser Ser Pro Glu Ser Ala Ala Leu
275 280 285

Ala Val Arg Leu Glu Gly Asp Glu Leu Leu Asp His Leu Arg Leu Ser
290 295 300

Ile Leu Pro Trp Asp Glu Ser Ile Leu Asp Thr Leu Ser Pro Arg Leu
305 310 315 320

Ala Thr Ala Leu Ser Glu Glu Met Lys Asp Lys Gly Gly Tyr Met Ser
325 330 335

Lys Ile Cys Asn Leu Leu Pro Ile Arg Ile Met Ser Tyr Val Met Leu
340 345 350

Pro Cys Thr Leu Pro Val Glu Ser Ala Ile Ala Ile Val Gln Arg Leu
355 360 365

Val Thr Trp Leu Pro Asp Met Pro Asp Asp Val Leu Trp Leu Gln Trp

370 375 380

Val Thr Ser Gln Val Phe Thr Arg Val Leu Met Cys Leu Leu Pro Ala
385 390 395 400

Ser Arg Ser Gln Met Pro Val Ser Ser Gln Gln Ala Ser Pro Cys Thr
405 410 415

Pro Glu Gln Asp Trp Pro Cys Trp Thr Pro Cys Ser Pro Lys Gly Cys
420 425 430

Pro Ala Glu Thr Lys Ala Glu Ala Thr Pro Arg Ser Ile Leu Arg Ser
435 440 445

Ser Leu Asn Phe Phe Leu Gly Asn Lys Val Pro Ala Gly Ala Glu Gly
450 455 460

Leu Ser Thr Phe Pro Ser Phe Ser Leu Glu Lys Ser Leu
465 470 475

<210> 42
<211> 481
<212> PRT
<213> Homo sapien

<400> 42

Met Tyr Asp Ala Glu Arg Gly Trp Ser Leu Ser Phe Ala Gly Cys Gly
1 5 10 15

Phe Leu Gly Phe Tyr His Val Gly Ala Thr Arg Cys Leu Ser Glu His
20 25 30

Ala Pro His Leu Leu Arg Asp Ala Arg Met Leu Phe Gly Ala Ser Ala
35 40 45

Gly Ala Leu His Cys Val Gly Val Leu Ser Gly Ile Pro Leu Glu Gln
50 55 60

```
Thr Leu Gln Val Leu Ser Asp Leu Val Arg Lys Ala Arg Ser Arg Asn
65                  70                  75                  80

Ile Gly Ile Phe His Pro Ser Phe Asn Leu Ser Lys Phe Leu Arg Gln
                85                  90                  95

Gly Leu Cys Lys Cys Leu Pro Ala Asn Val His Gln Leu Ile Ser Gly
            100                 105                 110

Lys Ile Gly Ile Ser Leu Thr Arg Val Ser Asp Gly Glu Asn Val Leu
        115                 120                 125

Val Ser Asp Phe Arg Ser Lys Asp Glu Val Val Asp Ala Leu Val Cys
    130                 135                 140

Ser Cys Phe Met Pro Phe Tyr Ser Gly Leu Ile Pro Pro Ser Phe Arg
145                 150                 155                 160

Gly Val Arg Tyr Val Asp Gly Gly Val Ser Asp Asn Val Pro Phe Ile
                165                 170                 175

Asp Ala Lys Thr Thr Ile Thr Val Ser Pro Phe Tyr Gly Glu Tyr Asp
            180                 185                 190

Ile Cys Pro Lys Val Lys Ser Thr Asn Phe Leu His Val Asp Ile Thr
        195                 200                 205

Lys Leu Ser Leu Arg Leu Cys Thr Gly Asn Leu Tyr Leu Leu Ser Arg
    210                 215                 220

Ala Phe Val Pro Pro Asp Leu Lys Val Leu Gly Glu Ile Cys Leu Arg
225                 230                 235                 240

Gly Tyr Leu Asp Ala Phe Arg Phe Leu Glu Glu Lys Gly Ile Cys Asn
                245                 250                 255
```

```
Arg Pro Gln Pro Gly Leu Lys Ser Ser Ser Glu Gly Met Asp Pro Glu
            260                 265                 270

Val Ala Met Pro Ser Trp Ala Asn Met Ser Leu Asp Ser Ser Pro Glu
        275                 280                 285

Ser Ala Ala Leu Ala Val Arg Leu Glu Gly Asp Glu Leu Leu Asp His
    290                 295                 300

Leu Arg Leu Ser Ile Leu Pro Trp Asp Glu Ser Ile Leu Asp Thr Leu
305                 310                 315                 320

Ser Pro Arg Leu Ala Thr Ala Leu Ser Glu Glu Met Lys Asp Lys Gly
                325                 330                 335

Gly Tyr Met Ser Lys Ile Cys Asn Leu Leu Pro Ile Arg Ile Met Ser
            340                 345                 350

Tyr Val Met Leu Pro Cys Thr Leu Pro Val Glu Ser Ala Ile Ala Ile
        355                 360                 365

Val Gln Arg Leu Val Thr Trp Leu Pro Asp Met Pro Asp Asp Val Leu
    370                 375                 380

Trp Leu Gln Trp Val Thr Ser Gln Val Phe Thr Arg Val Leu Met Cys
385                 390                 395                 400

Leu Leu Pro Ala Ser Arg Ser Gln Met Pro Val Ser Ser Gln Gln Ala
                405                 410                 415

Ser Pro Cys Thr Pro Glu Gln Asp Trp Pro Cys Trp Thr Pro Cys Ser
            420                 425                 430

Pro Lys Gly Cys Pro Ala Glu Thr Lys Ala Glu Ala Thr Pro Arg Ser
        435                 440                 445
```

```
Ile Leu Arg Ser Ser Leu Asn Phe Phe Leu Gly Asn Lys Val Pro Ala
    450                 455                 460


Gly Ala Glu Gly Leu Ser Thr Phe Pro Ser Phe Ser Leu Glu Lys Ser
465                 470                 475                 480


Leu
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<210> 43
<211> 477
<212> PRT
<213> Homo sapien

<400> 43

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Met Tyr Asp Ala Glu Arg Gly Trp Ser Leu Ser Phe Ala Gly Cys Gly
1               5                   10                  15


Phe Leu Gly Phe Tyr His Val Gly Ala Thr Arg Cys Leu Ser Glu His
            20                  25                  30


Ala Pro His Leu Leu Arg Asp Ala Arg Met Leu Phe Gly Ala Ser Ala
        35                  40                  45


Gly Ala Leu His Cys Val Gly Val Leu Ser Glu Gln Thr Leu Gln Val
    50                  55                  60


Leu Ser Asp Leu Val Arg Lys Ala Arg Ser Arg Asn Ile Gly Ile Phe
65                  70                  75                  80


His Pro Ser Phe Asn Leu Ser Lys Phe Leu Arg Gln Gly Leu Cys Lys
                85                  90                  95


Cys Leu Pro Ala Asn Val His Gln Leu Ile Ser Gly Lys Ile Gly Ile
            100                 105                 110
```

```
Ser Leu Thr Arg Val Ser Asp Gly Glu Asn Val Leu Val Ser Asp Phe
        115                 120                 125


Arg Ser Lys Asp Glu Val Val Asp Ala Leu Val Cys Ser Cys Phe Met
    130                 135                 140


Pro Phe Tyr Ser Gly Leu Ile Pro Pro Ser Phe Arg Gly Val Arg Tyr
145                 150                 155                 160


Val Asp Gly Gly Val Ser Asp Asn Val Pro Phe Ile Asp Ala Lys Thr
                165                 170                 175


Thr Ile Thr Val Ser Pro Phe Tyr Gly Glu Tyr Asp Ile Cys Pro Lys
            180                 185                 190


Val Lys Ser Thr Asn Phe Leu His Val Asp Ile Thr Lys Leu Ser Leu
        195                 200                 205


Arg Leu Cys Thr Gly Asn Leu Tyr Leu Leu Ser Arg Ala Phe Val Pro
    210                 215                 220


Pro Asp Leu Lys Val Leu Gly Glu Ile Cys Leu Arg Gly Tyr Leu Asp
225                 230                 235                 240


Ala Phe Arg Phe Leu Glu Glu Lys Gly Ile Cys Asn Arg Pro Gln Pro
                245                 250                 255


Gly Leu Lys Ser Ser Ser Glu Gly Met Asp Pro Glu Val Ala Met Pro
            260                 265                 270


Ser Trp Ala Asn Met Ser Leu Asp Ser Ser Pro Glu Ser Ala Ala Leu
        275                 280                 285


Ala Val Arg Leu Glu Gly Asp Glu Leu Leu Asp His Leu Arg Leu Ser
    290                 295                 300
```

```
Ile Leu Pro Trp Asp Glu Ser Ile Leu Asp Thr Leu Ser Pro Arg Leu
305                 310                 315                 320


Ala Thr Ala Leu Ser Glu Glu Met Lys Asp Lys Gly Gly Tyr Met Ser
                325                 330                 335


Lys Ile Cys Asn Leu Leu Pro Ile Arg Ile Met Ser Tyr Val Met Leu
            340                 345                 350


Pro Cys Thr Leu Pro Val Glu Ser Ala Ile Ala Ile Val Gln Arg Leu
        355                 360                 365


Val Thr Trp Leu Pro Asp Met Pro Asp Asp Val Leu Trp Leu Gln Trp
    370                 375                 380


Val Thr Ser Gln Val Phe Thr Arg Val Leu Met Cys Leu Leu Pro Ala
385                 390                 395                 400


Ser Arg Ser Gln Met Pro Val Ser Ser Gln Gln Ala Ser Pro Cys Thr
                405                 410                 415


Pro Glu Gln Asp Trp Pro Cys Trp Thr Pro Cys Ser Pro Lys Gly Cys
            420                 425                 430


Pro Ala Glu Thr Lys Ala Glu Ala Thr Pro Arg Ser Ile Leu Arg Ser
        435                 440                 445


Ser Leu Asn Phe Phe Leu Gly Asn Lys Val Pro Ala Gly Ala Glu Gly
    450                 455                 460


Leu Ser Thr Phe Pro Ser Phe Ser Leu Glu Lys Ser Leu
465                 470                 475


<210>  44
<211>  2397
<212>  DNA
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<213> Homo sapien

<400> 44

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uggagucguu ggugaaguuu uucauuccuc agaggagaaa aucuguggcu ggggagauug 180

uucucauuac uggagcuggg cauggaauag gcaggcagac uacuuaugaa uuugcaaaac 240

gacagagcau auugguucug ugggauauua auaagcgcgg uguggaggaa acugcagcug 300

agugccgaaa acuaggcguc acugcgcaug cguauguggu agacugcagc aacagagaag 360

agaucuaucg cucucuaaau caggugaaga aagaaguggg ugauguaaca aucgugguga 420

auaaugcugg gacaguauau ccagccgauc uucucagcac caaggaugaa gagauuacca 480

agacauuuga ggucaacauc cuaggacauu uuuggaucac aaaagcacuu cuuccaucga 540

ugauggagag aaaucauggc cacaucguca caguggcuuc agugugcggc cacgaaggga 600

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cagaugaagu cguaagaagu cugauagaug gaauacuuac caauaagaaa augauuuuug 840

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cgauuuuaaa ucguaugcag aauauucaau uugaagcagu gguuggccac aaaaucaaaa 960

ugaaaugaau aaauaagcuc cagccagaga uguaugcaug auaaugauau gaauaguuuc 1020

gaaucaaugc ugcaaagcuu uauuucacau uuuuucaguc cugauaauau uaaaaacauu 1080

gguuuggcac uagcagcagu caaacgaaca agauuaauua ccugucuucc uguuucucaa 1140

gaauauuuac guaguuuuuc auaggucugu uuuuccuuuc augccucuua aaaacuucug 1200

ugcuuacaua aacauacuua aaagguuuuc uuuaagauau uuuauuuuuc cauuuaaagg 1260

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aacggugcaa cucuauucug gacuuuauua cuugauucug ucuucuguau aacucugaag 1560

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gaaaggugac cgacucuauu uuaaaucuca gaauuuuaag uucuagcccc augauaaccu 1680

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uccugaguag cugggacuac aggcgcccgc caccacaccc ggcuaauuuu uuguauuuuu 2040

uguagagacg ggguuucacc auguuagcca agauggucuc gaucuccuga ccucgugauc 2100

caccugccuc ggccucccaa agugcuggga uuacgggugu gagccaccgu gcccagccuu 2160

uuuuuuuuua auagaaaaaa uaauccgacu cccacuacau caagacuaau cuuguuuugu 2220

guguuuuuca cauguauuau agaaugcuuu ugcauggacu auccucuugu uuuuauuaaa 2280

aacaaaugau uuuuuuaaaa gucacaaaaa caauucacua aaaauaaaua ugucauugug 2340

cuuuaaaaaa auaaccucuu guaguuauaa aauaaaacgu uugacuucua aacucug 2397

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<211> 2289
<212> RNA
<213> Homo sapien

<400> 45
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uggagucguu ggugaaguuu uucauuccuc agaggagaaa aucuguggcu ggggagauug 180

uucucauuac uggagcuggg cauggaauag gcaggcagac uacuuaugaa uuugcaaaac 240

gacagagcau auugguucug ugggauauua auaaggugaa gaaagaagug ggugauguaa 300

caaucguggu gaauaaugcu gggacaguau auccagccga ucuucucagc accaaggaug 360

aagagauuac caagacauuu gaggucaaca uccuaggaca uuuuuggauc acaaaagcac 420

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gccacgaagg gauuccuuac cucaucccau auuguuccag caaauuugcc gcuguuggcu 540

uucacagagg ucugacauca gaacuucagg ccuugggaaa aacugguauc aaaaccucau 600

gucucugccc aguuuuugug aauacugggu ucaccaaaaa uccaagcaca agauuauggc 660

cuguauugga gacagaugaa gucguaagaa gucugauaga uggaauacuu accaauaaga 720

aaaugauuuu uguuccaucg uauaucaaua ucuuucugag acuacagaag uuucuuccug 780

aacgcgccuc agcgauuuua aaucguaugc agaauauuca auuugaagca gugguuggcc 840

acaaaaucaa aaugaaauga auaaauaagc uccagccaga gauguaugca ugauaaugau 900

augaauaguu ucgaaucaau gcugcaaagc uuuauuucac auuuuuucag uccugauaau 960

auuaaaaaca uugguuuggc acuagcagca gucaaacgaa caagauuaau uaccugucuu 1020

ccuguuucuc aagaauauuu acguaguuuu ucauaggucu guuuuuccuu ucaugccucu 1080

uaaaaacuuc ugugcuuaca uaaacauacu uaaaagguuu ucuuuaagau auuuuauuuu 1140

uccauuuaaa gguggacaaa agcuaccucc cuaaaaguaa auacaaagag aacuuauuua 1200

cacagggaag guuuaagacu guucaaguag cauuccaauc uguagccaug ccacagaaua 1260

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cucaaccugg acauauuuua agauucagca uuugaaagau uucccuagcc ucuuccuuuu 1380

ucauuagccc aaaacggugc aacucuauuc uggacuuuau uacuugauuc ugucuucugu 1440

auaacucuga aguccaccaa aaguggaccc ucuauauuuc cucccuuuuu auagucuuau 1500

aagauacauu augaaaggug accgacucua uuuuaaaucu cagaauuuua aguucuagcc 1560

ccaugauaac cuuuuucuuu guaauuuaug cuuucauaua uccuuggucc cagagauguu 1620

uagacaauuu uaggcucaaa aauuaaagcu aacacaggaa aaggaacugu acuggcuauu 1680

acauaagaaa caauggaccc aagagaagaa aaggaagaaa gaaaggguuu uugguuuuug 1740

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gagugcagug guaugaucuc agcucacugc aagcuccacc ucccggguuc acgccauucu 1860

ccugccucag ccuccugagu agcugggacu acaggcgccc gccaccacac ccggcuaauu 1920

uuuuguauuu uuuguagaga cgggguuuca ccauguuagc caagaugguc ucgaucuccu 1980

gaccucguga uccaccugcc ucggccuccc aaagugcugg gauuacgggu gugagccacc 2040

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aucuuguuuu guguguuuuu cacauguauu auagaaugcu uuugcaugga cuauccucuu 2160

guuuuuauua aaaacaaaug auuuuuuuaa aagucacaaa aacaauucac uaaaaauaaa 2220

uaugucauug ugcuuuaaaa aaauaaccuc uuguaguuau aaaauaaaac guuugacuuc 2280

uaaacucug 2289

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<212> RNA
<213> Homo sapien

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uggagucguu ggugaaguuu uucauuccuc agaggagaaa aucuguggcu ggggagauug 180

uucucauuac uggagcuggg cauggaauag gcaggcagac uacuuaugaa uuugcaaaac 240

gacagagcau auugguucug ugggauauua auaagcgcgg uguggaggaa acugcagcug 300

agugccgaaa acuaggcguc acugcgcaug cguauguggu agacugcagc aacagagaag 360

agaucuaucg cucucuaaau caggugaaga aagaaguggg ugauguaaca aucgugguga 420

auaaugcugg gacaguauau ccagccgauc uucucagcac caaggaugaa gagauuacca 480

agacauuuga ggucaacauc cuaggacauu uuuggaucac aaaagcacuu cuuccaucga 540

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uuuuugugaa uacuggguuc accaaaaauc caagcacaag guuucuuccu gaacgcgccu 780

cagcgauuuu aaaucguaug cagaauauuc aauuugaagc agugguuggc cacaaaauca 840

aaaugaaaug aauaaauaag cuccagccag agauguaugc augauaauga uaugaauagu 900

uucgaaucaa ugcugcaaag cuuuauuuca cauuuuuuca guccugauaa uauuaaaaac 960

auugguuugg cacuagcagc agucaaacga acaagauuaa uuaccugucu uccuguuucu 1020

caagaauauu uacguaguuu uucauagguc uguuuuuccu uucaugccuc uuaaaaacuu 1080

cugugcuuac auaaacauac uuaaaagguu uucuuuaaga uauuuuauuu uuccauuuaa 1140

agguggacaa aagcuaccuc ccuaaaagua aauacaaaga gaacuuauuu acacagggaa 1200

gguuuaagac uguucaagua gcauuccaau cuguagccau gccacagaau aucaacaaga 1260

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gacauauuuu aagauucagc auuugaaaga uuucccuagc cucuuccuuu uucauuagcc 1380

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aaguccacca aaaguggacc cucuauauuu ccucccuuuu uauagucuua uaagauacau 1500

uaugaaaggu gaccgacucu auuuuaaauc ucagaauuuu aaguucuagc cccaugauaa 1560

ccuuuuucuu uguaauuuau gcuuucauau auccuugguc ccagagaugu uuagacaauu 1620

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gguaugaucu cagcucacug caagcuccac cucccggguu cacgccauuc uccugccuca 1860

gccuccugag uagcugggac uacaggcgcc cgccaccaca cccggcuaau uuuuuguauu 1920

uuuuguagag acgggguuuc accauguuag ccaagauggu cucgaucucc ugaccucgug 1980

auccaccugc cucggccucc caaagugcug ggauuacggg ugugagccac cgugcccagc 2040

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uguguguuuu ucacauguau uauagaaugc uuuugcaugg acuauccucu uguuuuuauu 2160

aaaaacaaau gauuuuuuua aaagucacaa aaacaauuca cuaaaaauaa auaugucauu 2220

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<400> 47
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agugccgaaa acuaggcguc acugcgcaug cguauguggu agacugcagc aacagagaag 360

agaucuaucg cucucuaaau caggugaaga aagaaguggg ugauguaaca aucgugguga 420

auaaugcugg gacaguauau ccagccgauc uucucagcac caaggaugaa gagauuacca 480

agacauuuga ggucaacauc cuaggacauu uuuggaucac aaaagcacuu cuuccaucga 540

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uuccuuaccu caucccauau uguuccagca aauuugccgc uguuggcuuu cacagagguc 660

ugacaucaga acuucaggcc uugggaaaaa cugguaucaa aaccucaugu cucugcccag 720

uuuuugugaa uacuggguuc accaaaaauc caagcacaag auuauggccu guauuggaga 780

cagaugaagu cguaagaagu cugauagaug gaauacuuac caauaagaaa augauuuuug 840

uuccaucgua uaucaauauc uuucugagac uacagaaggu uucuuccuga acgcgccuca 900

gcgauuuuaa aucguaugca gaauauucaa uuugaagcag ugguuggcca caaaaucaaa 960

augaaaugaa uaaauaagcu ccagccagag auguaugcau gauaaugaua ugaauaguuu 1020

cgaaucaaug cugcaaagcu uuauuucaca uuuuuucagu ccugauaaua uuaaaaacau 1080

ugguuuggca cuagcagcag ucaaacgaac aagauuaauu accugucuuc cuguuucuca 1140

agaauauuua cguaguuuuu cauaggucug uuuuuccuuu caugccucuu aaaaacuucu 1200

gugcuuacau aaacauacuu aaaagguuuu cuuuaagaua uuuuauuuuu ccauuuaaag 1260

guggacaaaa gcuaccuccc uaaaaguaaa uacaaagaga acuuauuuac acagggaagg 1320

uuuaagacug uucaaguagc auuccaaucu guagccaugc cacagaauau caacaagaac 1380

acagaaugag ugcacagcua agagaucaag uuucagcagg cagcuuuauc ucaaccugga 1440

cauauuuuaa gauucagcau uugaaagauu ucccuagccu cuuccuuuuu cauuagccca 1500

aaacggugca acucuauucu ggacuuuauu acuugauucu gucuucugua uaacucugaa 1560

guccaccaaa aguggacccu cuauauuucc ucccuuuuua uagucuuaua agauacauua 1620

ugaaagguga ccgacucuau uuuaaaucuc agaauuuuaa guucuagccc caugauaacc 1680

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aggcucaaaa auuaaagcua acacaggaaa aggaacugua cuggcuauua cauaagaaac 1800

aauggaccca agagaagaaa aggaagaaag aaagguuuuu ugguuuuugu uuuguuuugu 1860

uuuguuuuuu guuuuuuuga gauggagucu cacucuuucg cccaggcugg agugcagugg 1920

uaugaucuca gcucacugca agcuccaccu cccggguuca cgccauucuc cugccucagc 1980

cuccugagua gcugggacua caggcgcccg ccaccacacc cggcuaauuu uuuguauuuu 2040

uuguagagac gggguuucac cauguuagcc aagauggucu cgaucuccug accucgugau 2100

ccaccugccu cggccuccca aagugcuggg auuacgggug ugagccaccg ugcccagccu 2160

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uguguuuuuc acauguauua uagaaugcuu uugcauggac uauccucuug uuuuuauuaa 2280

aaacaaauga uuuuuuuaaa agucacaaaa acaauucacu aaaaauaaau augucauugu 2340

gcuuuaaaaa aauaaccucu uguaguuaua aaauaaaacg uuugacuucu aaacucug 2398

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<211> 2469
<212> RNA
<213> Homo sapien

<400> 48
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aagccaugaa caucauccua gaaauccuuc ugcuucugau caccaucauc uacuccuacu 120

uggagucguu ggugaaguuu uucauuccuc agaggagaaa aucuguggcu ggggagauug 180

uucucauuac uggagcuggg cauggaauag gcaggcagac uacuuaugaa uuugcaaaac 240

gacagagcau auugguucug ugggauauua auaagcgcgg uguggaggaa acugcagcug 300

agugccgaaa acuaggcguc acugcgcaug cguauguggu agacugcagc aacagagaag 360

agaucuaucg cucucuaaau caggugaaga aagaaguggg ugauguaaca aucgugguga 420

auaaugcugg gacaguauau ccagccgauc uucucagcac caaggaugaa gagauuacca 480

agacauuuga ggucaacauc cuaggacauu uuuggaaugg aaaggacauc agaaguaauu 540

acuuggaugu auauaggauc gaggacacuu uuggacgaga cucugagauc acaaaagcac 600

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gccacgaagg gauuccuuac cucaucccau auuguuccag caaauuugcc gcuguuggcu 720

uucacagagg ucugacauca gaacuucagg ccuugggaaa aacugguauc aaaaccucau 780

gucucugccc aguuuuugug aauacugggu ucaccaaaaa uccaagcaca agauuauggc 840

cuguauugga gacagaugaa gucguaagaa gucugauaga uggaauacuu accaauaaga 900

aaaugauuuu uguuccaucg uauaucaaua ucuuucugag acuacagaag uuucuuccug 960

aacgcgccuc agcgauuuua aaucguaugc agaauauuca auuugaagca gugguuggcc 1020

acaaaaucaa aaugaaauga auaaauaagc uccagccaga gauguaugca ugauaaugau 1080

augaauaguu ucgaaucaau gcugcaaagc uuuauuucac auuuuuucag uccugauaau 1140

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ccuguuucuc aagaauauuu acguaguuuu ucauaggucu guuuuuccuu ucaugccucu 1260

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uccauuuaaa gguggacaaa agcuaccucc cuaaaaguaa auacaaagag aacuuauuua 1380

cacagggaag guuuaagacu guucaaguag cauuccaauc uguagccaug ccacagaaua 1440

ucaacaagaa cacagaauga gugcacagcu aagagaucaa guuucagcag gcagcuuuau 1500

cucaaccugg acauauuuua agauucagca uuugaaagau uucccuagcc ucuuccuuuu 1560

ucauuagccc aaaacggugc aacucuauuc uggacuuuau uacuugauuc ugucuucugu 1620

auaacucuga aguccaccaa aaguggaccc ucuauauuuc cucccuuuuu auagucuuau 1680

aagauacauu augaaaggug accgacucua uuuuaaaucu cagaauuuua aguucuagcc 1740

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uagacaauuu uaggcucaaa aauuaaagcu aacacaggaa aaggaacugu acuggcuauu 1860

acauaagaaa caauggaccc aagagaagaa aaggaagaaa gaaagguuuu uugguuuuug 1920

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uuuuguauuu uuuguagaga cgggguuuca ccauguuagc caagaugguc ucgaucuccu 2160

gaccucguga uccaccugcc ucggccuccc aaagugcugg gauuacgggu gugagccacc 2220

gugcccagcc uuuuuuuuuu uaauagaaaa aauaauccga cucccacuac aucaagacua 2280

aucuuguuuu guguguuuuu cacauguauu auagaaugcu uuugcaugga cuauccucuu 2340

guuuuuauua aaaacaaaug auuuuuuuaa aagucacaaa aacaauucac uaaaaauaaa 2400

uaugucauug ugcuuuaaaa aaauaaccuc uuguaguuau aaaauaaaac guuugacuuc 2460

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<211> 1715

<212> RNA
<213> Homo sapien

<400> 49
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uggagucguu ggugaaguuu uucauuccuc agaggagaaa aucuguggcu ggggagauug 180

uucucauuac uggagcuggg cauggaauag gcaggcagac uacuuaugaa uuugcaaaac 240

gacagagcau auugguucug ugggauauua auaagcgcgg uguggaggaa acugcagcug 300

agugccgaaa acuaggcguc acugcgcaug cguauguggu agacugcagc aacagagaag 360

agaucuaucg cucucuaaau caggugaaga aagaaguggg ugauguaaca aucgugguga 420

auaaugcugg gacaguauau ccagccgauc uucucagcac caaggaugaa gagauuacca 480

agacauuuga ggucaacauc cuaggacauu uuuggaucac aaaagcacuu cuuccaucga 540

ugauggagag aaaucauggc cacaucguca caguggcuuc agugugcggc cacgaaggga 600

uuccuuaccu caucccauau uguuccagca aauuugccgc uguuggcuuu cacagagguc 660

ugacaucaga acuucaggcc uugggaaaaa cugguaucaa aaccucaugu cucugcccag 720

uuuuugugaa uacuggguuc accaaaaauc caagcacaag auuauggccu guauuggaga 780

cagaugaagu cguaagaagu cugauagaug gaauacuuac caauaagaaa augauuuuug 840

uuccaucgua uaucaauauc uuucugagac uacagaaguu aaguacagca cagaacaccc 900

aaauacuaaa acaccaauag agcuuuuuuu uuugcuuuuu uuuuuuuuag acagagucuc 960

acucugucac ccuggcugga uugcgguggu ugcaguggca ugaucuuggc ucacugcaac 1020

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cccauguugg ccaggcugga cucgaacucc ugaccucaag uuauccuccu gucucggccu 1200

cccaaagugc ugggauuaca gucaugagcc accaugccug gcccaauaga gcuauuauua 1260

uggagcaucu uucaguugug aaaauuggca uggaaacucu ccaucccugg ggagaacagu 1320

uauuuccucu guuauuuucc uacccagucu auaaaaagag agugauucau uuucucuacc 1380

aaaucuacug ucucugccca aacuuugcug aagacuauuc uaacuaaagg aaacacaguu 1440

uaaaaagaau gcaauauagu gaaguaguua auaauaaaga cuccauuuuu aaaagucugc 1500

uggaaguuug guuggggauug cacugaaucu auagagcaau uggggaguau ugacauauca 1560

acaauauuga guuuucuaau ccaagaacau aauaucuauu uuuaaaaucu ucuucaaaau 1620

cuuuaaaucu uuaaauugua uuuuguaguu uuugguguuu aagucuugca cauauuuugu 1680

cagauuuauu ccaaaguauu ucacggguuc uuuuu 1715

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<211> 2290
<212> RNA
<213> Homo sapien

<400> 50
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aagccaugaa caucauccua gaaauccuuc ugcuucugau caccaucauc uacuccuacu 120

uggagucguu ggugaaguuu uucauuccuc agaggagaaa aucuguggcu ggggagauug 180

uucucauuac uggagcuggg cauggaauag gcaggcagac uacuuaugaa uuugcaaaac 240

gacagagcau auugguucug ugggauauua auaaggugaa gaaagaagug ggugauguaa 300

caaucguggu gaauaaugcu gggacaguau auccagccga ucuucucagc accaaggaug 360

aagagauuac caagacauuu gaggucaaca uccuaggaca uuuuuggauc acaaaagcac 420

uucuuccauc gaugauggag agaaaucaug gccacaucgu cacaguggcu ucagugugcg 480

gccacgaagg gauuccuuac cucaucccau auuguuccag caaauuugcc gcuguuggcu 540

uucacagagg ucugacauca gaacuucagg ccuugggaaa aacugguauc aaaaccucau 600

gucucugccc aguuuuugug aauacugggu ucaccaaaaa uccaagcaca agauuauggc 660

cuguauugga gacagaugaa gucguaagaa gucugauaga uggaauacuu accaauaaga 720

aaaugauuuu uguuccaucg uauaucaaua ucuuucugag acuacagaag guuucuuccu 780

gaacgcgccu cagcgauuuu aaaucguaug cagaauauuc aauuugaagc agugguuggc 840

cacaaaauca aaaugaaaug aauaaauaag cuccagccag agauguaugc augauaauga 900

uaugaauagu uucgaaucaa ugcugcaaag cuuuauuuca cauuuuuuca guccugauaa 960

uauuaaaaac auugguuugg cacuagcagc agucaaacga acaagauuaa uuaccugucu 1020

uccuguuucu caagaauauu uacguaguuu uucauagguc uguuuuuccu uucaugccuc 1080

uuaaaaacuu cugugcuuac auaaacauac uuaaaagguu uucuuuaaga uauuuuauuu 1140

uuccauuuaa agguggacaa aagcuaccuc ccuaaaagua aauacaaaga gaacuuauuu 1200

acacagggaa gguuuaagac uguucaagua gcauuccaau cuguagccau gccacagaau 1260

aucaacaaga acacagaaug agugcacagc uaagagauca aguuucagca ggcagcuuua 1320

ucucaaccug gacauauuuu aagauucagc auuugaaaga uuucccuagc cucuuccuuu 1380

uucauuagcc caaaacggug caacucuauu cuggacuuua uuacuugauu cugucuucug 1440

uauaacucug aaguccacca aaaguggacc cucuauauuu ccucccuuuu uauagucuua 1500

uaagauacau uaugaaaggu gaccgacucu auuuuaaauc ucagaauuuu aaguucuagc 1560

cccaugauaa ccuuuuucuu uguaauuuau gcuuucauau auccuugguc ccagagaugu 1620

uuagacaauu uuaggcucaa aaauuaaagc uaacacagga aaaggaacug uacuggcuau 1680

uacauaagaa acaauggacc caagagaaga aaaggaagaa agaaagguuu uuugguuuuu 1740

guuuuguuuu guuuuguuuu uuguuuuuuu gagauggagu cucacucuuu cgcccaggcu 1800

ggagugcagu gguaugaucu cagcucacug caagcuccac cucccggguu cacgccauuc 1860

uccugccuca gccuccugag uagcugggac uacaggcgcc cgccaccaca cccggcuaau 1920

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aaucuuguuu uguguguuuu ucacauguau uauagaaugc uuuugcaugg acuauccucu 2160

uguuuuuauu aaaaacaaau gauuuuuuua aaagucacaa aaacaauuca cuaaaaauaa 2220

auaugucauu gugcuuuaaa aaaauaaccu cuuguaguua uaaaauaaaa cguuugacuu 2280

cuaaacucug 2290

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<211> 2470
<212> RNA
<213> Homo sapien

<400> 51
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uggagucguu ggugaaguuu uucauuccuc agaggagaaa aucuguggcu ggggagauug 180

uucucauuac uggagcuggg cauggaauag gcaggcagac uacuuaugaa uuugcaaaac 240

gacagagcau auugguucug ugggauauua auaagcgcgg uguggaggaa acugcagcug 300

agugccgaaa acuaggcguc acugcgcaug cguauguggu agacugcagc aacagagaag 360

agaucuaucg cucucuaaau caggugaaga aagaaguggg ugauguaaca aucgugguga 420

auaaugcugg gacaguauau ccagccgauc uucucagcac caaggaugaa gagauuacca 480

agacauuuga ggucaacauc cuaggacauu uuuggaaugg aaaggacauc agaaguaauu 540

acuuggaugu auauaggauc gaggacacuu uuggacgaga cucugagauc acaaaagcac 600

uucuuccauc gaugauggag agaaaucaug gccacaucgu cacaguggcu ucagugugcg 660

gccacgaagg gauuccuuac cucaucccau auuguuccag caaauuugcc gcuguuggcu 720

uucacagagg ucugacauca gaacuucagg ccuugggaaa aacugguauc aaaaccucau 780

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cuguauugga gacagaugaa gucguaagaa gucugauaga uggaauacuu accaauaaga 900

aaaugauuuu uguuccaucg uauaucaaua ucuuucugag acuacagaag guuucuuccu 960

gaacgcgccu cagcgauuuu aaaucguaug cagaauauuc aauuugaagc agugguuggc 1020

cacaaaauca aaaugaaaug aauaaauaag cuccagccag agauguaugc augauaauga 1080

uaugaauagu uucgaaucaa ugcugcaaag cuuuauuuca cauuuuuuca guccugauaa 1140

uauuaaaaac auugguuugg cacuagcagc agucaaacga acaagauuaa uuaccugucu 1200

uccuguuucu caagaauauu uacguaguuu uucauagguc uguuuuuccu uucaugccuc 1260

uuaaaaacuu cugugcuuac auaaacauac uuaaaagguu uucuuuaaga uauuuuauuu 1320

uuccauuuaa agguggacaa aagcuaccuc ccuaaaagua aauacaaaga gaacuuauuu 1380

acacagggaa gguuuaagac uguucaagua gcauuccaau cuguagccau gccacagaau 1440

aucaacaaga acacagaaug agugcacagc uaagagauca aguuucagca ggcagcuuua 1500

ucucaaccug gacauauuuu aagauucagc auuugaaaga uuucccuagc cucuuccuuu 1560

uucauuagcc caaaacggug caacucuauu cuggacuuua uuacuugauu cugucuucug 1620

uauaacucug aaguccacca aaaguggacc cucuauauuu ccucccuuuu uauagucuua 1680

uaagauacau uaugaaaggu gaccgacucu auuuuaaauc ucagaauuuu aaguucuagc 1740

cccaugauaa ccuuuuucuu uguaauuuau gcuuucauau auccuugguc ccagagaugu 1800

uuagacaauu uuaggcucaa aaauuaaagc uaacacagga aaaggaacug uacuggcuau 1860

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guuuuguuuu guuuuguuuu uuguuuuuuu gagauggagu cucacucuuu cgcccaggcu 1980

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aaucuuguuu uguguguuuu ucacauguau uauagaaugc uuuugcaugg acuauccucu 2340

uguuuuuauu aaaaacaaau gauuuuuuua aaagucacaa aaacaauuca cuaaaaauaa 2400

auaugucauu gugcuuuaaa aaaauaaccu cuuguaguua uaaaauaaaa cguuugacuu 2460

cuaaacucug 2470

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<211> 1714
<212> RNA
<213> Homo sapien

<400> 52
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uggagucguu ggugaaguuu uucauuccuc agaggagaaa aucuguggcu ggggagauug 180

uucucauuac uggagcuggg cauggaauag gcaggcagac uacuuaugaa uuugcaaaac 240

gacagagcau auugguucug ugggauauua auaagcgcgg uguggaggaa acugcagcug 300

agugccgaaa acuaggcguc acugcgcaug cguauguggu agacugcagc aacagagaag 360

agaucuaucg cucucuaaau caggugaaga aagaaguggg ugauguaaca aucgugguga 420

auaaugcugg gacaguauau ccagccgauc uucucagcac caaggaugaa gagauuacca 480

agacauuuga ggucaacauc cuaggacauu uuuggaucac aaaagcacuu cuuccaucga 540

ugauggagag aaaucauggc cacaucguca caguggcuuc agugugcggc cacgaaggga 600

uuccuuaccu caucccauau uguuccagca aauuugccgc uguuggcuuu cacagagguc 660

ugacaucaga acuucaggcc uugggaaaaa cugguaucaa aaccucaugu cucugcccag 720

uuuuugugaa uacuggguuc accaaaaauc caagcacaag auuauggccu guauuggaga 780

cagaugaagu cguaagaagu cugauagaug gaauacuuac caauaagaaa augauuuuug 840

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aauacuaaaa caccaauaga gcuuuuuuuu uugcuuuuuu uuuuuuuaga cagagucuca 960

cucugucacc cuggcuggau ugcggugguu gcaguggcau gaucuuggcu cacugcaacc 1020

uccgccuccu ggguucaagc aauucucaug ccucagaccc ccaaguaacu gggauuauag 1080

gugugugcug ccacacuaca cccagcuaau uuuuguauuu uuugauagag acagguuucc 1140

ccauguuggc caggcuggac ucgaacuccu gaccucaagu uauccuccug ucucggccuc 1200

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aaucuacugu cucugcccaa acuuugcuga agacuauucu aacuaaagga aacacaguuu 1440

aaaaagaaug caauauagug aaguaguuaa uaauaaagac uccauuuuua aaagucugcu 1500

ggaaguuugg uugggauugc acugaaucua uagagcaauu ggggaguauu gacauaucaa 1560

caauauugag uuuucuaauc caagaacaua auaucuauuu uuaaaaucuu cuucaaaauc 1620

uuuaaaucuu uaaauuguau uuuguaguuu uugguguuua agucuugcac auauuuuguc 1680

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<211> 2397
<212> DNA
<213> Homo sapien

<400> 53
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agtgccgaaa actaggcgtc actgcgcatg cgtatgtggt agactgcagc aacagagaag 360

agatctatcg ctctctaaat caggtgaaga aagaagtggg tgatgtaaca atcgtggtga 420

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agacatttga ggtcaacatc ctaggacatt tttggatcac aaaagcactt cttccatcga 540

tgatggagag aaatcatggc cacatcgtca cagtggcttc agtgtgcggc cacgaaggga 600

ttccttacct catcccatat tgttccagca aatttgccgc tgttggcttt cacagaggtc 660

tgacatcaga acttcaggcc ttgggaaaaa ctggtatcaa aacctcatgt ctctgcccag 720

tttttgtgaa tactgggttc accaaaaatc caagcacaag attatggcct gtattggaga 780

cagatgaagt cgtaagaagt ctgatagatg gaatacttac caataagaaa atgatttttg 840

ttccatcgta tatcaatatc tttctgagac tacagaagtt tcttcctgaa cgcgcctcag 900

cgattttaaa tcgtatgcag aatattcaat ttgaagcagt ggttggccac aaaatcaaaa 960

tgaaatgaat aaataagctc cagccagaga tgtatgcatg ataatgatat gaatagtttc 1020

gaatcaatgc tgcaaagctt tatttcacat tttttcagtc ctgataatat taaaaacatt 1080

ggtttggcac tagcagcagt caaacgaaca agattaatta cctgtcttcc tgtttctcaa 1140

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