SEQUENCE LISTING

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<120> GENE THERAPY FOR CNS DEGENERATION

<130> ROPA-009/01WO 329952-2067

<150> US 62/664,006
<151> 2018-04-27

<160> 81

<170> PatentIn version 3.5

<210> 1
<211> 465
<212> PRT
<213> Homo sapiens

<400> 1

Met Ile Val Phe Val Arg Phe Asn Ser Ser His Gly Phe Pro Val Glu
1 5 10 15

Val Asp Ser Asp Thr Ser Ile Phe Gln Leu Lys Glu Val Val Ala Lys
20 25 30

Arg Gln Gly Val Pro Ala Asp Gln Leu Arg Val Ile Phe Ala Gly Lys
35 40 45

Glu Leu Arg Asn Asp Trp Thr Val Gln Asn Cys Asp Leu Asp Gln Gln
50 55 60

Ser Ile Val His Ile Val Gln Arg Pro Trp Arg Lys Gly Gln Glu Met
65 70 75 80

Asn Ala Thr Gly Gly Asp Asp Pro Arg Asn Ala Ala Gly Gly Cys Glu
85 90 95

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Arg Glu Pro Gln Ser Leu Thr Arg Val Asp Leu Ser Ser Ser Val Leu
            100                 105                 110

Pro Gly Asp Ser Val Gly Leu Ala Val Ile Leu His Thr Asp Ser Arg
        115                 120                 125

Lys Asp Ser Pro Pro Ala Gly Ser Pro Ala Gly Arg Ser Ile Tyr Asn
    130                 135                 140

Ser Phe Tyr Val Tyr Cys Lys Gly Pro Cys Gln Arg Val Gln Pro Gly
145                 150                 155                 160

Lys Leu Arg Val Gln Cys Ser Thr Cys Arg Gln Ala Thr Leu Thr Leu
                165                 170                 175

Thr Gln Gly Pro Ser Cys Trp Asp Asp Val Leu Ile Pro Asn Arg Met
            180                 185                 190

Ser Gly Glu Cys Gln Ser Pro His Cys Pro Gly Thr Ser Ala Glu Phe
        195                 200                 205

Phe Phe Lys Cys Gly Ala His Pro Thr Ser Asp Lys Glu Thr Ser Val
    210                 215                 220

Ala Leu His Leu Ile Ala Thr Asn Ser Arg Asn Ile Thr Cys Ile Thr
225                 230                 235                 240

Cys Thr Asp Val Arg Ser Pro Val Leu Val Phe Gln Cys Asn Ser Arg
                245                 250                 255

His Val Ile Cys Leu Asp Cys Phe His Leu Tyr Cys Val Thr Arg Leu
            260                 265                 270

Asn Asp Arg Gln Phe Val His Asp Pro Gln Leu Gly Tyr Ser Leu Pro
        275                 280                 285
```

```
Cys Val Ala Gly Cys Pro Asn Ser Leu Ile Lys Glu Leu His His Phe
    290                 295                 300

Arg Ile Leu Gly Glu Glu Gln Tyr Asn Arg Tyr Gln Gln Tyr Gly Ala
305                 310                 315                 320

Glu Glu Cys Val Leu Gln Met Gly Gly Val Leu Cys Pro Arg Pro Gly
                325                 330                 335

Cys Gly Ala Gly Leu Leu Pro Glu Pro Asp Gln Arg Lys Val Thr Cys
            340                 345                 350

Glu Gly Gly Asn Gly Leu Gly Cys Gly Phe Ala Phe Cys Arg Glu Cys
        355                 360                 365

Lys Glu Ala Tyr His Glu Gly Glu Cys Ser Ala Val Phe Glu Ala Ser
    370                 375                 380

Gly Thr Thr Thr Gln Ala Tyr Arg Val Asp Glu Arg Ala Ala Glu Gln
385                 390                 395                 400

Ala Arg Trp Glu Ala Ala Ser Lys Glu Thr Ile Lys Lys Thr Thr Lys
                405                 410                 415

Pro Cys Pro Arg Cys His Val Pro Val Glu Lys Asn Gly Gly Cys Met
            420                 425                 430

His Met Lys Cys Pro Gln Pro Gln Cys Arg Leu Glu Trp Cys Trp Asn
        435                 440                 445

Cys Gly Cys Glu Trp Asn Arg Val Cys Met Gly Asp His Trp Phe Asp
    450                 455                 460

Val
465
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<212> PRT
<213> Homo sapiens

<400> 2

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Met Ala Val Arg Gln Ala Leu Gly Arg Gly Leu Gln Leu Gly Arg Ala
1               5                  10                  15


Leu Leu Leu Arg Phe Thr Gly Lys Pro Gly Arg Ala Tyr Gly Leu Gly
            20                  25                  30


Arg Pro Gly Pro Ala Ala Gly Cys Val Arg Gly Glu Arg Pro Gly Trp
        35                  40                  45


Ala Ala Gly Pro Gly Ala Glu Pro Arg Arg Val Gly Leu Gly Leu Pro
    50                  55                  60


Asn Arg Leu Arg Phe Phe Arg Gln Ser Val Ala Gly Leu Ala Ala Arg
65                  70                  75                  80


Leu Gln Arg Gln Phe Val Val Arg Ala Trp Gly Cys Ala Gly Pro Cys
                85                  90                  95


Gly Arg Ala Val Phe Leu Ala Phe Gly Leu Gly Leu Gly Leu Ile Glu
            100                 105                 110


Glu Lys Gln Ala Glu Ser Arg Arg Ala Val Ser Ala Cys Gln Glu Ile
        115                 120                 125


Gln Ala Ile Phe Thr Gln Lys Ser Lys Pro Gly Pro Asp Pro Leu Asp
    130                 135                 140


Thr Arg Arg Leu Gln Gly Phe Arg Leu Glu Glu Tyr Leu Ile Gly Gln
145                 150                 155                 160


Ser Ile Gly Lys Gly Cys Ser Ala Ala Val Tyr Glu Ala Thr Met Pro
                165                 170                 175


Thr Leu Pro Gln Asn Leu Glu Val Thr Lys Ser Thr Gly Leu Leu Pro
```

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            180                 185                 190

Gly Arg Gly Pro Gly Thr Ser Ala Pro Gly Glu Gly Gln Glu Arg Ala
        195                 200                 205

Pro Gly Ala Pro Ala Phe Pro Leu Ala Ile Lys Met Met Trp Asn Ile
    210                 215                 220

Ser Ala Gly Ser Ser Ser Glu Ala Ile Leu Asn Thr Met Ser Gln Glu
225                 230                 235                 240

Leu Val Pro Ala Ser Arg Val Ala Leu Ala Gly Glu Tyr Gly Ala Val
                245                 250                 255

Thr Tyr Arg Lys Ser Lys Arg Gly Pro Lys Gln Leu Ala Pro His Pro
            260                 265                 270

Asn Ile Ile Arg Val Leu Arg Ala Phe Thr Ser Ser Val Pro Leu Leu
        275                 280                 285

Pro Gly Ala Leu Val Asp Tyr Pro Asp Val Leu Pro Ser Arg Leu His
    290                 295                 300

Pro Glu Gly Leu Gly His Gly Arg Thr Leu Phe Leu Val Met Lys Asn
305                 310                 315                 320

Tyr Pro Cys Thr Leu Arg Gln Tyr Leu Cys Val Asn Thr Pro Ser Pro
                325                 330                 335

Arg Leu Ala Ala Met Met Leu Leu Gln Leu Leu Glu Gly Val Asp His
            340                 345                 350

Leu Val Gln Gln Gly Ile Ala His Arg Asp Leu Lys Ser Asp Asn Ile
        355                 360                 365

Leu Val Glu Leu Asp Pro Asp Gly Cys Pro Trp Leu Val Ile Ala Asp
    370                 375                 380
```

```
Phe Gly Cys Cys Leu Ala Asp Glu Ser Ile Gly Leu Gln Leu Pro Phe
385                 390                 395                 400

Ser Ser Trp Tyr Val Asp Arg Gly Gly Asn Gly Cys Leu Met Ala Pro
                405                 410                 415

Glu Val Ser Thr Ala Arg Pro Gly Pro Arg Ala Val Ile Asp Tyr Ser
            420                 425                 430

Lys Ala Asp Ala Trp Ala Val Gly Ala Ile Ala Tyr Glu Ile Phe Gly
        435                 440                 445

Leu Val Asn Pro Phe Tyr Gly Gln Gly Lys Ala His Leu Glu Ser Arg
    450                 455                 460

Ser Tyr Gln Glu Ala Gln Leu Pro Ala Leu Pro Glu Ser Val Pro Pro
465                 470                 475                 480

Asp Val Arg Gln Leu Val Arg Ala Leu Leu Gln Arg Glu Ala Ser Lys
                485                 490                 495

Arg Pro Ser Ala Arg Val Ala Ala Asn Val Leu His Leu Ser Leu Trp
            500                 505                 510

Gly Glu His Ile Leu Ala Leu Lys Asn Leu Lys Leu Asp Lys Met Val
        515                 520                 525

Gly Trp Leu Leu Gln Gln Ser Ala Ala Thr Leu Leu Ala Asn Arg Leu
    530                 535                 540

Thr Glu Lys Cys Cys Val Glu Thr Lys Met Lys Met Leu Phe Leu Ala
545                 550                 555                 560

Asn Leu Glu Cys Glu Thr Leu Cys Gln Ala Ala Leu Leu Leu Cys Ser
                565                 570                 575

Trp Arg Ala Ala Leu
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580

<210> 3
<211> 189
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Met Ala Ser Lys Arg Ala Leu Val Ile Leu Ala Lys Gly Ala Glu Glu
1 5 10 15

Met Glu Thr Val Ile Pro Val Asp Val Met Arg Arg Ala Gly Ile Lys
20 25 30

Val Thr Val Ala Gly Leu Ala Gly Lys Asp Pro Val Gln Cys Ser Arg
35 40 45

Asp Val Val Ile Cys Pro Asp Ala Ser Leu Glu Asp Ala Lys Lys Glu
50 55 60

Gly Pro Tyr Asp Val Val Val Leu Pro Gly Gly Asn Leu Gly Ala Gln
65 70 75 80

Asn Leu Ser Glu Ser Ala Ala Val Lys Glu Ile Leu Lys Glu Gln Glu
85 90 95

Asn Arg Lys Gly Leu Ile Ala Ala Ile Cys Ala Gly Pro Thr Ala Leu
100 105 110

Leu Ala His Glu Ile Gly Phe Gly Ser Lys Val Thr Thr His Pro Leu
115 120 125

Ala Lys Asp Lys Met Met Asn Gly Gly His Tyr Thr Tyr Ser Glu Asn
130 135 140

Arg Val Glu Lys Asp Gly Leu Ile Leu Thr Ser Arg Gly Pro Gly Thr
145 150 155 160

Ser Phe Glu Phe Ala Leu Ala Ile Val Glu Ala Leu Asn Gly Lys Glu
165 170 175

Val Ala Ala Gln Val Lys Ala Pro Leu Val Leu Lys Asp
180 185

<210> 4
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<212> PRT
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<400> 4

Met Ala Ser Gly Ser Cys Gln Gly Cys Glu Glu Asp Glu Glu Thr Leu
1 5 10 15

Lys Lys Leu Ile Val Arg Leu Asn Asn Val Gln Glu Gly Lys Gln Ile
20 25 30

Glu Thr Leu Val Gln Ile Leu Glu Asp Leu Leu Val Phe Thr Tyr Ser
35 40 45

Glu Arg Ala Ser Lys Leu Phe Gln Gly Lys Asn Ile His Val Pro Leu
50 55 60

Leu Ile Val Leu Asp Ser Tyr Met Arg Val Ala Ser Val Gln Gln Val
65 70 75 80

Gly Trp Ser Leu Leu Cys Lys Leu Ile Glu Val Cys Pro Gly Thr Met
85 90 95

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

Gly Val His Gln Leu Ile Leu Lys Met Leu Thr Val His Asn Ala Ser
115 120 125

Val Asn Leu Ser Val Ile Gly Leu Lys Thr Leu Asp Leu Leu Leu Thr
130 135 140

```
Ser Gly Lys Ile Thr Leu Leu Ile Leu Asp Glu Glu Ser Asp Ile Phe
145                 150                 155                 160

Met Leu Ile Phe Asp Ala Met His Ser Phe Pro Ala Asn Asp Glu Val
                165                 170                 175

Gln Lys Leu Gly Cys Lys Ala Leu His Val Leu Phe Glu Arg Val Ser
            180                 185                 190

Glu Glu Gln Leu Thr Glu Phe Val Glu Asn Lys Asp Tyr Met Ile Leu
        195                 200                 205

Leu Ser Ala Leu Thr Asn Phe Lys Asp Glu Glu Glu Ile Val Leu His
    210                 215                 220

Val Leu His Cys Leu His Ser Leu Ala Ile Pro Cys Asn Asn Val Glu
225                 230                 235                 240

Val Leu Met Ser Gly Asn Val Arg Cys Tyr Asn Ile Val Val Glu Ala
                245                 250                 255

Met Lys Ala Phe Pro Met Ser Glu Arg Ile Gln Glu Val Ser Cys Cys
            260                 265                 270

Leu Leu His Arg Leu Thr Leu Gly Asn Phe Phe Asn Ile Leu Val Leu
        275                 280                 285

Asn Glu Val His Glu Phe Val Val Lys Ala Val Gln Gln Tyr Pro Glu
    290                 295                 300

Asn Ala Ala Leu Gln Ile Ser Ala Leu Ser Cys Leu Ala Leu Leu Thr
305                 310                 315                 320

Glu Thr Ile Phe Leu Asn Gln Asp Leu Glu Glu Lys Asn Glu Asn Gln
                325                 330                 335

Glu Asn Asp Asp Glu Gly Glu Glu Asp Lys Leu Phe Trp Leu Glu Ala
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            340                 345                 350

Cys Tyr Lys Ala Leu Thr Trp His Arg Lys Asn Lys His Val Gln Glu
        355                 360                 365

Ala Ala Cys Trp Ala Leu Asn Asn Leu Leu Met Tyr Gln Asn Ser Leu
    370                 375                 380

His Glu Lys Ile Gly Asp Glu Asp Gly His Phe Pro Ala His Arg Glu
385                 390                 395                 400

Val Met Leu Ser Met Leu Met His Ser Ser Ser Lys Glu Val Phe Gln
                405                 410                 415

Ala Ser Ala Asn Ala Leu Ser Thr Leu Leu Glu Gln Asn Val Asn Phe
            420                 425                 430

Arg Lys Ile Leu Leu Ser Lys Gly Ile His Leu Asn Val Leu Glu Leu
        435                 440                 445

Met Gln Lys His Ile His Ser Pro Glu Val Ala Glu Ser Gly Cys Lys
    450                 455                 460

Met Leu Asn His Leu Phe Glu Gly Ser Asn Thr Ser Leu Asp Ile Met
465                 470                 475                 480

Ala Ala Val Val Pro Lys Ile Leu Thr Val Met Lys Arg His Glu Thr
                485                 490                 495

Ser Leu Pro Val Gln Leu Glu Ala Leu Arg Ala Ile Leu His Phe Ile
            500                 505                 510

Val Pro Gly Met Pro Glu Glu Ser Arg Glu Asp Thr Glu Phe His His
        515                 520                 525

Lys Leu Asn Met Val Lys Lys Gln Cys Phe Lys Asn Asp Ile His Lys
    530                 535                 540
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```
Leu Val Leu Ala Ala Leu Asn Arg Phe Ile Gly Asn Pro Gly Ile Gln
545                 550                 555                 560

Lys Cys Gly Leu Lys Val Ile Ser Ser Ile Val His Phe Pro Asp Ala
                565                 570                 575

Leu Glu Met Leu Ser Leu Glu Gly Ala Met Asp Ser Val Leu His Thr
            580                 585                 590

Leu Gln Met Tyr Pro Asp Asp Gln Glu Ile Gln Cys Leu Gly Leu Ser
        595                 600                 605

Leu Ile Gly Tyr Leu Ile Thr Lys Lys Asn Val Phe Ile Gly Thr Gly
    610                 615                 620

His Leu Leu Ala Lys Ile Leu Val Ser Ser Leu Tyr Arg Phe Lys Asp
625                 630                 635                 640

Val Ala Glu Ile Gln Thr Lys Gly Phe Gln Thr Ile Leu Ala Ile Leu
                645                 650                 655

Lys Leu Ser Ala Ser Phe Ser Lys Leu Leu Val His His Ser Phe Asp
            660                 665                 670

Leu Val Ile Phe His Gln Met Ser Ser Asn Ile Met Glu Gln Lys Asp
        675                 680                 685

Gln Gln Phe Leu Asn Leu Cys Cys Lys Cys Phe Ala Lys Val Ala Met
    690                 695                 700

Asp Asp Tyr Leu Lys Asn Val Met Leu Glu Arg Ala Cys Asp Gln Asn
705                 710                 715                 720

Asn Ser Ile Met Val Glu Cys Leu Leu Leu Leu Gly Ala Asp Ala Asn
                725                 730                 735

Gln Ala Lys Glu Gly Ser Ser Leu Ile Cys Gln Val Cys Glu Lys Glu
```

```
            740                 745                 750

Ser Ser Pro Lys Leu Val Glu Leu Leu Leu Asn Ser Gly Ser Arg Glu
        755                 760                 765

Gln Asp Val Arg Lys Ala Leu Thr Ile Ser Ile Gly Lys Gly Asp Ser
    770                 775                 780

Gln Ile Ile Ser Leu Leu Leu Arg Arg Leu Ala Leu Asp Val Ala Asn
785                 790                 795                 800

Asn Ser Ile Cys Leu Gly Gly Phe Cys Ile Gly Lys Val Glu Pro Ser
                805                 810                 815

Trp Leu Gly Pro Leu Phe Pro Asp Lys Thr Ser Asn Leu Arg Lys Gln
            820                 825                 830

Thr Asn Ile Ala Ser Thr Leu Ala Arg Met Val Ile Arg Tyr Gln Met
        835                 840                 845

Lys Ser Ala Val Glu Glu Gly Thr Ala Ser Gly Ser Asp Gly Asn Phe
    850                 855                 860

Ser Glu Asp Val Leu Ser Lys Phe Asp Glu Trp Thr Phe Ile Pro Asp
865                 870                 875                 880

Ser Ser Met Asp Ser Val Phe Ala Gln Ser Asp Asp Leu Asp Ser Glu
                885                 890                 895

Gly Ser Glu Gly Ser Phe Leu Val Lys Lys Lys Ser Asn Ser Ile Ser
            900                 905                 910

Val Gly Glu Phe Tyr Arg Asp Ala Val Leu Gln Arg Cys Ser Pro Asn
        915                 920                 925

Leu Gln Arg His Ser Asn Ser Leu Gly Pro Ile Phe Asp His Glu Asp
    930                 935                 940
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```
Leu Leu Lys Arg Lys Arg Lys Ile Leu Ser Ser Asp Asp Ser Leu Arg
945                 950                 955                 960


Ser Ser Lys Leu Gln Ser His Met Arg His Ser Asp Ser Ile Ser Ser
                965                 970                 975


Leu Ala Ser Glu Arg Glu Tyr Ile Thr Ser Leu Asp Leu Ser Ala Asn
            980                 985                 990


Glu Leu Arg Asp Ile Asp Ala Leu  Ser Gln Lys Cys Cys  Ile Ser Val
        995                 1000                1005


His Leu  Glu His Leu Glu Lys  Leu Glu Leu His Gln  Asn Ala Leu
    1010                1015                1020


Thr Ser  Phe Pro Gln Gln Leu  Cys Glu Thr Leu Lys  Ser Leu Thr
    1025                1030                1035


His Leu  Asp Leu His Ser Asn  Lys Phe Thr Ser Phe  Pro Ser Tyr
    1040                1045                1050


Leu Leu  Lys Met Ser Cys Ile  Ala Asn Leu Asp Val  Ser Arg Asn
    1055                1060                1065


Asp Ile  Gly Pro Ser Val Val  Leu Asp Pro Thr Val  Lys Cys Pro
    1070                1075                1080


Thr Leu  Lys Gln Phe Asn Leu  Ser Tyr Asn Gln Leu  Ser Phe Val
    1085                1090                1095


Pro Glu  Asn Leu Thr Asp Val  Val Glu Lys Leu Glu  Gln Leu Ile
    1100                1105                1110


Leu Glu  Gly Asn Lys Ile Ser  Gly Ile Cys Ser Pro  Leu Arg Leu
    1115                1120                1125


Lys Glu  Leu Lys Ile Leu Asn  Leu Ser Lys Asn His  Ile Ser Ser
```

```
    1130                1135                1140

Leu Ser  Glu Asn Phe Leu Glu  Ala Cys Pro Lys Val  Glu Ser Phe
    1145                1150                1155

Ser Ala  Arg Met Asn Phe Leu  Ala Ala Met Pro Phe  Leu Pro Pro
    1160                1165                1170

Ser Met  Thr Ile Leu Lys Leu  Ser Gln Asn Lys Phe  Ser Cys Ile
    1175                1180                1185

Pro Glu  Ala Ile Leu Asn Leu  Pro His Leu Arg Ser  Leu Asp Met
    1190                1195                1200

Ser Ser  Asn Asp Ile Gln Tyr  Leu Pro Gly Pro Ala  His Trp Lys
    1205                1210                1215

Ser Leu  Asn Leu Arg Glu Leu  Leu Phe Ser His Asn  Gln Ile Ser
    1220                1225                1230

Ile Leu  Asp Leu Ser Glu Lys  Ala Tyr Leu Trp Ser  Arg Val Glu
    1235                1240                1245

Lys Leu  His Leu Ser His Asn  Lys Leu Lys Glu Ile  Pro Pro Glu
    1250                1255                1260

Ile Gly  Cys Leu Glu Asn Leu  Thr Ser Leu Asp Val  Ser Tyr Asn
    1265                1270                1275

Leu Glu  Leu Arg Ser Phe Pro  Asn Glu Met Gly Lys  Leu Ser Lys
    1280                1285                1290

Ile Trp  Asp Leu Pro Leu Asp  Glu Leu His Leu Asn  Phe Asp Phe
    1295                1300                1305

Lys His  Ile Gly Cys Lys Ala  Lys Asp Ile Ile Arg  Phe Leu Gln
    1310                1315                1320
```

```
Gln Arg  Leu Lys Lys Ala Val  Pro Tyr Asn Arg Met  Lys Leu Met
    1325                1330                1335

Ile Val  Gly Asn Thr Gly Ser  Gly Lys Thr Thr Leu  Leu Gln Gln
    1340                1345                1350

Leu Met  Lys Thr Lys Lys Ser  Asp Leu Gly Met Gln  Ser Ala Thr
    1355                1360                1365

Val Gly  Ile Asp Val Lys Asp  Trp Pro Ile Gln Ile  Arg Asp Lys
    1370                1375                1380

Arg Lys  Arg Asp Leu Val Leu  Asn Val Trp Asp Phe  Ala Gly Arg
    1385                1390                1395

Glu Glu  Phe Tyr Ser Thr His  Pro His Phe Met Thr  Gln Arg Ala
    1400                1405                1410

Leu Tyr  Leu Ala Val Tyr Asp  Leu Ser Lys Gly Gln  Ala Glu Val
    1415                1420                1425

Asp Ala  Met Lys Pro Trp Leu  Phe Asn Ile Lys Ala  Arg Ala Ser
    1430                1435                1440

Ser Ser  Pro Val Ile Leu Val  Gly Thr His Leu Asp  Val Ser Asp
    1445                1450                1455

Glu Lys  Gln Arg Lys Ala Cys  Met Ser Lys Ile Thr  Lys Glu Leu
    1460                1465                1470

Leu Asn  Lys Arg Gly Phe Pro  Ala Ile Arg Asp Tyr  His Phe Val
    1475                1480                1485

Asn Ala  Thr Glu Glu Ser Asp  Ala Leu Ala Lys Leu  Arg Lys Thr
    1490                1495                1500

Ile Ile  Asn Glu Ser Leu Asn  Phe Lys Ile Arg Asp  Gln Leu Val
```

```
    1505                1510                1515

Val Gly  Gln Leu Ile Pro Asp  Cys Tyr Val Glu Leu  Glu Lys Ile
    1520                1525                1530

Ile Leu  Ser Glu Arg Lys Asn  Val Pro Ile Glu Phe  Pro Val Ile
    1535                1540                1545

Asp Arg  Lys Arg Leu Leu Gln  Leu Val Arg Glu Asn  Gln Leu Gln
    1550                1555                1560

Leu Asp  Glu Asn Glu Leu Pro  His Ala Val His Phe  Leu Asn Glu
    1565                1570                1575

Ser Gly  Val Leu Leu His Phe  Gln Asp Pro Ala Leu  Gln Leu Ser
    1580                1585                1590

Asp Leu  Tyr Phe Val Glu Pro  Lys Trp Leu Cys Lys  Ile Met Ala
    1595                1600                1605

Gln Ile  Leu Thr Val Lys Val  Glu Gly Cys Pro Lys  His Pro Lys
    1610                1615                1620

Gly Ile  Ile Ser Arg Arg Asp  Val Glu Lys Phe Leu  Ser Lys Lys
    1625                1630                1635

Arg Lys  Phe Pro Lys Asn Tyr  Met Ser Gln Tyr Phe  Lys Leu Leu
    1640                1645                1650

Glu Lys  Phe Gln Ile Ala Leu  Pro Ile Gly Glu Glu  Tyr Leu Leu
    1655                1660                1665

Val Pro  Ser Ser Leu Ser Asp  His Arg Pro Val Ile  Glu Leu Pro
    1670                1675                1680

His Cys  Glu Asn Ser Glu Ile  Ile Ile Arg Leu Tyr  Glu Met Pro
    1685                1690                1695
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```
Tyr Phe  Pro Met Gly Phe Trp  Ser Arg Leu Ile Asn  Arg Leu Leu
    1700                1705                1710

Glu Ile  Ser Pro Tyr Met Leu  Ser Gly Arg Glu Arg  Ala Leu Arg
    1715                1720                1725

Pro Asn  Arg Met Tyr Trp Arg  Gln Gly Ile Tyr Leu  Asn Trp Ser
    1730                1735                1740

Pro Glu  Ala Tyr Cys Leu Val  Gly Ser Glu Val Leu  Asp Asn His
    1745                1750                1755

Pro Glu  Ser Phe Leu Lys Ile  Thr Val Pro Ser Cys  Arg Lys Gly
    1760                1765                1770

Cys Ile  Leu Leu Gly Gln Val  Val Asp His Ile Asp  Ser Leu Met
    1775                1780                1785

Glu Glu  Trp Phe Pro Gly Leu  Leu Glu Ile Asp Ile  Cys Gly Glu
    1790                1795                1800

Gly Glu  Thr Leu Leu Lys Lys  Trp Ala Leu Tyr Ser  Phe Asn Asp
    1805                1810                1815

Gly Glu  Glu His Gln Lys Ile  Leu Leu Asp Asp Leu  Met Lys Lys
    1820                1825                1830

Ala Glu  Glu Gly Asp Leu Leu  Val Asn Pro Asp Gln  Pro Arg Leu
    1835                1840                1845

Thr Ile  Pro Ile Ser Gln Ile  Ala Pro Asp Leu Ile  Leu Ala Asp
    1850                1855                1860

Leu Pro  Arg Asn Ile Met Leu  Asn Asn Asp Glu Leu  Glu Phe Glu
    1865                1870                1875

Gln Ala  Pro Glu Phe Leu Leu  Gly Asp Gly Ser Phe  Gly Ser Val
```

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    1880                1885                1890

Tyr Arg  Ala Ala Tyr Glu Gly  Glu Glu Val Ala Val  Lys Ile Phe
    1895                1900                1905

Asn Lys  His Thr Ser Leu Arg  Leu Leu Arg Gln Glu  Leu Val Val
    1910                1915                1920

Leu Cys  His Leu His His Pro  Ser Leu Ile Ser Leu  Leu Ala Ala
    1925                1930                1935

Gly Ile  Arg Pro Arg Met Leu  Val Met Glu Leu Ala  Ser Lys Gly
    1940                1945                1950

Ser Leu  Asp Arg Leu Leu Gln  Gln Asp Lys Ala Ser  Leu Thr Arg
    1955                1960                1965

Thr Leu  Gln His Arg Ile Ala  Leu His Val Ala Asp  Gly Leu Arg
    1970                1975                1980

Tyr Leu  His Ser Ala Met Ile  Ile Tyr Arg Asp Leu  Lys Pro His
    1985                1990                1995

Asn Val  Leu Leu Phe Thr Leu  Tyr Pro Asn Ala Ala  Ile Ile Ala
    2000                2005                2010

Lys Ile  Ala Asp Tyr Gly Ile  Ala Gln Tyr Cys Cys  Arg Met Gly
    2015                2020                2025

Ile Lys  Thr Ser Glu Gly Thr  Pro Gly Phe Arg Ala  Pro Glu Val
    2030                2035                2040

Ala Arg  Gly Asn Val Ile Tyr  Asn Gln Gln Ala Asp  Val Tyr Ser
    2045                2050                2055

Phe Gly  Leu Leu Leu Tyr Asp  Ile Leu Thr Thr Gly  Gly Arg Ile
    2060                2065                2070
```

```
Val Glu  Gly Leu Lys Phe Pro  Asn Glu Phe Asp Glu  Leu Glu Ile
    2075                2080                2085

Gln Gly  Lys Leu Pro Asp Pro  Val Lys Glu Tyr Gly  Cys Ala Pro
    2090                2095                2100

Trp Pro  Met Val Glu Lys Leu  Ile Lys Gln Cys Leu  Lys Glu Asn
    2105                2110                2115

Pro Gln  Glu Arg Pro Thr Ser  Ala Gln Val Phe Asp  Ile Leu Asn
    2120                2125                2130

Ser Ala  Glu Leu Val Cys Leu  Thr Arg Arg Ile Leu  Leu Pro Lys
    2135                2140                2145

Asn Val  Ile Val Glu Cys Met  Val Ala Thr His His  Asn Ser Arg
    2150                2155                2160

Asn Ala  Ser Ile Trp Leu Gly  Cys Gly His Thr Asp  Arg Gly Gln
    2165                2170                2175

Leu Ser  Phe Leu Asp Leu Asn  Thr Glu Gly Tyr Thr  Ser Glu Glu
    2180                2185                2190

Val Ala  Asp Ser Arg Ile Leu  Cys Leu Ala Leu Val  His Leu Pro
    2195                2200                2205

Val Glu  Lys Glu Ser Trp Ile  Val Ser Gly Thr Gln  Ser Gly Thr
    2210                2215                2220

Leu Leu  Val Ile Asn Thr Glu  Asp Gly Lys Lys Arg  His Thr Leu
    2225                2230                2235

Glu Lys  Met Thr Asp Ser Val  Thr Cys Leu Tyr Cys  Asn Ser Phe
    2240                2245                2250

Ser Lys  Gln Ser Lys Gln Lys  Asn Phe Leu Leu Val  Gly Thr Ala
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    2255                2260                2265

Asp Gly  Lys Leu Ala Ile Phe  Glu Asp Lys Thr Val  Lys Leu Lys
    2270                2275                2280

Gly Ala  Ala Pro Leu Lys Ile  Leu Asn Ile Gly Asn  Val Ser Thr
    2285                2290                2295

Pro Leu  Met Cys Leu Ser Glu  Ser Thr Asn Ser Thr  Glu Arg Asn
    2300                2305                2310

Val Met  Trp Gly Gly Cys Gly  Thr Lys Ile Phe Ser  Phe Ser Asn
    2315                2320                2325

Asp Phe  Thr Ile Gln Lys Leu  Ile Glu Thr Arg Thr  Ser Gln Leu
    2330                2335                2340

Phe Ser  Tyr Ala Ala Phe Ser  Asp Ser Asn Ile Ile  Thr Val Val
    2345                2350                2355

Val Asp  Thr Ala Leu Tyr Ile  Ala Lys Gln Asn Ser  Pro Val Val
    2360                2365                2370

Glu Val  Trp Asp Lys Lys Thr  Glu Lys Leu Cys Gly  Leu Ile Asp
    2375                2380                2385

Cys Val  His Phe Leu Arg Glu  Val Met Val Lys Glu  Asn Lys Glu
    2390                2395                2400

Ser Lys  His Lys Met Ser Tyr  Ser Gly Arg Val Lys  Thr Leu Cys
    2405                2410                2415

Leu Gln  Lys Asn Thr Ala Leu  Trp Ile Gly Thr Gly  Gly Gly His
    2420                2425                2430

Ile Leu  Leu Leu Asp Leu Ser  Thr Arg Arg Leu Ile  Arg Val Ile
    2435                2440                2445
```

```
Tyr Asn  Phe Cys Asn Ser Val  Arg Val Met Met Thr  Ala Gln Leu
    2450                2455                2460


Gly Ser  Leu Lys Asn Val Met  Leu Val Leu Gly Tyr  Asn Arg Lys
    2465                2470                2475


Asn Thr  Glu Gly Thr Gln Lys  Gln Lys Glu Ile Gln  Ser Cys Leu
    2480                2485                2490


Thr Val  Trp Asp Ile Asn Leu  Pro His Glu Val Gln  Asn Leu Glu
    2495                2500                2505


Lys His  Ile Glu Val Arg Lys  Glu Leu Ala Glu Lys  Met Arg Arg
    2510                2515                2520


Thr Ser  Val Glu
    2525
```

<210> 5
<211> 140
<212> PRT
<213> Homo sapiens

<400> 5

```
Met Asp Val Phe Met Lys Gly Leu Ser Lys Ala Lys Glu Gly Val Val
1               5                   10                  15


Ala Ala Ala Glu Lys Thr Lys Gln Gly Val Ala Glu Ala Ala Gly Lys
            20                  25                  30


Thr Lys Glu Gly Val Leu Tyr Val Gly Ser Lys Thr Lys Glu Gly Val
        35                  40                  45


Val His Gly Val Ala Thr Val Ala Glu Lys Thr Lys Glu Gln Val Thr
    50                  55                  60


Asn Val Gly Gly Ala Val Val Thr Gly Val Thr Ala Val Ala Gln Lys
65                  70                  75                  80
```

Thr Val Glu Gly Ala Gly Ser Ile Ala Ala Ala Thr Gly Phe Val Lys
85 90 95

Lys Asp Gln Leu Gly Lys Asn Glu Glu Gly Ala Pro Gln Glu Gly Ile
100 105 110

Leu Glu Asp Met Pro Val Asp Pro Asp Asn Glu Ala Tyr Glu Met Pro
115 120 125

Ser Glu Glu Gly Tyr Gln Asp Tyr Glu Pro Glu Ala
130 135 140

<210> 6
<211> 619
<212> PRT
<213> Homo sapiens

<400> 6

Met Ala Ser Gly Ala Tyr Asn Pro Tyr Ile Glu Ile Ile Glu Gln Pro
1 5 10 15

Arg Gln Arg Gly Met Arg Phe Arg Tyr Lys Cys Glu Gly Arg Ser Ala
20 25 30

Gly Ser Ile Pro Gly Glu His Ser Thr Asp Asn Asn Arg Thr Tyr Pro
35 40 45

Ser Ile Gln Ile Met Asn Tyr Tyr Gly Lys Gly Lys Val Arg Ile Thr
50 55 60

Leu Val Thr Lys Asn Asp Pro Tyr Lys Pro His Pro His Asp Leu Val
65 70 75 80

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

Arg Arg Pro Leu Phe Phe Gln Asn Leu Gly Ile Arg Cys Val Lys Lys

```
            100                 105                 110

Lys Glu Val Lys Glu Ala Ile Ile Thr Arg Ile Lys Ala Gly Ile Asn
        115                 120                 125

Pro Phe Asn Val Pro Glu Lys Gln Leu Asn Asp Ile Glu Asp Cys Asp
    130                 135                 140

Leu Asn Val Val Arg Leu Cys Phe Gln Val Phe Leu Pro Asp Glu His
145                 150                 155                 160

Gly Asn Leu Thr Thr Ala Leu Pro Pro Val Val Ser Asn Pro Ile Tyr
                165                 170                 175

Asp Asn Arg Ala Pro Asn Thr Ala Glu Leu Arg Ile Cys Arg Val Asn
            180                 185                 190

Lys Asn Cys Gly Ser Val Arg Gly Gly Asp Glu Ile Phe Leu Leu Cys
        195                 200                 205

Asp Lys Val Gln Lys Asp Asp Ile Glu Val Arg Phe Val Leu Asn Asp
    210                 215                 220

Trp Glu Ala Lys Gly Ile Phe Ser Gln Ala Asp Val His Arg Gln Val
225                 230                 235                 240

Ala Ile Val Phe Lys Thr Pro Pro Tyr Cys Lys Ala Ile Thr Glu Pro
                245                 250                 255

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

Glu Ser Met Asp Phe Arg Tyr Leu Pro Asp Glu Lys Asp Thr Tyr Gly
        275                 280                 285

Asn Lys Ala Lys Lys Gln Lys Thr Thr Leu Leu Phe Gln Lys Leu Cys
    290                 295                 300
```

```
Gln Asp His Val Glu Thr Gly Phe Arg His Val Asp Gln Asp Gly Leu
305                 310                 315                 320

Glu Leu Leu Thr Ser Gly Asp Pro Pro Thr Leu Ala Ser Gln Ser Ala
                325                 330                 335

Gly Ile Thr Val Asn Phe Pro Glu Arg Pro Arg Pro Gly Leu Leu Gly
            340                 345                 350

Ser Ile Gly Glu Gly Arg Tyr Phe Lys Lys Glu Pro Asn Leu Phe Ser
        355                 360                 365

His Asp Ala Val Val Arg Glu Met Pro Thr Gly Val Ser Ser Gln Ala
    370                 375                 380

Glu Ser Tyr Tyr Pro Ser Pro Gly Pro Ile Ser Ser Gly Leu Ser His
385                 390                 395                 400

His Ala Ser Met Ala Pro Leu Pro Ser Ser Ser Trp Ser Ser Val Ala
                405                 410                 415

His Pro Thr Pro Arg Ser Gly Asn Thr Asn Pro Leu Ser Ser Phe Ser
            420                 425                 430

Thr Arg Thr Leu Pro Ser Asn Ser Gln Gly Ile Pro Pro Phe Leu Arg
        435                 440                 445

Ile Pro Val Gly Asn Asp Leu Asn Ala Ser Asn Ala Cys Ile Tyr Asn
    450                 455                 460

Asn Ala Asp Asp Ile Val Gly Met Glu Ala Ser Ser Met Pro Ser Ala
465                 470                 475                 480

Asp Leu Tyr Gly Ile Ser Asp Pro Asn Met Leu Ser Asn Cys Ser Val
                485                 490                 495

Asn Met Met Thr Thr Ser Ser Asp Ser Met Gly Glu Thr Asp Asn Pro
```

```
            500                 505                 510

Arg Leu Leu Ser Met Asn Leu Glu Asn Pro Ser Cys Asn Ser Val Leu
        515                 520                 525

Asp Pro Arg Asp Leu Arg Gln Leu His Gln Met Ser Ser Ser Ser Met
    530                 535                 540

Ser Ala Gly Ala Asn Ser Asn Thr Thr Val Phe Val Ser Gln Ser Asp
545                 550                 555                 560

Ala Phe Glu Gly Ser Asp Phe Ser Cys Ala Asp Asn Ser Met Ile Asn
                565                 570                 575

Glu Ser Gly Pro Ser Asn Ser Thr Asn Pro Asn Ser His Gly Phe Val
            580                 585                 590

Gln Asp Ser Gln Tyr Ser Gly Ile Gly Ser Met Gln Asn Glu Gln Leu
        595                 600                 605

Ser Asp Ser Phe Pro Tyr Glu Phe Phe Gln Val
    610                 615
```

<210> 7
<211> 698
<212> PRT
<213> Homo sapiens

<400> 7

```
Met Gly Asp Pro Gly Leu Ala Lys Leu Gln Phe Ala Pro Phe Asn Ser
1               5                   10                  15

Ala Leu Asp Val Gly Phe Trp His Glu Leu Thr Gln Lys Lys Leu Asn
            20                  25                  30

Glu Tyr Arg Leu Asp Glu Ala Pro Lys Asp Ile Lys Gly Tyr Tyr Tyr
        35                  40                  45
```

```
Asn Gly Asp Ser Ala Gly Leu Pro Thr Arg Leu Thr Leu Glu Phe Ser
    50                  55                  60

Ala Phe Asp Met Ser Ala Ser Thr Pro Ala His Cys Cys Pro Ala Met
65                  70                  75                  80

Gly Thr Leu His Asn Thr Asn Thr Leu Glu Ala Phe Lys Thr Ala Asp
                85                  90                  95

Lys Lys Leu Leu Leu Glu Gln Ser Ala Asn Glu Ile Trp Glu Ala Ile
            100                 105                 110

Lys Ser Gly Ala Ala Leu Glu Asn Pro Met Leu Leu Asn Lys Phe Leu
        115                 120                 125

Leu Leu Thr Phe Ala Asp Leu Lys Lys Tyr His Phe Tyr Tyr Trp Phe
    130                 135                 140

Cys Cys Pro Ala Leu Cys Leu Pro Glu Ser Ile Pro Leu Ile Arg Gly
145                 150                 155                 160

Pro Val Ser Leu Asp Gln Arg Leu Ser Pro Lys Gln Ile Gln Ala Leu
                165                 170                 175

Glu His Ala Tyr Asp Asp Leu Cys Arg Ala Glu Gly Val Thr Ala Leu
            180                 185                 190

Pro Tyr Phe Leu Phe Lys Tyr Asp Asp Asp Thr Val Leu Val Ser Leu
        195                 200                 205

Leu Lys His Tyr Ser Asp Phe Phe Gln Gly Gln Arg Thr Lys Ile Thr
    210                 215                 220

Val Gly Val Tyr Asp Pro Cys Asn Leu Ala Gln Tyr Pro Gly Trp Pro
225                 230                 235                 240

Leu Arg Asn Phe Leu Val Leu Ala Ala His Arg Trp Ser Gly Ser Phe
                245                 250                 255
```

```
Gln Ser Val Glu Val Leu Cys Phe Arg Asp Arg Thr Met Gln Gly Ala
            260                 265                 270

Arg Asp Val Thr His Ser Ile Ile Phe Glu Val Lys Leu Pro Glu Met
        275                 280                 285

Ala Phe Ser Pro Asp Cys Pro Lys Ala Val Gly Trp Glu Lys Asn Gln
    290                 295                 300

Lys Gly Gly Met Gly Pro Arg Met Val Asn Leu Ser Gly Cys Met Asp
305                 310                 315                 320

Pro Lys Arg Leu Ala Glu Ser Ser Val Asp Leu Asn Leu Lys Leu Met
                325                 330                 335

Cys Trp Arg Leu Val Pro Thr Leu Asp Leu Asp Lys Val Val Ser Val
            340                 345                 350

Lys Cys Leu Leu Leu Gly Ala Gly Thr Leu Gly Cys Asn Val Ala Arg
        355                 360                 365

Thr Leu Met Gly Trp Gly Val Arg His Val Thr Phe Val Asp Asn Ala
    370                 375                 380

Lys Ile Ser Tyr Ser Asn Pro Val Arg Gln Pro Leu Tyr Glu Phe Glu
385                 390                 395                 400

Asp Cys Leu Gly Gly Gly Lys Pro Lys Ala Leu Ala Ala Ala Glu Arg
                405                 410                 415

Leu Gln Lys Ile Phe Pro Gly Val Asn Ala Arg Gly Phe Asn Met Ser
            420                 425                 430

Ile Pro Met Pro Gly His Pro Val Asn Phe Ser Asp Val Thr Met Glu
        435                 440                 445
```

```
Gln Ala Arg Arg Asp Val Glu Gln Leu Glu Gln Leu Ile Asp Asn His
    450                 455                 460

Asp Val Ile Phe Leu Leu Met Asp Thr Arg Glu Ser Arg Trp Leu Pro
465                 470                 475                 480

Thr Val Ile Ala Ala Ser Lys Arg Lys Leu Val Ile Asn Ala Ala Leu
                485                 490                 495

Gly Phe Asp Thr Phe Val Val Met Arg His Gly Leu Lys Lys Pro Lys
            500                 505                 510

Gln Gln Gly Ala Gly Asp Leu Cys Pro Ser His Leu Val Ala Pro Ala
        515                 520                 525

Asp Leu Gly Ser Ser Leu Phe Ala Asn Ile Pro Gly Tyr Lys Leu Gly
    530                 535                 540

Cys Tyr Phe Cys Asn Asp Val Val Ala Pro Gly Asp Ser Thr Arg Asp
545                 550                 555                 560

Arg Thr Leu Asp Gln Gln Cys Thr Val Ser Arg Pro Gly Leu Ala Val
                565                 570                 575

Ile Ala Gly Ala Leu Ala Val Glu Leu Met Val Ser Val Leu Gln His
            580                 585                 590

Pro Glu Gly Gly Tyr Ala Ile Ala Ser Ser Ser Asp Asp Arg Met Asn
        595                 600                 605

Glu Pro Pro Thr Ser Leu Gly Leu Val Pro His Gln Ile Arg Gly Phe
    610                 615                 620

Leu Ser Arg Phe Asp Asn Val Leu Pro Val Ser Leu Ala Phe Asp Lys
625                 630                 635                 640

Cys Thr Ala Cys Ser Pro Lys Val Leu Asp Gln Tyr Glu Arg Glu Gly
                645                 650                 655
```

```
Phe Thr Phe Leu Ala Lys Val Phe Asn Ser Ser His Ser Phe Leu Glu
            660                 665                 670


Asp Leu Thr Gly Leu Thr Leu Leu His Gln Glu Thr Gln Ala Ala Glu
        675                 680                 685


Ile Trp Asp Met Ser Asp Glu Glu Thr Val
    690                 695


<210>  8
<211>  514
<212>  PRT
<213>  Homo sapiens

<400>  8

Met Ala Leu Ser Glu Leu Ala Leu Val Arg Trp Leu Gln Glu Ser Arg
1               5                   10                  15


Arg Ser Arg Lys Leu Ile Leu Phe Ile Val Phe Leu Ala Leu Leu Leu
            20                  25                  30


Asp Asn Met Leu Leu Thr Val Val Val Pro Ile Ile Pro Ser Tyr Leu
        35                  40                  45


Tyr Ser Ile Lys His Glu Lys Asn Ala Thr Glu Ile Gln Thr Ala Arg
    50                  55                  60


Pro Val His Thr Ala Ser Ile Ser Asp Ser Phe Gln Ser Ile Phe Ser
65                  70                  75                  80


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


Thr Leu His Gln Thr Ala Thr Gln His Met Val Thr Asn Ala Ser Ala
            100                 105                 110


Val Pro Ser Asp Cys Pro Ser Glu Asp Lys Asp Leu Leu Asn Glu Asn
```

```
        115                 120                 125

Val Gln Val Gly Leu Leu Phe Ala Ser Lys Ala Thr Val Gln Leu Ile
    130                 135                 140

Thr Asn Pro Phe Ile Gly Leu Leu Thr Asn Arg Ile Gly Tyr Pro Ile
145                 150                 155                 160

Pro Ile Phe Ala Gly Phe Cys Ile Met Phe Val Ser Thr Ile Met Phe
                165                 170                 175

Ala Phe Ser Ser Ser Tyr Ala Phe Leu Leu Ile Ala Arg Ser Leu Gln
            180                 185                 190

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

Ser Val Tyr Thr Asp Asp Glu Glu Arg Gly Asn Val Met Gly Ile Ala
    210                 215                 220

Leu Gly Gly Leu Ala Met Gly Val Leu Val Gly Pro Pro Phe Gly Ser
225                 230                 235                 240

Val Leu Tyr Glu Phe Val Gly Lys Thr Ala Pro Phe Leu Val Leu Ala
                245                 250                 255

Ala Leu Val Leu Leu Asp Gly Ala Ile Gln Leu Phe Val Leu Gln Pro
            260                 265                 270

Ser Arg Val Gln Pro Glu Ser Gln Lys Gly Thr Pro Leu Thr Thr Leu
        275                 280                 285

Leu Lys Asp Pro Tyr Ile Leu Ile Ala Ala Gly Ser Ile Cys Phe Ala
    290                 295                 300

Asn Met Gly Ile Ala Met Leu Glu Pro Ala Leu Pro Ile Trp Met Met
305                 310                 315                 320
```

```
Glu Thr Met Cys Ser Arg Lys Trp Gln Leu Gly Val Ala Phe Leu Pro
                325                 330                 335

Ala Ser Ile Ser Tyr Leu Ile Gly Thr Asn Ile Phe Gly Ile Leu Ala
            340                 345                 350

His Lys Met Gly Arg Trp Leu Cys Ala Leu Leu Gly Met Ile Ile Val
        355                 360                 365

Gly Val Ser Ile Leu Cys Ile Pro Phe Ala Lys Asn Ile Tyr Gly Leu
    370                 375                 380

Ile Ala Pro Asn Phe Gly Val Gly Phe Ala Ile Gly Met Val Asp Ser
385                 390                 395                 400

Ser Met Met Pro Ile Met Gly Tyr Leu Val Asp Leu Arg His Val Ser
                405                 410                 415

Val Tyr Gly Ser Val Tyr Ala Ile Ala Asp Val Ala Phe Cys Met Gly
            420                 425                 430

Tyr Ala Ile Gly Pro Ser Ala Gly Gly Ala Ile Ala Lys Ala Ile Gly
        435                 440                 445

Phe Pro Trp Leu Met Thr Ile Ile Gly Ile Ile Asp Ile Leu Phe Ala
    450                 455                 460

Pro Leu Cys Phe Phe Leu Arg Ser Pro Pro Ala Lys Glu Glu Lys Met
465                 470                 475                 480

Ala Ile Leu Met Asp His Asn Cys Pro Ile Lys Thr Lys Met Tyr Thr
                485                 490                 495

Gln Asn Asn Ile Gln Ser Tyr Pro Ile Gly Glu Asp Glu Glu Ser Glu
            500                 505                 510

Ser Asp
```

<210> 9
<211> 536
<212> PRT
<213> Homo sapiens

<400> 9

```
Met Glu Phe Ser Ser Pro Ser Arg Glu Glu Cys Pro Lys Pro Leu Ser
1               5                  10                  15


Arg Val Ser Ile Met Ala Gly Ser Leu Thr Gly Leu Leu Leu Leu Gln
            20                  25                  30


Ala Val Ser Trp Ala Ser Gly Ala Arg Pro Cys Ile Pro Lys Ser Phe
        35                  40                  45


Gly Tyr Ser Ser Val Val Cys Val Cys Asn Ala Thr Tyr Cys Asp Ser
    50                  55                  60


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


Ser Thr Arg Ser Gly Arg Arg Met Glu Leu Ser Met Gly Pro Ile Gln
                85                  90                  95


Ala Asn His Thr Gly Thr Gly Leu Leu Leu Thr Leu Gln Pro Glu Gln
            100                 105                 110


Lys Phe Gln Lys Val Lys Gly Phe Gly Gly Ala Met Thr Asp Ala Ala
        115                 120                 125


Ala Leu Asn Ile Leu Ala Leu Ser Pro Pro Ala Gln Asn Leu Leu Leu
    130                 135                 140


Lys Ser Tyr Phe Ser Glu Glu Gly Ile Gly Tyr Asn Ile Ile Arg Val
145                 150                 155                 160
```

```
Pro Met Ala Ser Cys Asp Phe Ser Ile Arg Thr Tyr Thr Tyr Ala Asp
                165                 170                 175

Thr Pro Asp Asp Phe Gln Leu His Asn Phe Ser Leu Pro Glu Glu Asp
            180                 185                 190

Thr Lys Leu Lys Ile Pro Leu Ile His Arg Ala Leu Gln Leu Ala Gln
        195                 200                 205

Arg Pro Val Ser Leu Leu Ala Ser Pro Trp Thr Ser Pro Thr Trp Leu
    210                 215                 220

Lys Thr Asn Gly Ala Val Asn Gly Lys Gly Ser Leu Lys Gly Gln Pro
225                 230                 235                 240

Gly Asp Ile Tyr His Gln Thr Trp Ala Arg Tyr Phe Val Lys Phe Leu
                245                 250                 255

Asp Ala Tyr Ala Glu His Lys Leu Gln Phe Trp Ala Val Thr Ala Glu
            260                 265                 270

Asn Glu Pro Ser Ala Gly Leu Leu Ser Gly Tyr Pro Phe Gln Cys Leu
        275                 280                 285

Gly Phe Thr Pro Glu His Gln Arg Asp Phe Ile Ala Arg Asp Leu Gly
    290                 295                 300

Pro Thr Leu Ala Asn Ser Thr His His Asn Val Arg Leu Leu Met Leu
305                 310                 315                 320

Asp Asp Gln Arg Leu Leu Leu Pro His Trp Ala Lys Val Val Leu Thr
                325                 330                 335

Asp Pro Glu Ala Ala Lys Tyr Val His Gly Ile Ala Val His Trp Tyr
            340                 345                 350

Leu Asp Phe Leu Ala Pro Ala Lys Ala Thr Leu Gly Glu Thr His Arg
        355                 360                 365
```

```
Leu Phe Pro Asn Thr Met Leu Phe Ala Ser Glu Ala Cys Val Gly Ser
    370                 375                 380

Lys Phe Trp Glu Gln Ser Val Arg Leu Gly Ser Trp Asp Arg Gly Met
385                 390                 395                 400

Gln Tyr Ser His Ser Ile Ile Thr Asn Leu Leu Tyr His Val Val Gly
                405                 410                 415

Trp Thr Asp Trp Asn Leu Ala Leu Asn Pro Glu Gly Gly Pro Asn Trp
            420                 425                 430

Val Arg Asn Phe Val Asp Ser Pro Ile Ile Val Asp Ile Thr Lys Asp
        435                 440                 445

Thr Phe Tyr Lys Gln Pro Met Phe Tyr His Leu Gly His Phe Ser Lys
    450                 455                 460

Phe Ile Pro Glu Gly Ser Gln Arg Val Gly Leu Val Ala Ser Gln Lys
465                 470                 475                 480

Asn Asp Leu Asp Ala Val Ala Leu Met His Pro Asp Gly Ser Ala Val
                485                 490                 495

Val Val Val Leu Asn Arg Ser Ser Lys Asp Val Pro Leu Thr Ile Lys
            500                 505                 510

Asp Pro Ala Val Gly Phe Leu Glu Thr Ile Ser Pro Gly Tyr Ser Ile
        515                 520                 525

His Thr Tyr Leu Trp Arg Arg Gln
    530                 535
```

<210> 10
<211> 464
<212> PRT
<213> Homo sapiens

<400> 10

```
Ile Val Phe Val Arg Phe Asn Ser Ser His Gly Phe Pro Val Glu Val
1               5                   10                  15


Asp Ser Asp Thr Ser Ile Phe Gln Leu Lys Glu Val Val Ala Lys Arg
            20                  25                  30


Gln Gly Val Pro Ala Asp Gln Leu Arg Val Ile Phe Ala Gly Lys Glu
        35                  40                  45


Leu Arg Asn Asp Trp Thr Val Gln Asn Cys Asp Leu Asp Gln Gln Ser
    50                  55                  60


Ile Val His Ile Val Gln Arg Pro Trp Arg Lys Gly Gln Glu Met Asn
65                  70                  75                  80


Ala Thr Gly Gly Asp Asp Pro Arg Asn Ala Ala Gly Gly Cys Glu Arg
                85                  90                  95


Glu Pro Gln Ser Leu Thr Arg Val Asp Leu Ser Ser Ser Val Leu Pro
            100                 105                 110


Gly Asp Ser Val Gly Leu Ala Val Ile Leu His Thr Asp Ser Arg Lys
        115                 120                 125


Asp Ser Pro Pro Ala Gly Ser Pro Ala Gly Arg Ser Ile Tyr Asn Ser
    130                 135                 140


Phe Tyr Val Tyr Cys Lys Gly Pro Cys Gln Arg Val Gln Pro Gly Lys
145                 150                 155                 160


Leu Arg Val Gln Cys Ser Thr Cys Arg Gln Ala Thr Leu Thr Leu Thr
                165                 170                 175


Gln Gly Pro Ser Cys Trp Asp Asp Val Leu Ile Pro Asn Arg Met Ser
            180                 185                 190
```

```
Gly Glu Cys Gln Ser Pro His Cys Pro Gly Thr Ser Ala Glu Phe Phe
        195                 200                 205

Phe Lys Cys Gly Ala His Pro Thr Ser Asp Lys Glu Thr Ser Val Ala
    210                 215                 220

Leu His Leu Ile Ala Thr Asn Ser Arg Asn Ile Thr Cys Ile Thr Cys
225                 230                 235                 240

Thr Asp Val Arg Ser Pro Val Leu Val Phe Gln Cys Asn Ser Arg His
                245                 250                 255

Val Ile Cys Leu Asp Cys Phe His Leu Tyr Cys Val Thr Arg Leu Asn
            260                 265                 270

Asp Arg Gln Phe Val His Asp Pro Gln Leu Gly Tyr Ser Leu Pro Cys
        275                 280                 285

Val Ala Gly Cys Pro Asn Ser Leu Ile Lys Glu Leu His His Phe Arg
    290                 295                 300

Ile Leu Gly Glu Glu Gln Tyr Asn Arg Tyr Gln Gln Tyr Gly Ala Glu
305                 310                 315                 320

Glu Cys Val Leu Gln Met Gly Gly Val Leu Cys Pro Arg Pro Gly Cys
                325                 330                 335

Gly Ala Gly Leu Leu Pro Glu Pro Asp Gln Arg Lys Val Thr Cys Glu
            340                 345                 350

Gly Gly Asn Gly Leu Gly Cys Gly Phe Ala Phe Cys Arg Glu Cys Lys
        355                 360                 365

Glu Ala Tyr His Glu Gly Glu Cys Ser Ala Val Phe Glu Ala Ser Gly
    370                 375                 380

Thr Thr Thr Gln Ala Tyr Arg Val Asp Glu Arg Ala Ala Glu Gln Ala
```

385 390 395 400

Arg Trp Glu Ala Ala Ser Lys Glu Thr Ile Lys Lys Thr Thr Lys Pro
405 410 415

Cys Pro Arg Cys His Val Pro Val Glu Lys Asn Gly Gly Cys Met His
420 425 430

Met Lys Cys Pro Gln Pro Gln Cys Arg Leu Glu Trp Cys Trp Asn Cys
435 440 445

Gly Cys Glu Trp Asn Arg Val Cys Met Gly Asp His Trp Phe Asp Val
450 455 460

<210> 11
<211> 437
<212> PRT
<213> Homo sapiens

<400> 11

Met Ile Val Phe Val Arg Phe Asn Ser Ser His Gly Phe Pro Val Glu
1 5 10 15

Val Asp Ser Asp Thr Ser Ile Phe Gln Leu Lys Glu Val Val Ala Lys
20 25 30

Arg Gln Gly Val Pro Ala Asp Gln Leu Arg Val Ile Phe Ala Gly Lys
35 40 45

Glu Leu Arg Asn Asp Trp Thr Val Gln Asn Cys Asp Leu Asp Gln Gln
50 55 60

Ser Ile Val His Ile Val Gln Arg Pro Trp Arg Lys Gly Gln Glu Met
65 70 75 80

Asn Ala Thr Gly Gly Asp Asp Pro Arg Asn Ala Ala Gly Gly Cys Glu
85 90 95

```
Arg Glu Pro Gln Ser Leu Thr Arg Val Asp Leu Ser Ser Ser Val Leu
            100                 105                 110

Pro Gly Asp Ser Val Gly Leu Ala Val Ile Leu His Thr Asp Ser Arg
        115                 120                 125

Lys Asp Ser Pro Pro Ala Gly Ser Pro Ala Gly Arg Ser Ile Tyr Asn
    130                 135                 140

Ser Phe Tyr Val Tyr Cys Lys Gly Pro Cys Gln Arg Val Gln Pro Gly
145                 150                 155                 160

Lys Leu Arg Val Gln Cys Ser Thr Cys Arg Gln Ala Thr Leu Thr Leu
                165                 170                 175

Thr Gln Glu Phe Phe Phe Lys Cys Gly Ala His Pro Thr Ser Asp Lys
            180                 185                 190

Glu Thr Ser Val Ala Leu His Leu Ile Ala Thr Asn Ser Arg Asn Ile
        195                 200                 205

Thr Cys Ile Thr Cys Thr Asp Val Arg Ser Pro Val Leu Val Phe Gln
    210                 215                 220

Cys Asn Ser Arg His Val Ile Cys Leu Asp Cys Phe His Leu Tyr Cys
225                 230                 235                 240

Val Thr Arg Leu Asn Asp Arg Gln Phe Val His Asp Pro Gln Leu Gly
                245                 250                 255

Tyr Ser Leu Pro Cys Val Ala Gly Cys Pro Asn Ser Leu Ile Lys Glu
            260                 265                 270

Leu His His Phe Arg Ile Leu Gly Glu Glu Gln Tyr Asn Arg Tyr Gln
        275                 280                 285

Gln Tyr Gly Ala Glu Glu Cys Val Leu Gln Met Gly Gly Val Leu Cys
    290                 295                 300
```

```
Pro Arg Pro Gly Cys Gly Ala Gly Leu Leu Pro Glu Pro Asp Gln Arg
305                 310                 315                 320


Lys Val Thr Cys Glu Gly Gly Asn Gly Leu Gly Cys Gly Phe Ala Phe
                325                 330                 335


Cys Arg Glu Cys Lys Glu Ala Tyr His Glu Gly Glu Cys Ser Ala Val
            340                 345                 350


Phe Glu Ala Ser Gly Thr Thr Thr Gln Ala Tyr Arg Val Asp Glu Arg
        355                 360                 365


Ala Ala Glu Gln Ala Arg Trp Glu Ala Ala Ser Lys Glu Thr Ile Lys
    370                 375                 380


Lys Thr Thr Lys Pro Cys Pro Arg Cys His Val Pro Val Glu Lys Asn
385                 390                 395                 400


Gly Gly Cys Met His Met Lys Cys Pro Gln Pro Gln Cys Arg Leu Glu
                405                 410                 415


Trp Cys Trp Asn Cys Gly Cys Glu Trp Asn Arg Val Cys Met Gly Asp
            420                 425                 430


His Trp Phe Asp Val
        435


<210>  12
<211>  218
<212>  PRT
<213>  Homo sapiens

<400>  12

Met Asn Ala Thr Gly Gly Asp Asp Pro Arg Asn Ala Ala Gly Gly Cys
1               5                   10                  15


Glu Arg Glu Pro Gln Ser Leu Thr Arg Val Asp Leu Ser Ser Ser Val
```

```
            20                  25                  30

Leu Pro Gly Asp Ser Val Gly Leu Ala Val Ile Leu His Thr Asp Ser
        35                  40                  45

Arg Lys Asp Ser Pro Pro Ala Gly Ser Pro Ala Gly Arg Ser Ile Tyr
    50                  55                  60

Asn Ser Phe Tyr Val Tyr Cys Lys Gly Pro Cys Gln Arg Val Gln Pro
65                  70                  75                  80

Gly Lys Leu Arg Val Gln Cys Ser Thr Cys Arg Gln Ala Thr Leu Thr
                85                  90                  95

Leu Thr Gln Gly Pro Ser Cys Trp Asp Asp Val Leu Ile Pro Asn Arg
            100                 105                 110

Met Ser Gly Glu Cys Gln Ser Pro His Cys Pro Gly Thr Ser Ala Glu
        115                 120                 125

Phe Phe Phe Lys Cys Gly Ala His Pro Thr Ser Asp Lys Glu Thr Ser
    130                 135                 140

Val Ala Leu His Leu Ile Ala Thr Asn Ser Arg Asn Ile Thr Cys Ile
145                 150                 155                 160

Thr Cys Thr Asp Val Arg Ser Pro Val Leu Val Phe Gln Cys Asn Ser
                165                 170                 175

Arg His Val Ile Cys Leu Asp Cys Phe His Leu Tyr Cys Val Thr Arg
            180                 185                 190

Leu Asn Asp Arg Gln Phe Val His Asp Pro Gln Leu Gly Tyr Ser Leu
        195                 200                 205

Pro Cys Val Val Cys Leu Leu Pro Gly Met
    210                 215
```

<210> 13
<211> 274
<212> PRT
<213> Homo sapiens

<400> 13

```
Met Ser Gly Glu Cys Gln Ser Pro His Cys Pro Gly Thr Ser Ala Glu
1               5                  10                  15


Phe Phe Phe Lys Cys Gly Ala His Pro Thr Ser Asp Lys Glu Thr Ser
            20                  25                  30


Val Ala Leu His Leu Ile Ala Thr Asn Ser Arg Asn Ile Thr Cys Ile
        35                  40                  45


Thr Cys Thr Asp Val Arg Ser Pro Val Leu Val Phe Gln Cys Asn Ser
    50                  55                  60


Arg His Val Ile Cys Leu Asp Cys Phe His Leu Tyr Cys Val Thr Arg
65                  70                  75                  80


Leu Asn Asp Arg Gln Phe Val His Asp Pro Gln Leu Gly Tyr Ser Leu
                85                  90                  95


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


Phe Arg Ile Leu Gly Glu Glu Gln Tyr Asn Arg Tyr Gln Gln Tyr Gly
        115                 120                 125


Ala Glu Glu Cys Val Leu Gln Met Gly Gly Val Leu Cys Pro Arg Pro
    130                 135                 140


Gly Cys Gly Ala Gly Leu Leu Pro Glu Pro Asp Gln Arg Lys Val Thr
145                 150                 155                 160


Cys Glu Gly Gly Asn Gly Leu Gly Cys Gly Phe Ala Phe Cys Arg Glu
                165                 170                 175
```

```
Cys Lys Glu Ala Tyr His Glu Gly Glu Cys Ser Ala Val Phe Glu Ala
            180                 185                 190


Ser Gly Thr Thr Thr Gln Ala Tyr Arg Val Asp Glu Arg Ala Ala Glu
        195                 200                 205


Gln Ala Arg Trp Glu Ala Ala Ser Lys Glu Thr Ile Lys Lys Thr Thr
    210                 215                 220


Lys Pro Cys Pro Arg Cys His Val Pro Val Glu Lys Asn Gly Gly Cys
225                 230                 235                 240


Met His Met Lys Cys Pro Gln Pro Gln Cys Arg Leu Glu Trp Cys Trp
                245                 250                 255


Asn Cys Gly Cys Glu Trp Asn Arg Val Cys Met Gly Asp His Trp Phe
            260                 265                 270


Asp Val
```

<210> 14
<211> 387
<212> PRT
<213> Homo sapiens

<400> 14

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Met Ile Val Phe Val Arg Phe Asn Ser Ser His Gly Phe Pro Val Glu
1               5                   10                  15


Val Asp Ser Asp Thr Ser Ile Phe Gln Leu Lys Glu Val Val Ala Lys
            20                  25                  30


Arg Gln Gly Val Pro Ala Asp Gln Leu Arg Val Ile Phe Ala Gly Lys
        35                  40                  45


Glu Leu Arg Asn Asp Trp Thr Val Gln Asn Cys Asp Leu Asp Gln Gln
```

```
    50                  55                  60

Ser Ile Val His Ile Val Gln Arg Pro Trp Arg Lys Gly Gln Glu Met
65                  70                  75                  80

Asn Ala Thr Gly Gly Asp Asp Pro Arg Asn Ala Ala Gly Gly Cys Glu
                85                  90                  95

Arg Glu Pro Gln Ser Leu Thr Arg Val Asp Leu Ser Ser Ser Val Leu
            100                 105                 110

Pro Gly Asp Ser Val Gly Leu Ala Val Ile Leu His Thr Asp Ser Arg
        115                 120                 125

Lys Asp Ser Pro Pro Ala Gly Ser Pro Ala Gly Arg Ser Ile Tyr Asn
    130                 135                 140

Ser Phe Tyr Val Tyr Cys Lys Gly Pro Cys Gln Arg Val Gln Pro Gly
145                 150                 155                 160

Lys Leu Arg Val Gln Cys Ser Thr Cys Arg Gln Ala Thr Leu Thr Leu
                165                 170                 175

Thr Gln Gly Pro Ser Cys Trp Asp Asp Val Leu Ile Pro Asn Arg Met
            180                 185                 190

Ser Gly Glu Cys Gln Ser Pro His Cys Pro Gly Thr Ser Ala Glu Phe
        195                 200                 205

Phe Phe Lys Cys Gly Ala His Pro Thr Ser Asp Lys Glu Thr Ser Val
    210                 215                 220

Ala Leu His Leu Ile Ala Thr Asn Ser Arg Asn Ile Thr Cys Ile Thr
225                 230                 235                 240

Cys Thr Asp Val Arg Ser Pro Val Leu Val Phe Gln Cys Asn Ser Arg
                245                 250                 255
```

```
His Val Ile Cys Leu Asp Cys Phe His Leu Tyr Cys Val Thr Arg Leu
            260                 265                 270


Asn Asp Arg Gln Phe Val His Asp Pro Gln Leu Gly Tyr Ser Leu Pro
        275                 280                 285


Cys Val Gly Thr Gly Asp Thr Val Val Leu Arg Gly Ala Leu Gly Gly
    290                 295                 300


Phe Arg Arg Gly Val Ala Gly Cys Pro Asn Ser Leu Ile Lys Glu Leu
305                 310                 315                 320


His His Phe Arg Ile Leu Gly Glu Glu Gln Tyr Asn Arg Tyr Gln Gln
                325                 330                 335


Tyr Gly Ala Glu Glu Cys Val Leu Gln Met Gly Gly Val Leu Cys Pro
            340                 345                 350


Arg Pro Gly Cys Gly Ala Gly Leu Leu Pro Glu Pro Asp Gln Arg Lys
        355                 360                 365


Val Thr Cys Glu Gly Gly Asn Gly Leu Gly Cys Gly Tyr Gly Gln Arg
    370                 375                 380


Arg Thr Lys
385
```

<210> 15
<211> 316
<212> PRT
<213> Homo sapiens

<400> 15

```
Met Ile Val Phe Val Arg Phe Asn Ser Ser His Gly Phe Pro Val Glu
1               5                   10                  15


Val Asp Ser Asp Thr Ser Ile Phe Gln Leu Lys Glu Val Val Ala Lys
            20                  25                  30
```

```
Arg Gln Gly Val Pro Ala Asp Gln Leu Arg Val Ile Phe Ala Gly Lys
        35                  40                  45

Glu Leu Arg Asn Asp Trp Thr Val Gln Glu Phe Phe Phe Lys Cys Gly
    50                  55                  60

Ala His Pro Thr Ser Asp Lys Glu Thr Ser Val Ala Leu His Leu Ile
65                  70                  75                  80

Ala Thr Asn Ser Arg Asn Ile Thr Cys Ile Thr Cys Thr Asp Val Arg
                85                  90                  95

Ser Pro Val Leu Val Phe Gln Cys Asn Ser Arg His Val Ile Cys Leu
            100                 105                 110

Asp Cys Phe His Leu Tyr Cys Val Thr Arg Leu Asn Asp Arg Gln Phe
        115                 120                 125

Val His Asp Pro Gln Leu Gly Tyr Ser Leu Pro Cys Val Ala Gly Cys
    130                 135                 140

Pro Asn Ser Leu Ile Lys Glu Leu His His Phe Arg Ile Leu Gly Glu
145                 150                 155                 160

Glu Gln Tyr Asn Arg Tyr Gln Gln Tyr Gly Ala Glu Glu Cys Val Leu
                165                 170                 175

Gln Met Gly Gly Val Leu Cys Pro Arg Pro Gly Cys Gly Ala Gly Leu
            180                 185                 190

Leu Pro Glu Pro Asp Gln Arg Lys Val Thr Cys Glu Gly Gly Asn Gly
        195                 200                 205

Leu Gly Cys Gly Phe Ala Phe Cys Arg Glu Cys Lys Glu Ala Tyr His
    210                 215                 220
```

```
Glu Gly Glu Cys Ser Ala Val Phe Glu Ala Ser Gly Thr Thr Thr Gln
225                 230                 235                 240


Ala Tyr Arg Val Asp Glu Arg Ala Ala Glu Gln Ala Arg Trp Glu Ala
                245                 250                 255


Ala Ser Lys Glu Thr Ile Lys Lys Thr Thr Lys Pro Cys Pro Arg Cys
            260                 265                 270


His Val Pro Val Glu Lys Asn Gly Gly Cys Met His Met Lys Cys Pro
        275                 280                 285


Gln Pro Gln Cys Arg Leu Glu Trp Cys Trp Asn Cys Gly Cys Glu Trp
    290                 295                 300


Asn Arg Val Cys Met Gly Asp His Trp Phe Asp Val
305                 310                 315


<210>  16
<211>  387
<212>  PRT
<213>  Homo sapiens

<400>  16

Met Ile Val Phe Val Arg Phe Asn Ser Ser His Gly Phe Pro Val Glu
1               5                   10                  15


Val Asp Ser Asp Thr Ser Ile Phe Gln Leu Lys Glu Val Val Ala Lys
            20                  25                  30


Arg Gln Gly Val Pro Ala Asp Gln Leu Arg Val Ile Phe Ala Gly Lys
        35                  40                  45


Glu Leu Arg Asn Asp Trp Thr Val Gln Asn Cys Asp Leu Asp Gln Gln
    50                  55                  60


Ser Ile Val His Ile Val Gln Arg Pro Trp Arg Lys Gly Gln Glu Met
65                  70                  75                  80
```

```
Asn Ala Thr Gly Gly Asp Asp Pro Arg Asn Ala Ala Gly Gly Cys Glu
                85                  90                  95

Arg Glu Pro Gln Ser Leu Thr Arg Val Asp Leu Ser Ser Ser Val Leu
            100                 105                 110

Pro Gly Asp Ser Val Gly Leu Ala Val Ile Leu His Thr Asp Ser Arg
        115                 120                 125

Lys Asp Ser Pro Pro Ala Gly Ser Pro Ala Gly Arg Ser Ile Tyr Asn
    130                 135                 140

Ser Phe Tyr Val Tyr Cys Lys Gly Pro Cys Gln Arg Val Gln Pro Gly
145                 150                 155                 160

Lys Leu Arg Val Gln Cys Ser Thr Cys Arg Gln Ala Thr Leu Thr Leu
                165                 170                 175

Thr Gln Glu Phe Phe Phe Lys Cys Gly Ala His Pro Thr Ser Asp Lys
            180                 185                 190

Glu Thr Ser Val Ala Leu His Leu Ile Ala Thr Asn Ser Arg Asn Ile
        195                 200                 205

Thr Cys Ile Thr Cys Thr Asp Val Arg Ser Pro Val Leu Val Phe Gln
    210                 215                 220

Cys Asn Ser Arg His Val Ile Cys Leu Asp Cys Phe His Leu Tyr Cys
225                 230                 235                 240

Val Thr Arg Leu Asn Asp Arg Gln Phe Val His Asp Pro Gln Leu Gly
                245                 250                 255

Tyr Ser Leu Pro Cys Val Ala Gly Cys Pro Asn Ser Leu Ile Lys Glu
            260                 265                 270

Leu His His Phe Arg Ile Leu Gly Glu Glu Gln Phe Ala Phe Cys Arg
```

```
        275                 280                 285

Glu Cys Lys Glu Ala Tyr His Glu Gly Glu Cys Ser Ala Val Phe Glu
    290                 295                 300

Ala Ser Gly Thr Thr Thr Gln Ala Tyr Arg Val Asp Glu Arg Ala Ala
305                 310                 315                 320

Glu Gln Ala Arg Trp Glu Ala Ala Ser Lys Glu Thr Ile Lys Lys Thr
                325                 330                 335

Thr Lys Pro Cys Pro Arg Cys His Val Pro Val Glu Lys Asn Gly Gly
            340                 345                 350

Cys Met His Met Lys Cys Pro Gln Pro Gln Cys Arg Leu Glu Trp Cys
        355                 360                 365

Trp Asn Cys Gly Cys Glu Trp Asn Arg Val Cys Met Gly Asp His Trp
    370                 375                 380

Phe Asp Val
385
```

<210> 17
<211> 415
<212> PRT
<213> Homo sapiens

<400> 17

```
Met Ile Val Phe Val Arg Phe Asn Ser Ser His Gly Phe Pro Val Glu
1               5                   10                  15

Val Asp Ser Asp Thr Ser Ile Phe Gln Leu Lys Glu Val Val Ala Lys
            20                  25                  30

Arg Gln Gly Val Pro Ala Asp Gln Leu Arg Val Ile Phe Ala Gly Lys
        35                  40                  45
```

```
Glu Leu Arg Asn Asp Trp Thr Val Gln Asn Cys Asp Leu Asp Gln Gln
    50                  55                  60

Ser Ile Val His Ile Val Gln Arg Pro Trp Arg Lys Gly Gln Glu Met
65                  70                  75                  80

Asn Ala Thr Gly Gly Asp Asp Pro Arg Asn Ala Ala Gly Gly Cys Glu
                85                  90                  95

Arg Glu Pro Gln Ser Leu Thr Arg Val Asp Leu Ser Ser Ser Val Leu
            100                 105                 110

Pro Gly Asp Ser Val Gly Leu Ala Val Ile Leu His Thr Asp Ser Arg
        115                 120                 125

Lys Asp Ser Pro Pro Ala Gly Ser Pro Ala Gly Arg Ser Ile Tyr Asn
    130                 135                 140

Ser Phe Tyr Val Tyr Cys Lys Gly Pro Cys Gln Arg Val Gln Pro Gly
145                 150                 155                 160

Lys Leu Arg Val Gln Cys Ser Thr Cys Arg Gln Ala Thr Leu Thr Leu
                165                 170                 175

Thr Gln Gly Pro Ser Cys Trp Asp Asp Val Leu Ile Pro Asn Arg Met
            180                 185                 190

Ser Gly Glu Cys Gln Ser Pro His Cys Pro Gly Thr Ser Ala Glu Phe
        195                 200                 205

Phe Phe Lys Cys Gly Ala His Pro Thr Ser Asp Lys Glu Thr Ser Val
    210                 215                 220

Ala Leu His Leu Ile Ala Thr Asn Ser Arg Asn Ile Thr Cys Ile Thr
225                 230                 235                 240

Cys Thr Asp Val Arg Ser Pro Val Leu Val Phe Gln Cys Asn Ser Arg
                245                 250                 255
```

```
His Val Ile Cys Leu Asp Cys Phe His Leu Tyr Cys Val Thr Arg Leu
            260                 265                 270

Asn Asp Arg Gln Phe Val His Asp Pro Gln Leu Gly Tyr Ser Leu Pro
        275                 280                 285

Cys Val Ala Gly Cys Pro Asn Ser Leu Ile Lys Glu Leu His His Phe
    290                 295                 300

Arg Ile Leu Gly Glu Glu Gln Phe Ala Phe Cys Arg Glu Cys Lys Glu
305                 310                 315                 320

Ala Tyr His Glu Gly Glu Cys Ser Ala Val Phe Glu Ala Ser Gly Thr
                325                 330                 335

Thr Thr Gln Ala Tyr Arg Val Asp Glu Arg Ala Ala Glu Gln Ala Arg
            340                 345                 350

Trp Glu Ala Ala Ser Lys Glu Thr Ile Lys Lys Thr Thr Lys Pro Cys
        355                 360                 365

Pro Arg Cys His Val Pro Val Glu Lys Asn Gly Gly Cys Met His Met
    370                 375                 380

Lys Cys Pro Gln Pro Gln Cys Arg Leu Glu Trp Cys Trp Asn Cys Gly
385                 390                 395                 400

Cys Glu Trp Asn Arg Val Cys Met Gly Asp His Trp Phe Asp Val
                405                 410                 415
```

<210> 18
<211> 1398
<212> DNA
<213> Homo sapiens

<400> 18
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<211> 1746
<212> DNA

<213> Homo sapiens

<400> 19
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<210> 20
<211> 570
<212> DNA
<213> Homo sapiens

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<211> 7583
<212> DNA
<213> Homo sapiens

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gttgctgaaa tacagactaa aggatttcag acaatcttag caatcctcaa attgtcagca 1980

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ctggttttcc agtgcaactc ccgccacgtg atttgcttag actgtttcca cttatactgt 720

gtgacaagac tcaatgatcg gcagtttgtt cacgaccctc aacttggcta ctccctgcct 780

tgtgtggctg gctgtcccaa ctccttgatt aaagagctcc atcacttcag gattctggga 840

gaagagcagt acaaccggta ccagcagtat ggtgcagagg agtgtgtcct gcagatgggg 900

ggcgtgttat gcccccgccc tggctgtgga gcggggctgc tgccggagcc tgaccagagg 960

aaagtcacct gcgaaggggg caatggcctg ggctgtgggt ttgccttctg ccgggaatgt 1020

aaagaagcgt accatgaagg ggagtgcagt gccgtatttg aagcctcagg aacaactact 1080

caggcctaca gagtcgatga aagagccgcc gagcaggctc gttgggaagc agcctccaaa 1140

gaaaccatca agaaaaccac caagccctgt ccccgctgcc atgtaccagt ggaaaaaaat 1200

ggaggctgca tgcacatgaa gtgtccgcag ccccagtgca ggctcgagtg gtgctggaac 1260

tgtggctgcg agtggaaccg cgtctgcatg ggggaccact ggttcgacgt gtag 1314

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<212> DNA
<213> Homo sapiens

<400> 29
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gctgtcattc tgcacactga cagcaggaag gactcaccac cagctggaag tccagcaggt 180

agatcaatct acaacagctt ttatgtgtat tgcaaaggcc cctgtcaaag agtgcagccg 240

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ccatcttgct gggatgatgt tttaattcca aaccggatga gtggtgaatg ccaatcccca 360

cactgccctg ggactagtgc agaatttttc tttaaatgtg gagcacaccc cacctctgac 420

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gaccctcaac ttggctactc cctgccttgt gtggtttgcc ttctgccggg aatgtaa 657

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<211> 825
<212> DNA
<213> Homo sapiens

<400> 30
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tgtggagcac accccacctc tgacaaggaa acatcagtag ctttgcacct gatcgcaaca 120

aatagtcgga acatcacttg cattacgtgc acagacgtca ggagccccgt cctggttttc 180

cagtgcaact cccgccacgt gatttgctta gactgtttcc acttatactg tgtgacaaga 240

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tgcgaagggg gcaatggcct gggctgtggg tttgccttct gccgggaatg taaagaagcg 540

taccatgaag gggagtgcag tgccgtattt gaagcctcag gaacaactac tcaggcctac 600

agagtcgatg aaagagccgc cgagcaggct cgttgggaag cagcctccaa agaaaccatc 660

aagaaaacca ccaagccctg tccccgctgc catgtaccag tggaaaaaaa tggaggctgc 720

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gagtggaacc gcgtctgcat gggggaccac tggttcgacg tgtag 825

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<211> 1161
<212> DNA
<213> Homo sapiens

<400> 31
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ttgcgtgtga ttttcgcagg gaaggagctg aggaatgact ggactgtgca gaattgtgac 180

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tcaatctaca acagctttta tgtgtattgc aaaggcccct gtcaaagagt gcagccggga 480

aaactcaggg tacagtgcag cacctgcagg caggcaacgc tcaccttgac ccagggtcca 540

tcttgctggg atgatgtttt aattccaaac cggatgagtg gtgaatgcca atccccacac 600

tgccctggga ctagtgcaga atttttcttt aaatgtggag cacaccccac ctctgacaag 660

gaaacatcag tagctttgca cctgatcgca acaaatagtc ggaacatcac ttgcattacg 720

tgcacagacg tcaggagccc cgtcctggtt ttccagtgca actcccgcca cgtgatttgc 780

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cctcaacttg gctactccct gccttgtgtg ggaactggag acacagtggt gcttagagga 900

gctctggggg gattcaggag aggagtcgct ggctgtccca actccttgat taaagagctc 960

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gagtgtgtcc tgcagatggg gggcgtgtta tgcccccgcc ctggctgtgg agcggggctg 1080

ctgccggagc ctgaccagag gaaagtcacc tgcgaagggg gcaatggcct gggctgtggg 1140

tatggacaac gaagaacaaa a 1161

<210> 32
<211> 951
<212> DNA
<213> Homo sapiens

<400> 32
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ttgcgtgtga ttttcgcagg gaaggagctg aggaatgact ggactgtgca ggaatttttc 180

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gcaacaaata gtcggaacat cacttgcatt acgtgcacag acgtcaggag ccccgtcctg 300

gttttccagt gcaactcccg ccacgtgatt tgcttagact gtttccactt atactgtgtg 360

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gagcagtaca accggtacca gcagtatggt gcagaggagt gtgtcctgca gatgggggggc 540

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gtcacctgcg aaggggggcaa tggcctgggc tgtgggtttg ccttctgccg ggaatgtaaa 660

gaagcgtacc atgaagggga gtgcagtgcc gtatttgaag cctcaggaac aactactcag 720

gcctacagag tcgatgaaag agccgccgag caggctcgtt gggaagcagc ctccaaagaa 780

accatcaaga aaaccaccaa gccctgtccc cgctgccatg taccagtgga aaaaaatgga 840

ggctgcatgc acatgaagtg tccgcagccc cagtgcaggc tcgagtggtg ctggaactgt 900

ggctgcgagt ggaaccgcgt ctgcatgggg gaccactggt tcgacgtgta g 951

<210> 33
<211> 1164
<212> DNA
<213> Homo sapiens

<400> 33
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ttgcgtgtga ttttcgcagg gaaggagctg aggaatgact ggactgtgca gaattgtgac 180

ctggatcagc agagcattgt tcacattgtg cagagaccgt ggagaaaagg tcaagaaatg 240

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tcaatctaca acagctttta tgtgtattgc aaaggcccct gtcaaagagt gcagccggga 480

aaactcaggg tacagtgcag cacctgcagg caggcaacgc tcaccttgac ccaggaattt 540

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atcgcaacaa atagtcggaa catcacttgc attacgtgca cagacgtcag gagccccgtc 660

ctggttttcc agtgcaactc ccgccacgtg atttgcttag actgtttcca cttatactgt 720

gtgacaagac tcaatgatcg gcagtttgtt cacgaccctc aacttggcta ctccctgcct 780

tgtgtggctg gctgtcccaa ctccttgatt aaagagctcc atcacttcag gattctggga 840

gaagagcagt ttgccttctg ccgggaatgt aaagaagcgt accatgaagg ggagtgcagt 900

gccgtatttg aagcctcagg aacaactact caggcctaca gagtcgatga aagagccgcc 960

gagcaggctc gttgggaagc agcctccaaa gaaaccatca agaaaaccac caagccctgt 1020

ccccgctgcc atgtaccagt ggaaaaaaat ggaggctgca tgcacatgaa gtgtccgcag 1080

ccccagtgca ggctcgagtg gtgctggaac tgtggctgcg agtggaaccg cgtctgcatg 1140

ggggaccact ggttcgacgt gtag 1164

<210> 34
<211> 1248
<212> DNA
<213> Homo sapiens

<400> 34
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ttgcgtgtga ttttcgcagg gaaggagctg aggaatgact ggactgtgca gaattgtgac 180

ctggatcagc agagcattgt tcacattgtg cagagaccgt ggagaaaagg tcaagaaatg 240

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gtcattctgc acactgacag caggaaggac tcaccaccag ctggaagtcc agcaggtaga 420

tcaatctaca acagctttta tgtgtattgc aaaggcccct gtcaaagagt gcagccggga 480

aaactcaggg tacagtgcag cacctgcagg caggcaacgc tcaccttgac ccagggtcca 540

tcttgctggg atgatgtttt aattccaaac cggatgagtg gtgaatgcca atccccacac 600

tgccctggga ctagtgcaga atttttcttt aaatgtggag cacaccccac ctctgacaag 660

gaaacatcag tagctttgca cctgatcgca acaaatagtc ggaacatcac ttgcattacg 720

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ctccatcact tcaggattct gggagaagag cagtttgcct tctgccggga atgtaaagaa 960

gcgtaccatg aaggggagtg cagtgccgta tttgaagcct caggaacaac tactcaggcc 1020

tacagagtcg atgaaagagc cgccgagcag gctcgttggg aagcagcctc caaagaaacc 1080

atcaagaaaa ccaccaagcc ctgtccccgc tgccatgtac cagtggaaaa aaatggaggc 1140

tgcatgcaca tgaagtgtcc gcagccccag tgcaggctcg agtggtgctg gaactgtggc 1200

tgcgagtgga accgcgtctg catgggggac cactggttcg acgtgtag 1248

<210> 35
<211> 1398
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in Lab - Codon optimized PRKN variant CO1

<400> 35
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acctccatct tccaactgaa ggaggtggtg gccaagagac agggggtgcc tgcagatcag 120

cttagggtca tctttgctgg aaaggagctg agaaatgact ggactgtgca gaactgtgac 180

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tccctgacca gagtggacct gtccagctca gtgctcccag gagactcagt ggggcttgct 360

gtgattctgc acactgactc caggaaggac tccccccctg ctggaagccc agcgggcaga 420

agcatctaca actccttcta tgtgtactgc aagggcccct gccagagagt gcagcctgga 480

aagctgaggg tgcagtgctc cacctgtcgc caagccactc tcaccctgac ccagggccca 540

tcctgctggg atgatgtctt gatccccaac aggatgtcgg gagaatgtca gtcaccacac 600

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gaagagtgtg tgctccaaat ggggggagtg ctgtgccccc ggccgggctg tggagctggc 1020

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gggtttgcct tctgccggga gtgcaaggag gcctaccacg aaggagagtg ctctgcagtg 1140

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gccagatggg aagctgccag caaggaaacc attaagaaaa ccaccaagcc atgccccgg 1260

tgccacgtgc cagtggagaa gaatggaggg tgcatgcaca tgaagtgccc ccagccccag 1320

tgccgcttgg agtggtgctg gaactgtggt tgtgaatgga acagggtctg tatgggggac 1380

cactggtttg atgtgtaa 1398

<210> 36
<211> 1398
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in Lab - Codon optimized PRKN variant CO2

<400> 36
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accagcatct tccagctgaa ggaagtggtg gccaagagac agggagtgcc agcagatcag 120

ctccgggtca tttttgctgg aaaggaactg aggaatgact ggactgtcca gaactgtgac 180

ctggaccagc agtccattgt ccacattgtg cagaggcctt ggaggaaggg ccaagagatg 240

aatgccactg gggggatga ccctagaaat gcggctggag gctgtgaacg ggagcctcag 300

tccctcacta gagtggacct gagctcctca gtcctccctg gagactcagt gggcctggct 360

gtgatcctcc acactgactc ccgcaaggac agcccccag cgggcagccc tgcaggccgg 420

tccatctaca actccttcta tgtgtactgc aagggaccct gccagagagt ccagcctggc 480

aaactgaggg tgcagtgctc cacctgtcgc caagccaccc tgaccctgac ccaaggaccc 540

tcctgctggg atgatgtgct gatccccaac cggatgtcag gagaatgtca aagcccgcat 600

tgcccaggga cctctgcaga gttcttcttc aagtgtggag cccaccccac ctcggacaag 660

gaaacctcag tggccctgca cctgattgcc acaaactccc ggaacatcac ctgtatcacc 720

tgtactgatg tgcgctcacc agtgctggtg ttccagtgca actcccgcca tgtgatctgc 780

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gaagaatgtg tgctgcagat gggggggggtg ctctgcccga ggccaggatg tggtgcaggc 1020

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gccagatggg aagcagcctc caaggaaacc atcaagaaaa ccactaagcc ctgcccccgc 1260

tgccatgtgc ctgtggagaa gaatggtgga tgcatgcaca tgaagtgccc ccaacctcag 1320

tgcaggcttg aatggtgctg gaactgtggc tgtgaatgga acagagtctg catgggggac 1380

cactggtttg atgtctaa 1398

<210> 37
<211> 1398
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in Lab - Codon optimized PRKN variant CO3

<400> 37
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acctccatct tccaattaaa ggaggtggtg gccaagcgtc agggagtccc agcagaccag 120

ctgagggtga tctttgctgg caaagaactt agaaatgact ggactgtgca gaactgtgac 180

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aatgccactg gggggggatga cccccggaat gccgcggggg gctgtgagag ggaacctcaa 300

tccctgacca gagtggacct gagctcctcg gtgttgccag gagacagcgt gggcctggct 360

gtgatcctgc acactgactc caggaaggac agccccccctg ctggaagccc agctggccgc 420

tccatctaca actccttcta tgtctactgc aagggcccct gccagagagt gcagcctgga 480

aagctgagag tgcagtgctc cacctgtcgc caggccaccc tgaccctgac ccaaggaccg 540

tcctgctggg atgatgtcct catccccaac aggatgtcag gagaatgcca atccccccac 600

tgtcctggca cttcagcgga gttcttcttc aagtgtggag ctcaccccac ttctgacaag 660

gaaacctcag tggccctcca cctgattgcc accaactcca gaaacatcac atgcattact 720

tgcactgatg tcaggtcccc tgtgttggtg ttccagtgca actcaagaca tgtgatctgc 780

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gccagatggg aggcagcctc caaggaaacc atcaagaaaa ccactaagcc ttgccctcgg 1260

tgccatgtgc ctgtggagaa gaatggaggg tgcatgcaca tgaagtgccc ccagcctcag 1320

tgcaggctgg aatggtgctg gaactgtggc tgtgaatgga acagggtctg catgggagat 1380

cactggtttg atgtctaa 1398

<210> 38
<211> 1398
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in Lab - Codon optimized PRKN variant CO4

<400> 38

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accagcatct tccaactgaa ggaagtggtg gccaagcgtc agggggtccc ggcagaccag 120

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gtcattctgc acactgacag ccgcaaggat tccccccctg cgggttcacc agctggacgg 420

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aagctcagag tgcagtgcag cacttgcaga caagccaccc tgaccctgac ccagggccca 540

tcctgctggg atgatgtcct gatccccaac cggatgtcag gggaatgcca aagccctcac 600

tgccctggaa cctcggccga gttcttcttc aaatgtggag cccaccccac ctcggacaag 660

gaaacctcgg tggcccttca cctcattgcc accaactccc gcaacatcac ctgtatcact 720

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tttgaagcct cagggaccac cacacaagcc tacagagtgg atgagagggc agcggagcag 1200

gcccgctggg aagcggcctc caaggagact atcaagaaaa ccaccaagcc atgccctagg 1260

tgccatgtgc ctgtggaaaa gaatggaggc tgcatgcaca tgaagtgccc ccagccacag 1320

tgccgccttg aatggtgctg gaactgtggc tgcgagtgga acagagtgtg tatgggggac 1380

cactggtttg atgtgtga 1398

<210> 39

<211> 4187
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in Lab - AAV expression cassette construct

<400> 39
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ccccgcccat tgacgtcaat aatgacgtat gttcccatag taacgccaat agggactttc 120

cattgacgtc aatgggtgga gtatttacgg taaactgccc acttggcagt acatcaagtg 180

tatcatatgc caagtacgcc ccctattgac gtcaatgacg gtaaatggcc cgcctggcat 240

tatgcccagt acatgacctt atgggacttt cctacttggc agtacatcta cgtattagtc 300

atcgctatta ccagcccagc accccaaggc ggccaacgcc aaaactctcc ctcctcctct 360

tcctcaatct cgctctcgct ctttttttt ttcgcaaaag gaggggagag ggggtaaaaa 420

aatgctgcac tgtgcggcga agccggtgag tgagcggcgc ggggccaatc agcgtgcgcc 480

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<211> 4198
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<220>
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<211> 4166
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in Lab - AAV expression cassette construct

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aaataagttt gttcgagaag cttcag 4166

<210> 47

<211> 4155
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in Lab - AAV expression cassette construct

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<211> 4147
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<223> Made in Lab - AAV expression cassette construct

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<223> Made in Lab - AAV expression cassette construct

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<210> 59
<211> 253
<212> DNA

<213> Homo sapiens

<400> 59
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gcggcgaagc cggtgagtga gcggcgcggg gccaatcagc gtgcgccgtt ccgaaagttg 180

ccttttatgg ctcgagcggc cgcggcggcg ccctataaaa cccagcggcg cgacgcgcca 240

ccaccgccga gtc 253

<210> 60
<211> 281
<212> DNA
<213> Gallus gallus

<400> 60
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cggcggcagc caatcagagc ggcgcgctcc gaaagtttcc ttttatggcg aggcggcggc 240

ggcggcggcc ctataaaaag cgaagcgcgc ggcgggcggg a 281

<210> 61
<211> 220
<212> DNA
<213> Human betaherpesvirus 5

<400> 61
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ttccaagtct ccaccccatt gacgtcaatg ggagtttgtt ttggcaccaa aatcaacggg 120

actttccaaa atgtcgtaat aaccccgccc cgttgacgca aatgggcggt aggcgtgtac 180

ggtgggaggt ctatataagc agagctcgtt tagtgaaccg 220

<210> 62
<211> 455
<212> DNA
<213> Homo sapiens

<400> 62
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aacccagaga tcgctgcgtt cccgcccccc cacccgcccg ctctcgtcat cactgaggtg 240

gagaatagca tgcgtgaggc tccggtgccc gtcagtgggc agagcgcaca tcgcccacag 300

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gggtaaactg ggaaagtgat gtcgtgtact ggctccgcct ttttcccgag ggtgggggag 420

aaccgtatat aagtgcagta gtcgccgtga acgtt 455

<210> 63
<211> 422
<212> DNA
<213> Homo sapiens

<400> 63
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actgccagct tcagcaccgc ggacagtgcc ttcgcccccg cctggcggcg cgcgccaccg 240

ccgcctcagc actgaaggcg cgctgacgtc actcgccggt cccccgcaaa ctccccttcc 300

cggccacctt ggtcgcgtcc gcgccgccgc cggcccagcc ggaccgcacc acgcgaggcg 360

cgagataggg gggcacgggc gcgaccatct gcgctgcggc gccggcgact cagcgctgcc 420

tc 422

<210> 64
<211> 281
<212> DNA
<213> Homo sapiens

<400> 64
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caggggtgct gggtccatcc cacccccagg cccacacagg cttgcagtat tgtgtgcggt 120

atggtcaggg cgtccgagag caggtttcgc agtggaaggc aggcaggtgt tggggaggca 180

gttaccgggg caacgggaac agggcgtttt ggaggtggtt gccatgggga cctggatgct 240

gacgaaggct cgcgaggctg tgagcagcca cagtgccctg c 281

<210> 65
<211> 953
<212> DNA
<213> Homo sapiens

<400> 65
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cgccaggtaa gcccggccag ccgaccgggg catgcggccg cggcccttcg cccgtgcaga 120

gccgccgtct gggccgcagc ggggggcgca tggggcggaa ccggaccgcc gtgggggggcg 180

cgggagaagc ccctgggcct ccggagatgg gggacacccc acgccagttc gcaggcgcga 240

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aatcgcgcgt gcgttctggg gcccgggcgc ttgcgccact tcctgcccga gccgctggcg 540

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gtcttgatag ttcgccagcc tctgctaacc atgttcatgc cttcttcttt ttcctacagc 900

tcctgggcaa cgtgctggtt attgtgctgt ctcatcattt tggcaaagaa ttc 953

<210> 66
<211> 1068

<212> DNA
<213> Artificial Sequence

<220>
<223> Made in Lab - Chicken beta-actin exon/intron + rabbit globin intron construct

<400> 66
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cggctctgac tgaccgcgtt actcccacag gtgagcgggc gggacggccc ttctcctccg 120

ggctgtaatt agcgcttggt ttaatgacgg cttgtttctt ttctgtggct gcgtgaaagc 180

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gtgggggggt gagcaggggg tgtgggcgcg tcggtcgggc tgcaaccccc cctgcacccc 480

cctccccgag ttgctgagca cggcccggct tcgggtgcgg ggctccgtac ggggcgtggc 540

gcggggctcg ccgtgccggg cgggggggtgg cggcaggtgg gggtgccggg cggggcgggg 600

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ggcaacgtgc tggttattgt gctgtctcat cattttggca aagaattc 1068

<210> 67
<211> 127
<212> DNA
<213> Homo sapiens

<400> 67
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caccgcgcag tccgcccccg cggctcctgg ccagaccacc cctaggaccc cctgccccaa 120

gtcgcag 127

<210> 68
<211> 121
<212> DNA
<213> Human betaherpesvirus 5

<400> 68
tcagatcgcc tggagaggcc atccacgctg ttttgacctc catagtggac accgggaccg 60

atccagcctc cgcggccggg aacggtgcat tggaacgcgg attccccgtg ccaagagtga 120

c 121

<210> 69
<211> 512
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic construct

<400> 69
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aactcttcgc ggtctttcca gtactcttgg atcggaaacc cgtcggcctc cgaacggtac 120

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gagacggcgg atggtcgagg tgaggtgtgg caggcttgag atccagctgt tggggtgagt 360

actccctctc aaaagcgggc attacttctg cgctaagatt gtcagtttcc aaaaacgagg 420

aggatttgat attcacctgg cccgatctgg ccatacactt gagtgacaat gacatccact 480

ttgcctttct ctccacaggt gtccactccc ag 512

<210> 70

<211> 956
<212> DNA
<213> Homo sapiens

<400> 70
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gacgtgctgc gacgcttttt ttctggcaag atagtcttgt aaatgcgggc caggatctgc 360

acactggtat ttcggttttt gggcccgcgg ccggcgacgg ggcccgtgcg tcccagcgca 420

catgttcggc gaggcggggc ctgcgagcgc ggccaccgag aatcggacgg gggtagtctc 480

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ctgctccagg gggctcaaaa tggaggacgc ggcgctcggg agagcgggcg ggtgagtcac 660

ccacacaaag gaaaagggcc tttccgtcct cagccgtcgc ttcatgtgac tccacggagt 720

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cttggttcat tctcaagcct cagacagtgg ttcaaagttt ttttcttcca tttcag 956

<210> 71
<211> 83
<212> DNA
<213> Homo sapiens

<400> 71
tcagaagccc cgggctcgtc agtcaaaccg gttctctgtt tgcactcggc agcacgggca 60

ggcaagtggt ccctaggttc ggg 83

<210> 72

<211> 755
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in Lab - mutated woodchuck hepatitis regulatory element

<400> 72
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atgttgctcc ttttacgcta tgtggatacg ctgctttaat gcctttgtat catgctattg 120

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cggccctcaa tccagcggac cttccttccc gcggcctgct gccggctctg cggcctcttc 540

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tgtatctttt tcacctgtgc cttgtttttg cctgtgttcc gcgtcctact tttcaagcct 660

ccaagctgtg ccttgggcgg ctttggggca tggacataga tccctataaa gaatttggtt 720

catcttatca gttgttgaat tttcttcctt tggac 755

<210> 73
<211> 755
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in Lab - HepB derived enhancer element

<400> 73
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ttgctgcccc ttttacgcaa tgtggatatc ctgctttaat gcctttatat gcatgtatac 120

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ccaagctgtg ccttgggcgg ctttggggca tggacataga tccctataaa gaatttggtt 720

catcttatca gttgttgaat tttcttcctt tggac 755

<210> 74
<211> 94
<212> DNA
<213> Homo sapiens

<400> 74
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tccttgcacc ggcccttcct ggtctttgaa taaa 94

<210> 75
<211> 596
<212> DNA
<213> Woodchuck hepatitis virus

<400> 75
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acatttaaat gttaataaaa caaaatggtg gggcaatcat ttacattttt agggatatgt 120

aattactagt tcaggtgtat tgccacaaga caaacatgtt aagaaacttt cccgttattt 180

acgctctgtt cctgttaatc aacctctgga ttacaaaatt tgtgaaagat tgactgatat 240

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tgctattgct tcccgtacgg ctttcgtttt ctcctccttg tataaatcct ggttgctgtc 360

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gacaggggct aggttgctgg gcactgataa ttccgtggtg ttgtcgggga agggcc 596

<210> 76
<211> 387
<212> DNA
<213> Oryctolagus cuniculus

<400> 76
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gagtttggca acatatgccc atatgctggc tgccatgaac aaaggttggc tataaagagg 180

tcatcagtat atgaaacagc cccctgctgt ccattcctta ttccatagaa aagccttgac 240

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<210> 77
<211> 251
<212> DNA
<213> Bos taurus

<400> 77
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ttctattctg gggggtgggg tggggcagga cagcaagggg gaggattggg aatacaatag 180

caggcatgct ggggatgcgg tgggctctat gggtacccag gtgctgaaga attgacccgg 240

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<210> 78
<211> 202
<212> DNA

<213> Homo sapiens

<400> 78
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actccagtgc ccaccagcct tgtcctaata aaattaagtt gcatcatttt gtctgactag 120

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ggaagaaacc tgtagggcct gc 202

<210> 79
<211> 304
<212> DNA
<213> Human betaherpesvirus 5

<400> 79
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caatgggtgg agtatttacg gtaaactgcc cacttggcag tacatcaagt gtatcatatg 180

ccaagtacgc cccctattga cgtcaatgac ggtaaatggc ccgcctggca ttatgcccag 240

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acca 304

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<211> 111
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