SEQUENCE LISTING

<110> Regeneron Pharmaceuticals, Inc.

<120> Treatment Of Glycemic Deficiencies With Solute Carrier Family 39 Member 5 Inhibitors (SLC39A5)

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<211> 1968
<212> DNA
<213> homo sapien

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<212> DNA
<213> homo sapien

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<211> 1968
<212> DNA
<213> homo sapien

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agggccagua ggagcaauag gauuuuaaua aacagaaccc aucccaaa 1968

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<211> 1968
<212> DNA
<213> homo sapien

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<211> 1968
<212> DNA
<213> homo sapien

<400> 12
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<211> 1968
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<213> homo sapien

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tggatgtctg ggcagggatg cctctgggtc cctcagggtg gggtgacctg gaagagtcaa 600

aggcccctca cctaccccgt gggccagccc cctcgggcct ggacctcctt cacaggcttc 660

tgttgctgga ccactcattg gctgaccacc tgaatgagga ttgtctgaac ggctcccagc 720

tgctggtcaa ttttggcttg agccccgctg ctcctctgac ccctcgtcag tttgctctgc 780

tgtgcccagc cctgctttat cagatcgaca gccgcgtctg catcggcgct ccggcccctg 840

caccccccagg ggatctacta tctgccctgc ttcagagtgc cctggcagtc ctgttgctca 900

gcctcccttc tcccctatcc ctgctgctgc tgcggctcct gggacctcgt ctactacggc 960

ccttgctggg cttcctgggg gccctggcgg tgggcactct ttgtggggat gcactgctac 1020

atctgctacc gcatgcacaa gaagggcggc acgcaggacc tggcggacta ccagagaagg 1080

acctgggccc ggggctgtca gtgctcggag gcctcttcct gctctttgtg ctggagaaca 1140

tgctggggct tttgcggcac tgagggctca ggccaagatg ctgcaggcga aaacgaagga 1200

atctcgaaac acgcaacttg gatccggaga atggcagtgg gatggccctt cagcccctac 1260

aggcagctcc agagccaggg gctcagggcc agagggagaa gaacagccag cacccaccag 1320

ctctggcccc tcctgggcac caaggccaca gtcatgggca ccagggtggc actgatatca 1380

cgtggatggt cctcctggga gatggtctac acaacctcac tgatgggctg gccataggtg 1440

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ggctgctgct gctgagcctc gtgtctggag ccctgggatt ggggggtgca gtcctggggg 1620

tggggctcag cctgggccct gtccccctca ctccctgggt gtttggggtc actgctgggg 1680

tcttcctcta tgtggccctt gtggacatgc taccagccct gcttcgtcct ccggagcccc 1740

tgcctacgcc ccatgtgctc ctgcaggggc tggggctgct gctgggggggc ggcctcatgc 1800

ttgccataac cctgctggag gagcggctac tgcccgtgac cactgagggc tgatggggcc 1860

agtggaaagg ggtcgggttg cccttccttc cccccaacca caggaatgga ggcgggacac 1920

agggccagta ggagcaatag gattttaata aacagaaccc atcccaaa 1968

<210> 22
<211> 540
<212> PRT
<213> homo sapien

<400> 22

Met Met Gly Ser Pro Val Ser His Leu Leu Ala Gly Phe Cys Val Trp
1 5 10 15

Val Val Leu Gly Trp Val Gly Gly Ser Val Pro Asn Leu Gly Pro Ala
20 25 30

Glu Gln Glu Gln Asn His Tyr Leu Ala Gln Leu Phe Gly Leu Tyr Gly
35 40 45

Glu Asn Gly Thr Leu Thr Ala Gly Gly Leu Ala Arg Leu Leu His Ser
50 55 60

Leu Gly Leu Gly Arg Val Gln Gly Leu Arg Leu Gly Gln His Gly Pro
65 70 75 80

Leu Thr Gly Arg Ala Ala Ser Pro Ala Ala Asp Asn Ser Thr His Arg
85 90 95

Pro Gln Asn Pro Glu Leu Ser Val Asp Val Trp Ala Gly Met Pro Leu
100 105 110

Gly Pro Ser Gly Trp Gly Asp Leu Glu Glu Ser Lys Ala Pro His Leu
115 120 125

Pro Arg Gly Pro Ala Pro Ser Gly Leu Asp Leu Leu His Arg Leu Leu

```
    130                 135                 140

Leu Leu Asp His Ser Leu Ala Asp His Leu Asn Glu Asp Cys Leu Asn
145                 150                 155                 160

Gly Ser Gln Leu Leu Val Asn Phe Gly Leu Ser Pro Ala Ala Pro Leu
                165                 170                 175

Thr Pro Arg Gln Phe Ala Leu Leu Cys Pro Ala Leu Leu Tyr Gln Ile
            180                 185                 190

Asp Ser Arg Val Cys Ile Gly Ala Pro Ala Pro Ala Pro Pro Gly Asp
        195                 200                 205

Leu Leu Ser Ala Leu Leu Gln Ser Ala Leu Ala Val Leu Leu Leu Ser
    210                 215                 220

Leu Pro Ser Pro Leu Ser Leu Leu Leu Leu Arg Leu Leu Gly Pro Arg
225                 230                 235                 240

Leu Leu Arg Pro Leu Leu Gly Phe Leu Gly Ala Leu Ala Val Gly Thr
                245                 250                 255

Leu Cys Gly Asp Ala Leu Leu His Leu Leu Pro His Ala Gln Glu Gly
            260                 265                 270

Arg His Ala Gly Pro Gly Gly Leu Pro Glu Lys Asp Leu Gly Pro Gly
        275                 280                 285

Leu Ser Val Leu Gly Gly Leu Phe Leu Leu Phe Val Leu Glu Asn Met
    290                 295                 300

Leu Gly Leu Leu Arg His Arg Gly Leu Arg Pro Arg Cys Cys Arg Arg
305                 310                 315                 320

Lys Arg Arg Asn Leu Glu Thr Arg Asn Leu Asp Pro Glu Asn Gly Ser
                325                 330                 335
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Gly Met Ala Leu Gln Pro Leu Gln Ala Ala Pro Glu Pro Gly Ala Gln
            340                 345                 350

Gly Gln Arg Glu Lys Asn Ser Gln His Pro Pro Ala Leu Ala Pro Pro
        355                 360                 365

Gly His Gln Gly His Ser His Gly His Gln Gly Gly Thr Asp Ile Thr
    370                 375                 380

Trp Met Val Leu Leu Gly Asp Gly Leu His Asn Leu Thr Asp Gly Leu
385                 390                 395                 400

Ala Ile Gly Ala Ala Phe Ser Asp Gly Phe Ser Ser Gly Leu Ser Thr
                405                 410                 415

Thr Leu Ala Val Phe Cys His Glu Leu Pro His Glu Leu Gly Asp Phe
            420                 425                 430

Ala Met Leu Leu Gln Ser Gly Leu Ser Phe Arg Arg Leu Leu Leu Leu
        435                 440                 445

Ser Leu Val Ser Gly Ala Leu Gly Leu Gly Gly Ala Val Leu Gly Val
    450                 455                 460

Gly Leu Ser Leu Gly Pro Val Pro Leu Thr Pro Trp Val Phe Gly Val
465                 470                 475                 480

Thr Ala Gly Val Phe Leu Tyr Val Ala Leu Val Asp Met Leu Pro Ala
                485                 490                 495

Leu Leu Arg Pro Pro Glu Pro Leu Pro Thr Pro His Val Leu Leu Gln
            500                 505                 510

Gly Leu Gly Leu Leu Leu Gly Gly Gly Leu Met Leu Ala Ile Thr Leu
        515                 520                 525

Leu Glu Glu Arg Leu Leu Pro Val Thr Thr Glu Gly
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530 535 540

<210> 23
<211> 46
<212> PRT
<213> homo sapien

<400> 23

Met Met Gly Ser Pro Val Ser His Leu Leu Ala Gly Phe Cys Val Trp
1 5 10 15

Val Val Leu Gly Trp Val Gly Gly Ser Val Pro Asn Leu Gly Pro Ala
20 25 30

Glu Gln Glu Gln Asn His Tyr Leu Ala Gln Leu Phe Gly Leu
35 40 45

<210> 24
<211> 540
<212> PRT
<213> homo sapien

<400> 24

Met Met Gly Ser Pro Val Ser His Leu Leu Ala Gly Phe Cys Val Trp
1 5 10 15

Val Val Leu Gly Trp Val Gly Gly Ser Val Pro Asn Leu Gly Pro Ala
20 25 30

Glu Gln Glu Gln Asn His Tyr Leu Ala Gln Leu Phe Gly Leu Tyr Gly
35 40 45

Glu Asn Gly Thr Leu Thr Ala Gly Gly Leu Ala Arg Leu Leu His Ser
50 55 60

Leu Gly Leu Gly Arg Val Gln Gly Leu Arg Leu Gly Gln His Gly Pro
65 70 75 80

Leu Thr Gly Arg Ala Ala Ser Pro Ala Ala Asp Asn Ser Thr His Arg

```
                85                  90                  95

Pro Gln Asn Pro Glu Leu Ser Val Asp Val Trp Ala Gly Met Pro Leu
            100                 105                 110

Gly Pro Ser Gly Trp Gly Asp Leu Glu Glu Ser Lys Ala Pro His Leu
        115                 120                 125

Pro Arg Gly Pro Ala Pro Ser Gly Leu Asp Leu Leu His Arg Leu Leu
    130                 135                 140

Leu Leu Asp His Ser Leu Ala Asp His Leu Asn Glu Asp Cys Leu Asn
145                 150                 155                 160

Gly Ser Gln Leu Leu Val Asn Phe Gly Leu Ser Pro Ala Ala Pro Leu
                165                 170                 175

Thr Pro Arg Gln Phe Ala Leu Leu Cys Pro Ala Leu Leu Tyr Gln Ile
            180                 185                 190

Asp Ser Arg Val Cys Ile Gly Ala Pro Ala Pro Ala Pro Pro Gly Asp
        195                 200                 205

Leu Leu Ser Ala Leu Leu Gln Ser Ala Leu Ala Val Leu Leu Leu Ser
    210                 215                 220

Leu Pro Ser Pro Leu Ser Leu Leu Leu Leu Arg Leu Leu Gly Pro Arg
225                 230                 235                 240

Leu Leu Arg Pro Leu Leu Gly Phe Leu Gly Ala Leu Ala Val Gly Thr
                245                 250                 255

Leu Cys Gly Asp Ala Leu Leu His Leu Leu Pro His Ala Gln Glu Gly
            260                 265                 270

Arg His Ala Gly Pro Gly Gly Leu Pro Glu Lys Asp Leu Gly Pro Gly
        275                 280                 285
```

```
Leu Ser Val Leu Gly Gly Leu Phe Leu Leu Phe Val Leu Glu Asn Thr
    290                 295                 300

Leu Gly Leu Leu Arg His Arg Gly Leu Arg Pro Arg Cys Cys Arg Arg
305                 310                 315                 320

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

Gly Met Ala Leu Gln Pro Leu Gln Ala Ala Pro Glu Pro Gly Ala Gln
            340                 345                 350

Gly Gln Arg Glu Lys Asn Ser Gln His Pro Pro Ala Leu Ala Pro Pro
        355                 360                 365

Gly His Gln Gly His Ser His Gly His Gln Gly Gly Thr Asp Ile Thr
    370                 375                 380

Trp Met Val Leu Leu Gly Asp Gly Leu His Asn Leu Thr Asp Gly Leu
385                 390                 395                 400

Ala Ile Gly Ala Ala Phe Ser Asp Gly Phe Ser Ser Gly Leu Ser Thr
                405                 410                 415

Thr Leu Ala Val Phe Cys His Glu Leu Pro His Glu Leu Gly Asp Phe
            420                 425                 430

Ala Met Leu Leu Gln Ser Gly Leu Ser Phe Arg Arg Leu Leu Leu Leu
        435                 440                 445

Ser Leu Val Ser Gly Ala Leu Gly Leu Gly Gly Ala Val Leu Gly Val
    450                 455                 460

Gly Leu Ser Leu Gly Pro Val Pro Leu Thr Pro Trp Val Phe Gly Val
465                 470                 475                 480

Thr Ala Gly Val Phe Leu Tyr Val Ala Leu Val Asp Met Leu Pro Ala
```

```
                485                 490                 495

Leu Leu Arg Pro Pro Glu Pro Leu Pro Thr Pro His Val Leu Leu Gln
            500                 505                 510

Gly Leu Gly Leu Leu Leu Gly Gly Gly Leu Met Leu Ala Ile Thr Leu
        515                 520                 525

Leu Glu Glu Arg Leu Leu Pro Val Thr Thr Glu Gly
    530                 535                 540

<210>  25
<211>  321
<212>  PRT
<213>  homo sapien

<400>  25

Met Met Gly Ser Pro Val Ser His Leu Leu Ala Gly Phe Cys Val Trp
1               5                   10                  15

Val Val Leu Gly Trp Val Gly Gly Ser Val Pro Asn Leu Gly Pro Ala
            20                  25                  30

Glu Gln Glu Gln Asn His Tyr Leu Ala Gln Leu Phe Gly Leu Tyr Gly
        35                  40                  45

Glu Asn Gly Thr Leu Thr Ala Gly Gly Leu Ala Arg Leu Leu His Ser
    50                  55                  60

Leu Gly Leu Gly Arg Val Gln Gly Leu Arg Leu Gly Gln His Gly Pro
65                  70                  75                  80

Leu Thr Gly Arg Ala Ala Ser Pro Ala Ala Asp Asn Ser Thr His Arg
                85                  90                  95

Pro Gln Asn Pro Glu Leu Ser Val Asp Val Trp Ala Gly Met Pro Leu
            100                 105                 110
```

```
Gly Pro Ser Gly Trp Gly Asp Leu Glu Glu Ser Lys Ala Pro His Leu
        115                 120                 125

Pro Arg Gly Pro Ala Pro Ser Gly Leu Asp Leu Leu His Arg Leu Leu
    130                 135                 140

Leu Leu Asp His Ser Leu Ala Asp His Leu Asn Glu Asp Cys Leu Asn
145                 150                 155                 160

Gly Ser Gln Leu Leu Val Asn Phe Gly Leu Ser Pro Ala Ala Pro Leu
                165                 170                 175

Thr Pro Arg Gln Phe Ala Leu Leu Cys Pro Ala Leu Leu Tyr Gln Ile
            180                 185                 190

Asp Ser Arg Val Cys Ile Gly Ala Pro Ala Pro Ala Pro Pro Gly Asp
        195                 200                 205

Leu Leu Ser Ala Leu Leu Gln Ser Ala Leu Ala Val Leu Leu Leu Ser
    210                 215                 220

Leu Pro Ser Pro Leu Ser Leu Leu Leu Leu Arg Leu Leu Gly Pro Arg
225                 230                 235                 240

Leu Leu Arg Pro Leu Leu Gly Phe Leu Gly Ala Leu Ala Val Gly Thr
                245                 250                 255

Leu Cys Gly Asp Ala Leu Leu His Leu Leu Pro His Ala Gln Glu Gly
            260                 265                 270

Arg His Ala Gly Pro Gly Gly Leu Pro Glu Lys Asp Leu Gly Pro Gly
        275                 280                 285

Leu Ser Val Leu Gly Gly Leu Phe Leu Leu Phe Val Leu Glu Asn Met
    290                 295                 300

Leu Gly Leu Leu Arg His Arg Gly Leu Arg Pro Arg Cys Cys Arg Arg
305                 310                 315                 320
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Lys

<210> 26
<211> 540
<212> PRT
<213> homo sapien

<400> 26

Met Met Gly Ser Pro Val Ser His Leu Leu Ala Gly Phe Cys Val Trp
1 5 10 15

Val Val Leu Gly Trp Val Gly Gly Ser Val Pro Asn Leu Gly Pro Ala
20 25 30

Glu Gln Glu Gln Asn His Tyr Leu Ala Gln Leu Phe Gly Leu Tyr Gly
35 40 45

Glu Asn Gly Thr Leu Thr Ala Gly Gly Leu Ala Arg Leu Leu His Ser
50 55 60

Leu Gly Leu Gly Arg Val Gln Gly Leu Arg Leu Gly Gln His Gly Pro
65 70 75 80

Leu Thr Gly Arg Ala Ala Ser Pro Ala Ala Asp Asn Ser Thr His Arg
85 90 95

Pro Gln Asn Pro Glu Leu Ser Val Asp Val Trp Ala Gly Met Pro Leu
100 105 110

Gly Pro Ser Gly Trp Gly Asp Leu Glu Glu Ser Lys Ala Pro His Leu
115 120 125

Pro Arg Gly Pro Ala Pro Ser Gly Leu Asp Leu Leu His Arg Leu Leu
130 135 140

Leu Leu Asp His Ser Leu Ala Asp His Leu Asn Glu Asp Cys Leu Asn

```
145                 150                 155                 160

Gly Ser Gln Leu Leu Val Asn Phe Gly Leu Ser Pro Ala Ala Pro Leu
                165                 170                 175

Thr Pro Arg Gln Phe Ala Leu Leu Cys Pro Ala Leu Leu Tyr Gln Ile
            180                 185                 190

Asp Ser Arg Val Cys Ile Gly Ala Pro Ala Pro Ala Pro Pro Gly Asp
        195                 200                 205

Leu Leu Ser Ala Leu Leu Gln Ser Ala Leu Ala Val Leu Leu Leu Ser
    210                 215                 220

Leu Pro Ser Pro Leu Ser Leu Leu Leu Leu Arg Leu Leu Gly Pro Arg
225                 230                 235                 240

Leu Leu Arg Pro Leu Leu Gly Phe Leu Gly Ala Leu Ala Val Gly Thr
                245                 250                 255

Leu Cys Gly Asp Ala Leu Leu His Leu Leu Pro His Ala Gln Glu Gly
            260                 265                 270

Arg His Ala Gly Pro Gly Gly Leu Pro Glu Lys Asp Leu Gly Pro Gly
        275                 280                 285

Leu Ser Val Leu Gly Gly Leu Phe Leu Leu Phe Val Leu Glu Asn Met
    290                 295                 300

Leu Gly Leu Leu Arg His Arg Gly Leu Arg Pro Arg Cys Cys Arg Arg
305                 310                 315                 320

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

Gly Met Ala Leu Gln Pro Leu Gln Ala Ala Pro Glu Pro Gly Ala Gln
            340                 345                 350
```

```
Gly Gln Arg Glu Lys Asn Ser Gln His Pro Pro Ala Leu Ala Pro Pro
        355                 360                 365

Gly His Gln Gly His Ser His Gly His Gln Gly Gly Thr Asp Ile Thr
    370                 375                 380

Trp Met Val Leu Leu Gly Asp Gly Leu His Asn Leu Thr Asp Gly Leu
385                 390                 395                 400

Ala Ile Gly Ala Ala Phe Ser Asp Gly Phe Ser Ser Ala Leu Ser Thr
                405                 410                 415

Thr Leu Ala Val Phe Cys His Glu Leu Pro His Glu Leu Gly Asp Phe
            420                 425                 430

Ala Met Leu Leu Gln Ser Gly Leu Ser Phe Arg Arg Leu Leu Leu Leu
        435                 440                 445

Ser Leu Val Ser Gly Ala Leu Gly Leu Gly Gly Ala Val Leu Gly Val
    450                 455                 460

Gly Leu Ser Leu Gly Pro Val Pro Leu Thr Pro Trp Val Phe Gly Val
465                 470                 475                 480

Thr Ala Gly Val Phe Leu Tyr Val Ala Leu Val Asp Met Leu Pro Ala
                485                 490                 495

Leu Leu Arg Pro Pro Glu Pro Leu Pro Thr Pro His Val Leu Leu Gln
            500                 505                 510

Gly Leu Gly Leu Leu Leu Gly Gly Gly Leu Met Leu Ala Ile Thr Leu
        515                 520                 525

Leu Glu Glu Arg Leu Leu Pro Val Thr Thr Glu Gly
    530                 535                 540
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<210> 27

<211> 310
<212> PRT
<213> homo sapien

<400> 27

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Met Met Gly Ser Pro Val Ser His Leu Leu Ala Gly Phe Cys Val Trp
1               5                  10                  15


Val Val Leu Gly Trp Val Gly Gly Ser Val Pro Asn Leu Gly Pro Ala
            20                  25                  30


Glu Gln Glu Gln Asn His Tyr Leu Ala Gln Leu Phe Gly Leu Tyr Gly
        35                  40                  45


Glu Asn Gly Thr Leu Thr Ala Gly Gly Leu Ala Arg Leu Leu His Ser
    50                  55                  60


Leu Gly Leu Gly Arg Val Gln Gly Leu Arg Leu Gly Gln His Gly Pro
65                  70                  75                  80


Leu Thr Gly Arg Ala Ala Ser Pro Ala Ala Asp Asn Ser Thr His Arg
                85                  90                  95


Pro Gln Asn Pro Glu Leu Ser Val Asp Val Trp Ala Gly Met Pro Leu
            100                 105                 110


Gly Pro Ser Gly Trp Gly Asp Leu Glu Glu Ser Lys Ala Pro His Leu
        115                 120                 125


Pro Arg Gly Pro Ala Pro Ser Gly Leu Asp Leu Leu His Arg Leu Leu
    130                 135                 140


Leu Leu Asp His Ser Leu Ala Asp His Leu Asn Glu Asp Cys Leu Asn
145                 150                 155                 160


Gly Ser Gln Leu Leu Val Asn Phe Gly Leu Ser Pro Ala Ala Pro Leu
                165                 170                 175
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Thr Pro Arg Gln Phe Ala Leu Leu Cys Pro Ala Leu Leu Tyr Gln Ile
180 185 190

Asp Ser Arg Val Cys Ile Gly Ala Pro Ala Pro Ala Pro Pro Gly Asp
195 200 205

Leu Leu Ser Ala Leu Leu Gln Ser Ala Leu Ala Val Leu Leu Leu Ser
210 215 220

Leu Pro Ser Pro Leu Ser Leu Leu Leu Leu Arg Leu Leu Gly Pro Arg
225 230 235 240

Leu Leu Arg Pro Leu Leu Gly Phe Leu Gly Ala Leu Ala Val Gly Thr
245 250 255

Leu Cys Gly Asp Ala Leu Leu His Leu Leu Pro His Ala Gln Glu Gly
260 265 270

Arg His Ala Gly Pro Gly Gly Leu Pro Glu Lys Asp Leu Gly Pro Gly
275 280 285

Leu Ser Val Leu Gly Gly Leu Phe Leu Leu Phe Val Leu Glu Asn Met
290 295 300

Leu Gly Leu Leu Arg His
305 310

<210> 28
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 28
cgcaacttgg atccggagaa tgg 23

<210> 29
<211> 23

<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 29
gaatctcgaa acacgcaact tgg 23

<210> 30
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 30
cgaaacacgc aacttggatc cgg 23

<210> 31
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 31
tggatccgga gaatggcagt ggg 23

<210> 32
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 32
aggcagctcc aggtgactag agg 23

<210> 33
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 33
gatggccctt cagcccctac agg 23

<210> 34
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 34
aaataggagg gcatccctcc tgg 23

<210> 35
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 35
ttggatccgg agaatggcag tgg 23

<210> 36
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 36
gtcacctgga gctgcctgta ggg 23

<210> 37
<211> 23
<212> DNA
<213> artificial sequence

<220>

<223> Guide RNA Recognition Sequence

<400> 37
aattttctcc tctagtcacc tgg 23

<210> 38
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 38
tcacctggag ctgcctgtag ggg 23

<210> 39
<211> 23
<212> DNA
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<220>
<223> Guide RNA Recognition Sequence

<400> 39
tcctatttca gagatgctgc agg 23

<210> 40
<211> 23
<212> DNA
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<220>
<223> Guide RNA Recognition Sequence

<400> 40
tgcagcatct ctgaaatagg agg 23

<210> 41
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 41
gtgttcatct tcccagcttg tgg 23

<210> 42
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 42
tgaacacctg gttccacctc tgg 23

<210> 43
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 43
catcttccca gcttgtggcc tgg 23

<210> 44
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 44
taggagggca tccctcctgg tgg 23

<210> 45
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 45
gatgctgcag gcgaaaatga agg 23

<210> 46
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 46
aagctgggaa gatgaacacc tgg 23

<210> 47
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 47
gcagcatctc tgaaatagga ggg 23

<210> 48
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 48
cagcagagcc agggactaag ggg 23

<210> 49
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 49
gcctgcagca tctctgaaat agg 23

<210> 50
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 50
gccatcccac tgccattctc cgg 23

<210> 51
<211> 23
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<220>
<223> Guide RNA Recognition Sequence

<400> 51
gggaagccag gccacaagct ggg 23

<210> 52
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 52
agctgcctgt aggggctgaa ggg 23

<210> 53
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 53
ggggaagcca ggccacaagc tgg 23

<210> 54
<211> 23

<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 54
agtcacctgg agctgcctgt agg 23

<210> 55
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 55
gcagcagagc cagggactaa ggg 23

<210> 56
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 56
cctggcttcc ccttagtccc tgg 23

<210> 57
<211> 351
<212> DNA
<213> Mus musculus

<400> 57
caggtgcagc tgaaggagtc aggacctggc ctggtggcgc cctcacagag cctgtccatc 60

acatgcaccg tctcagggtt ctcattaacc ggctatgctg taaactgggt tcgccagcct 120

ccaggacagg ggctggagtg gctgggagtg atttggggtg atggaagaac agactataat 180

tcagttctca aatccagact gagcatcaac aaggacaact ccaagagcca agttttctta 240

aaaatgaaca gtctgcaaac tgatgacaca gccaggtact actgtgccag atttggtaac 300

tcctatgctc tggactactg gggtcaagga acctcagtca ccgtctcctc a 351

<210> 58
<211> 117
<212> PRT
<213> Mus musculus

<400> 58

Gln Val Gln Leu Lys Glu Ser Gly Pro Gly Leu Val Ala Pro Ser Gln
1 5 10 15

Ser Leu Ser Ile Thr Cys Thr Val Ser Gly Phe Ser Leu Thr Gly Tyr
20 25 30

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

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

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

Lys Met Asn Ser Leu Gln Thr Asp Asp Thr Ala Arg Tyr Tyr Cys Ala
85 90 95

Arg Phe Gly Asn Ser Tyr Ala Leu Asp Tyr Trp Gly Gln Gly Thr Ser
100 105 110

Val Thr Val Ser Ser
115

<210> 59
<211> 336
<212> DNA
<213> Mus musculus

<400> 59
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atgagctgca aatccagtca gagtctgctc aacagtagaa cccgaaagaa ctacttggct 120

tggtaccagc agaaaccagg gcagtctcct aaactgctga tctactgggc atccactagg 180

gaatctgggg tccctgatcg cttcacaggc agtggatctg ggacagattt cactctcacc 240

atcagcagtg tgcaggctga agacctggca gtttattact gcaagcaatc ttataatctt 300

cacacgttcg gaggggggac caagctggaa ataaaa 336

<210> 60
<211> 112
<212> PRT
<213> Mus musculus

<400> 60

Asp Ile Val Met Ser Gln Ser Pro Ser Ser Leu Ala Val Ser Ala Gly
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Glu Lys Val Thr Met Ser Cys Lys Ser Ser Gln Ser Leu Leu Asn Ser
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Arg Thr Arg Lys Asn Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
35 40 45

Ser Pro Lys Leu Leu Ile Tyr Trp Ala Ser Thr Arg Glu Ser Gly Val
50 55 60

Pro Asp Arg Phe Thr Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
65 70 75 80

Ile Ser Ser Val Gln Ala Glu Asp Leu Ala Val Tyr Tyr Cys Lys Gln
85 90 95

Ser Tyr Asn Leu His Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
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<400> 61

Phe Ser Leu Thr Gly Tyr Ala Val Asn
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Trp Leu Gly Val Ile Trp Gly Asp Gly Arg Thr Asp Tyr
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Ala Arg Phe Gly Asn Ser Tyr Ala Leu Asp Tyr
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Gln Ser Leu Leu Asn Ser Arg Thr Arg Lys Asn Tyr Leu Ala
1 5 10

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Leu Leu Ile Tyr Trp Ala Ser Thr Arg Glu Ser
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Lys Gln Ser Tyr Asn Leu His
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<210> 67
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<400> 67

Gly Pro Ser Gly Trp Gly Asp Gln Glu Glu Ser Lys Ala Pro Asp Leu
1   5   10   15

His Gly