SEQUENCE LISTING

<110> PRESIDENT AND FELLOWS OF HARVARD COLLEGE

<120> NUCLEOBASE EDITORS COMPRISING NUCLEIC ACID PROGRAMMABLE DNA BINDING PROTEINS

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<151> 2017-04-26

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Ala Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
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His Glu Gln Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
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35 40 45

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

Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys
65 70 75 80

Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser
85 90 95

Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys
100 105 110

His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr
115 120 125

His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp
130 135 140

Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His
145 150 155 160

```
Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro
                165                 170                 175

Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr
            180                 185                 190

Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala
        195                 200                 205

Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn
    210                 215                 220

Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn
225                 230                 235                 240

Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe
                245                 250                 255

Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp
            260                 265                 270

Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp
        275                 280                 285

Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp
    290                 295                 300

Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser
305                 310                 315                 320

Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys
                325                 330                 335

Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe
            340                 345                 350

Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser
        355                 360                 365
```

```
Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp
    370                 375                 380

Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg
385                 390                 395                 400

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
                405                 410                 415

Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe
            420                 425                 430

Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
        435                 440                 445

Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp
    450                 455                 460

Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu
465                 470                 475                 480

Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr
                485                 490                 495

Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser
            500                 505                 510

Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys
        515                 520                 525

Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln
    530                 535                 540

Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr
545                 550                 555                 560

Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp
                565                 570                 575
```

```
Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly
            580                 585                 590

Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
        595                 600                 605

Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr
    610                 615                 620

Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala
625                 630                 635                 640

His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr
                645                 650                 655

Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp
            660                 665                 670

Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe
        675                 680                 685

Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe
    690                 695                 700

Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu
705                 710                 715                 720

His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
                725                 730                 735

Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
            740                 745                 750

Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln
        755                 760                 765

Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780
```

```
Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
785                 790                 795                 800

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu
                805                 810                 815

Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg
            820                 825                 830

Leu Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys
        835                 840                 845

Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg
    850                 855                 860

Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
865                 870                 875                 880

Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys
                885                 890                 895

Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
            900                 905                 910

Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
        915                 920                 925

Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
    930                 935                 940

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
945                 950                 955                 960

Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
                965                 970                 975

Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val
            980                 985                 990
```

```
Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
        995                 1000                1005


Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
    1010                1015                1020


Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
    1025                1030                1035


Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
    1040                1045                1050


Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
    1055                1060                1065


Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1070                1075                1080


Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1085                1090                1095


Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
    1100                1105                1110


Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
    1115                1120                1125


Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
    1130                1135                1140


Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
    1145                1150                1155


Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser
    1160                1165                1170


Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys
    1175                1180                1185
```

```
Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu
    1190                1195                1200

Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                1210                1215

Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
    1220                1225                1230

Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu Lys Leu  Lys Gly Ser
    1235                1240                1245

Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe Val Glu  Gln His Lys
    1250                1255                1260

His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile Ser Glu  Phe Ser Lys
    1265                1270                1275

Arg Val  Ile Leu Ala Asp Ala  Asn Leu Asp Lys Val  Leu Ser Ala
    1280                1285                1290

Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg Glu Gln  Ala Glu Asn
    1295                1300                1305

Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu Gly Ala  Pro Ala Ala
    1310                1315                1320

Phe Lys  Tyr Phe Asp Thr Thr  Ile Asp Arg Lys Arg  Tyr Thr Ser
    1325                1330                1335

Thr Lys  Glu Val Leu Asp Ala  Thr Leu Ile His Gln  Ser Ile Thr
    1340                1345                1350

Gly Leu  Tyr Glu Thr Arg Ile  Asp Leu Ser Gln Leu  Gly Gly Asp
    1355                1360                1365
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cttgaagagt ctttttggt ggaagaagac aagaagcatg aacgtcatcc tatttttgga 360

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aaattggtag attctactga taaagcggat ttgcgcttaa tctatttggc cttagcgcat 480

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cgattagaaa atctcattgc tcagctcccc ggtgagaaga aaaatggctt atttgggaat 720

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caaattggag atcaatatgc tgatttgttt ttggcagcta agaatttatc agatgctatt 900

ttactttcag atatcctaag agtaaatact gaaataacta aggctcccct atcagcttca 960

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aatcttccaa atgaaaaagt actaccaaaa catagtttgc tttatgagta ttttacggtt 1560

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cccgctgctt ttaaatattt tgatacaaca attgatcgta aacgatatac gtctacaaaa 4020

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Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe
20 25 30

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Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile
        35                  40                  45

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

Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys
65                  70                  75                  80

Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser
                85                  90                  95

Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys
            100                 105                 110

His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr
        115                 120                 125

His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp
    130                 135                 140

Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His
145                 150                 155                 160

Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro
                165                 170                 175

Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr
            180                 185                 190

Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala
        195                 200                 205

Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn
    210                 215                 220

Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn
225                 230                 235                 240
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Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe
                245                 250                 255

Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp
            260                 265                 270

Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp
        275                 280                 285

Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp
    290                 295                 300

Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser
305                 310                 315                 320

Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys
                325                 330                 335

Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe
            340                 345                 350

Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser
        355                 360                 365

Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp
    370                 375                 380

Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg
385                 390                 395                 400

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
                405                 410                 415

Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe
            420                 425                 430

Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
        435                 440                 445
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```
Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp
    450                 455                 460

Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu
465                 470                 475                 480

Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr
                485                 490                 495

Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser
            500                 505                 510

Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys
        515                 520                 525

Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln
    530                 535                 540

Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr
545                 550                 555                 560

Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp
                565                 570                 575

Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly
            580                 585                 590

Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
        595                 600                 605

Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr
    610                 615                 620

Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala
625                 630                 635                 640

His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr
                645                 650                 655
```

```
Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp
            660                 665                 670

Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe
        675                 680                 685

Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe
    690                 695                 700

Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu
705                 710                 715                 720

His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
                725                 730                 735

Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
            740                 745                 750

Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln
        755                 760                 765

Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780

Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
785                 790                 795                 800

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu
                805                 810                 815

Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg
            820                 825                 830

Leu Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys
        835                 840                 845

Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg
    850                 855                 860
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```
Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
865                 870                 875                 880

Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys
                885                 890                 895

Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
            900                 905                 910

Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
        915                 920                 925

Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
    930                 935                 940

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
945                 950                 955                 960

Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
                965                 970                 975

Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val
            980                 985                 990

Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
        995                 1000                1005

Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
    1010                1015                1020

Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
    1025                1030                1035

Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
    1040                1045                1050

Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
    1055                1060                1065
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```
Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1070                1075                1080

Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1085                1090                1095

Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
    1100                1105                1110

Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
    1115                1120                1125

Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
    1130                1135                1140

Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
    1145                1150                1155

Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser
    1160                1165                1170

Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys
    1175                1180                1185

Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu
    1190                1195                1200

Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                1210                1215

Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
    1220                1225                1230

Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu Lys Leu  Lys Gly Ser
    1235                1240                1245

Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe Val Glu  Gln His Lys
    1250                1255                1260
```

```
His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile Ser Glu  Phe Ser Lys
    1265                1270                1275


Arg Val  Ile Leu Ala Asp Ala  Asn Leu Asp Lys Val  Leu Ser Ala
    1280                1285                1290


Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg Glu Gln  Ala Glu Asn
    1295                1300                1305


Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu Gly Ala  Pro Ala Ala
    1310                1315                1320


Phe Lys  Tyr Phe Asp Thr Thr  Ile Asp Arg Lys Arg  Tyr Thr Ser
    1325                1330                1335


Thr Lys  Glu Val Leu Asp Ala  Thr Leu Ile His Gln  Ser Ile Thr
    1340                1345                1350


Gly Leu  Tyr Glu Thr Arg Ile  Asp Leu Ser Gln Leu  Gly Gly Asp
    1355                1360                1365
```

<210> 7
<211> 1368
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 7

```
Met Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val
1               5                   10                  15


Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe
            20                  25                  30


Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile
        35                  40                  45
```

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

Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys
65                  70                  75                  80

Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser
                85                  90                  95

Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys
            100                 105                 110

His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr
        115                 120                 125

His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp
    130                 135                 140

Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His
145                 150                 155                 160

Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro
                165                 170                 175

Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr
            180                 185                 190

Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala
        195                 200                 205

Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn
    210                 215                 220

Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn
225                 230                 235                 240

Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe
                245                 250                 255
```

```
Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp
            260                 265                 270

Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp
        275                 280                 285

Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp
    290                 295                 300

Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser
305                 310                 315                 320

Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys
                325                 330                 335

Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe
            340                 345                 350

Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser
        355                 360                 365

Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp
    370                 375                 380

Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg
385                 390                 395                 400

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
                405                 410                 415

Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe
            420                 425                 430

Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
        435                 440                 445

Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp
    450                 455                 460
```

```
Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu
465                 470                 475                 480

Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr
                485                 490                 495

Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser
            500                 505                 510

Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys
        515                 520                 525

Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln
    530                 535                 540

Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr
545                 550                 555                 560

Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp
                565                 570                 575

Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly
            580                 585                 590

Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
        595                 600                 605

Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr
    610                 615                 620

Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala
625                 630                 635                 640

His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr
                645                 650                 655

Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp
            660                 665                 670
```

```
Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe
        675                 680                 685

Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe
    690                 695                 700

Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu
705                 710                 715                 720

His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
                725                 730                 735

Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
            740                 745                 750

Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln
        755                 760                 765

Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780

Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
785                 790                 795                 800

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu
                805                 810                 815

Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg
            820                 825                 830

Leu Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe Leu Lys
        835                 840                 845

Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg
    850                 855                 860

Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
865                 870                 875                 880
```

```
Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys
                885                 890                 895

Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
            900                 905                 910

Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
        915                 920                 925

Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
    930                 935                 940

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
945                 950                 955                 960

Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
                965                 970                 975

Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val
            980                 985                 990

Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
        995                 1000                1005

Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
    1010                1015                1020

Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
    1025                1030                1035

Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
    1040                1045                1050

Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
    1055                1060                1065

Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1070                1075                1080
```

```
Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1085                1090                1095

Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
    1100                1105                1110

Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
    1115                1120                1125

Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
    1130                1135                1140

Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
    1145                1150                1155

Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser
    1160                1165                1170

Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys
    1175                1180                1185

Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu
    1190                1195                1200

Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                1210                1215

Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
    1220                1225                1230

Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu Lys Leu  Lys Gly Ser
    1235                1240                1245

Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe Val Glu  Gln His Lys
    1250                1255                1260

His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile Ser Glu  Phe Ser Lys
    1265                1270                1275
```

Arg Val Ile Leu Ala Asp Ala Asn Leu Asp Lys Val Leu Ser Ala
1280 1285 1290

Tyr Asn Lys His Arg Asp Lys Pro Ile Arg Glu Gln Ala Glu Asn
1295 1300 1305

Ile Ile His Leu Phe Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala
1310 1315 1320

Phe Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser
1325 1330 1335

Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His Gln Ser Ile Thr
1340 1345 1350

Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp
1355 1360 1365

<210> 8
<211> 1368
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 8

Met Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val
1 5 10 15

Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe
20 25 30

Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile
35 40 45

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

Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys
65 70 75 80

```
Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser
                85                  90                  95

Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys
            100                 105                 110

His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr
        115                 120                 125

His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp
    130                 135                 140

Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His
145                 150                 155                 160

Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro
                165                 170                 175

Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr
            180                 185                 190

Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala
        195                 200                 205

Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn
    210                 215                 220

Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn
225                 230                 235                 240

Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe
                245                 250                 255

Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp
            260                 265                 270

Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp
        275                 280                 285
```

```
Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp
    290                 295                 300

Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser
305                 310                 315                 320

Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys
                325                 330                 335

Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe
            340                 345                 350

Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser
        355                 360                 365

Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp
    370                 375                 380

Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg
385                 390                 395                 400

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
                405                 410                 415

Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe
            420                 425                 430

Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
        435                 440                 445

Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp
    450                 455                 460

Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu
465                 470                 475                 480

Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr
                485                 490                 495
```

```
Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser
            500                 505                 510

Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys
        515                 520                 525

Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln
    530                 535                 540

Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr
545                 550                 555                 560

Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp
                565                 570                 575

Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly
            580                 585                 590

Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
        595                 600                 605

Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr
    610                 615                 620

Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala
625                 630                 635                 640

His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr
                645                 650                 655

Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp
            660                 665                 670

Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe
        675                 680                 685

Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe
    690                 695                 700
```

```
Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu
705                 710                 715                 720

His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
                725                 730                 735

Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
            740                 745                 750

Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln
        755                 760                 765

Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780

Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
785                 790                 795                 800

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu
                805                 810                 815

Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg
            820                 825                 830

Leu Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys
        835                 840                 845

Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg
    850                 855                 860

Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
865                 870                 875                 880

Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys
                885                 890                 895

Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
            900                 905                 910
```

```
Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
        915                 920                 925

Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
    930                 935                 940

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
945                 950                 955                 960

Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
                965                 970                 975

Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val
            980                 985                 990

Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
        995                 1000                1005

Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
    1010                1015                1020

Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
    1025                1030                1035

Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
    1040                1045                1050

Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
    1055                1060                1065

Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1070                1075                1080

Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1085                1090                1095

Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
    1100                1105                1110
```

```
Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
    1115                 1120                 1125

Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
    1130                 1135                 1140

Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
    1145                 1150                 1155

Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser
    1160                 1165                 1170

Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys
    1175                 1180                 1185

Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu
    1190                 1195                 1200

Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                 1210                 1215

Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
    1220                 1225                 1230

Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu Lys Leu  Lys Gly Ser
    1235                 1240                 1245

Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe Val Glu  Gln His Lys
    1250                 1255                 1260

His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile Ser Glu  Phe Ser Lys
    1265                 1270                 1275

Arg Val  Ile Leu Ala Asp Ala  Asn Leu Asp Lys Val  Leu Ser Ala
    1280                 1285                 1290

Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg Glu Gln  Ala Glu Asn
    1295                 1300                 1305
```

```
Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu Gly Ala  Pro Ala Ala
    1310                1315                1320


Phe Lys  Tyr Phe Asp Thr Thr  Ile Asp Arg Lys Arg  Tyr Thr Ser
    1325                1330                1335


Thr Lys  Glu Val Leu Asp Ala  Thr Leu Ile His Gln  Ser Ile Thr
    1340                1345                1350


Gly Leu  Tyr Glu Thr Arg Ile  Asp Leu Ser Gln Leu  Gly Gly Asp
    1355                1360                1365
```

<210> 9
<211> 1300
<212> PRT
<213> Francisella novicida

<400> 9

```
Met Ser Ile Tyr Gln Glu Phe Val Asn Lys Tyr Ser Leu Ser Lys Thr
1               5                   10                  15


Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Glu Asn Ile Lys
            20                  25                  30


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


Lys Ala Lys Gln Ile Ile Asp Lys Tyr His Gln Phe Phe Ile Glu Glu
    50                  55                  60


Ile Leu Ser Ser Val Cys Ile Ser Glu Asp Leu Leu Gln Asn Tyr Ser
65                  70                  75                  80


Asp Val Tyr Phe Lys Leu Lys Lys Ser Asp Asp Asp Asn Leu Gln Lys
                85                  90                  95


Asp Phe Lys Ser Ala Lys Asp Thr Ile Lys Lys Gln Ile Ser Glu Tyr
            100                 105                 110
```

```
Ile Lys Asp Ser Glu Lys Phe Lys Asn Leu Phe Asn Gln Asn Leu Ile
        115                 120                 125

Asp Ala Lys Lys Gly Gln Glu Ser Asp Leu Ile Leu Trp Leu Lys Gln
    130                 135                 140

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

Asp Ile Asp Glu Ala Leu Glu Ile Ile Lys Ser Phe Lys Gly Trp Thr
                165                 170                 175

Thr Tyr Phe Lys Gly Phe His Glu Asn Arg Lys Asn Val Tyr Ser Ser
            180                 185                 190

Asn Asp Ile Pro Thr Ser Ile Ile Tyr Arg Ile Val Asp Asp Asn Leu
        195                 200                 205

Pro Lys Phe Leu Glu Asn Lys Ala Lys Tyr Glu Ser Leu Lys Asp Lys
    210                 215                 220

Ala Pro Glu Ala Ile Asn Tyr Glu Gln Ile Lys Lys Asp Leu Ala Glu
225                 230                 235                 240

Glu Leu Thr Phe Asp Ile Asp Tyr Lys Thr Ser Glu Val Asn Gln Arg
                245                 250                 255

Val Phe Ser Leu Asp Glu Val Phe Glu Ile Ala Asn Phe Asn Asn Tyr
            260                 265                 270

Leu Asn Gln Ser Gly Ile Thr Lys Phe Asn Thr Ile Ile Gly Gly Lys
        275                 280                 285

Phe Val Asn Gly Glu Asn Thr Lys Arg Lys Gly Ile Asn Glu Tyr Ile
    290                 295                 300

Asn Leu Tyr Ser Gln Gln Ile Asn Asp Lys Thr Leu Lys Lys Tyr Lys
305                 310                 315                 320
```

```
Met Ser Val Leu Phe Lys Gln Ile Leu Ser Asp Thr Glu Ser Lys Ser
                325                 330                 335

Phe Val Ile Asp Lys Leu Glu Asp Asp Ser Asp Val Val Thr Thr Met
            340                 345                 350

Gln Ser Phe Tyr Glu Gln Ile Ala Ala Phe Lys Thr Val Glu Glu Lys
        355                 360                 365

Ser Ile Lys Glu Thr Leu Ser Leu Leu Phe Asp Asp Leu Lys Ala Gln
    370                 375                 380

Lys Leu Asp Leu Ser Lys Ile Tyr Phe Lys Asn Asp Lys Ser Leu Thr
385                 390                 395                 400

Asp Leu Ser Gln Gln Val Phe Asp Asp Tyr Ser Val Ile Gly Thr Ala
                405                 410                 415

Val Leu Glu Tyr Ile Thr Gln Gln Ile Ala Pro Lys Asn Leu Asp Asn
            420                 425                 430

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

Lys Tyr Leu Ser Leu Glu Thr Ile Lys Leu Ala Leu Glu Glu Phe Asn
    450                 455                 460

Lys His Arg Asp Ile Asp Lys Gln Cys Arg Phe Glu Glu Ile Leu Ala
465                 470                 475                 480

Asn Phe Ala Ala Ile Pro Met Ile Phe Asp Glu Ile Ala Gln Asn Lys
                485                 490                 495

Asp Asn Leu Ala Gln Ile Ser Ile Lys Tyr Gln Asn Gln Gly Lys Lys
            500                 505                 510

Asp Leu Leu Gln Ala Ser Ala Glu Asp Asp Val Lys Ala Ile Lys Asp
        515                 520                 525
```

```
Leu Leu Asp Gln Thr Asn Asn Leu Leu His Lys Leu Lys Ile Phe His
    530                 535                 540

Ile Ser Gln Ser Glu Asp Lys Ala Asn Ile Leu Asp Lys Asp Glu His
545                 550                 555                 560

Phe Tyr Leu Val Phe Glu Glu Cys Tyr Phe Glu Leu Ala Asn Ile Val
                565                 570                 575

Pro Leu Tyr Asn Lys Ile Arg Asn Tyr Ile Thr Gln Lys Pro Tyr Ser
            580                 585                 590

Asp Glu Lys Phe Lys Leu Asn Phe Glu Asn Ser Thr Leu Ala Asn Gly
        595                 600                 605

Trp Asp Lys Asn Lys Glu Pro Asp Asn Thr Ala Ile Leu Phe Ile Lys
    610                 615                 620

Asp Asp Lys Tyr Tyr Leu Gly Val Met Asn Lys Lys Asn Asn Lys Ile
625                 630                 635                 640

Phe Asp Asp Lys Ala Ile Lys Glu Asn Lys Gly Glu Gly Tyr Lys Lys
                645                 650                 655

Ile Val Tyr Lys Leu Leu Pro Gly Ala Asn Lys Met Leu Pro Lys Val
            660                 665                 670

Phe Phe Ser Ala Lys Ser Ile Lys Phe Tyr Asn Pro Ser Glu Asp Ile
        675                 680                 685

Leu Arg Ile Arg Asn His Ser Thr His Thr Lys Asn Gly Ser Pro Gln
    690                 695                 700

Lys Gly Tyr Glu Lys Phe Glu Phe Asn Ile Glu Asp Cys Arg Lys Phe
705                 710                 715                 720

Ile Asp Phe Tyr Lys Gln Ser Ile Ser Lys His Pro Glu Trp Lys Asp
                725                 730                 735
```

```
Phe Gly Phe Arg Phe Ser Asp Thr Gln Arg Tyr Asn Ser Ile Asp Glu
            740                 745                 750

Phe Tyr Arg Glu Val Glu Asn Gln Gly Tyr Lys Leu Thr Phe Glu Asn
        755                 760                 765

Ile Ser Glu Ser Tyr Ile Asp Ser Val Val Asn Gln Gly Lys Leu Tyr
    770                 775                 780

Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ser Ala Tyr Ser Lys Gly Arg
785                 790                 795                 800

Pro Asn Leu His Thr Leu Tyr Trp Lys Ala Leu Phe Asp Glu Arg Asn
                805                 810                 815

Leu Gln Asp Val Val Tyr Lys Leu Asn Gly Glu Ala Glu Leu Phe Tyr
            820                 825                 830

Arg Lys Gln Ser Ile Pro Lys Lys Ile Thr His Pro Ala Lys Glu Ala
        835                 840                 845

Ile Ala Asn Lys Asn Lys Asp Asn Pro Lys Lys Glu Ser Val Phe Glu
    850                 855                 860

Tyr Asp Leu Ile Lys Asp Lys Arg Phe Thr Glu Asp Lys Phe Phe Phe
865                 870                 875                 880

His Cys Pro Ile Thr Ile Asn Phe Lys Ser Ser Gly Ala Asn Lys Phe
                885                 890                 895

Asn Asp Glu Ile Asn Leu Leu Leu Lys Glu Lys Ala Asn Asp Val His
            900                 905                 910

Ile Leu Ser Ile Asp Arg Gly Glu Arg His Leu Ala Tyr Tyr Thr Leu
        915                 920                 925

Val Asp Gly Lys Gly Asn Ile Ile Lys Gln Asp Thr Phe Asn Ile Ile
    930                 935                 940
```

```
Gly Asn Asp Arg Met Lys Thr Asn Tyr His Asp Lys Leu Ala Ala Ile
945                 950                 955                 960


Glu Lys Asp Arg Asp Ser Ala Arg Lys Asp Trp Lys Lys Ile Asn Asn
                965                 970                 975


Ile Lys Glu Met Lys Glu Gly Tyr Leu Ser Gln Val Val His Glu Ile
            980                 985                 990


Ala Lys Leu Val Ile Glu Tyr Asn  Ala Ile Val Val Phe  Glu Asp Leu
        995                 1000                1005


Asn Phe  Gly Phe Lys Arg Gly  Arg Phe Lys Val Glu  Lys Gln Val
    1010                1015                1020


Tyr Gln  Lys Leu Glu Lys Met  Leu Ile Glu Lys Leu  Asn Tyr Leu
    1025                1030                1035


Val Phe  Lys Asp Asn Glu Phe  Asp Lys Thr Gly Gly  Val Leu Arg
    1040                1045                1050


Ala Tyr  Gln Leu Thr Ala Pro  Phe Glu Thr Phe Lys  Lys Met Gly
    1055                1060                1065


Lys Gln  Thr Gly Ile Ile Tyr  Tyr Val Pro Ala Gly  Phe Thr Ser
    1070                1075                1080


Lys Ile  Cys Pro Val Thr Gly  Phe Val Asn Gln Leu  Tyr Pro Lys
    1085                1090                1095


Tyr Glu  Ser Val Ser Lys Ser  Gln Glu Phe Phe Ser  Lys Phe Asp
    1100                1105                1110


Lys Ile  Cys Tyr Asn Leu Asp  Lys Gly Tyr Phe Glu  Phe Ser Phe
    1115                1120                1125


Asp Tyr  Lys Asn Phe Gly Asp  Lys Ala Ala Lys Gly  Lys Trp Thr
    1130                1135                1140
```

```
Ile Ala  Ser Phe Gly Ser Arg  Leu Ile Asn Phe Arg  Asn Ser Asp
    1145                 1150                 1155


Lys Asn  His Asn Trp Asp Thr  Arg Glu Val Tyr Pro  Thr Lys Glu
    1160                 1165                 1170


Leu Glu  Lys Leu Leu Lys Asp  Tyr Ser Ile Glu Tyr  Gly His Gly
    1175                 1180                 1185


Glu Cys  Ile Lys Ala Ala Ile  Cys Gly Glu Ser Asp  Lys Lys Phe
    1190                 1195                 1200


Phe Ala  Lys Leu Thr Ser Val  Leu Asn Thr Ile Leu  Gln Met Arg
    1205                 1210                 1215


Asn Ser  Lys Thr Gly Thr Glu  Leu Asp Tyr Leu Ile  Ser Pro Val
    1220                 1225                 1230


Ala Asp  Val Asn Gly Asn Phe  Phe Asp Ser Arg Gln  Ala Pro Lys
    1235                 1240                 1245


Asn Met  Pro Gln Asp Ala Asp  Ala Asn Gly Ala Tyr  His Ile Gly
    1250                 1255                 1260


Leu Lys  Gly Leu Met Leu Leu  Gly Arg Ile Lys Asn  Asn Gln Glu
    1265                 1270                 1275


Gly Lys  Lys Leu Asn Leu Val  Ile Lys Asn Glu Glu  Tyr Phe Glu
    1280                 1285                 1290


Phe Val  Gln Asn Arg Asn Asn
    1295                 1300


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<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic Polypeptide
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<400> 10

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Met Ser Ile Tyr Gln Glu Phe Val Asn Lys Tyr Ser Leu Ser Lys Thr
1               5                  10                  15

Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Glu Asn Ile Lys
            20                  25                  30

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

Lys Ala Lys Gln Ile Ile Asp Lys Tyr His Gln Phe Phe Ile Glu Glu
    50                  55                  60

Ile Leu Ser Ser Val Cys Ile Ser Glu Asp Leu Leu Gln Asn Tyr Ser
65                  70                  75                  80

Asp Val Tyr Phe Lys Leu Lys Lys Ser Asp Asp Asp Asn Leu Gln Lys
                85                  90                  95

Asp Phe Lys Ser Ala Lys Asp Thr Ile Lys Lys Gln Ile Ser Glu Tyr
            100                 105                 110

Ile Lys Asp Ser Glu Lys Phe Lys Asn Leu Phe Asn Gln Asn Leu Ile
        115                 120                 125

Asp Ala Lys Lys Gly Gln Glu Ser Asp Leu Ile Leu Trp Leu Lys Gln
    130                 135                 140

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

Asp Ile Asp Glu Ala Leu Glu Ile Ile Lys Ser Phe Lys Gly Trp Thr
                165                 170                 175

Thr Tyr Phe Lys Gly Phe His Glu Asn Arg Lys Asn Val Tyr Ser Ser
            180                 185                 190

Asn Asp Ile Pro Thr Ser Ile Ile Tyr Arg Ile Val Asp Asp Asn Leu
```

195 200 205

Pro Lys Phe Leu Glu Asn Lys Ala Lys Tyr Glu Ser Leu Lys Asp Lys
210 215 220

Ala Pro Glu Ala Ile Asn Tyr Glu Gln Ile Lys Lys Asp Leu Ala Glu
225 230 235 240

Glu Leu Thr Phe Asp Ile Asp Tyr Lys Thr Ser Glu Val Asn Gln Arg
245 250 255

Val Phe Ser Leu Asp Glu Val Phe Glu Ile Ala Asn Phe Asn Asn Tyr
260 265 270

Leu Asn Gln Ser Gly Ile Thr Lys Phe Asn Thr Ile Ile Gly Gly Lys
275 280 285

Phe Val Asn Gly Glu Asn Thr Lys Arg Lys Gly Ile Asn Glu Tyr Ile
290 295 300

Asn Leu Tyr Ser Gln Gln Ile Asn Asp Lys Thr Leu Lys Lys Tyr Lys
305 310 315 320

Met Ser Val Leu Phe Lys Gln Ile Leu Ser Asp Thr Glu Ser Lys Ser
325 330 335

Phe Val Ile Asp Lys Leu Glu Asp Asp Ser Asp Val Val Thr Thr Met
340 345 350

Gln Ser Phe Tyr Glu Gln Ile Ala Ala Phe Lys Thr Val Glu Glu Lys
355 360 365

Ser Ile Lys Glu Thr Leu Ser Leu Leu Phe Asp Asp Leu Lys Ala Gln
370 375 380

Lys Leu Asp Leu Ser Lys Ile Tyr Phe Lys Asn Asp Lys Ser Leu Thr
385 390 395 400

Asp Leu Ser Gln Gln Val Phe Asp Asp Tyr Ser Val Ile Gly Thr Ala

405 410 415

Val Leu Glu Tyr Ile Thr Gln Gln Ile Ala Pro Lys Asn Leu Asp Asn
420 425 430

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

Lys Tyr Leu Ser Leu Glu Thr Ile Lys Leu Ala Leu Glu Glu Phe Asn
450 455 460

Lys His Arg Asp Ile Asp Lys Gln Cys Arg Phe Glu Glu Ile Leu Ala
465 470 475 480

Asn Phe Ala Ala Ile Pro Met Ile Phe Asp Glu Ile Ala Gln Asn Lys
485 490 495

Asp Asn Leu Ala Gln Ile Ser Ile Lys Tyr Gln Asn Gln Gly Lys Lys
500 505 510

Asp Leu Leu Gln Ala Ser Ala Glu Asp Asp Val Lys Ala Ile Lys Asp
515 520 525

Leu Leu Asp Gln Thr Asn Asn Leu Leu His Lys Leu Lys Ile Phe His
530 535 540

Ile Ser Gln Ser Glu Asp Lys Ala Asn Ile Leu Asp Lys Asp Glu His
545 550 555 560

Phe Tyr Leu Val Phe Glu Glu Cys Tyr Phe Glu Leu Ala Asn Ile Val
565 570 575

Pro Leu Tyr Asn Lys Ile Arg Asn Tyr Ile Thr Gln Lys Pro Tyr Ser
580 585 590

Asp Glu Lys Phe Lys Leu Asn Phe Glu Asn Ser Thr Leu Ala Asn Gly
595 600 605

Trp Asp Lys Asn Lys Glu Pro Asp Asn Thr Ala Ile Leu Phe Ile Lys

610 615 620

Asp Asp Lys Tyr Tyr Leu Gly Val Met Asn Lys Lys Asn Asn Lys Ile
625 630 635 640

Phe Asp Asp Lys Ala Ile Lys Glu Asn Lys Gly Glu Gly Tyr Lys Lys
645 650 655

Ile Val Tyr Lys Leu Leu Pro Gly Ala Asn Lys Met Leu Pro Lys Val
660 665 670

Phe Phe Ser Ala Lys Ser Ile Lys Phe Tyr Asn Pro Ser Glu Asp Ile
675 680 685

Leu Arg Ile Arg Asn His Ser Thr His Thr Lys Asn Gly Ser Pro Gln
690 695 700

Lys Gly Tyr Glu Lys Phe Glu Phe Asn Ile Glu Asp Cys Arg Lys Phe
705 710 715 720

Ile Asp Phe Tyr Lys Gln Ser Ile Ser Lys His Pro Glu Trp Lys Asp
725 730 735

Phe Gly Phe Arg Phe Ser Asp Thr Gln Arg Tyr Asn Ser Ile Asp Glu
740 745 750

Phe Tyr Arg Glu Val Glu Asn Gln Gly Tyr Lys Leu Thr Phe Glu Asn
755 760 765

Ile Ser Glu Ser Tyr Ile Asp Ser Val Val Asn Gln Gly Lys Leu Tyr
770 775 780

Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ser Ala Tyr Ser Lys Gly Arg
785 790 795 800

Pro Asn Leu His Thr Leu Tyr Trp Lys Ala Leu Phe Asp Glu Arg Asn
805 810 815

Leu Gln Asp Val Val Tyr Lys Leu Asn Gly Glu Ala Glu Leu Phe Tyr

820 825 830

Arg Lys Gln Ser Ile Pro Lys Lys Ile Thr His Pro Ala Lys Glu Ala
835 840 845

Ile Ala Asn Lys Asn Lys Asp Asn Pro Lys Lys Glu Ser Val Phe Glu
850 855 860

Tyr Asp Leu Ile Lys Asp Lys Arg Phe Thr Glu Asp Lys Phe Phe Phe
865 870 875 880

His Cys Pro Ile Thr Ile Asn Phe Lys Ser Ser Gly Ala Asn Lys Phe
885 890 895

Asn Asp Glu Ile Asn Leu Leu Leu Lys Glu Lys Ala Asn Asp Val His
900 905 910

Ile Leu Ser Ile Ala Arg Gly Glu Arg His Leu Ala Tyr Tyr Thr Leu
915 920 925

Val Asp Gly Lys Gly Asn Ile Ile Lys Gln Asp Thr Phe Asn Ile Ile
930 935 940

Gly Asn Asp Arg Met Lys Thr Asn Tyr His Asp Lys Leu Ala Ala Ile
945 950 955 960

Glu Lys Asp Arg Asp Ser Ala Arg Lys Asp Trp Lys Lys Ile Asn Asn
965 970 975

Ile Lys Glu Met Lys Glu Gly Tyr Leu Ser Gln Val Val His Glu Ile
980 985 990

Ala Lys Leu Val Ile Glu Tyr Asn Ala Ile Val Val Phe Glu Asp Leu
995 1000 1005

Asn Phe Gly Phe Lys Arg Gly Arg Phe Lys Val Glu Lys Gln Val
1010 1015 1020

Tyr Gln Lys Leu Glu Lys Met Leu Ile Glu Lys Leu Asn Tyr Leu

1025 1030 1035

Val Phe Lys Asp Asn Glu Phe Asp Lys Thr Gly Gly Val Leu Arg
1040 1045 1050

Ala Tyr Gln Leu Thr Ala Pro Phe Glu Thr Phe Lys Lys Met Gly
1055 1060 1065

Lys Gln Thr Gly Ile Ile Tyr Tyr Val Pro Ala Gly Phe Thr Ser
1070 1075 1080

Lys Ile Cys Pro Val Thr Gly Phe Val Asn Gln Leu Tyr Pro Lys
1085 1090 1095

Tyr Glu Ser Val Ser Lys Ser Gln Glu Phe Phe Ser Lys Phe Asp
1100 1105 1110

Lys Ile Cys Tyr Asn Leu Asp Lys Gly Tyr Phe Glu Phe Ser Phe
1115 1120 1125

Asp Tyr Lys Asn Phe Gly Asp Lys Ala Ala Lys Gly Lys Trp Thr
1130 1135 1140

Ile Ala Ser Phe Gly Ser Arg Leu Ile Asn Phe Arg Asn Ser Asp
1145 1150 1155

Lys Asn His Asn Trp Asp Thr Arg Glu Val Tyr Pro Thr Lys Glu
1160 1165 1170

Leu Glu Lys Leu Leu Lys Asp Tyr Ser Ile Glu Tyr Gly His Gly
1175 1180 1185

Glu Cys Ile Lys Ala Ala Ile Cys Gly Glu Ser Asp Lys Lys Phe
1190 1195 1200

Phe Ala Lys Leu Thr Ser Val Leu Asn Thr Ile Leu Gln Met Arg
1205 1210 1215

Asn Ser Lys Thr Gly Thr Glu Leu Asp Tyr Leu Ile Ser Pro Val

1220 1225 1230

Ala Asp Val Asn Gly Asn Phe Phe Asp Ser Arg Gln Ala Pro Lys
1235 1240 1245

Asn Met Pro Gln Asp Ala Asp Ala Asn Gly Ala Tyr His Ile Gly
1250 1255 1260

Leu Lys Gly Leu Met Leu Leu Gly Arg Ile Lys Asn Asn Gln Glu
1265 1270 1275

Gly Lys Lys Leu Asn Leu Val Ile Lys Asn Glu Glu Tyr Phe Glu
1280 1285 1290

Phe Val Gln Asn Arg Asn Asn
1295 1300

<210> 11
<211> 1300
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 11

Met Ser Ile Tyr Gln Glu Phe Val Asn Lys Tyr Ser Leu Ser Lys Thr
1 5 10 15

Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Glu Asn Ile Lys
20 25 30

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

Lys Ala Lys Gln Ile Ile Asp Lys Tyr His Gln Phe Phe Ile Glu Glu
50 55 60

Ile Leu Ser Ser Val Cys Ile Ser Glu Asp Leu Leu Gln Asn Tyr Ser
65 70 75 80

```
Asp Val Tyr Phe Lys Leu Lys Lys Ser Asp Asp Asp Asn Leu Gln Lys
                85                  90                  95

Asp Phe Lys Ser Ala Lys Asp Thr Ile Lys Lys Gln Ile Ser Glu Tyr
            100                 105                 110

Ile Lys Asp Ser Glu Lys Phe Lys Asn Leu Phe Asn Gln Asn Leu Ile
        115                 120                 125

Asp Ala Lys Lys Gly Gln Glu Ser Asp Leu Ile Leu Trp Leu Lys Gln
    130                 135                 140

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

Asp Ile Asp Glu Ala Leu Glu Ile Ile Lys Ser Phe Lys Gly Trp Thr
                165                 170                 175

Thr Tyr Phe Lys Gly Phe His Glu Asn Arg Lys Asn Val Tyr Ser Ser
            180                 185                 190

Asn Asp Ile Pro Thr Ser Ile Ile Tyr Arg Ile Val Asp Asp Asn Leu
        195                 200                 205

Pro Lys Phe Leu Glu Asn Lys Ala Lys Tyr Glu Ser Leu Lys Asp Lys
    210                 215                 220

Ala Pro Glu Ala Ile Asn Tyr Glu Gln Ile Lys Lys Asp Leu Ala Glu
225                 230                 235                 240

Glu Leu Thr Phe Asp Ile Asp Tyr Lys Thr Ser Glu Val Asn Gln Arg
                245                 250                 255

Val Phe Ser Leu Asp Glu Val Phe Glu Ile Ala Asn Phe Asn Asn Tyr
            260                 265                 270

Leu Asn Gln Ser Gly Ile Thr Lys Phe Asn Thr Ile Ile Gly Gly Lys
        275                 280                 285
```

```
Phe Val Asn Gly Glu Asn Thr Lys Arg Lys Gly Ile Asn Glu Tyr Ile
    290                 295                 300

Asn Leu Tyr Ser Gln Gln Ile Asn Asp Lys Thr Leu Lys Lys Tyr Lys
305                 310                 315                 320

Met Ser Val Leu Phe Lys Gln Ile Leu Ser Asp Thr Glu Ser Lys Ser
                325                 330                 335

Phe Val Ile Asp Lys Leu Glu Asp Asp Ser Asp Val Val Thr Thr Met
            340                 345                 350

Gln Ser Phe Tyr Glu Gln Ile Ala Ala Phe Lys Thr Val Glu Glu Lys
        355                 360                 365

Ser Ile Lys Glu Thr Leu Ser Leu Leu Phe Asp Asp Leu Lys Ala Gln
    370                 375                 380

Lys Leu Asp Leu Ser Lys Ile Tyr Phe Lys Asn Asp Lys Ser Leu Thr
385                 390                 395                 400

Asp Leu Ser Gln Gln Val Phe Asp Asp Tyr Ser Val Ile Gly Thr Ala
                405                 410                 415

Val Leu Glu Tyr Ile Thr Gln Gln Ile Ala Pro Lys Asn Leu Asp Asn
            420                 425                 430

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

Lys Tyr Leu Ser Leu Glu Thr Ile Lys Leu Ala Leu Glu Glu Phe Asn
    450                 455                 460

Lys His Arg Asp Ile Asp Lys Gln Cys Arg Phe Glu Glu Ile Leu Ala
465                 470                 475                 480

Asn Phe Ala Ala Ile Pro Met Ile Phe Asp Glu Ile Ala Gln Asn Lys
                485                 490                 495
```

```
Asp Asn Leu Ala Gln Ile Ser Ile Lys Tyr Gln Asn Gln Gly Lys Lys
            500                 505                 510

Asp Leu Leu Gln Ala Ser Ala Glu Asp Asp Val Lys Ala Ile Lys Asp
        515                 520                 525

Leu Leu Asp Gln Thr Asn Asn Leu Leu His Lys Leu Lys Ile Phe His
    530                 535                 540

Ile Ser Gln Ser Glu Asp Lys Ala Asn Ile Leu Asp Lys Asp Glu His
545                 550                 555                 560

Phe Tyr Leu Val Phe Glu Glu Cys Tyr Phe Glu Leu Ala Asn Ile Val
                565                 570                 575

Pro Leu Tyr Asn Lys Ile Arg Asn Tyr Ile Thr Gln Lys Pro Tyr Ser
            580                 585                 590

Asp Glu Lys Phe Lys Leu Asn Phe Glu Asn Ser Thr Leu Ala Asn Gly
        595                 600                 605

Trp Asp Lys Asn Lys Glu Pro Asp Asn Thr Ala Ile Leu Phe Ile Lys
    610                 615                 620

Asp Asp Lys Tyr Tyr Leu Gly Val Met Asn Lys Lys Asn Asn Lys Ile
625                 630                 635                 640

Phe Asp Asp Lys Ala Ile Lys Glu Asn Lys Gly Glu Gly Tyr Lys Lys
                645                 650                 655

Ile Val Tyr Lys Leu Leu Pro Gly Ala Asn Lys Met Leu Pro Lys Val
            660                 665                 670

Phe Phe Ser Ala Lys Ser Ile Lys Phe Tyr Asn Pro Ser Glu Asp Ile
        675                 680                 685

Leu Arg Ile Arg Asn His Ser Thr His Thr Lys Asn Gly Ser Pro Gln
    690                 695                 700
```

```
Lys Gly Tyr Glu Lys Phe Glu Phe Asn Ile Glu Asp Cys Arg Lys Phe
705                 710                 715                 720

Ile Asp Phe Tyr Lys Gln Ser Ile Ser Lys His Pro Glu Trp Lys Asp
                725                 730                 735

Phe Gly Phe Arg Phe Ser Asp Thr Gln Arg Tyr Asn Ser Ile Asp Glu
            740                 745                 750

Phe Tyr Arg Glu Val Glu Asn Gln Gly Tyr Lys Leu Thr Phe Glu Asn
        755                 760                 765

Ile Ser Glu Ser Tyr Ile Asp Ser Val Val Asn Gln Gly Lys Leu Tyr
    770                 775                 780

Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ser Ala Tyr Ser Lys Gly Arg
785                 790                 795                 800

Pro Asn Leu His Thr Leu Tyr Trp Lys Ala Leu Phe Asp Glu Arg Asn
                805                 810                 815

Leu Gln Asp Val Val Tyr Lys Leu Asn Gly Glu Ala Glu Leu Phe Tyr
            820                 825                 830

Arg Lys Gln Ser Ile Pro Lys Lys Ile Thr His Pro Ala Lys Glu Ala
        835                 840                 845

Ile Ala Asn Lys Asn Lys Asp Asn Pro Lys Lys Glu Ser Val Phe Glu
    850                 855                 860

Tyr Asp Leu Ile Lys Asp Lys Arg Phe Thr Glu Asp Lys Phe Phe Phe
865                 870                 875                 880

His Cys Pro Ile Thr Ile Asn Phe Lys Ser Ser Gly Ala Asn Lys Phe
                885                 890                 895

Asn Asp Glu Ile Asn Leu Leu Leu Lys Glu Lys Ala Asn Asp Val His
            900                 905                 910
```

```
Ile Leu Ser Ile Asp Arg Gly Glu Arg His Leu Ala Tyr Tyr Thr Leu
        915                 920                 925


Val Asp Gly Lys Gly Asn Ile Ile Lys Gln Asp Thr Phe Asn Ile Ile
    930                 935                 940


Gly Asn Asp Arg Met Lys Thr Asn Tyr His Asp Lys Leu Ala Ala Ile
945                 950                 955                 960


Glu Lys Asp Arg Asp Ser Ala Arg Lys Asp Trp Lys Lys Ile Asn Asn
                965                 970                 975


Ile Lys Glu Met Lys Glu Gly Tyr Leu Ser Gln Val Val His Glu Ile
            980                 985                 990


Ala Lys Leu Val Ile Glu Tyr Asn  Ala Ile Val Val Phe  Ala Asp Leu
        995                 1000                1005


Asn Phe  Gly Phe Lys Arg Gly  Arg Phe Lys Val Glu  Lys Gln Val
    1010                1015                1020


Tyr Gln  Lys Leu Glu Lys Met  Leu Ile Glu Lys Leu  Asn Tyr Leu
    1025                1030                1035


Val Phe  Lys Asp Asn Glu Phe  Asp Lys Thr Gly Gly  Val Leu Arg
    1040                1045                1050


Ala Tyr  Gln Leu Thr Ala Pro  Phe Glu Thr Phe Lys  Lys Met Gly
    1055                1060                1065


Lys Gln  Thr Gly Ile Ile Tyr  Tyr Val Pro Ala Gly  Phe Thr Ser
    1070                1075                1080


Lys Ile  Cys Pro Val Thr Gly  Phe Val Asn Gln Leu  Tyr Pro Lys
    1085                1090                1095


Tyr Glu  Ser Val Ser Lys Ser  Gln Glu Phe Phe Ser  Lys Phe Asp
    1100                1105                1110
```

```
Lys Ile  Cys Tyr Asn Leu Asp  Lys Gly Tyr Phe Glu  Phe Ser Phe
    1115                1120                1125

Asp Tyr  Lys Asn Phe Gly Asp  Lys Ala Ala Lys Gly  Lys Trp Thr
    1130                1135                1140

Ile Ala  Ser Phe Gly Ser Arg  Leu Ile Asn Phe Arg  Asn Ser Asp
    1145                1150                1155

Lys Asn  His Asn Trp Asp Thr  Arg Glu Val Tyr Pro  Thr Lys Glu
    1160                1165                1170

Leu Glu  Lys Leu Leu Lys Asp  Tyr Ser Ile Glu Tyr  Gly His Gly
    1175                1180                1185

Glu Cys  Ile Lys Ala Ala Ile  Cys Gly Glu Ser Asp  Lys Lys Phe
    1190                1195                1200

Phe Ala  Lys Leu Thr Ser Val  Leu Asn Thr Ile Leu  Gln Met Arg
    1205                1210                1215

Asn Ser  Lys Thr Gly Thr Glu  Leu Asp Tyr Leu Ile  Ser Pro Val
    1220                1225                1230

Ala Asp  Val Asn Gly Asn Phe  Phe Asp Ser Arg Gln  Ala Pro Lys
    1235                1240                1245

Asn Met  Pro Gln Asp Ala Asp  Ala Asn Gly Ala Tyr  His Ile Gly
    1250                1255                1260

Leu Lys  Gly Leu Met Leu Leu  Gly Arg Ile Lys Asn  Asn Gln Glu
    1265                1270                1275

Gly Lys  Lys Leu Asn Leu Val  Ile Lys Asn Glu Glu  Tyr Phe Glu
    1280                1285                1290

Phe Val  Gln Asn Arg Asn Asn
    1295                1300
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<210> 12
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<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 12

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Met Ser Ile Tyr Gln Glu Phe Val Asn Lys Tyr Ser Leu Ser Lys Thr
1               5                  10                  15


Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Glu Asn Ile Lys
            20                  25                  30


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


Lys Ala Lys Gln Ile Ile Asp Lys Tyr His Gln Phe Phe Ile Glu Glu
    50                  55                  60


Ile Leu Ser Ser Val Cys Ile Ser Glu Asp Leu Leu Gln Asn Tyr Ser
65                  70                  75                  80


Asp Val Tyr Phe Lys Leu Lys Lys Ser Asp Asp Asp Asn Leu Gln Lys
                85                  90                  95


Asp Phe Lys Ser Ala Lys Asp Thr Ile Lys Lys Gln Ile Ser Glu Tyr
            100                 105                 110


Ile Lys Asp Ser Glu Lys Phe Lys Asn Leu Phe Asn Gln Asn Leu Ile
        115                 120                 125


Asp Ala Lys Lys Gly Gln Glu Ser Asp Leu Ile Leu Trp Leu Lys Gln
    130                 135                 140


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


Asp Ile Asp Glu Ala Leu Glu Ile Ile Lys Ser Phe Lys Gly Trp Thr
```

165 170 175

Thr Tyr Phe Lys Gly Phe His Glu Asn Arg Lys Asn Val Tyr Ser Ser
180 185 190

Asn Asp Ile Pro Thr Ser Ile Ile Tyr Arg Ile Val Asp Asp Asn Leu
195 200 205

Pro Lys Phe Leu Glu Asn Lys Ala Lys Tyr Glu Ser Leu Lys Asp Lys
210 215 220

Ala Pro Glu Ala Ile Asn Tyr Glu Gln Ile Lys Lys Asp Leu Ala Glu
225 230 235 240

Glu Leu Thr Phe Asp Ile Asp Tyr Lys Thr Ser Glu Val Asn Gln Arg
245 250 255

Val Phe Ser Leu Asp Glu Val Phe Glu Ile Ala Asn Phe Asn Asn Tyr
260 265 270

Leu Asn Gln Ser Gly Ile Thr Lys Phe Asn Thr Ile Ile Gly Gly Lys
275 280 285

Phe Val Asn Gly Glu Asn Thr Lys Arg Lys Gly Ile Asn Glu Tyr Ile
290 295 300

Asn Leu Tyr Ser Gln Gln Ile Asn Asp Lys Thr Leu Lys Lys Tyr Lys
305 310 315 320

Met Ser Val Leu Phe Lys Gln Ile Leu Ser Asp Thr Glu Ser Lys Ser
325 330 335

Phe Val Ile Asp Lys Leu Glu Asp Asp Ser Asp Val Val Thr Thr Met
340 345 350

Gln Ser Phe Tyr Glu Gln Ile Ala Ala Phe Lys Thr Val Glu Glu Lys
355 360 365

Ser Ile Lys Glu Thr Leu Ser Leu Leu Phe Asp Asp Leu Lys Ala Gln

370 375 380

Lys Leu Asp Leu Ser Lys Ile Tyr Phe Lys Asn Asp Lys Ser Leu Thr
385 390 395 400

Asp Leu Ser Gln Gln Val Phe Asp Asp Tyr Ser Val Ile Gly Thr Ala
405 410 415

Val Leu Glu Tyr Ile Thr Gln Gln Ile Ala Pro Lys Asn Leu Asp Asn
420 425 430

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

Lys Tyr Leu Ser Leu Glu Thr Ile Lys Leu Ala Leu Glu Glu Phe Asn
450 455 460

Lys His Arg Asp Ile Asp Lys Gln Cys Arg Phe Glu Glu Ile Leu Ala
465 470 475 480

Asn Phe Ala Ala Ile Pro Met Ile Phe Asp Glu Ile Ala Gln Asn Lys
485 490 495

Asp Asn Leu Ala Gln Ile Ser Ile Lys Tyr Gln Asn Gln Gly Lys Lys
500 505 510

Asp Leu Leu Gln Ala Ser Ala Glu Asp Asp Val Lys Ala Ile Lys Asp
515 520 525

Leu Leu Asp Gln Thr Asn Asn Leu Leu His Lys Leu Lys Ile Phe His
530 535 540

Ile Ser Gln Ser Glu Asp Lys Ala Asn Ile Leu Asp Lys Asp Glu His
545 550 555 560

Phe Tyr Leu Val Phe Glu Glu Cys Tyr Phe Glu Leu Ala Asn Ile Val
565 570 575

Pro Leu Tyr Asn Lys Ile Arg Asn Tyr Ile Thr Gln Lys Pro Tyr Ser

580 585 590

Asp Glu Lys Phe Lys Leu Asn Phe Glu Asn Ser Thr Leu Ala Asn Gly
595 600 605

Trp Asp Lys Asn Lys Glu Pro Asp Asn Thr Ala Ile Leu Phe Ile Lys
610 615 620

Asp Asp Lys Tyr Tyr Leu Gly Val Met Asn Lys Lys Asn Asn Lys Ile
625 630 635 640

Phe Asp Asp Lys Ala Ile Lys Glu Asn Lys Gly Glu Gly Tyr Lys Lys
645 650 655

Ile Val Tyr Lys Leu Leu Pro Gly Ala Asn Lys Met Leu Pro Lys Val
660 665 670

Phe Phe Ser Ala Lys Ser Ile Lys Phe Tyr Asn Pro Ser Glu Asp Ile
675 680 685

Leu Arg Ile Arg Asn His Ser Thr His Thr Lys Asn Gly Ser Pro Gln
690 695 700

Lys Gly Tyr Glu Lys Phe Glu Phe Asn Ile Glu Asp Cys Arg Lys Phe
705 710 715 720

Ile Asp Phe Tyr Lys Gln Ser Ile Ser Lys His Pro Glu Trp Lys Asp
725 730 735

Phe Gly Phe Arg Phe Ser Asp Thr Gln Arg Tyr Asn Ser Ile Asp Glu
740 745 750

Phe Tyr Arg Glu Val Glu Asn Gln Gly Tyr Lys Leu Thr Phe Glu Asn
755 760 765

Ile Ser Glu Ser Tyr Ile Asp Ser Val Val Asn Gln Gly Lys Leu Tyr
770 775 780

Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ser Ala Tyr Ser Lys Gly Arg

785 790 795 800

Pro Asn Leu His Thr Leu Tyr Trp Lys Ala Leu Phe Asp Glu Arg Asn
805 810 815

Leu Gln Asp Val Val Tyr Lys Leu Asn Gly Glu Ala Glu Leu Phe Tyr
820 825 830

Arg Lys Gln Ser Ile Pro Lys Lys Ile Thr His Pro Ala Lys Glu Ala
835 840 845

Ile Ala Asn Lys Asn Lys Asp Asn Pro Lys Lys Glu Ser Val Phe Glu
850 855 860

Tyr Asp Leu Ile Lys Asp Lys Arg Phe Thr Glu Asp Lys Phe Phe Phe
865 870 875 880

His Cys Pro Ile Thr Ile Asn Phe Lys Ser Ser Gly Ala Asn Lys Phe
885 890 895

Asn Asp Glu Ile Asn Leu Leu Leu Lys Glu Lys Ala Asn Asp Val His
900 905 910

Ile Leu Ser Ile Asp Arg Gly Glu Arg His Leu Ala Tyr Tyr Thr Leu
915 920 925

Val Asp Gly Lys Gly Asn Ile Ile Lys Gln Asp Thr Phe Asn Ile Ile
930 935 940

Gly Asn Asp Arg Met Lys Thr Asn Tyr His Asp Lys Leu Ala Ala Ile
945 950 955 960

Glu Lys Asp Arg Asp Ser Ala Arg Lys Asp Trp Lys Lys Ile Asn Asn
965 970 975

Ile Lys Glu Met Lys Glu Gly Tyr Leu Ser Gln Val Val His Glu Ile
980 985 990

Ala Lys Leu Val Ile Glu Tyr Asn Ala Ile Val Val Phe Glu Asp Leu

995 1000 1005

Asn Phe Gly Phe Lys Arg Gly Arg Phe Lys Val Glu Lys Gln Val
1010 1015 1020

Tyr Gln Lys Leu Glu Lys Met Leu Ile Glu Lys Leu Asn Tyr Leu
1025 1030 1035

Val Phe Lys Asp Asn Glu Phe Asp Lys Thr Gly Gly Val Leu Arg
1040 1045 1050

Ala Tyr Gln Leu Thr Ala Pro Phe Glu Thr Phe Lys Lys Met Gly
1055 1060 1065

Lys Gln Thr Gly Ile Ile Tyr Tyr Val Pro Ala Gly Phe Thr Ser
1070 1075 1080

Lys Ile Cys Pro Val Thr Gly Phe Val Asn Gln Leu Tyr Pro Lys
1085 1090 1095

Tyr Glu Ser Val Ser Lys Ser Gln Glu Phe Phe Ser Lys Phe Asp
1100 1105 1110

Lys Ile Cys Tyr Asn Leu Asp Lys Gly Tyr Phe Glu Phe Ser Phe
1115 1120 1125

Asp Tyr Lys Asn Phe Gly Asp Lys Ala Ala Lys Gly Lys Trp Thr
1130 1135 1140

Ile Ala Ser Phe Gly Ser Arg Leu Ile Asn Phe Arg Asn Ser Asp
1145 1150 1155

Lys Asn His Asn Trp Asp Thr Arg Glu Val Tyr Pro Thr Lys Glu
1160 1165 1170

Leu Glu Lys Leu Leu Lys Asp Tyr Ser Ile Glu Tyr Gly His Gly
1175 1180 1185

Glu Cys Ile Lys Ala Ala Ile Cys Gly Glu Ser Asp Lys Lys Phe

1190 1195 1200

Phe Ala Lys Leu Thr Ser Val Leu Asn Thr Ile Leu Gln Met Arg
1205 1210 1215

Asn Ser Lys Thr Gly Thr Glu Leu Asp Tyr Leu Ile Ser Pro Val
1220 1225 1230

Ala Asp Val Asn Gly Asn Phe Phe Asp Ser Arg Gln Ala Pro Lys
1235 1240 1245

Asn Met Pro Gln Asp Ala Ala Ala Asn Gly Ala Tyr His Ile Gly
1250 1255 1260

Leu Lys Gly Leu Met Leu Leu Gly Arg Ile Lys Asn Asn Gln Glu
1265 1270 1275

Gly Lys Lys Leu Asn Leu Val Ile Lys Asn Glu Glu Tyr Phe Glu
1280 1285 1290

Phe Val Gln Asn Arg Asn Asn
1295 1300

<210> 13
<211> 1300
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 13

Met Ser Ile Tyr Gln Glu Phe Val Asn Lys Tyr Ser Leu Ser Lys Thr
1 5 10 15

Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Glu Asn Ile Lys
20 25 30

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

```
Lys Ala Lys Gln Ile Ile Asp Lys Tyr His Gln Phe Phe Ile Glu Glu
    50                  55                  60

Ile Leu Ser Ser Val Cys Ile Ser Glu Asp Leu Leu Gln Asn Tyr Ser
65                  70                  75                  80

Asp Val Tyr Phe Lys Leu Lys Lys Ser Asp Asp Asp Asn Leu Gln Lys
                85                  90                  95

Asp Phe Lys Ser Ala Lys Asp Thr Ile Lys Lys Gln Ile Ser Glu Tyr
            100                 105                 110

Ile Lys Asp Ser Glu Lys Phe Lys Asn Leu Phe Asn Gln Asn Leu Ile
        115                 120                 125

Asp Ala Lys Lys Gly Gln Glu Ser Asp Leu Ile Leu Trp Leu Lys Gln
    130                 135                 140

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

Asp Ile Asp Glu Ala Leu Glu Ile Ile Lys Ser Phe Lys Gly Trp Thr
                165                 170                 175

Thr Tyr Phe Lys Gly Phe His Glu Asn Arg Lys Asn Val Tyr Ser Ser
            180                 185                 190

Asn Asp Ile Pro Thr Ser Ile Ile Tyr Arg Ile Val Asp Asp Asn Leu
        195                 200                 205

Pro Lys Phe Leu Glu Asn Lys Ala Lys Tyr Glu Ser Leu Lys Asp Lys
    210                 215                 220

Ala Pro Glu Ala Ile Asn Tyr Glu Gln Ile Lys Lys Asp Leu Ala Glu
225                 230                 235                 240

Glu Leu Thr Phe Asp Ile Asp Tyr Lys Thr Ser Glu Val Asn Gln Arg
                245                 250                 255
```

```
Val Phe Ser Leu Asp Glu Val Phe Glu Ile Ala Asn Phe Asn Asn Tyr
            260                 265                 270

Leu Asn Gln Ser Gly Ile Thr Lys Phe Asn Thr Ile Ile Gly Gly Lys
        275                 280                 285

Phe Val Asn Gly Glu Asn Thr Lys Arg Lys Gly Ile Asn Glu Tyr Ile
    290                 295                 300

Asn Leu Tyr Ser Gln Gln Ile Asn Asp Lys Thr Leu Lys Lys Tyr Lys
305                 310                 315                 320

Met Ser Val Leu Phe Lys Gln Ile Leu Ser Asp Thr Glu Ser Lys Ser
                325                 330                 335

Phe Val Ile Asp Lys Leu Glu Asp Asp Ser Asp Val Val Thr Thr Met
            340                 345                 350

Gln Ser Phe Tyr Glu Gln Ile Ala Ala Phe Lys Thr Val Glu Glu Lys
        355                 360                 365

Ser Ile Lys Glu Thr Leu Ser Leu Leu Phe Asp Asp Leu Lys Ala Gln
    370                 375                 380

Lys Leu Asp Leu Ser Lys Ile Tyr Phe Lys Asn Asp Lys Ser Leu Thr
385                 390                 395                 400

Asp Leu Ser Gln Gln Val Phe Asp Asp Tyr Ser Val Ile Gly Thr Ala
                405                 410                 415

Val Leu Glu Tyr Ile Thr Gln Gln Ile Ala Pro Lys Asn Leu Asp Asn
            420                 425                 430

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

Lys Tyr Leu Ser Leu Glu Thr Ile Lys Leu Ala Leu Glu Glu Phe Asn
    450                 455                 460
```

```
Lys His Arg Asp Ile Asp Lys Gln Cys Arg Phe Glu Glu Ile Leu Ala
465                 470                 475                 480

Asn Phe Ala Ala Ile Pro Met Ile Phe Asp Glu Ile Ala Gln Asn Lys
                485                 490                 495

Asp Asn Leu Ala Gln Ile Ser Ile Lys Tyr Gln Asn Gln Gly Lys Lys
            500                 505                 510

Asp Leu Leu Gln Ala Ser Ala Glu Asp Asp Val Lys Ala Ile Lys Asp
        515                 520                 525

Leu Leu Asp Gln Thr Asn Asn Leu Leu His Lys Leu Lys Ile Phe His
    530                 535                 540

Ile Ser Gln Ser Glu Asp Lys Ala Asn Ile Leu Asp Lys Asp Glu His
545                 550                 555                 560

Phe Tyr Leu Val Phe Glu Glu Cys Tyr Phe Glu Leu Ala Asn Ile Val
                565                 570                 575

Pro Leu Tyr Asn Lys Ile Arg Asn Tyr Ile Thr Gln Lys Pro Tyr Ser
            580                 585                 590

Asp Glu Lys Phe Lys Leu Asn Phe Glu Asn Ser Thr Leu Ala Asn Gly
        595                 600                 605

Trp Asp Lys Asn Lys Glu Pro Asp Asn Thr Ala Ile Leu Phe Ile Lys
    610                 615                 620

Asp Asp Lys Tyr Tyr Leu Gly Val Met Asn Lys Lys Asn Asn Lys Ile
625                 630                 635                 640

Phe Asp Asp Lys Ala Ile Lys Glu Asn Lys Gly Glu Gly Tyr Lys Lys
                645                 650                 655

Ile Val Tyr Lys Leu Leu Pro Gly Ala Asn Lys Met Leu Pro Lys Val
            660                 665                 670
```

```
Phe Phe Ser Ala Lys Ser Ile Lys Phe Tyr Asn Pro Ser Glu Asp Ile
        675                 680                 685

Leu Arg Ile Arg Asn His Ser Thr His Thr Lys Asn Gly Ser Pro Gln
    690                 695                 700

Lys Gly Tyr Glu Lys Phe Glu Phe Asn Ile Glu Asp Cys Arg Lys Phe
705                 710                 715                 720

Ile Asp Phe Tyr Lys Gln Ser Ile Ser Lys His Pro Glu Trp Lys Asp
                725                 730                 735

Phe Gly Phe Arg Phe Ser Asp Thr Gln Arg Tyr Asn Ser Ile Asp Glu
            740                 745                 750

Phe Tyr Arg Glu Val Glu Asn Gln Gly Tyr Lys Leu Thr Phe Glu Asn
        755                 760                 765

Ile Ser Glu Ser Tyr Ile Asp Ser Val Val Asn Gln Gly Lys Leu Tyr
    770                 775                 780

Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ser Ala Tyr Ser Lys Gly Arg
785                 790                 795                 800

Pro Asn Leu His Thr Leu Tyr Trp Lys Ala Leu Phe Asp Glu Arg Asn
                805                 810                 815

Leu Gln Asp Val Val Tyr Lys Leu Asn Gly Glu Ala Glu Leu Phe Tyr
            820                 825                 830

Arg Lys Gln Ser Ile Pro Lys Lys Ile Thr His Pro Ala Lys Glu Ala
        835                 840                 845

Ile Ala Asn Lys Asn Lys Asp Asn Pro Lys Lys Glu Ser Val Phe Glu
    850                 855                 860

Tyr Asp Leu Ile Lys Asp Lys Arg Phe Thr Glu Asp Lys Phe Phe Phe
865                 870                 875                 880
```

```
His Cys Pro Ile Thr Ile Asn Phe Lys Ser Ser Gly Ala Asn Lys Phe
                885                 890                 895

Asn Asp Glu Ile Asn Leu Leu Leu Lys Glu Lys Ala Asn Asp Val His
            900                 905                 910

Ile Leu Ser Ile Ala Arg Gly Glu Arg His Leu Ala Tyr Tyr Thr Leu
        915                 920                 925

Val Asp Gly Lys Gly Asn Ile Ile Lys Gln Asp Thr Phe Asn Ile Ile
    930                 935                 940

Gly Asn Asp Arg Met Lys Thr Asn Tyr His Asp Lys Leu Ala Ala Ile
945                 950                 955                 960

Glu Lys Asp Arg Asp Ser Ala Arg Lys Asp Trp Lys Lys Ile Asn Asn
                965                 970                 975

Ile Lys Glu Met Lys Glu Gly Tyr Leu Ser Gln Val Val His Glu Ile
            980                 985                 990

Ala Lys Leu Val Ile Glu Tyr Asn  Ala Ile Val Val Phe  Ala Asp Leu
        995                 1000                1005

Asn Phe  Gly Phe Lys Arg Gly  Arg Phe Lys Val Glu  Lys Gln Val
    1010                1015                1020

Tyr Gln  Lys Leu Glu Lys Met  Leu Ile Glu Lys Leu  Asn Tyr Leu
    1025                1030                1035

Val Phe  Lys Asp Asn Glu Phe  Asp Lys Thr Gly Gly  Val Leu Arg
    1040                1045                1050

Ala Tyr  Gln Leu Thr Ala Pro  Phe Glu Thr Phe Lys  Lys Met Gly
    1055                1060                1065

Lys Gln  Thr Gly Ile Ile Tyr  Tyr Val Pro Ala Gly  Phe Thr Ser
    1070                1075                1080
```

```
Lys Ile  Cys Pro Val Thr Gly  Phe Val Asn Gln Leu  Tyr Pro Lys
    1085                1090                1095

Tyr Glu  Ser Val Ser Lys Ser  Gln Glu Phe Phe Ser  Lys Phe Asp
    1100                1105                1110

Lys Ile  Cys Tyr Asn Leu Asp  Lys Gly Tyr Phe Glu  Phe Ser Phe
    1115                1120                1125

Asp Tyr  Lys Asn Phe Gly Asp  Lys Ala Ala Lys Gly  Lys Trp Thr
    1130                1135                1140

Ile Ala  Ser Phe Gly Ser Arg  Leu Ile Asn Phe Arg  Asn Ser Asp
    1145                1150                1155

Lys Asn  His Asn Trp Asp Thr  Arg Glu Val Tyr Pro  Thr Lys Glu
    1160                1165                1170

Leu Glu  Lys Leu Leu Lys Asp  Tyr Ser Ile Glu Tyr  Gly His Gly
    1175                1180                1185

Glu Cys  Ile Lys Ala Ala Ile  Cys Gly Glu Ser Asp  Lys Lys Phe
    1190                1195                1200

Phe Ala  Lys Leu Thr Ser Val  Leu Asn Thr Ile Leu  Gln Met Arg
    1205                1210                1215

Asn Ser  Lys Thr Gly Thr Glu  Leu Asp Tyr Leu Ile  Ser Pro Val
    1220                1225                1230

Ala Asp  Val Asn Gly Asn Phe  Phe Asp Ser Arg Gln  Ala Pro Lys
    1235                1240                1245

Asn Met  Pro Gln Asp Ala Asp  Ala Asn Gly Ala Tyr  His Ile Gly
    1250                1255                1260

Leu Lys  Gly Leu Met Leu Leu  Gly Arg Ile Lys Asn  Asn Gln Glu
    1265                1270                1275
```

Gly Lys Lys Leu Asn Leu Val Ile Lys Asn Glu Glu Tyr Phe Glu
1280 1285 1290

Phe Val Gln Asn Arg Asn Asn
1295 1300

<210> 14
<211> 1300
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 14

Met Ser Ile Tyr Gln Glu Phe Val Asn Lys Tyr Ser Leu Ser Lys Thr
1 5 10 15

Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Glu Asn Ile Lys
20 25 30

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

Lys Ala Lys Gln Ile Ile Asp Lys Tyr His Gln Phe Phe Ile Glu Glu
50 55 60

Ile Leu Ser Ser Val Cys Ile Ser Glu Asp Leu Leu Gln Asn Tyr Ser
65 70 75 80

Asp Val Tyr Phe Lys Leu Lys Lys Ser Asp Asp Asp Asn Leu Gln Lys
85 90 95

Asp Phe Lys Ser Ala Lys Asp Thr Ile Lys Lys Gln Ile Ser Glu Tyr
100 105 110

Ile Lys Asp Ser Glu Lys Phe Lys Asn Leu Phe Asn Gln Asn Leu Ile
115 120 125

Asp Ala Lys Lys Gly Gln Glu Ser Asp Leu Ile Leu Trp Leu Lys Gln

130 135 140

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

Asp Ile Asp Glu Ala Leu Glu Ile Ile Lys Ser Phe Lys Gly Trp Thr
165 170 175

Thr Tyr Phe Lys Gly Phe His Glu Asn Arg Lys Asn Val Tyr Ser Ser
180 185 190

Asn Asp Ile Pro Thr Ser Ile Ile Tyr Arg Ile Val Asp Asp Asn Leu
195 200 205

Pro Lys Phe Leu Glu Asn Lys Ala Lys Tyr Glu Ser Leu Lys Asp Lys
210 215 220

Ala Pro Glu Ala Ile Asn Tyr Glu Gln Ile Lys Lys Asp Leu Ala Glu
225 230 235 240

Glu Leu Thr Phe Asp Ile Asp Tyr Lys Thr Ser Glu Val Asn Gln Arg
245 250 255

Val Phe Ser Leu Asp Glu Val Phe Glu Ile Ala Asn Phe Asn Asn Tyr
260 265 270

Leu Asn Gln Ser Gly Ile Thr Lys Phe Asn Thr Ile Ile Gly Gly Lys
275 280 285

Phe Val Asn Gly Glu Asn Thr Lys Arg Lys Gly Ile Asn Glu Tyr Ile
290 295 300

Asn Leu Tyr Ser Gln Gln Ile Asn Asp Lys Thr Leu Lys Lys Tyr Lys
305 310 315 320

Met Ser Val Leu Phe Lys Gln Ile Leu Ser Asp Thr Glu Ser Lys Ser
325 330 335

Phe Val Ile Asp Lys Leu Glu Asp Asp Ser Asp Val Val Thr Thr Met

```
            340                 345                 350

Gln Ser Phe Tyr Glu Gln Ile Ala Ala Phe Lys Thr Val Glu Glu Lys
        355                 360                 365

Ser Ile Lys Glu Thr Leu Ser Leu Leu Phe Asp Asp Leu Lys Ala Gln
    370                 375                 380

Lys Leu Asp Leu Ser Lys Ile Tyr Phe Lys Asn Asp Lys Ser Leu Thr
385                 390                 395                 400

Asp Leu Ser Gln Gln Val Phe Asp Asp Tyr Ser Val Ile Gly Thr Ala
                405                 410                 415

Val Leu Glu Tyr Ile Thr Gln Gln Ile Ala Pro Lys Asn Leu Asp Asn
            420                 425                 430

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

Lys Tyr Leu Ser Leu Glu Thr Ile Lys Leu Ala Leu Glu Glu Phe Asn
    450                 455                 460

Lys His Arg Asp Ile Asp Lys Gln Cys Arg Phe Glu Glu Ile Leu Ala
465                 470                 475                 480

Asn Phe Ala Ala Ile Pro Met Ile Phe Asp Glu Ile Ala Gln Asn Lys
                485                 490                 495

Asp Asn Leu Ala Gln Ile Ser Ile Lys Tyr Gln Asn Gln Gly Lys Lys
            500                 505                 510

Asp Leu Leu Gln Ala Ser Ala Glu Asp Asp Val Lys Ala Ile Lys Asp
        515                 520                 525

Leu Leu Asp Gln Thr Asn Asn Leu Leu His Lys Leu Lys Ile Phe His
    530                 535                 540

Ile Ser Gln Ser Glu Asp Lys Ala Asn Ile Leu Asp Lys Asp Glu His
```

545 550 555 560

Phe Tyr Leu Val Phe Glu Glu Cys Tyr Phe Glu Leu Ala Asn Ile Val
565 570 575

Pro Leu Tyr Asn Lys Ile Arg Asn Tyr Ile Thr Gln Lys Pro Tyr Ser
580 585 590

Asp Glu Lys Phe Lys Leu Asn Phe Glu Asn Ser Thr Leu Ala Asn Gly
595 600 605

Trp Asp Lys Asn Lys Glu Pro Asp Asn Thr Ala Ile Leu Phe Ile Lys
610 615 620

Asp Asp Lys Tyr Tyr Leu Gly Val Met Asn Lys Lys Asn Asn Lys Ile
625 630 635 640

Phe Asp Asp Lys Ala Ile Lys Glu Asn Lys Gly Glu Gly Tyr Lys Lys
645 650 655

Ile Val Tyr Lys Leu Leu Pro Gly Ala Asn Lys Met Leu Pro Lys Val
660 665 670

Phe Phe Ser Ala Lys Ser Ile Lys Phe Tyr Asn Pro Ser Glu Asp Ile
675 680 685

Leu Arg Ile Arg Asn His Ser Thr His Thr Lys Asn Gly Ser Pro Gln
690 695 700

Lys Gly Tyr Glu Lys Phe Glu Phe Asn Ile Glu Asp Cys Arg Lys Phe
705 710 715 720

Ile Asp Phe Tyr Lys Gln Ser Ile Ser Lys His Pro Glu Trp Lys Asp
725 730 735

Phe Gly Phe Arg Phe Ser Asp Thr Gln Arg Tyr Asn Ser Ile Asp Glu
740 745 750

Phe Tyr Arg Glu Val Glu Asn Gln Gly Tyr Lys Leu Thr Phe Glu Asn

```
        755                 760                 765

Ile Ser Glu Ser Tyr Ile Asp Ser Val Val Asn Gln Gly Lys Leu Tyr
    770                 775                 780

Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ser Ala Tyr Ser Lys Gly Arg
785                 790                 795                 800

Pro Asn Leu His Thr Leu Tyr Trp Lys Ala Leu Phe Asp Glu Arg Asn
                805                 810                 815

Leu Gln Asp Val Val Tyr Lys Leu Asn Gly Glu Ala Glu Leu Phe Tyr
            820                 825                 830

Arg Lys Gln Ser Ile Pro Lys Lys Ile Thr His Pro Ala Lys Glu Ala
        835                 840                 845

Ile Ala Asn Lys Asn Lys Asp Asn Pro Lys Lys Glu Ser Val Phe Glu
    850                 855                 860

Tyr Asp Leu Ile Lys Asp Lys Arg Phe Thr Glu Asp Lys Phe Phe Phe
865                 870                 875                 880

His Cys Pro Ile Thr Ile Asn Phe Lys Ser Ser Gly Ala Asn Lys Phe
                885                 890                 895

Asn Asp Glu Ile Asn Leu Leu Leu Lys Glu Lys Ala Asn Asp Val His
            900                 905                 910

Ile Leu Ser Ile Ala Arg Gly Glu Arg His Leu Ala Tyr Tyr Thr Leu
        915                 920                 925

Val Asp Gly Lys Gly Asn Ile Ile Lys Gln Asp Thr Phe Asn Ile Ile
    930                 935                 940

Gly Asn Asp Arg Met Lys Thr Asn Tyr His Asp Lys Leu Ala Ala Ile
945                 950                 955                 960

Glu Lys Asp Arg Asp Ser Ala Arg Lys Asp Trp Lys Lys Ile Asn Asn
```

```
                965                 970                 975

Ile Lys Glu Met Lys Glu Gly Tyr Leu Ser Gln Val Val His Glu Ile
            980                 985                 990

Ala Lys Leu Val Ile Glu Tyr Asn  Ala Ile Val Val Phe  Glu Asp Leu
        995                 1000                1005

Asn Phe  Gly Phe Lys Arg Gly  Arg Phe Lys Val Glu  Lys Gln Val
    1010                1015                1020

Tyr Gln  Lys Leu Glu Lys Met  Leu Ile Glu Lys Leu  Asn Tyr Leu
    1025                1030                1035

Val Phe  Lys Asp Asn Glu Phe  Asp Lys Thr Gly Gly  Val Leu Arg
    1040                1045                1050

Ala Tyr  Gln Leu Thr Ala Pro  Phe Glu Thr Phe Lys  Lys Met Gly
    1055                1060                1065

Lys Gln  Thr Gly Ile Ile Tyr  Tyr Val Pro Ala Gly  Phe Thr Ser
    1070                1075                1080

Lys Ile  Cys Pro Val Thr Gly  Phe Val Asn Gln Leu  Tyr Pro Lys
    1085                1090                1095

Tyr Glu  Ser Val Ser Lys Ser  Gln Glu Phe Phe Ser  Lys Phe Asp
    1100                1105                1110

Lys Ile  Cys Tyr Asn Leu Asp  Lys Gly Tyr Phe Glu  Phe Ser Phe
    1115                1120                1125

Asp Tyr  Lys Asn Phe Gly Asp  Lys Ala Ala Lys Gly  Lys Trp Thr
    1130                1135                1140

Ile Ala  Ser Phe Gly Ser Arg  Leu Ile Asn Phe Arg  Asn Ser Asp
    1145                1150                1155

Lys Asn  His Asn Trp Asp Thr  Arg Glu Val Tyr Pro  Thr Lys Glu
```

1160 1165 1170

Leu Glu Lys Leu Leu Lys Asp Tyr Ser Ile Glu Tyr Gly His Gly
1175 1180 1185

Glu Cys Ile Lys Ala Ala Ile Cys Gly Glu Ser Asp Lys Lys Phe
1190 1195 1200

Phe Ala Lys Leu Thr Ser Val Leu Asn Thr Ile Leu Gln Met Arg
1205 1210 1215

Asn Ser Lys Thr Gly Thr Glu Leu Asp Tyr Leu Ile Ser Pro Val
1220 1225 1230

Ala Asp Val Asn Gly Asn Phe Phe Asp Ser Arg Gln Ala Pro Lys
1235 1240 1245

Asn Met Pro Gln Asp Ala Ala Ala Asn Gly Ala Tyr His Ile Gly
1250 1255 1260

Leu Lys Gly Leu Met Leu Leu Gly Arg Ile Lys Asn Asn Gln Glu
1265 1270 1275

Gly Lys Lys Leu Asn Leu Val Ile Lys Asn Glu Glu Tyr Phe Glu
1280 1285 1290

Phe Val Gln Asn Arg Asn Asn
1295 1300

<210> 15
<211> 1300
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 15

Met Ser Ile Tyr Gln Glu Phe Val Asn Lys Tyr Ser Leu Ser Lys Thr
1 5 10 15

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Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Glu Asn Ile Lys
            20                  25                  30

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

Lys Ala Lys Gln Ile Ile Asp Lys Tyr His Gln Phe Phe Ile Glu Glu
    50                  55                  60

Ile Leu Ser Ser Val Cys Ile Ser Glu Asp Leu Leu Gln Asn Tyr Ser
65                  70                  75                  80

Asp Val Tyr Phe Lys Leu Lys Lys Ser Asp Asp Asp Asn Leu Gln Lys
                85                  90                  95

Asp Phe Lys Ser Ala Lys Asp Thr Ile Lys Lys Gln Ile Ser Glu Tyr
            100                 105                 110

Ile Lys Asp Ser Glu Lys Phe Lys Asn Leu Phe Asn Gln Asn Leu Ile
        115                 120                 125

Asp Ala Lys Lys Gly Gln Glu Ser Asp Leu Ile Leu Trp Leu Lys Gln
    130                 135                 140

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

Asp Ile Asp Glu Ala Leu Glu Ile Ile Lys Ser Phe Lys Gly Trp Thr
                165                 170                 175

Thr Tyr Phe Lys Gly Phe His Glu Asn Arg Lys Asn Val Tyr Ser Ser
            180                 185                 190

Asn Asp Ile Pro Thr Ser Ile Ile Tyr Arg Ile Val Asp Asp Asn Leu
        195                 200                 205

Pro Lys Phe Leu Glu Asn Lys Ala Lys Tyr Glu Ser Leu Lys Asp Lys
    210                 215                 220
```

```
Ala Pro Glu Ala Ile Asn Tyr Glu Gln Ile Lys Lys Asp Leu Ala Glu
225                 230                 235                 240

Glu Leu Thr Phe Asp Ile Asp Tyr Lys Thr Ser Glu Val Asn Gln Arg
                245                 250                 255

Val Phe Ser Leu Asp Glu Val Phe Glu Ile Ala Asn Phe Asn Asn Tyr
            260                 265                 270

Leu Asn Gln Ser Gly Ile Thr Lys Phe Asn Thr Ile Ile Gly Gly Lys
        275                 280                 285

Phe Val Asn Gly Glu Asn Thr Lys Arg Lys Gly Ile Asn Glu Tyr Ile
    290                 295                 300

Asn Leu Tyr Ser Gln Gln Ile Asn Asp Lys Thr Leu Lys Lys Tyr Lys
305                 310                 315                 320

Met Ser Val Leu Phe Lys Gln Ile Leu Ser Asp Thr Glu Ser Lys Ser
                325                 330                 335

Phe Val Ile Asp Lys Leu Glu Asp Asp Ser Asp Val Val Thr Thr Met
            340                 345                 350

Gln Ser Phe Tyr Glu Gln Ile Ala Ala Phe Lys Thr Val Glu Glu Lys
        355                 360                 365

Ser Ile Lys Glu Thr Leu Ser Leu Leu Phe Asp Asp Leu Lys Ala Gln
    370                 375                 380

Lys Leu Asp Leu Ser Lys Ile Tyr Phe Lys Asn Asp Lys Ser Leu Thr
385                 390                 395                 400

Asp Leu Ser Gln Gln Val Phe Asp Asp Tyr Ser Val Ile Gly Thr Ala
                405                 410                 415

Val Leu Glu Tyr Ile Thr Gln Gln Ile Ala Pro Lys Asn Leu Asp Asn
            420                 425                 430
```

```
Pro Ser Lys Lys Glu Gln Glu Leu Ile Ala Lys Lys Thr Glu Lys Ala
        435                 440                 445

Lys Tyr Leu Ser Leu Glu Thr Ile Lys Leu Ala Leu Glu Glu Phe Asn
    450                 455                 460

Lys His Arg Asp Ile Asp Lys Gln Cys Arg Phe Glu Glu Ile Leu Ala
465                 470                 475                 480

Asn Phe Ala Ala Ile Pro Met Ile Phe Asp Glu Ile Ala Gln Asn Lys
                485                 490                 495

Asp Asn Leu Ala Gln Ile Ser Ile Lys Tyr Gln Asn Gln Gly Lys Lys
            500                 505                 510

Asp Leu Leu Gln Ala Ser Ala Glu Asp Asp Val Lys Ala Ile Lys Asp
        515                 520                 525

Leu Leu Asp Gln Thr Asn Asn Leu Leu His Lys Leu Lys Ile Phe His
    530                 535                 540

Ile Ser Gln Ser Glu Asp Lys Ala Asn Ile Leu Asp Lys Asp Glu His
545                 550                 555                 560

Phe Tyr Leu Val Phe Glu Glu Cys Tyr Phe Glu Leu Ala Asn Ile Val
                565                 570                 575

Pro Leu Tyr Asn Lys Ile Arg Asn Tyr Ile Thr Gln Lys Pro Tyr Ser
            580                 585                 590

Asp Glu Lys Phe Lys Leu Asn Phe Glu Asn Ser Thr Leu Ala Asn Gly
        595                 600                 605

Trp Asp Lys Asn Lys Glu Pro Asp Asn Thr Ala Ile Leu Phe Ile Lys
    610                 615                 620

Asp Asp Lys Tyr Tyr Leu Gly Val Met Asn Lys Lys Asn Asn Lys Ile
625                 630                 635                 640
```

```
Phe Asp Asp Lys Ala Ile Lys Glu Asn Lys Gly Glu Gly Tyr Lys Lys
               645                 650                 655

Ile Val Tyr Lys Leu Leu Pro Gly Ala Asn Lys Met Leu Pro Lys Val
            660                 665                 670

Phe Phe Ser Ala Lys Ser Ile Lys Phe Tyr Asn Pro Ser Glu Asp Ile
        675                 680                 685

Leu Arg Ile Arg Asn His Ser Thr His Thr Lys Asn Gly Ser Pro Gln
    690                 695                 700

Lys Gly Tyr Glu Lys Phe Glu Phe Asn Ile Glu Asp Cys Arg Lys Phe
705                 710                 715                 720

Ile Asp Phe Tyr Lys Gln Ser Ile Ser Lys His Pro Glu Trp Lys Asp
                725                 730                 735

Phe Gly Phe Arg Phe Ser Asp Thr Gln Arg Tyr Asn Ser Ile Asp Glu
            740                 745                 750

Phe Tyr Arg Glu Val Glu Asn Gln Gly Tyr Lys Leu Thr Phe Glu Asn
        755                 760                 765

Ile Ser Glu Ser Tyr Ile Asp Ser Val Val Asn Gln Gly Lys Leu Tyr
    770                 775                 780

Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ser Ala Tyr Ser Lys Gly Arg
785                 790                 795                 800

Pro Asn Leu His Thr Leu Tyr Trp Lys Ala Leu Phe Asp Glu Arg Asn
                805                 810                 815

Leu Gln Asp Val Val Tyr Lys Leu Asn Gly Glu Ala Glu Leu Phe Tyr
            820                 825                 830

Arg Lys Gln Ser Ile Pro Lys Lys Ile Thr His Pro Ala Lys Glu Ala
        835                 840                 845
```

```
Ile Ala Asn Lys Asn Lys Asp Asn Pro Lys Lys Glu Ser Val Phe Glu
    850                 855                 860

Tyr Asp Leu Ile Lys Asp Lys Arg Phe Thr Glu Asp Lys Phe Phe Phe
865                 870                 875                 880

His Cys Pro Ile Thr Ile Asn Phe Lys Ser Ser Gly Ala Asn Lys Phe
                885                 890                 895

Asn Asp Glu Ile Asn Leu Leu Leu Lys Glu Lys Ala Asn Asp Val His
            900                 905                 910

Ile Leu Ser Ile Asp Arg Gly Glu Arg His Leu Ala Tyr Tyr Thr Leu
        915                 920                 925

Val Asp Gly Lys Gly Asn Ile Ile Lys Gln Asp Thr Phe Asn Ile Ile
    930                 935                 940

Gly Asn Asp Arg Met Lys Thr Asn Tyr His Asp Lys Leu Ala Ala Ile
945                 950                 955                 960

Glu Lys Asp Arg Asp Ser Ala Arg Lys Asp Trp Lys Lys Ile Asn Asn
                965                 970                 975

Ile Lys Glu Met Lys Glu Gly Tyr Leu Ser Gln Val Val His Glu Ile
            980                 985                 990

Ala Lys Leu Val Ile Glu Tyr Asn  Ala Ile Val Val Phe  Ala Asp Leu
        995                 1000                1005

Asn Phe  Gly Phe Lys Arg Gly  Arg Phe Lys Val Glu  Lys Gln Val
    1010                1015                1020

Tyr Gln  Lys Leu Glu Lys Met  Leu Ile Glu Lys Leu  Asn Tyr Leu
    1025                1030                1035

Val Phe  Lys Asp Asn Glu Phe  Asp Lys Thr Gly Gly  Val Leu Arg
    1040                1045                1050
```

```
Ala Tyr  Gln Leu Thr Ala Pro  Phe Glu Thr Phe Lys  Lys Met Gly
    1055                1060                1065

Lys Gln  Thr Gly Ile Ile Tyr  Tyr Val Pro Ala Gly  Phe Thr Ser
    1070                1075                1080

Lys Ile  Cys Pro Val Thr Gly  Phe Val Asn Gln Leu  Tyr Pro Lys
    1085                1090                1095

Tyr Glu  Ser Val Ser Lys Ser  Gln Glu Phe Phe Ser  Lys Phe Asp
    1100                1105                1110

Lys Ile  Cys Tyr Asn Leu Asp  Lys Gly Tyr Phe Glu  Phe Ser Phe
    1115                1120                1125

Asp Tyr  Lys Asn Phe Gly Asp  Lys Ala Ala Lys Gly  Lys Trp Thr
    1130                1135                1140

Ile Ala  Ser Phe Gly Ser Arg  Leu Ile Asn Phe Arg  Asn Ser Asp
    1145                1150                1155

Lys Asn  His Asn Trp Asp Thr  Arg Glu Val Tyr Pro  Thr Lys Glu
    1160                1165                1170

Leu Glu  Lys Leu Leu Lys Asp  Tyr Ser Ile Glu Tyr  Gly His Gly
    1175                1180                1185

Glu Cys  Ile Lys Ala Ala Ile  Cys Gly Glu Ser Asp  Lys Lys Phe
    1190                1195                1200

Phe Ala  Lys Leu Thr Ser Val  Leu Asn Thr Ile Leu  Gln Met Arg
    1205                1210                1215

Asn Ser  Lys Thr Gly Thr Glu  Leu Asp Tyr Leu Ile  Ser Pro Val
    1220                1225                1230

Ala Asp  Val Asn Gly Asn Phe  Phe Asp Ser Arg Gln  Ala Pro Lys
    1235                1240                1245
```

```
Asn Met  Pro Gln Asp Ala Ala  Ala Asn Gly Ala Tyr  His Ile Gly
    1250                 1255                 1260


Leu Lys  Gly Leu Met Leu Leu  Gly Arg Ile Lys Asn  Asn Gln Glu
    1265                 1270                 1275


Gly Lys  Lys Leu Asn Leu Val  Ile Lys Asn Glu Glu  Tyr Phe Glu
    1280                 1285                 1290


Phe Val  Gln Asn Arg Asn Asn
    1295                 1300
```

<210> 16
<211> 1300
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 16

```
Met Ser Ile Tyr Gln Glu Phe Val Asn Lys Tyr Ser Leu Ser Lys Thr
1               5                   10                  15


Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Glu Asn Ile Lys
            20                  25                  30


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


Lys Ala Lys Gln Ile Ile Asp Lys Tyr His Gln Phe Phe Ile Glu Glu
    50                  55                  60


Ile Leu Ser Ser Val Cys Ile Ser Glu Asp Leu Leu Gln Asn Tyr Ser
65                  70                  75                  80


Asp Val Tyr Phe Lys Leu Lys Lys Ser Asp Asp Asp Asn Leu Gln Lys
                85                  90                  95


Asp Phe Lys Ser Ala Lys Asp Thr Ile Lys Lys Gln Ile Ser Glu Tyr
```

100 105 110

Ile Lys Asp Ser Glu Lys Phe Lys Asn Leu Phe Asn Gln Asn Leu Ile
115 120 125

Asp Ala Lys Lys Gly Gln Glu Ser Asp Leu Ile Leu Trp Leu Lys Gln
130 135 140

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

Asp Ile Asp Glu Ala Leu Glu Ile Ile Lys Ser Phe Lys Gly Trp Thr
165 170 175

Thr Tyr Phe Lys Gly Phe His Glu Asn Arg Lys Asn Val Tyr Ser Ser
180 185 190

Asn Asp Ile Pro Thr Ser Ile Ile Tyr Arg Ile Val Asp Asp Asn Leu
195 200 205

Pro Lys Phe Leu Glu Asn Lys Ala Lys Tyr Glu Ser Leu Lys Asp Lys
210 215 220

Ala Pro Glu Ala Ile Asn Tyr Glu Gln Ile Lys Lys Asp Leu Ala Glu
225 230 235 240

Glu Leu Thr Phe Asp Ile Asp Tyr Lys Thr Ser Glu Val Asn Gln Arg
245 250 255

Val Phe Ser Leu Asp Glu Val Phe Glu Ile Ala Asn Phe Asn Asn Tyr
260 265 270

Leu Asn Gln Ser Gly Ile Thr Lys Phe Asn Thr Ile Ile Gly Gly Lys
275 280 285

Phe Val Asn Gly Glu Asn Thr Lys Arg Lys Gly Ile Asn Glu Tyr Ile
290 295 300

Asn Leu Tyr Ser Gln Gln Ile Asn Asp Lys Thr Leu Lys Lys Tyr Lys

305 310 315 320

Met Ser Val Leu Phe Lys Gln Ile Leu Ser Asp Thr Glu Ser Lys Ser
325 330 335

Phe Val Ile Asp Lys Leu Glu Asp Asp Ser Asp Val Val Thr Thr Met
340 345 350

Gln Ser Phe Tyr Glu Gln Ile Ala Ala Phe Lys Thr Val Glu Glu Lys
355 360 365

Ser Ile Lys Glu Thr Leu Ser Leu Leu Phe Asp Asp Leu Lys Ala Gln
370 375 380

Lys Leu Asp Leu Ser Lys Ile Tyr Phe Lys Asn Asp Lys Ser Leu Thr
385 390 395 400

Asp Leu Ser Gln Gln Val Phe Asp Asp Tyr Ser Val Ile Gly Thr Ala
405 410 415

Val Leu Glu Tyr Ile Thr Gln Gln Ile Ala Pro Lys Asn Leu Asp Asn
420 425 430

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

Lys Tyr Leu Ser Leu Glu Thr Ile Lys Leu Ala Leu Glu Glu Phe Asn
450 455 460

Lys His Arg Asp Ile Asp Lys Gln Cys Arg Phe Glu Glu Ile Leu Ala
465 470 475 480

Asn Phe Ala Ala Ile Pro Met Ile Phe Asp Glu Ile Ala Gln Asn Lys
485 490 495

Asp Asn Leu Ala Gln Ile Ser Ile Lys Tyr Gln Asn Gln Gly Lys Lys
500 505 510

Asp Leu Leu Gln Ala Ser Ala Glu Asp Asp Val Lys Ala Ile Lys Asp

```
        515                 520                 525

Leu Leu Asp Gln Thr Asn Asn Leu Leu His Lys Leu Lys Ile Phe His
    530                 535                 540

Ile Ser Gln Ser Glu Asp Lys Ala Asn Ile Leu Asp Lys Asp Glu His
545                 550                 555                 560

Phe Tyr Leu Val Phe Glu Glu Cys Tyr Phe Glu Leu Ala Asn Ile Val
                565                 570                 575

Pro Leu Tyr Asn Lys Ile Arg Asn Tyr Ile Thr Gln Lys Pro Tyr Ser
            580                 585                 590

Asp Glu Lys Phe Lys Leu Asn Phe Glu Asn Ser Thr Leu Ala Asn Gly
        595                 600                 605

Trp Asp Lys Asn Lys Glu Pro Asp Asn Thr Ala Ile Leu Phe Ile Lys
    610                 615                 620

Asp Asp Lys Tyr Tyr Leu Gly Val Met Asn Lys Lys Asn Asn Lys Ile
625                 630                 635                 640

Phe Asp Asp Lys Ala Ile Lys Glu Asn Lys Gly Glu Gly Tyr Lys Lys
                645                 650                 655

Ile Val Tyr Lys Leu Leu Pro Gly Ala Asn Lys Met Leu Pro Lys Val
            660                 665                 670

Phe Phe Ser Ala Lys Ser Ile Lys Phe Tyr Asn Pro Ser Glu Asp Ile
        675                 680                 685

Leu Arg Ile Arg Asn His Ser Thr His Thr Lys Asn Gly Ser Pro Gln
    690                 695                 700

Lys Gly Tyr Glu Lys Phe Glu Phe Asn Ile Glu Asp Cys Arg Lys Phe
705                 710                 715                 720

Ile Asp Phe Tyr Lys Gln Ser Ile Ser Lys His Pro Glu Trp Lys Asp
```

725 730 735

Phe Gly Phe Arg Phe Ser Asp Thr Gln Arg Tyr Asn Ser Ile Asp Glu
740 745 750

Phe Tyr Arg Glu Val Glu Asn Gln Gly Tyr Lys Leu Thr Phe Glu Asn
755 760 765

Ile Ser Glu Ser Tyr Ile Asp Ser Val Val Asn Gln Gly Lys Leu Tyr
770 775 780

Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ser Ala Tyr Ser Lys Gly Arg
785 790 795 800

Pro Asn Leu His Thr Leu Tyr Trp Lys Ala Leu Phe Asp Glu Arg Asn
805 810 815

Leu Gln Asp Val Val Tyr Lys Leu Asn Gly Glu Ala Glu Leu Phe Tyr
820 825 830

Arg Lys Gln Ser Ile Pro Lys Lys Ile Thr His Pro Ala Lys Glu Ala
835 840 845

Ile Ala Asn Lys Asn Lys Asp Asn Pro Lys Lys Glu Ser Val Phe Glu
850 855 860

Tyr Asp Leu Ile Lys Asp Lys Arg Phe Thr Glu Asp Lys Phe Phe Phe
865 870 875 880

His Cys Pro Ile Thr Ile Asn Phe Lys Ser Ser Gly Ala Asn Lys Phe
885 890 895

Asn Asp Glu Ile Asn Leu Leu Leu Lys Glu Lys Ala Asn Asp Val His
900 905 910

Ile Leu Ser Ile Ala Arg Gly Glu Arg His Leu Ala Tyr Tyr Thr Leu
915 920 925

Val Asp Gly Lys Gly Asn Ile Ile Lys Gln Asp Thr Phe Asn Ile Ile

930 935 940

Gly Asn Asp Arg Met Lys Thr Asn Tyr His Asp Lys Leu Ala Ala Ile
945 950 955 960

Glu Lys Asp Arg Asp Ser Ala Arg Lys Asp Trp Lys Lys Ile Asn Asn
965 970 975

Ile Lys Glu Met Lys Glu Gly Tyr Leu Ser Gln Val Val His Glu Ile
980 985 990

Ala Lys Leu Val Ile Glu Tyr Asn Ala Ile Val Val Phe Ala Asp Leu
995 1000 1005

Asn Phe Gly Phe Lys Arg Gly Arg Phe Lys Val Glu Lys Gln Val
1010 1015 1020

Tyr Gln Lys Leu Glu Lys Met Leu Ile Glu Lys Leu Asn Tyr Leu
1025 1030 1035

Val Phe Lys Asp Asn Glu Phe Asp Lys Thr Gly Gly Val Leu Arg
1040 1045 1050

Ala Tyr Gln Leu Thr Ala Pro Phe Glu Thr Phe Lys Lys Met Gly
1055 1060 1065

Lys Gln Thr Gly Ile Ile Tyr Tyr Val Pro Ala Gly Phe Thr Ser
1070 1075 1080

Lys Ile Cys Pro Val Thr Gly Phe Val Asn Gln Leu Tyr Pro Lys
1085 1090 1095

Tyr Glu Ser Val Ser Lys Ser Gln Glu Phe Phe Ser Lys Phe Asp
1100 1105 1110

Lys Ile Cys Tyr Asn Leu Asp Lys Gly Tyr Phe Glu Phe Ser Phe
1115 1120 1125

Asp Tyr Lys Asn Phe Gly Asp Lys Ala Ala Lys Gly Lys Trp Thr

```
    1130                1135                1140

Ile Ala  Ser Phe Gly Ser Arg  Leu Ile Asn Phe Arg  Asn Ser Asp
    1145                1150                1155

Lys Asn  His Asn Trp Asp Thr  Arg Glu Val Tyr Pro  Thr Lys Glu
    1160                1165                1170

Leu Glu  Lys Leu Leu Lys Asp  Tyr Ser Ile Glu Tyr  Gly His Gly
    1175                1180                1185

Glu Cys  Ile Lys Ala Ala Ile  Cys Gly Glu Ser Asp  Lys Lys Phe
    1190                1195                1200

Phe Ala  Lys Leu Thr Ser Val  Leu Asn Thr Ile Leu  Gln Met Arg
    1205                1210                1215

Asn Ser  Lys Thr Gly Thr Glu  Leu Asp Tyr Leu Ile  Ser Pro Val
    1220                1225                1230

Ala Asp  Val Asn Gly Asn Phe  Phe Asp Ser Arg Gln  Ala Pro Lys
    1235                1240                1245

Asn Met  Pro Gln Asp Ala Ala  Ala Asn Gly Ala Tyr  His Ile Gly
    1250                1255                1260

Leu Lys  Gly Leu Met Leu Leu  Gly Arg Ile Lys Asn  Asn Gln Glu
    1265                1270                1275

Gly Lys  Lys Leu Asn Leu Val  Ile Lys Asn Glu Glu  Tyr Phe Glu
    1280                1285                1290

Phe Val  Gln Asn Arg Asn Asn
    1295                1300
```

<210> 17
<211> 1307
<212> PRT
<213> Acidaminococcus species

<400> 17

```
Thr Gln Phe Glu Gly Phe Thr Asn Leu Tyr Gln Val Ser Lys Thr Leu
1               5                  10                  15

Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Lys His Ile Gln Glu
            20                  25                  30

Gln Gly Phe Ile Glu Glu Asp Lys Ala Arg Asn Asp His Tyr Lys Glu
        35                  40                  45

Leu Lys Pro Ile Ile Asp Arg Ile Tyr Lys Thr Tyr Ala Asp Gln Cys
    50                  55                  60

Leu Gln Leu Val Gln Leu Asp Trp Glu Asn Leu Ser Ala Ala Ile Asp
65                  70                  75                  80

Ser Tyr Arg Lys Glu Lys Thr Glu Glu Thr Arg Asn Ala Leu Ile Glu
                85                  90                  95

Glu Gln Ala Thr Tyr Arg Asn Ala Ile His Asp Tyr Phe Ile Gly Arg
            100                 105                 110

Thr Asp Asn Leu Thr Asp Ala Ile Asn Lys Arg His Ala Glu Ile Tyr
        115                 120                 125

Lys Gly Leu Phe Lys Ala Glu Leu Phe Asn Gly Lys Val Leu Lys Gln
    130                 135                 140

Leu Gly Thr Val Thr Thr Thr Glu His Glu Asn Ala Leu Leu Arg Ser
145                 150                 155                 160

Phe Asp Lys Phe Thr Thr Tyr Phe Ser Gly Phe Tyr Glu Asn Arg Lys
                165                 170                 175

Asn Val Phe Ser Ala Glu Asp Ile Ser Thr Ala Ile Pro His Arg Ile
            180                 185                 190

Val Gln Asp Asn Phe Pro Lys Phe Lys Glu Asn Cys His Ile Phe Thr
        195                 200                 205
```

```
Arg Leu Ile Thr Ala Val Pro Ser Leu Arg Glu His Phe Glu Asn Val
    210                 215                 220

Lys Lys Ala Ile Gly Ile Phe Val Ser Thr Ser Ile Glu Glu Val Phe
225                 230                 235                 240

Ser Phe Pro Phe Tyr Asn Gln Leu Leu Thr Gln Thr Gln Ile Asp Leu
                245                 250                 255

Tyr Asn Gln Leu Leu Gly Gly Ile Ser Arg Glu Ala Gly Thr Glu Lys
            260                 265                 270

Ile Lys Gly Leu Asn Glu Val Leu Asn Leu Ala Ile Gln Lys Asn Asp
        275                 280                 285

Glu Thr Ala His Ile Ile Ala Ser Leu Pro His Arg Phe Ile Pro Leu
    290                 295                 300

Phe Lys Gln Ile Leu Ser Asp Arg Asn Thr Leu Ser Phe Ile Leu Glu
305                 310                 315                 320

Glu Phe Lys Ser Asp Glu Glu Val Ile Gln Ser Phe Cys Lys Tyr Lys
                325                 330                 335

Thr Leu Leu Arg Asn Glu Asn Val Leu Glu Thr Ala Glu Ala Leu Phe
            340                 345                 350

Asn Glu Leu Asn Ser Ile Asp Leu Thr His Ile Phe Ile Ser His Lys
        355                 360                 365

Lys Leu Glu Thr Ile Ser Ser Ala Leu Cys Asp His Trp Asp Thr Leu
    370                 375                 380

Arg Asn Ala Leu Tyr Glu Arg Arg Ile Ser Glu Leu Thr Gly Lys Ile
385                 390                 395                 400

Thr Lys Ser Ala Lys Glu Lys Val Gln Arg Ser Leu Lys His Glu Asp
                405                 410                 415
```

```
Ile Asn Leu Gln Glu Ile Ile Ser Ala Ala Gly Lys Glu Leu Ser Glu
            420                 425                 430

Ala Phe Lys Gln Lys Thr Ser Glu Ile Leu Ser His Ala His Ala Ala
        435                 440                 445

Leu Asp Gln Pro Leu Pro Thr Thr Met Leu Lys Lys Gln Glu Glu Lys
    450                 455                 460

Glu Ile Leu Lys Ser Gln Leu Asp Ser Leu Leu Gly Leu Tyr His Leu
465                 470                 475                 480

Leu Asp Trp Phe Ala Val Asp Glu Ser Asn Glu Val Asp Pro Glu Phe
                485                 490                 495

Ser Ala Arg Leu Thr Gly Ile Lys Leu Glu Met Glu Pro Ser Leu Ser
            500                 505                 510

Phe Tyr Asn Lys Ala Arg Asn Tyr Ala Thr Lys Lys Pro Tyr Ser Val
        515                 520                 525

Glu Lys Phe Lys Leu Asn Phe Gln Met Pro Thr Leu Ala Ser Gly Trp
    530                 535                 540

Asp Val Asn Lys Glu Lys Asn Asn Gly Ala Ile Leu Phe Val Lys Asn
545                 550                 555                 560

Gly Leu Tyr Tyr Leu Gly Ile Met Pro Lys Gln Lys Gly Arg Tyr Lys
                565                 570                 575

Ala Leu Ser Phe Glu Pro Thr Glu Lys Thr Ser Glu Gly Phe Asp Lys
            580                 585                 590

Met Tyr Tyr Asp Tyr Phe Pro Asp Ala Ala Lys Met Ile Pro Lys Cys
        595                 600                 605

Ser Thr Gln Leu Lys Ala Val Thr Ala His Phe Gln Thr His Thr Thr
    610                 615                 620
```

```
Pro Ile Leu Leu Ser Asn Asn Phe Ile Glu Pro Leu Glu Ile Thr Lys
625                 630                 635                 640

Glu Ile Tyr Asp Leu Asn Asn Pro Glu Lys Glu Pro Lys Lys Phe Gln
                645                 650                 655

Thr Ala Tyr Ala Lys Lys Thr Gly Asp Gln Lys Gly Tyr Arg Glu Ala
            660                 665                 670

Leu Cys Lys Trp Ile Asp Phe Thr Arg Asp Phe Leu Ser Lys Tyr Thr
        675                 680                 685

Lys Thr Thr Ser Ile Asp Leu Ser Ser Leu Arg Pro Ser Ser Gln Tyr
    690                 695                 700

Lys Asp Leu Gly Glu Tyr Tyr Ala Glu Leu Asn Pro Leu Leu Tyr His
705                 710                 715                 720

Ile Ser Phe Gln Arg Ile Ala Glu Lys Glu Ile Met Asp Ala Val Glu
                725                 730                 735

Thr Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ala Lys
            740                 745                 750

Gly His His Gly Lys Pro Asn Leu His Thr Leu Tyr Trp Thr Gly Leu
        755                 760                 765

Phe Ser Pro Glu Asn Leu Ala Lys Thr Ser Ile Lys Leu Asn Gly Gln
    770                 775                 780

Ala Glu Leu Phe Tyr Arg Pro Lys Ser Arg Met Lys Arg Met Ala His
785                 790                 795                 800

Arg Leu Gly Glu Lys Met Leu Asn Lys Lys Leu Lys Asp Gln Lys Thr
                805                 810                 815

Pro Ile Pro Asp Thr Leu Tyr Gln Glu Leu Tyr Asp Tyr Val Asn His
            820                 825                 830
```

```
Arg Leu Ser His Asp Leu Ser Asp Glu Ala Arg Ala Leu Leu Pro Asn
        835                 840                 845

Val Ile Thr Lys Glu Val Ser His Glu Ile Ile Lys Asp Arg Arg Phe
    850                 855                 860

Thr Ser Asp Lys Phe Phe Phe His Val Pro Ile Thr Leu Asn Tyr Gln
865                 870                 875                 880

Ala Ala Asn Ser Pro Ser Lys Phe Asn Gln Arg Val Asn Ala Tyr Leu
                885                 890                 895

Lys Glu His Pro Glu Thr Pro Ile Ile Gly Ile Asp Arg Gly Glu Arg
            900                 905                 910

Asn Leu Ile Tyr Ile Thr Val Ile Asp Ser Thr Gly Lys Ile Leu Glu
        915                 920                 925

Gln Arg Ser Leu Asn Thr Ile Gln Gln Phe Asp Tyr Gln Lys Lys Leu
    930                 935                 940

Asp Asn Arg Glu Lys Glu Arg Val Ala Ala Arg Gln Ala Trp Ser Val
945                 950                 955                 960

Val Gly Thr Ile Lys Asp Leu Lys Gln Gly Tyr Leu Ser Gln Val Ile
                965                 970                 975

His Glu Ile Val Asp Leu Met Ile His Tyr Gln Ala Val Val Val Leu
            980                 985                 990

Glu Asn Leu Asn Phe Gly Phe Lys  Ser Lys Arg Thr Gly  Ile Ala Glu
        995                 1000                1005

Lys Ala  Val Tyr Gln Gln Phe  Glu Lys Met Leu Ile  Asp Lys Leu
    1010                1015                1020

Asn Cys  Leu Val Leu Lys Asp  Tyr Pro Ala Glu Lys  Val Gly Gly
    1025                1030                1035
```

```
Val Leu  Asn Pro Tyr Gln Leu  Thr Asp Gln Phe Thr  Ser Phe Ala
    1040                1045                1050

Lys Met  Gly Thr Gln Ser Gly  Phe Leu Phe Tyr Val  Pro Ala Pro
    1055                1060                1065

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

Val Trp  Lys Thr Ile Lys Asn  His Glu Ser Arg Lys  His Phe Leu
    1085                1090                1095

Glu Gly  Phe Asp Phe Leu His  Tyr Asp Val Lys Thr  Gly Asp Phe
    1100                1105                1110

Ile Leu  His Phe Lys Met Asn  Arg Asn Leu Ser Phe  Gln Arg Gly
    1115                1120                1125

Leu Pro  Gly Phe Met Pro Ala  Trp Asp Ile Val Phe  Glu Lys Asn
    1130                1135                1140

Glu Thr  Gln Phe Asp Ala Lys  Gly Thr Pro Phe Ile  Ala Gly Lys
    1145                1150                1155

Arg Ile  Val Pro Val Ile Glu  Asn His Arg Phe Thr  Gly Arg Tyr
    1160                1165                1170

Arg Asp  Leu Tyr Pro Ala Asn  Glu Leu Ile Ala Leu  Leu Glu Glu
    1175                1180                1185

Lys Gly  Ile Val Phe Arg Asp  Gly Ser Asn Ile Leu  Pro Lys Leu
    1190                1195                1200

Leu Glu  Asn Asp Asp Ser His  Ala Ile Asp Thr Met  Val Ala Leu
    1205                1210                1215

Ile Arg  Ser Val Leu Gln Met  Arg Asn Ser Asn Ala  Ala Thr Gly
    1220                1225                1230
```

```
Glu Asp  Tyr Ile Asn Ser Pro  Val Arg Asp Leu Asn  Gly Val Cys
    1235                 1240                 1245


Phe Asp  Ser Arg Phe Gln Asn  Pro Glu Trp Pro Met  Asp Ala Asp
    1250                 1255                 1260


Ala Asn  Gly Ala Tyr His Ile  Ala Leu Lys Gly Gln  Leu Leu Leu
    1265                 1270                 1275


Asn His  Leu Lys Glu Ser Lys  Asp Leu Lys Leu Gln  Asn Gly Ile
    1280                 1285                 1290


Ser Asn  Gln Asp Trp Leu Ala  Tyr Ile Gln Glu Leu  Arg Asn
    1295                 1300                 1305


<210>  18
<211>  1228
<212>  PRT
<213>  Lachnospiraceae species

<400>  18

Met Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr
1               5                   10                  15


Leu Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp
            20                  25                  30


Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys
        35                  40                  45


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


Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu
65                  70                  75                  80


Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn
                85                  90                  95
```

```
Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn
            100                 105                 110

Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu
        115                 120                 125

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

Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn
145                 150                 155                 160

Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile
                165                 170                 175

Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys
            180                 185                 190

Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys
        195                 200                 205

Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe
    210                 215                 220

Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile
225                 230                 235                 240

Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn
                245                 250                 255

Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys
            260                 265                 270

Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser
        275                 280                 285

Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe
    290                 295                 300
```

```
Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys
305                 310                 315                 320

Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile
                325                 330                 335

Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe
            340                 345                 350

Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp
        355                 360                 365

Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp
    370                 375                 380

Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu
385                 390                 395                 400

Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu
                405                 410                 415

Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser
            420                 425                 430

Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys
        435                 440                 445

Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys
    450                 455                 460

Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr
465                 470                 475                 480

Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile
                485                 490                 495

Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr
            500                 505                 510
```

```
Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro
        515                 520                 525

Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala
    530                 535                 540

Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys
545                 550                 555                 560

Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly
                565                 570                 575

Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met
            580                 585                 590

Leu Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro
        595                 600                 605

Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly
    610                 615                 620

Asp Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys
625                 630                 635                 640

Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn
                645                 650                 655

Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu
            660                 665                 670

Val Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys
        675                 680                 685

Glu Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile
    690                 695                 700

Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His
705                 710                 715                 720
```

```
Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile
                725                 730                 735

Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys
            740                 745                 750

Lys Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys
        755                 760                 765

Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr
    770                 775                 780

Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile
785                 790                 795                 800

Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val
                805                 810                 815

Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Asp
            820                 825                 830

Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly
        835                 840                 845

Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn
    850                 855                 860

Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu
865                 870                 875                 880

Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile
                885                 890                 895

Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys
            900                 905                 910

Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu Asn
        915                 920                 925
```

```
Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val Tyr Gln
    930                 935                 940

Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val Asp Lys
945                 950                 955                 960

Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly Tyr Gln Ile
                965                 970                 975

Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser Thr Gln Asn Gly Phe
            980                 985                 990

Ile Phe Tyr Ile Pro Ala Trp Leu  Thr Ser Lys Ile Asp  Pro Ser Thr
        995                 1000                1005

Gly Phe  Val Asn Leu Leu Lys  Thr Lys Tyr Thr Ser  Ile Ala Asp
    1010                1015                1020

Ser Lys  Lys Phe Ile Ser Ser  Phe Asp Arg Ile Met  Tyr Val Pro
    1025                1030                1035

Glu Glu  Asp Leu Phe Glu Phe  Ala Leu Asp Tyr Lys  Asn Phe Ser
    1040                1045                1050

Arg Thr  Asp Ala Asp Tyr Ile  Lys Lys Trp Lys Leu  Tyr Ser Tyr
    1055                1060                1065

Gly Asn  Arg Ile Arg Ile Phe  Arg Asn Pro Lys Lys  Asn Asn Val
    1070                1075                1080

Phe Asp  Trp Glu Glu Val Cys  Leu Thr Ser Ala Tyr  Lys Glu Leu
    1085                1090                1095

Phe Asn  Lys Tyr Gly Ile Asn  Tyr Gln Gln Gly Asp  Ile Arg Ala
    1100                1105                1110

Leu Leu  Cys Glu Gln Ser Asp  Lys Ala Phe Tyr Ser  Ser Phe Met
    1115                1120                1125
```

```
Ala Leu  Met Ser Leu Met Leu  Gln Met Arg Asn Ser  Ile Thr Gly
    1130                1135                1140


Arg Thr  Asp Val Asp Phe Leu  Ile Ser Pro Val Lys  Asn Ser Asp
    1145                1150                1155


Gly Ile  Phe Tyr Asp Ser Arg  Asn Tyr Glu Ala Gln  Glu Asn Ala
    1160                1165                1170


Ile Leu  Pro Lys Asn Ala Asp  Ala Asn Gly Ala Tyr  Asn Ile Ala
    1175                1180                1185


Arg Lys  Val Leu Trp Ala Ile  Gly Gln Phe Lys Lys  Ala Glu Asp
    1190                1195                1200


Glu Lys  Leu Asp Lys Val Lys  Ile Ala Ile Ser Asn  Lys Glu Trp
    1205                1210                1215


Leu Glu  Tyr Ala Gln Thr Ser  Val Lys His
    1220                1225
```

<210> 19
<211> 1307
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 19

```
Thr Gln Phe Glu Gly Phe Thr Asn Leu Tyr Gln Val Ser Lys Thr Leu
1               5                   10                  15


Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Lys His Ile Gln Glu
            20                  25                  30


Gln Gly Phe Ile Glu Glu Asp Lys Ala Arg Asn Asp His Tyr Lys Glu
        35                  40                  45


Leu Lys Pro Ile Ile Asp Arg Ile Tyr Lys Thr Tyr Ala Asp Gln Cys
```

50 55 60

Leu Gln Leu Val Gln Leu Asp Trp Glu Asn Leu Ser Ala Ala Ile Asp
65 70 75 80

Ser Tyr Arg Lys Glu Lys Thr Glu Glu Thr Arg Asn Ala Leu Ile Glu
85 90 95

Glu Gln Ala Thr Tyr Arg Asn Ala Ile His Asp Tyr Phe Ile Gly Arg
100 105 110

Thr Asp Asn Leu Thr Asp Ala Ile Asn Lys Arg His Ala Glu Ile Tyr
115 120 125

Lys Gly Leu Phe Lys Ala Glu Leu Phe Asn Gly Lys Val Leu Lys Gln
130 135 140

Leu Gly Thr Val Thr Thr Thr Glu His Glu Asn Ala Leu Leu Arg Ser
145 150 155 160

Phe Asp Lys Phe Thr Thr Tyr Phe Ser Gly Phe Tyr Glu Asn Arg Lys
165 170 175

Asn Val Phe Ser Ala Glu Asp Ile Ser Thr Ala Ile Pro His Arg Ile
180 185 190

Val Gln Asp Asn Phe Pro Lys Phe Lys Glu Asn Cys His Ile Phe Thr
195 200 205

Arg Leu Ile Thr Ala Val Pro Ser Leu Arg Glu His Phe Glu Asn Val
210 215 220

Lys Lys Ala Ile Gly Ile Phe Val Ser Thr Ser Ile Glu Glu Val Phe
225 230 235 240

Ser Phe Pro Phe Tyr Asn Gln Leu Leu Thr Gln Thr Gln Ile Asp Leu
245 250 255

Tyr Asn Gln Leu Leu Gly Gly Ile Ser Arg Glu Ala Gly Thr Glu Lys

260 265 270

Ile Lys Gly Leu Asn Glu Val Leu Asn Leu Ala Ile Gln Lys Asn Asp
275 280 285

Glu Thr Ala His Ile Ile Ala Ser Leu Pro His Arg Phe Ile Pro Leu
290 295 300

Phe Lys Gln Ile Leu Ser Asp Arg Asn Thr Leu Ser Phe Ile Leu Glu
305 310 315 320

Glu Phe Lys Ser Asp Glu Glu Val Ile Gln Ser Phe Cys Lys Tyr Lys
325 330 335

Thr Leu Leu Arg Asn Glu Asn Val Leu Glu Thr Ala Glu Ala Leu Phe
340 345 350

Asn Glu Leu Asn Ser Ile Asp Leu Thr His Ile Phe Ile Ser His Lys
355 360 365

Lys Leu Glu Thr Ile Ser Ser Ala Leu Cys Asp His Trp Asp Thr Leu
370 375 380

Arg Asn Ala Leu Tyr Glu Arg Arg Ile Ser Glu Leu Thr Gly Lys Ile
385 390 395 400

Thr Lys Ser Ala Lys Glu Lys Val Gln Arg Ser Leu Lys His Glu Asp
405 410 415

Ile Asn Leu Gln Glu Ile Ile Ser Ala Ala Gly Lys Glu Leu Ser Glu
420 425 430

Ala Phe Lys Gln Lys Thr Ser Glu Ile Leu Ser His Ala His Ala Ala
435 440 445

Leu Asp Gln Pro Leu Pro Thr Thr Met Leu Lys Lys Gln Glu Glu Lys
450 455 460

Glu Ile Leu Lys Ser Gln Leu Asp Ser Leu Leu Gly Leu Tyr His Leu

465 470 475 480

Leu Asp Trp Phe Ala Val Asp Glu Ser Asn Glu Val Asp Pro Glu Phe
485 490 495

Ser Ala Arg Leu Thr Gly Ile Lys Leu Glu Met Glu Pro Ser Leu Ser
500 505 510

Phe Tyr Asn Lys Ala Arg Asn Tyr Ala Thr Lys Lys Pro Tyr Ser Val
515 520 525

Glu Lys Phe Lys Leu Asn Phe Gln Met Pro Thr Leu Ala Ser Gly Trp
530 535 540

Asp Val Asn Lys Glu Lys Asn Asn Gly Ala Ile Leu Phe Val Lys Asn
545 550 555 560

Gly Leu Tyr Tyr Leu Gly Ile Met Pro Lys Gln Lys Gly Arg Tyr Lys
565 570 575

Ala Leu Ser Phe Glu Pro Thr Glu Lys Thr Ser Glu Gly Phe Asp Lys
580 585 590

Met Tyr Tyr Asp Tyr Phe Pro Asp Ala Ala Lys Met Ile Pro Lys Cys
595 600 605

Ser Thr Gln Leu Lys Ala Val Thr Ala His Phe Gln Thr His Thr Thr
610 615 620

Pro Ile Leu Leu Ser Asn Asn Phe Ile Glu Pro Leu Glu Ile Thr Lys
625 630 635 640

Glu Ile Tyr Asp Leu Asn Asn Pro Glu Lys Glu Pro Lys Lys Phe Gln
645 650 655

Thr Ala Tyr Ala Lys Lys Thr Gly Asp Gln Lys Gly Tyr Arg Glu Ala
660 665 670

Leu Cys Lys Trp Ile Asp Phe Thr Arg Asp Phe Leu Ser Lys Tyr Thr

675 680 685

Lys Thr Thr Ser Ile Asp Leu Ser Ser Leu Arg Pro Ser Ser Gln Tyr
690 695 700

Lys Asp Leu Gly Glu Tyr Tyr Ala Glu Leu Asn Pro Leu Leu Tyr His
705 710 715 720

Ile Ser Phe Gln Arg Ile Ala Glu Lys Glu Ile Met Asp Ala Val Glu
725 730 735

Thr Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ala Lys
740 745 750

Gly His His Gly Lys Pro Asn Leu His Thr Leu Tyr Trp Thr Gly Leu
755 760 765

Phe Ser Pro Glu Asn Leu Ala Lys Thr Ser Ile Lys Leu Asn Gly Gln
770 775 780

Ala Glu Leu Phe Tyr Arg Pro Lys Ser Arg Met Lys Arg Met Ala His
785 790 795 800

Arg Leu Gly Glu Lys Met Leu Asn Lys Lys Leu Lys Asp Gln Lys Thr
805 810 815

Pro Ile Pro Asp Thr Leu Tyr Gln Glu Leu Tyr Asp Tyr Val Asn His
820 825 830

Arg Leu Ser His Asp Leu Ser Asp Glu Ala Arg Ala Leu Leu Pro Asn
835 840 845

Val Ile Thr Lys Glu Val Ser His Glu Ile Ile Lys Asp Arg Arg Phe
850 855 860

Thr Ser Asp Lys Phe Phe Phe His Val Pro Ile Thr Leu Asn Tyr Gln
865 870 875 880

Ala Ala Asn Ser Pro Ser Lys Phe Asn Gln Arg Val Asn Ala Tyr Leu

885 890 895

Lys Glu His Pro Glu Thr Pro Ile Ile Gly Ile Asp Arg Gly Glu Ala
900 905 910

Asn Leu Ile Tyr Ile Thr Val Ile Asp Ser Thr Gly Lys Ile Leu Glu
915 920 925

Gln Arg Ser Leu Asn Thr Ile Gln Gln Phe Asp Tyr Gln Lys Lys Leu
930 935 940

Asp Asn Arg Glu Lys Glu Arg Val Ala Ala Arg Gln Ala Trp Ser Val
945 950 955 960

Val Gly Thr Ile Lys Asp Leu Lys Gln Gly Tyr Leu Ser Gln Val Ile
965 970 975

His Glu Ile Val Asp Leu Met Ile His Tyr Gln Ala Val Val Val Leu
980 985 990

Glu Asn Leu Asn Phe Gly Phe Lys Ser Lys Arg Thr Gly Ile Ala Glu
995 1000 1005

Lys Ala Val Tyr Gln Gln Phe Glu Lys Met Leu Ile Asp Lys Leu
1010 1015 1020

Asn Cys Leu Val Leu Lys Asp Tyr Pro Ala Glu Lys Val Gly Gly
1025 1030 1035

Val Leu Asn Pro Tyr Gln Leu Thr Asp Gln Phe Thr Ser Phe Ala
1040 1045 1050

Lys Met Gly Thr Gln Ser Gly Phe Leu Phe Tyr Val Pro Ala Pro
1055 1060 1065

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

Val Trp Lys Thr Ile Lys Asn His Glu Ser Arg Lys His Phe Leu

1085 1090 1095

Glu Gly Phe Asp Phe Leu His Tyr Asp Val Lys Thr Gly Asp Phe
1100 1105 1110

Ile Leu His Phe Lys Met Asn Arg Asn Leu Ser Phe Gln Arg Gly
1115 1120 1125

Leu Pro Gly Phe Met Pro Ala Trp Asp Ile Val Phe Glu Lys Asn
1130 1135 1140

Glu Thr Gln Phe Asp Ala Lys Gly Thr Pro Phe Ile Ala Gly Lys
1145 1150 1155

Arg Ile Val Pro Val Ile Glu Asn His Arg Phe Thr Gly Arg Tyr
1160 1165 1170

Arg Asp Leu Tyr Pro Ala Asn Glu Leu Ile Ala Leu Leu Glu Glu
1175 1180 1185

Lys Gly Ile Val Phe Arg Asp Gly Ser Asn Ile Leu Pro Lys Leu
1190 1195 1200

Leu Glu Asn Asp Asp Ser His Ala Ile Asp Thr Met Val Ala Leu
1205 1210 1215

Ile Arg Ser Val Leu Gln Met Arg Asn Ser Asn Ala Ala Thr Gly
1220 1225 1230

Glu Asp Tyr Ile Asn Ser Pro Val Arg Asp Leu Asn Gly Val Cys
1235 1240 1245

Phe Asp Ser Arg Phe Gln Asn Pro Glu Trp Pro Met Asp Ala Asp
1250 1255 1260

Ala Asn Gly Ala Tyr His Ile Ala Leu Lys Gly Gln Leu Leu Leu
1265 1270 1275

Asn His Leu Lys Glu Ser Lys Asp Leu Lys Leu Gln Asn Gly Ile

1280 1285 1290

Ser Asn Gln Asp Trp Leu Ala Tyr Ile Gln Glu Leu Arg Asn
1295 1300 1305

<210> 20
<211> 1228
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 20

Met Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr
1 5 10 15

Leu Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp
20 25 30

Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys
35 40 45

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

Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu
65 70 75 80

Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn
85 90 95

Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn
100 105 110

Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu
115 120 125

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

```
Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn
145                 150                 155                 160

Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile
                165                 170                 175

Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys
            180                 185                 190

Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys
        195                 200                 205

Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe
    210                 215                 220

Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile
225                 230                 235                 240

Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn
                245                 250                 255

Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys
            260                 265                 270

Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser
        275                 280                 285

Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe
    290                 295                 300

Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys
305                 310                 315                 320

Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile
                325                 330                 335

Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe
            340                 345                 350
```

```
Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp
        355                 360                 365

Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp
    370                 375                 380

Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu
385                 390                 395                 400

Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu
                405                 410                 415

Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser
            420                 425                 430

Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys
        435                 440                 445

Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys
    450                 455                 460

Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr
465                 470                 475                 480

Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile
                485                 490                 495

Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr
            500                 505                 510

Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro
        515                 520                 525

Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala
    530                 535                 540

Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys
545                 550                 555                 560
```

```
Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly
                565                 570                 575

Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met
            580                 585                 590

Leu Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro
        595                 600                 605

Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly
    610                 615                 620

Asp Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys
625                 630                 635                 640

Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn
                645                 650                 655

Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu
            660                 665                 670

Val Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys
        675                 680                 685

Glu Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile
    690                 695                 700

Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His
705                 710                 715                 720

Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile
                725                 730                 735

Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys
            740                 745                 750

Lys Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys
        755                 760                 765
```

```
Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr
    770                 775                 780

Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile
785                 790                 795                 800

Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val
                805                 810                 815

Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Asp
            820                 825                 830

Arg Gly Glu Ala Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly
        835                 840                 845

Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn
    850                 855                 860

Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu
865                 870                 875                 880

Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile
                885                 890                 895

Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys
            900                 905                 910

Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu Asn
        915                 920                 925

Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val Tyr Gln
    930                 935                 940

Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val Asp Lys
945                 950                 955                 960

Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly Tyr Gln Ile
                965                 970                 975
```

```
Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser Thr Gln Asn Gly Phe
            980                 985                 990


Ile Phe Tyr Ile Pro Ala Trp Leu  Thr Ser Lys Ile Asp  Pro Ser Thr
        995                 1000                1005


Gly Phe  Val Asn Leu Leu Lys  Thr Lys Tyr Thr Ser  Ile Ala Asp
    1010                1015                1020


Ser Lys  Lys Phe Ile Ser Ser  Phe Asp Arg Ile Met  Tyr Val Pro
    1025                1030                1035


Glu Glu  Asp Leu Phe Glu Phe  Ala Leu Asp Tyr Lys  Asn Phe Ser
    1040                1045                1050


Arg Thr  Asp Ala Asp Tyr Ile  Lys Lys Trp Lys Leu  Tyr Ser Tyr
    1055                1060                1065


Gly Asn  Arg Ile Arg Ile Phe  Arg Asn Pro Lys Lys  Asn Asn Val
    1070                1075                1080


Phe Asp  Trp Glu Glu Val Cys  Leu Thr Ser Ala Tyr  Lys Glu Leu
    1085                1090                1095


Phe Asn  Lys Tyr Gly Ile Asn  Tyr Gln Gln Gly Asp  Ile Arg Ala
    1100                1105                1110


Leu Leu  Cys Glu Gln Ser Asp  Lys Ala Phe Tyr Ser  Ser Phe Met
    1115                1120                1125


Ala Leu  Met Ser Leu Met Leu  Gln Met Arg Asn Ser  Ile Thr Gly
    1130                1135                1140


Arg Thr  Asp Val Asp Phe Leu  Ile Ser Pro Val Lys  Asn Ser Asp
    1145                1150                1155


Gly Ile  Phe Tyr Asp Ser Arg  Asn Tyr Glu Ala Gln  Glu Asn Ala
    1160                1165                1170
```

```
Ile Leu  Pro Lys Asn Ala Asp  Ala Asn Gly Ala Tyr  Asn Ile Ala
    1175                 1180                 1185


Arg Lys  Val Leu Trp Ala Ile  Gly Gln Phe Lys Lys  Ala Glu Asp
    1190                 1195                 1200


Glu Lys  Leu Asp Lys Val Lys  Ile Ala Ile Ser Asn  Lys Glu Trp
    1205                 1210                 1215


Leu Glu  Tyr Ala Gln Thr Ser  Val Lys His
    1220                 1225
```

<210> 21
<211> 1228
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 21

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Met Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr
1               5                  10                  15


Leu Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp
            20                  25                  30


Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys
        35                  40                  45


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


Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu
65                  70                  75                  80


Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn
                85                  90                  95


Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn
```

100 105 110

Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu
115 120 125

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

Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn
145 150 155 160

Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile
165 170 175

Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys
180 185 190

Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys
195 200 205

Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe
210 215 220

Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile
225 230 235 240

Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn
245 250 255

Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys
260 265 270

Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser
275 280 285

Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe
290 295 300

Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys

305 310 315 320

Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile
325 330 335

Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe
340 345 350

Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp
355 360 365

Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp
370 375 380

Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu
385 390 395 400

Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu
405 410 415

Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser
420 425 430

Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys
435 440 445

Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys
450 455 460

Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr
465 470 475 480

Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile
485 490 495

Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr
500 505 510

Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro

```
        515                 520                 525

Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala
    530                 535                 540

Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys
545                 550                 555                 560

Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly
                565                 570                 575

Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met
            580                 585                 590

Leu Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro
        595                 600                 605

Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly
    610                 615                 620

Asp Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys
625                 630                 635                 640

Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn
                645                 650                 655

Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu
            660                 665                 670

Val Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys
        675                 680                 685

Glu Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile
    690                 695                 700

Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His
705                 710                 715                 720

Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile
```

725 730 735

Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys
740 745 750

Lys Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys
755 760 765

Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr
770 775 780

Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile
785 790 795 800

Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val
805 810 815

Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Asp
820 825 830

Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly
835 840 845

Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn
850 855 860

Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu
865 870 875 880

Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile
885 890 895

Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys
900 905 910

Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu Asn
915 920 925

Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val Tyr Gln

```
    930                 935                 940

Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val Asp Lys
945                 950                 955                 960

Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly Tyr Gln Ile
                965                 970                 975

Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser Thr Gln Asn Gly Phe
            980                 985                 990

Ile Phe Tyr Ile Pro Ala Trp Leu  Thr Ser Lys Ile Asp  Pro Ser Thr
        995                 1000                1005

Gly Phe  Val Asn Leu Leu Lys  Thr Lys Tyr Thr Ser  Ile Ala Asp
    1010                1015                1020

Ser Lys  Lys Phe Ile Ser Ser  Phe Asp Arg Ile Met  Tyr Val Pro
    1025                1030                1035

Glu Glu  Asp Leu Phe Glu Phe  Ala Leu Asp Tyr Lys  Asn Phe Ser
    1040                1045                1050

Arg Thr  Asp Ala Asp Tyr Ile  Lys Lys Trp Lys Leu  Tyr Ser Tyr
    1055                1060                1065

Gly Asn  Arg Ile Arg Ile Phe  Arg Asn Pro Lys Lys  Asn Asn Val
    1070                1075                1080

Phe Asp  Trp Glu Glu Val Cys  Leu Thr Ser Ala Tyr  Lys Glu Leu
    1085                1090                1095

Phe Asn  Lys Tyr Gly Ile Asn  Tyr Gln Gln Gly Asp  Ile Arg Ala
    1100                1105                1110

Leu Leu  Cys Glu Gln Ser Asp  Lys Ala Phe Tyr Ser  Ser Phe Met
    1115                1120                1125

Ala Leu  Met Ser Leu Met Leu  Gln Met Ala Asn Ser  Ile Thr Gly
```

1130 1135 1140

Arg Thr Asp Val Asp Phe Leu Ile Ser Pro Val Lys Asn Ser Asp
1145 1150 1155

Gly Ile Phe Tyr Asp Ser Arg Asn Tyr Glu Ala Gln Glu Asn Ala
1160 1165 1170

Ile Leu Pro Lys Asn Ala Asp Ala Asn Gly Ala Tyr Asn Ile Ala
1175 1180 1185

Arg Lys Val Leu Trp Ala Ile Gly Gln Phe Lys Lys Ala Glu Asp
1190 1195 1200

Glu Lys Leu Asp Lys Val Lys Ile Ala Ile Ser Asn Lys Glu Trp
1205 1210 1215

Leu Glu Tyr Ala Gln Thr Ser Val Lys His
1220 1225

<210> 22
<211> 1305
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 22

Thr Gln Phe Glu Gly Phe Thr Asn Leu Tyr Gln Val Ser Lys Thr Leu
1 5 10 15

Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Lys His Ile Gln Glu
20 25 30

Gln Gly Phe Ile Glu Glu Asp Lys Ala Arg Asn Asp His Tyr Lys Glu
35 40 45

Leu Lys Pro Ile Ile Asp Arg Ile Tyr Lys Thr Tyr Ala Asp Gln Cys
50 55 60

```
Leu Gln Leu Val Gln Leu Asp Trp Glu Asn Leu Ser Ala Ala Ile Asp
65                  70                  75                  80

Ser Tyr Arg Lys Glu Lys Thr Glu Glu Thr Arg Asn Ala Leu Ile Glu
                85                  90                  95

Glu Gln Ala Thr Tyr Arg Asn Ala Ile His Asp Tyr Phe Ile Gly Arg
            100                 105                 110

Thr Asp Asn Leu Thr Asp Ala Ile Asn Lys Arg His Ala Glu Ile Tyr
        115                 120                 125

Lys Gly Leu Phe Lys Ala Glu Leu Phe Asn Gly Lys Val Leu Lys Gln
    130                 135                 140

Leu Gly Thr Val Thr Thr Thr Glu His Glu Asn Ala Leu Leu Arg Ser
145                 150                 155                 160

Phe Asp Lys Phe Thr Thr Tyr Phe Ser Gly Phe Tyr Glu Asn Arg Lys
                165                 170                 175

Asn Val Phe Ser Ala Glu Asp Ile Ser Thr Ala Ile Pro His Arg Ile
            180                 185                 190

Val Gln Asp Asn Phe Pro Lys Phe Lys Glu Asn Cys His Ile Phe Thr
        195                 200                 205

Arg Leu Ile Thr Ala Val Pro Ser Leu Arg Glu His Phe Glu Asn Val
    210                 215                 220

Lys Lys Ala Ile Gly Ile Phe Val Ser Thr Ser Ile Glu Glu Val Phe
225                 230                 235                 240

Ser Phe Pro Phe Tyr Asn Gln Leu Leu Thr Gln Thr Gln Ile Asp Leu
                245                 250                 255

Tyr Asn Gln Leu Leu Gly Gly Ile Ser Arg Glu Ala Gly Thr Glu Lys
            260                 265                 270
```

```
Ile Lys Gly Leu Asn Glu Val Leu Asn Leu Ala Ile Gln Lys Asn Asp
        275                 280                 285

Glu Thr Ala His Ile Ile Ala Ser Leu Pro His Arg Phe Ile Pro Leu
    290                 295                 300

Phe Lys Gln Ile Leu Ser Asp Arg Asn Thr Leu Ser Phe Ile Leu Glu
305                 310                 315                 320

Glu Phe Lys Ser Asp Glu Glu Val Ile Gln Ser Phe Cys Lys Tyr Lys
                325                 330                 335

Thr Leu Leu Arg Asn Glu Asn Val Leu Glu Thr Ala Glu Ala Leu Phe
            340                 345                 350

Asn Glu Leu Asn Ser Ile Asp Leu Thr His Ile Phe Ile Ser His Lys
        355                 360                 365

Lys Leu Glu Thr Ile Ser Ser Ala Leu Cys Asp His Trp Asp Thr Leu
    370                 375                 380

Arg Asn Ala Leu Tyr Glu Arg Arg Ile Ser Glu Leu Thr Gly Lys Ile
385                 390                 395                 400

Thr Lys Ser Ala Lys Glu Lys Val Gln Arg Ser Leu Lys His Glu Asp
                405                 410                 415

Ile Asn Leu Gln Glu Ile Ile Ser Ala Ala Gly Lys Glu Leu Ser Glu
            420                 425                 430

Ala Phe Lys Gln Lys Thr Ser Glu Ile Leu Ser His Ala His Ala Ala
        435                 440                 445

Leu Asp Gln Pro Leu Pro Thr Thr Met Leu Lys Lys Gln Glu Glu Lys
    450                 455                 460

Glu Ile Leu Lys Ser Gln Leu Asp Ser Leu Leu Gly Leu Tyr His Leu
465                 470                 475                 480
```

```
Leu Asp Trp Phe Ala Val Asp Glu Ser Asn Glu Val Asp Pro Glu Phe
                485                 490                 495

Ser Ala Arg Leu Thr Gly Ile Lys Leu Glu Met Glu Pro Ser Leu Ser
            500                 505                 510

Phe Tyr Asn Lys Ala Arg Asn Tyr Ala Thr Lys Lys Pro Tyr Ser Val
        515                 520                 525

Glu Lys Phe Lys Leu Asn Phe Gln Met Pro Thr Leu Ala Ser Gly Trp
    530                 535                 540

Asp Val Asn Lys Glu Lys Asn Asn Gly Ala Ile Leu Phe Val Lys Asn
545                 550                 555                 560

Gly Leu Tyr Tyr Leu Gly Ile Met Pro Lys Gln Lys Gly Arg Tyr Lys
                565                 570                 575

Ala Leu Ser Phe Glu Pro Thr Glu Lys Thr Ser Glu Gly Phe Asp Lys
            580                 585                 590

Met Tyr Tyr Asp Tyr Phe Pro Asp Ala Ala Lys Met Ile Pro Lys Cys
        595                 600                 605

Ser Thr Gln Leu Lys Ala Val Thr Ala His Phe Gln Thr His Thr Thr
    610                 615                 620

Pro Ile Leu Leu Ser Asn Asn Phe Ile Glu Pro Leu Glu Ile Thr Lys
625                 630                 635                 640

Glu Ile Tyr Asp Leu Asn Asn Pro Glu Lys Glu Pro Lys Lys Phe Gln
                645                 650                 655

Thr Ala Tyr Ala Lys Lys Gly Gln Lys Gly Tyr Arg Glu Ala Leu Cys
            660                 665                 670

Lys Trp Ile Asp Phe Thr Arg Asp Phe Leu Ser Lys Tyr Thr Lys Thr
        675                 680                 685
```

```
Thr Ser Ile Asp Leu Ser Ser Leu Arg Pro Ser Ser Gln Tyr Lys Asp
    690                 695                 700

Leu Gly Glu Tyr Tyr Ala Glu Leu Asn Pro Leu Leu Tyr His Ile Ser
705                 710                 715                 720

Phe Gln Arg Ile Ala Glu Lys Glu Ile Met Asp Ala Val Glu Thr Gly
                725                 730                 735

Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ala Lys Gly His
            740                 745                 750

His Gly Lys Pro Asn Leu His Thr Leu Tyr Trp Thr Gly Leu Phe Ser
        755                 760                 765

Pro Glu Asn Leu Ala Lys Thr Ser Ile Lys Leu Asn Gly Gln Ala Glu
    770                 775                 780

Leu Phe Tyr Arg Pro Lys Ser Arg Met Lys Arg Met Ala His Arg Leu
785                 790                 795                 800

Gly Glu Lys Met Leu Asn Lys Lys Leu Lys Asp Gln Lys Thr Pro Ile
                805                 810                 815

Pro Asp Thr Leu Tyr Gln Glu Leu Tyr Asp Tyr Val Asn His Arg Leu
            820                 825                 830

Ser His Asp Leu Ser Asp Glu Ala Arg Ala Leu Leu Pro Asn Val Ile
        835                 840                 845

Thr Lys Glu Val Ser His Glu Ile Ile Lys Asp Arg Arg Phe Thr Ser
    850                 855                 860

Asp Lys Phe Phe Phe His Val Pro Ile Thr Leu Asn Tyr Gln Ala Ala
865                 870                 875                 880

Asn Ser Pro Ser Lys Phe Asn Gln Arg Val Asn Ala Tyr Leu Lys Glu
                885                 890                 895
```

```
His Pro Glu Thr Pro Ile Ile Gly Ile Asp Arg Gly Glu Arg Asn Leu
            900                 905                 910

Ile Tyr Ile Thr Val Ile Asp Ser Thr Gly Lys Ile Leu Glu Gln Arg
        915                 920                 925

Ser Leu Asn Thr Ile Gln Gln Phe Asp Tyr Gln Lys Lys Leu Asp Asn
    930                 935                 940

Arg Glu Lys Glu Arg Val Ala Ala Arg Gln Ala Trp Ser Val Val Gly
945                 950                 955                 960

Thr Ile Lys Asp Leu Lys Gln Gly Tyr Leu Ser Gln Val Ile His Glu
                965                 970                 975

Ile Val Asp Leu Met Ile His Tyr Gln Ala Val Val Val Leu Glu Asn
            980                 985                 990

Leu Asn Phe Gly Phe Lys Ser Lys  Arg Thr Gly Ile Ala  Glu Lys Ala
        995                 1000                1005

Val Tyr  Gln Gln Phe Glu Lys  Met Leu Ile Asp Lys  Leu Asn Cys
    1010                1015                1020

Leu Val  Leu Lys Asp Tyr Pro  Ala Glu Lys Val Gly  Gly Val Leu
    1025                1030                1035

Asn Pro  Tyr Gln Leu Thr Asp  Gln Phe Thr Ser Phe  Ala Lys Met
    1040                1045                1050

Gly Thr  Gln Ser Gly Phe Leu  Phe Tyr Val Pro Ala  Pro Tyr Thr
    1055                1060                1065

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

Lys Thr  Ile Lys Asn His Glu  Ser Arg Lys His Phe  Leu Glu Gly
    1085                1090                1095
```

```
Phe Asp  Phe Leu His Tyr Asp  Val Lys Thr Gly Asp  Phe Ile Leu
    1100                1105                1110

His Phe  Lys Met Asn Arg Asn  Leu Ser Phe Gln Arg  Gly Leu Pro
    1115                1120                1125

Gly Phe  Met Pro Ala Trp Asp  Ile Val Phe Glu Lys  Asn Glu Thr
    1130                1135                1140

Gln Phe  Asp Ala Lys Gly Thr  Pro Phe Ile Ala Gly  Lys Arg Ile
    1145                1150                1155

Val Pro  Val Ile Glu Asn His  Arg Phe Thr Gly Arg  Tyr Arg Asp
    1160                1165                1170

Leu Tyr  Pro Ala Asn Glu Leu  Ile Ala Leu Leu Glu  Glu Lys Gly
    1175                1180                1185

Ile Val  Phe Arg Asp Gly Ser  Asn Ile Leu Pro Lys  Leu Leu Glu
    1190                1195                1200

Asn Asp  Asp Ser His Ala Ile  Asp Thr Met Val Ala  Leu Ile Arg
    1205                1210                1215

Ser Val  Leu Gln Met Arg Asn  Ser Asn Ala Ala Thr  Gly Glu Asp
    1220                1225                1230

Tyr Ile  Asn Ser Pro Val Arg  Asp Leu Asn Gly Val  Cys Phe Asp
    1235                1240                1245

Ser Arg  Phe Gln Asn Pro Glu  Trp Pro Met Asp Ala  Asp Ala Asn
    1250                1255                1260

Gly Ala  Tyr His Ile Ala Leu  Lys Gly Gln Leu Leu  Leu Asn His
    1265                1270                1275

Leu Lys  Glu Ser Lys Asp Leu  Lys Leu Gln Asn Gly  Ile Ser Asn
    1280                1285                1290
```

Gln Asp Trp Leu Ala Tyr Ile Gln Glu Leu Arg Asn
1295 1300 1305

<210> 23
<211> 1303
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 23

Thr Gln Phe Glu Gly Phe Thr Asn Leu Tyr Gln Val Ser Lys Thr Leu
1 5 10 15

Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Lys His Ile Gln Glu
20 25 30

Gln Gly Phe Ile Glu Glu Asp Lys Ala Arg Asn Asp His Tyr Lys Glu
35 40 45

Leu Lys Pro Ile Ile Asp Arg Ile Tyr Lys Thr Tyr Ala Asp Gln Cys
50 55 60

Leu Gln Leu Val Gln Leu Asp Trp Glu Asn Leu Ser Ala Ala Ile Asp
65 70 75 80

Ser Tyr Arg Lys Glu Lys Thr Glu Glu Thr Arg Asn Ala Leu Ile Glu
85 90 95

Glu Gln Ala Thr Tyr Arg Asn Ala Ile His Asp Tyr Phe Ile Gly Arg
100 105 110

Thr Asp Asn Leu Thr Asp Ala Ile Asn Lys Arg His Ala Glu Ile Tyr
115 120 125

Lys Gly Leu Phe Lys Ala Glu Leu Phe Asn Gly Lys Val Leu Lys Gln
130 135 140

Leu Gly Thr Val Thr Thr Thr Glu His Glu Asn Ala Leu Leu Arg Ser

145 150 155 160

Phe Asp Lys Phe Thr Thr Tyr Phe Ser Gly Phe Tyr Glu Asn Arg Lys
165 170 175

Asn Val Phe Ser Ala Glu Asp Ile Ser Thr Ala Ile Pro His Arg Ile
180 185 190

Val Gln Asp Asn Phe Pro Lys Phe Lys Glu Asn Cys His Ile Phe Thr
195 200 205

Arg Leu Ile Thr Ala Val Pro Ser Leu Arg Glu His Phe Glu Asn Val
210 215 220

Lys Lys Ala Ile Gly Ile Phe Val Ser Thr Ser Ile Glu Glu Val Phe
225 230 235 240

Ser Phe Pro Phe Tyr Asn Gln Leu Leu Thr Gln Thr Gln Ile Asp Leu
245 250 255

Tyr Asn Gln Leu Leu Gly Gly Ile Ser Arg Glu Ala Gly Thr Glu Lys
260 265 270

Ile Lys Gly Leu Asn Glu Val Leu Asn Leu Ala Ile Gln Lys Asn Asp
275 280 285

Glu Thr Ala His Ile Ile Ala Ser Leu Pro His Arg Phe Ile Pro Leu
290 295 300

Phe Lys Gln Ile Leu Ser Asp Arg Asn Thr Leu Ser Phe Ile Leu Glu
305 310 315 320

Glu Phe Lys Ser Asp Glu Glu Val Ile Gln Ser Phe Cys Lys Tyr Lys
325 330 335

Thr Leu Leu Arg Asn Glu Asn Val Leu Glu Thr Ala Glu Ala Leu Phe
340 345 350

Asn Glu Leu Asn Ser Ile Asp Leu Thr His Ile Phe Ile Ser His Lys

```
        355                 360                 365

Lys Leu Glu Thr Ile Ser Ser Ala Leu Cys Asp His Trp Asp Thr Leu
    370                 375                 380

Arg Asn Ala Leu Tyr Glu Arg Arg Ile Ser Glu Leu Thr Gly Lys Ile
385                 390                 395                 400

Thr Lys Ser Ala Lys Glu Lys Val Gln Arg Ser Leu Lys His Glu Asp
                405                 410                 415

Ile Asn Leu Gln Glu Ile Ile Ser Ala Ala Gly Lys Glu Leu Ser Glu
            420                 425                 430

Ala Phe Lys Gln Lys Thr Ser Glu Ile Leu Ser His Ala His Ala Ala
        435                 440                 445

Leu Asp Gln Pro Leu Pro Thr Thr Met Leu Lys Lys Gln Glu Glu Lys
    450                 455                 460

Glu Ile Leu Lys Ser Gln Leu Asp Ser Leu Leu Gly Leu Tyr His Leu
465                 470                 475                 480

Leu Asp Trp Phe Ala Val Asp Glu Ser Asn Glu Val Asp Pro Glu Phe
                485                 490                 495

Ser Ala Arg Leu Thr Gly Ile Lys Leu Glu Met Glu Pro Ser Leu Ser
            500                 505                 510

Phe Tyr Asn Lys Ala Arg Asn Tyr Ala Thr Lys Lys Pro Tyr Ser Val
        515                 520                 525

Glu Lys Phe Lys Leu Asn Phe Gln Met Pro Thr Leu Ala Ser Gly Trp
    530                 535                 540

Asp Val Asn Lys Glu Lys Asn Asn Gly Ala Ile Leu Phe Val Lys Asn
545                 550                 555                 560

Gly Leu Tyr Tyr Leu Gly Ile Met Pro Lys Gln Lys Gly Arg Tyr Lys
```

565 570 575

Ala Leu Ser Phe Glu Pro Thr Glu Lys Thr Ser Glu Gly Phe Asp Lys
580 585 590

Met Tyr Tyr Asp Tyr Phe Pro Asp Ala Ala Lys Met Ile Pro Lys Cys
595 600 605

Ser Thr Gln Leu Lys Ala Val Thr Ala His Phe Gln Thr His Thr Thr
610 615 620

Pro Ile Leu Leu Ser Asn Asn Phe Ile Glu Pro Leu Glu Ile Thr Lys
625 630 635 640

Glu Ile Tyr Asp Leu Asn Asn Pro Glu Lys Glu Pro Lys Lys Phe Gln
645 650 655

Thr Ala Tyr Ala Lys Gly Lys Gly Tyr Arg Glu Ala Leu Cys Lys Trp
660 665 670

Ile Asp Phe Thr Arg Asp Phe Leu Ser Lys Tyr Thr Lys Thr Thr Ser
675 680 685

Ile Asp Leu Ser Ser Leu Arg Pro Ser Ser Gln Tyr Lys Asp Leu Gly
690 695 700

Glu Tyr Tyr Ala Glu Leu Asn Pro Leu Leu Tyr His Ile Ser Phe Gln
705 710 715 720

Arg Ile Ala Glu Lys Glu Ile Met Asp Ala Val Glu Thr Gly Lys Leu
725 730 735

Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ala Lys Gly His His Gly
740 745 750

Lys Pro Asn Leu His Thr Leu Tyr Trp Thr Gly Leu Phe Ser Pro Glu
755 760 765

Asn Leu Ala Lys Thr Ser Ile Lys Leu Asn Gly Gln Ala Glu Leu Phe

```
    770                 775                 780

Tyr Arg Pro Lys Ser Arg Met Lys Arg Met Ala His Arg Leu Gly Glu
785                 790                 795                 800

Lys Met Leu Asn Lys Lys Leu Lys Asp Gln Lys Thr Pro Ile Pro Asp
                805                 810                 815

Thr Leu Tyr Gln Glu Leu Tyr Asp Tyr Val Asn His Arg Leu Ser His
            820                 825                 830

Asp Leu Ser Asp Glu Ala Arg Ala Leu Leu Pro Asn Val Ile Thr Lys
        835                 840                 845

Glu Val Ser His Glu Ile Ile Lys Asp Arg Arg Phe Thr Ser Asp Lys
    850                 855                 860

Phe Phe Phe His Val Pro Ile Thr Leu Asn Tyr Gln Ala Ala Asn Ser
865                 870                 875                 880

Pro Ser Lys Phe Asn Gln Arg Val Asn Ala Tyr Leu Lys Glu His Pro
                885                 890                 895

Glu Thr Pro Ile Ile Gly Ile Asp Arg Gly Glu Arg Asn Leu Ile Tyr
            900                 905                 910

Ile Thr Val Ile Asp Ser Thr Gly Lys Ile Leu Glu Gln Arg Ser Leu
        915                 920                 925

Asn Thr Ile Gln Gln Phe Asp Tyr Gln Lys Lys Leu Asp Asn Arg Glu
    930                 935                 940

Lys Glu Arg Val Ala Ala Arg Gln Ala Trp Ser Val Val Gly Thr Ile
945                 950                 955                 960

Lys Asp Leu Lys Gln Gly Tyr Leu Ser Gln Val Ile His Glu Ile Val
                965                 970                 975

Asp Leu Met Ile His Tyr Gln Ala Val Val Val Leu Glu Asn Leu Asn
```

980 985 990

Phe Gly Phe Lys Ser Lys Arg Thr Gly Ile Ala Glu Lys Ala Val Tyr
995 1000 1005

Gln Gln Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Cys Leu Val
1010 1015 1020

Leu Lys Asp Tyr Pro Ala Glu Lys Val Gly Gly Val Leu Asn Pro
1025 1030 1035

Tyr Gln Leu Thr Asp Gln Phe Thr Ser Phe Ala Lys Met Gly Thr
1040 1045 1050

Gln Ser Gly Phe Leu Phe Tyr Val Pro Ala Pro Tyr Thr Ser Lys
1055 1060 1065

Ile Asp Pro Leu Thr Gly Phe Val Asp Pro Phe Val Trp Lys Thr
1070 1075 1080

Ile Lys Asn His Glu Ser Arg Lys His Phe Leu Glu Gly Phe Asp
1085 1090 1095

Phe Leu His Tyr Asp Val Lys Thr Gly Asp Phe Ile Leu His Phe
1100 1105 1110

Lys Met Asn Arg Asn Leu Ser Phe Gln Arg Gly Leu Pro Gly Phe
1115 1120 1125

Met Pro Ala Trp Asp Ile Val Phe Glu Lys Asn Glu Thr Gln Phe
1130 1135 1140

Asp Ala Lys Gly Thr Pro Phe Ile Ala Gly Lys Arg Ile Val Pro
1145 1150 1155

Val Ile Glu Asn His Arg Phe Thr Gly Arg Tyr Arg Asp Leu Tyr
1160 1165 1170

Pro Ala Asn Glu Leu Ile Ala Leu Leu Glu Glu Lys Gly Ile Val

1175 1180 1185

Phe Arg Asp Gly Ser Asn Ile Leu Pro Lys Leu Leu Glu Asn Asp
1190 1195 1200

Asp Ser His Ala Ile Asp Thr Met Val Ala Leu Ile Arg Ser Val
1205 1210 1215

Leu Gln Met Arg Asn Ser Asn Ala Ala Thr Gly Glu Asp Tyr Ile
1220 1225 1230

Asn Ser Pro Val Arg Asp Leu Asn Gly Val Cys Phe Asp Ser Arg
1235 1240 1245

Phe Gln Asn Pro Glu Trp Pro Met Asp Ala Asp Ala Asn Gly Ala
1250 1255 1260

Tyr His Ile Ala Leu Lys Gly Gln Leu Leu Leu Asn His Leu Lys
1265 1270 1275

Glu Ser Lys Asp Leu Lys Leu Gln Asn Gly Ile Ser Asn Gln Asp
1280 1285 1290

Trp Leu Ala Tyr Ile Gln Glu Leu Arg Asn
1295 1300

<210> 24
<211> 1301
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 24

Thr Gln Phe Glu Gly Phe Thr Asn Leu Tyr Gln Val Ser Lys Thr Leu
1 5 10 15

Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Lys His Ile Gln Glu
20 25 30

```
Gln Gly Phe Ile Glu Glu Asp Lys Ala Arg Asn Asp His Tyr Lys Glu
        35                  40                  45

Leu Lys Pro Ile Ile Asp Arg Ile Tyr Lys Thr Tyr Ala Asp Gln Cys
    50                  55                  60

Leu Gln Leu Val Gln Leu Asp Trp Glu Asn Leu Ser Ala Ala Ile Asp
65                  70                  75                  80

Ser Tyr Arg Lys Glu Lys Thr Glu Glu Thr Arg Asn Ala Leu Ile Glu
                85                  90                  95

Glu Gln Ala Thr Tyr Arg Asn Ala Ile His Asp Tyr Phe Ile Gly Arg
            100                 105                 110

Thr Asp Asn Leu Thr Asp Ala Ile Asn Lys Arg His Ala Glu Ile Tyr
        115                 120                 125

Lys Gly Leu Phe Lys Ala Glu Leu Phe Asn Gly Lys Val Leu Lys Gln
    130                 135                 140

Leu Gly Thr Val Thr Thr Thr Glu His Glu Asn Ala Leu Leu Arg Ser
145                 150                 155                 160

Phe Asp Lys Phe Thr Thr Tyr Phe Ser Gly Phe Tyr Glu Asn Arg Lys
                165                 170                 175

Asn Val Phe Ser Ala Glu Asp Ile Ser Thr Ala Ile Pro His Arg Ile
            180                 185                 190

Val Gln Asp Asn Phe Pro Lys Phe Lys Glu Asn Cys His Ile Phe Thr
        195                 200                 205

Arg Leu Ile Thr Ala Val Pro Ser Leu Arg Glu His Phe Glu Asn Val
    210                 215                 220

Lys Lys Ala Ile Gly Ile Phe Val Ser Thr Ser Ile Glu Glu Val Phe
225                 230                 235                 240
```

```
Ser Phe Pro Phe Tyr Asn Gln Leu Leu Thr Gln Thr Gln Ile Asp Leu
                245                 250                 255

Tyr Asn Gln Leu Leu Gly Gly Ile Ser Arg Glu Ala Gly Thr Glu Lys
            260                 265                 270

Ile Lys Gly Leu Asn Glu Val Leu Asn Leu Ala Ile Gln Lys Asn Asp
        275                 280                 285

Glu Thr Ala His Ile Ile Ala Ser Leu Pro His Arg Phe Ile Pro Leu
    290                 295                 300

Phe Lys Gln Ile Leu Ser Asp Arg Asn Thr Leu Ser Phe Ile Leu Glu
305                 310                 315                 320

Glu Phe Lys Ser Asp Glu Glu Val Ile Gln Ser Phe Cys Lys Tyr Lys
                325                 330                 335

Thr Leu Leu Arg Asn Glu Asn Val Leu Glu Thr Ala Glu Ala Leu Phe
            340                 345                 350

Asn Glu Leu Asn Ser Ile Asp Leu Thr His Ile Phe Ile Ser His Lys
        355                 360                 365

Lys Leu Glu Thr Ile Ser Ser Ala Leu Cys Asp His Trp Asp Thr Leu
    370                 375                 380

Arg Asn Ala Leu Tyr Glu Arg Arg Ile Ser Glu Leu Thr Gly Lys Ile
385                 390                 395                 400

Thr Lys Ser Ala Lys Glu Lys Val Gln Arg Ser Leu Lys His Glu Asp
                405                 410                 415

Ile Asn Leu Gln Glu Ile Ile Ser Ala Ala Gly Lys Glu Leu Ser Glu
            420                 425                 430

Ala Phe Lys Gln Lys Thr Ser Glu Ile Leu Ser His Ala His Ala Ala
        435                 440                 445
```

```
Leu Asp Gln Pro Leu Pro Thr Thr Met Leu Lys Lys Gln Glu Glu Lys
    450                 455                 460

Glu Ile Leu Lys Ser Gln Leu Asp Ser Leu Leu Gly Leu Tyr His Leu
465                 470                 475                 480

Leu Asp Trp Phe Ala Val Asp Glu Ser Asn Glu Val Asp Pro Glu Phe
                485                 490                 495

Ser Ala Arg Leu Thr Gly Ile Lys Leu Glu Met Glu Pro Ser Leu Ser
            500                 505                 510

Phe Tyr Asn Lys Ala Arg Asn Tyr Ala Thr Lys Lys Pro Tyr Ser Val
        515                 520                 525

Glu Lys Phe Lys Leu Asn Phe Gln Met Pro Thr Leu Ala Ser Gly Trp
    530                 535                 540

Asp Val Asn Lys Glu Lys Asn Asn Gly Ala Ile Leu Phe Val Lys Asn
545                 550                 555                 560

Gly Leu Tyr Tyr Leu Gly Ile Met Pro Lys Gln Lys Gly Arg Tyr Lys
                565                 570                 575

Ala Leu Ser Phe Glu Pro Thr Glu Lys Thr Ser Glu Gly Phe Asp Lys
            580                 585                 590

Met Tyr Tyr Asp Tyr Phe Pro Asp Ala Ala Lys Met Ile Pro Lys Cys
        595                 600                 605

Ser Thr Gln Leu Lys Ala Val Thr Ala His Phe Gln Thr His Thr Thr
    610                 615                 620

Pro Ile Leu Leu Ser Asn Asn Phe Ile Glu Pro Leu Glu Ile Thr Lys
625                 630                 635                 640

Glu Ile Tyr Asp Leu Asn Asn Pro Glu Lys Glu Pro Lys Lys Phe Gln
                645                 650                 655
```

```
Thr Ala Tyr Ala Gly Gly Tyr Arg Glu Ala Leu Cys Lys Trp Ile Asp
            660                 665                 670

Phe Thr Arg Asp Phe Leu Ser Lys Tyr Thr Lys Thr Thr Ser Ile Asp
        675                 680                 685

Leu Ser Ser Leu Arg Pro Ser Ser Gln Tyr Lys Asp Leu Gly Glu Tyr
    690                 695                 700

Tyr Ala Glu Leu Asn Pro Leu Leu Tyr His Ile Ser Phe Gln Arg Ile
705                 710                 715                 720

Ala Glu Lys Glu Ile Met Asp Ala Val Glu Thr Gly Lys Leu Tyr Leu
                725                 730                 735

Phe Gln Ile Tyr Asn Lys Asp Phe Ala Lys Gly His His Gly Lys Pro
            740                 745                 750

Asn Leu His Thr Leu Tyr Trp Thr Gly Leu Phe Ser Pro Glu Asn Leu
        755                 760                 765

Ala Lys Thr Ser Ile Lys Leu Asn Gly Gln Ala Glu Leu Phe Tyr Arg
    770                 775                 780

Pro Lys Ser Arg Met Lys Arg Met Ala His Arg Leu Gly Glu Lys Met
785                 790                 795                 800

Leu Asn Lys Lys Leu Lys Asp Gln Lys Thr Pro Ile Pro Asp Thr Leu
                805                 810                 815

Tyr Gln Glu Leu Tyr Asp Tyr Val Asn His Arg Leu Ser His Asp Leu
            820                 825                 830

Ser Asp Glu Ala Arg Ala Leu Leu Pro Asn Val Ile Thr Lys Glu Val
        835                 840                 845

Ser His Glu Ile Ile Lys Asp Arg Arg Phe Thr Ser Asp Lys Phe Phe
    850                 855                 860
```

```
Phe His Val Pro Ile Thr Leu Asn Tyr Gln Ala Ala Asn Ser Pro Ser
865                 870                 875                 880

Lys Phe Asn Gln Arg Val Asn Ala Tyr Leu Lys Glu His Pro Glu Thr
                885                 890                 895

Pro Ile Ile Gly Ile Asp Arg Gly Glu Arg Asn Leu Ile Tyr Ile Thr
            900                 905                 910

Val Ile Asp Ser Thr Gly Lys Ile Leu Glu Gln Arg Ser Leu Asn Thr
        915                 920                 925

Ile Gln Gln Phe Asp Tyr Gln Lys Lys Leu Asp Asn Arg Glu Lys Glu
    930                 935                 940

Arg Val Ala Ala Arg Gln Ala Trp Ser Val Val Gly Thr Ile Lys Asp
945                 950                 955                 960

Leu Lys Gln Gly Tyr Leu Ser Gln Val Ile His Glu Ile Val Asp Leu
                965                 970                 975

Met Ile His Tyr Gln Ala Val Val Val Leu Glu Asn Leu Asn Phe Gly
            980                 985                 990

Phe Lys Ser Lys Arg Thr Gly Ile  Ala Glu Lys Ala Val  Tyr Gln Gln
        995                 1000                1005

Phe Glu  Lys Met Leu Ile Asp  Lys Leu Asn Cys Leu  Val Leu Lys
    1010                1015                1020

Asp Tyr  Pro Ala Glu Lys Val  Gly Gly Val Leu Asn  Pro Tyr Gln
    1025                1030                1035

Leu Thr  Asp Gln Phe Thr Ser  Phe Ala Lys Met Gly  Thr Gln Ser
    1040                1045                1050

Gly Phe  Leu Phe Tyr Val Pro  Ala Pro Tyr Thr Ser  Lys Ile Asp
    1055                1060                1065
```

```
Pro Leu  Thr Gly Phe Val Asp  Pro Phe Val Trp Lys  Thr Ile Lys
    1070                1075                1080

Asn His  Glu Ser Arg Lys His  Phe Leu Glu Gly Phe  Asp Phe Leu
    1085                1090                1095

His Tyr  Asp Val Lys Thr Gly  Asp Phe Ile Leu His  Phe Lys Met
    1100                1105                1110

Asn Arg  Asn Leu Ser Phe Gln  Arg Gly Leu Pro Gly  Phe Met Pro
    1115                1120                1125

Ala Trp  Asp Ile Val Phe Glu  Lys Asn Glu Thr Gln  Phe Asp Ala
    1130                1135                1140

Lys Gly  Thr Pro Phe Ile Ala  Gly Lys Arg Ile Val  Pro Val Ile
    1145                1150                1155

Glu Asn  His Arg Phe Thr Gly  Arg Tyr Arg Asp Leu  Tyr Pro Ala
    1160                1165                1170

Asn Glu  Leu Ile Ala Leu Leu  Glu Glu Lys Gly Ile  Val Phe Arg
    1175                1180                1185

Asp Gly  Ser Asn Ile Leu Pro  Lys Leu Leu Glu Asn  Asp Asp Ser
    1190                1195                1200

His Ala  Ile Asp Thr Met Val  Ala Leu Ile Arg Ser  Val Leu Gln
    1205                1210                1215

Met Arg  Asn Ser Asn Ala Ala  Thr Gly Glu Asp Tyr  Ile Asn Ser
    1220                1225                1230

Pro Val  Arg Asp Leu Asn Gly  Val Cys Phe Asp Ser  Arg Phe Gln
    1235                1240                1245

Asn Pro  Glu Trp Pro Met Asp  Ala Asp Ala Asn Gly  Ala Tyr His
    1250                1255                1260
```

```
Ile Ala  Leu Lys Gly Gln Leu  Leu Leu Asn His Leu  Lys Glu Ser
    1265                1270                1275


Lys Asp  Leu Lys Leu Gln Asn  Gly Ile Ser Asn Gln  Asp Trp Leu
    1280                1285                1290


Ala Tyr  Ile Gln Glu Leu Arg  Asn
    1295                1300


<210>  25
<211>  887
<212>  PRT
<213>  Natronobacterium gregoryi

<400>  25

Met Thr Val Ile Asp Leu Asp Ser Thr Thr Thr Ala Asp Glu Leu Thr
1               5                   10                  15


Ser Gly His Thr Tyr Asp Ile Ser Val Thr Leu Thr Gly Val Tyr Asp
            20                  25                  30


Asn Thr Asp Glu Gln His Pro Arg Met Ser Leu Ala Phe Glu Gln Asp
        35                  40                  45


Asn Gly Glu Arg Arg Tyr Ile Thr Leu Trp Lys Asn Thr Thr Pro Lys
    50                  55                  60


Asp Val Phe Thr Tyr Asp Tyr Ala Thr Gly Ser Thr Tyr Ile Phe Thr
65                  70                  75                  80


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


Tyr Gln Thr Thr Val Glu Asn Ala Thr Ala Gln Glu Val Gly Thr Thr
            100                 105                 110


Asp Glu Asp Glu Thr Phe Ala Gly Gly Glu Pro Leu Asp His His Leu
        115                 120                 125
```

```
Asp Asp Ala Leu Asn Glu Thr Pro Asp Asp Ala Glu Thr Glu Ser Asp
    130                 135                 140

Ser Gly His Val Met Thr Ser Phe Ala Ser Arg Asp Gln Leu Pro Glu
145                 150                 155                 160

Trp Thr Leu His Thr Tyr Thr Leu Thr Ala Thr Asp Gly Ala Lys Thr
                165                 170                 175

Asp Thr Glu Tyr Ala Arg Arg Thr Leu Ala Tyr Thr Val Arg Gln Glu
            180                 185                 190

Leu Tyr Thr Asp His Asp Ala Ala Pro Val Ala Thr Asp Gly Leu Met
        195                 200                 205

Leu Leu Thr Pro Glu Pro Leu Gly Glu Thr Pro Leu Asp Leu Asp Cys
    210                 215                 220

Gly Val Arg Val Glu Ala Asp Glu Thr Arg Thr Leu Asp Tyr Thr Thr
225                 230                 235                 240

Ala Lys Asp Arg Leu Leu Ala Arg Glu Leu Val Glu Glu Gly Leu Lys
                245                 250                 255

Arg Ser Leu Trp Asp Asp Tyr Leu Val Arg Gly Ile Asp Glu Val Leu
            260                 265                 270

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

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

Ile Asn Phe Arg His Arg Phe Val Pro Lys Leu Thr Leu Ala Asp Ile
305                 310                 315                 320

Asp Asp Asp Asn Ile Tyr Pro Gly Leu Arg Val Lys Thr Thr Tyr Arg
                325                 330                 335
```

```
Pro Arg Arg Gly His Ile Val Trp Gly Leu Arg Asp Glu Cys Ala Thr
            340                 345                 350

Asp Ser Leu Asn Thr Leu Gly Asn Gln Ser Val Val Ala Tyr His Arg
        355                 360                 365

Asn Asn Gln Thr Pro Ile Asn Thr Asp Leu Leu Asp Ala Ile Glu Ala
    370                 375                 380

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

Ala Val Ser Phe Pro Gln Glu Leu Leu Ala Val Glu Pro Asn Thr His
                405                 410                 415

Gln Ile Lys Gln Phe Ala Ser Asp Gly Phe His Gln Gln Ala Arg Ser
            420                 425                 430

Lys Thr Arg Leu Ser Ala Ser Arg Cys Ser Glu Lys Ala Gln Ala Phe
        435                 440                 445

Ala Glu Arg Leu Asp Pro Val Arg Leu Asn Gly Ser Thr Val Glu Phe
    450                 455                 460

Ser Ser Glu Phe Phe Thr Gly Asn Asn Glu Gln Gln Leu Arg Leu Leu
465                 470                 475                 480

Tyr Glu Asn Gly Glu Ser Val Leu Thr Phe Arg Asp Gly Ala Arg Gly
                485                 490                 495

Ala His Pro Asp Glu Thr Phe Ser Lys Gly Ile Val Asn Pro Pro Glu
            500                 505                 510

Ser Phe Glu Val Ala Val Val Leu Pro Glu Gln Gln Ala Asp Thr Cys
        515                 520                 525

Lys Ala Gln Trp Asp Thr Met Ala Asp Leu Leu Asn Gln Ala Gly Ala
    530                 535                 540
```

```
Pro Pro Thr Arg Ser Glu Thr Val Gln Tyr Asp Ala Phe Ser Ser Pro
545                 550                 555                 560

Glu Ser Ile Ser Leu Asn Val Ala Gly Ala Ile Asp Pro Ser Glu Val
                565                 570                 575

Asp Ala Ala Phe Val Val Leu Pro Pro Asp Gln Glu Gly Phe Ala Asp
            580                 585                 590

Leu Ala Ser Pro Thr Glu Thr Tyr Asp Glu Leu Lys Lys Ala Leu Ala
        595                 600                 605

Asn Met Gly Ile Tyr Ser Gln Met Ala Tyr Phe Asp Arg Phe Arg Asp
    610                 615                 620

Ala Lys Ile Phe Tyr Thr Arg Asn Val Ala Leu Gly Leu Leu Ala Ala
625                 630                 635                 640

Ala Gly Gly Val Ala Phe Thr Thr Glu His Ala Met Pro Gly Asp Ala
                645                 650                 655

Asp Met Phe Ile Gly Ile Asp Val Ser Arg Ser Tyr Pro Glu Asp Gly
            660                 665                 670

Ala Ser Gly Gln Ile Asn Ile Ala Ala Thr Ala Thr Ala Val Tyr Lys
        675                 680                 685

Asp Gly Thr Ile Leu Gly His Ser Ser Thr Arg Pro Gln Leu Gly Glu
    690                 695                 700

Lys Leu Gln Ser Thr Asp Val Arg Asp Ile Met Lys Asn Ala Ile Leu
705                 710                 715                 720

Gly Tyr Gln Gln Val Thr Gly Glu Ser Pro Thr His Ile Val Ile His
                725                 730                 735

Arg Asp Gly Phe Met Asn Glu Asp Leu Asp Pro Ala Thr Glu Phe Leu
            740                 745                 750
```

```
Asn Glu Gln Gly Val Glu Tyr Asp Ile Val Glu Ile Arg Lys Gln Pro
        755                 760                 765

Gln Thr Arg Leu Leu Ala Val Ser Asp Val Gln Tyr Asp Thr Pro Val
    770                 775                 780

Lys Ser Ile Ala Ala Ile Asn Gln Asn Glu Pro Arg Ala Thr Val Ala
785                 790                 795                 800

Thr Phe Gly Ala Pro Glu Tyr Leu Ala Thr Arg Asp Gly Gly Gly Leu
                805                 810                 815

Pro Arg Pro Ile Gln Ile Glu Arg Val Ala Gly Glu Thr Asp Ile Glu
            820                 825                 830

Thr Leu Thr Arg Gln Val Tyr Leu Leu Ser Gln Ser His Ile Gln Val
        835                 840                 845

His Asn Ser Thr Ala Arg Leu Pro Ile Thr Thr Ala Tyr Ala Asp Gln
    850                 855                 860

Ala Ser Thr His Ala Thr Lys Gly Tyr Leu Val Gln Thr Gly Ala Phe
865                 870                 875                 880

Glu Ser Asn Val Gly Phe Leu
                885
```

<210> 26
<211> 1129
<212> PRT
<213> Alicyclobacillus acidoterrestris

<400> 26

```
Met Ala Val Lys Ser Ile Lys Val Lys Leu Arg Leu Asp Asp Met Pro
1               5                   10                  15

Glu Ile Arg Ala Gly Leu Trp Lys Leu His Lys Glu Val Asn Ala Gly
            20                  25                  30

Val Arg Tyr Tyr Thr Glu Trp Leu Ser Leu Leu Arg Gln Glu Asn Leu
```

35 40 45

Tyr Arg Arg Ser Pro Asn Gly Asp Gly Glu Gln Glu Cys Asp Lys Thr
50 55 60

Ala Glu Glu Cys Lys Ala Glu Leu Leu Glu Arg Leu Arg Ala Arg Gln
65 70 75 80

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

Gln Leu Ala Arg Gln Leu Tyr Glu Leu Leu Val Pro Gln Ala Ile Gly
100 105 110

Ala Lys Gly Asp Ala Gln Gln Ile Ala Arg Lys Phe Leu Ser Pro Leu
115 120 125

Ala Asp Lys Asp Ala Val Gly Gly Leu Gly Ile Ala Lys Ala Gly Asn
130 135 140

Lys Pro Arg Trp Val Arg Met Arg Glu Ala Gly Glu Pro Gly Trp Glu
145 150 155 160

Glu Glu Lys Glu Lys Ala Glu Thr Arg Lys Ser Ala Asp Arg Thr Ala
165 170 175

Asp Val Leu Arg Ala Leu Ala Asp Phe Gly Leu Lys Pro Leu Met Arg
180 185 190

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

Lys Gly Gln Ala Val Arg Thr Trp Asp Arg Asp Met Phe Gln Gln Ala
210 215 220

Ile Glu Arg Met Met Ser Trp Glu Ser Trp Asn Gln Arg Val Gly Gln
225 230 235 240

Glu Tyr Ala Lys Leu Val Glu Gln Lys Asn Arg Phe Glu Gln Lys Asn

245 250 255

Phe Val Gly Gln Glu His Leu Val His Leu Val Asn Gln Leu Gln Gln
260 265 270

Asp Met Lys Glu Ala Ser Pro Gly Leu Glu Ser Lys Glu Gln Thr Ala
275 280 285

His Tyr Val Thr Gly Arg Ala Leu Arg Gly Ser Asp Lys Val Phe Glu
290 295 300

Lys Trp Gly Lys Leu Ala Pro Asp Ala Pro Phe Asp Leu Tyr Asp Ala
305 310 315 320

Glu Ile Lys Asn Val Gln Arg Arg Asn Thr Arg Arg Phe Gly Ser His
325 330 335

Asp Leu Phe Ala Lys Leu Ala Glu Pro Glu Tyr Gln Ala Leu Trp Arg
340 345 350

Glu Asp Ala Ser Phe Leu Thr Arg Tyr Ala Val Tyr Asn Ser Ile Leu
355 360 365

Arg Lys Leu Asn His Ala Lys Met Phe Ala Thr Phe Thr Leu Pro Asp
370 375 380

Ala Thr Ala His Pro Ile Trp Thr Arg Phe Asp Lys Leu Gly Gly Asn
385 390 395 400

Leu His Gln Tyr Thr Phe Leu Phe Asn Glu Phe Gly Glu Arg Arg His
405 410 415

Ala Ile Arg Phe His Lys Leu Leu Lys Val Glu Asn Gly Val Ala Arg
420 425 430

Glu Val Asp Asp Val Thr Val Pro Ile Ser Met Ser Glu Gln Leu Asp
435 440 445

Asn Leu Leu Pro Arg Asp Pro Asn Glu Pro Ile Ala Leu Tyr Phe Arg

```
    450                 455                 460

Asp Tyr Gly Ala Glu Gln His Phe Thr Gly Glu Phe Gly Gly Ala Lys
465                 470                 475                 480

Ile Gln Cys Arg Arg Asp Gln Leu Ala His Met His Arg Arg Arg Gly
                485                 490                 495

Ala Arg Asp Val Tyr Leu Asn Val Ser Val Arg Val Gln Ser Gln Ser
            500                 505                 510

Glu Ala Arg Gly Glu Arg Arg Pro Pro Tyr Ala Ala Val Phe Arg Leu
        515                 520                 525

Val Gly Asp Asn His Arg Ala Phe Val His Phe Asp Lys Leu Ser Asp
    530                 535                 540

Tyr Leu Ala Glu His Pro Asp Asp Gly Lys Leu Gly Ser Glu Gly Leu
545                 550                 555                 560

Leu Ser Gly Leu Arg Val Met Ser Val Asp Leu Gly Leu Arg Thr Ser
                565                 570                 575

Ala Ser Ile Ser Val Phe Arg Val Ala Arg Lys Asp Glu Leu Lys Pro
            580                 585                 590

Asn Ser Lys Gly Arg Val Pro Phe Phe Phe Pro Ile Lys Gly Asn Asp
        595                 600                 605

Asn Leu Val Ala Val His Glu Arg Ser Gln Leu Leu Lys Leu Pro Gly
    610                 615                 620

Glu Thr Glu Ser Lys Asp Leu Arg Ala Ile Arg Glu Glu Arg Gln Arg
625                 630                 635                 640

Thr Leu Arg Gln Leu Arg Thr Gln Leu Ala Tyr Leu Arg Leu Leu Val
                645                 650                 655

Arg Cys Gly Ser Glu Asp Val Gly Arg Arg Glu Arg Ser Trp Ala Lys
```

660 665 670

Leu Ile Glu Gln Pro Val Asp Ala Ala Asn His Met Thr Pro Asp Trp
675 680 685

Arg Glu Ala Phe Glu Asn Glu Leu Gln Lys Leu Lys Ser Leu His Gly
690 695 700

Ile Cys Ser Asp Lys Glu Trp Met Asp Ala Val Tyr Glu Ser Val Arg
705 710 715 720

Arg Val Trp Arg His Met Gly Lys Gln Val Arg Asp Trp Arg Lys Asp
725 730 735

Val Arg Ser Gly Glu Arg Pro Lys Ile Arg Gly Tyr Ala Lys Asp Val
740 745 750

Val Gly Gly Asn Ser Ile Glu Gln Ile Glu Tyr Leu Glu Arg Gln Tyr
755 760 765

Lys Phe Leu Lys Ser Trp Ser Phe Phe Gly Lys Val Ser Gly Gln Val
770 775 780

Ile Arg Ala Glu Lys Gly Ser Arg Phe Ala Ile Thr Leu Arg Glu His
785 790 795 800

Ile Asp His Ala Lys Glu Asp Arg Leu Lys Lys Leu Ala Asp Arg Ile
805 810 815

Ile Met Glu Ala Leu Gly Tyr Val Tyr Ala Leu Asp Glu Arg Gly Lys
820 825 830

Gly Lys Trp Val Ala Lys Tyr Pro Pro Cys Gln Leu Ile Leu Leu Glu
835 840 845

Glu Leu Ser Glu Tyr Gln Phe Asn Asn Asp Arg Pro Pro Ser Glu Asn
850 855 860

Asn Gln Leu Met Gln Trp Ser His Arg Gly Val Phe Gln Glu Leu Ile

865 870 875 880

Asn Gln Ala Gln Val His Asp Leu Leu Val Gly Thr Met Tyr Ala Ala
885 890 895

Phe Ser Ser Arg Phe Asp Ala Arg Thr Gly Ala Pro Gly Ile Arg Cys
900 905 910

Arg Arg Val Pro Ala Arg Cys Thr Gln Glu His Asn Pro Glu Pro Phe
915 920 925

Pro Trp Trp Leu Asn Lys Phe Val Val Glu His Thr Leu Asp Ala Cys
930 935 940

Pro Leu Arg Ala Asp Asp Leu Ile Pro Thr Gly Glu Gly Glu Ile Phe
945 950 955 960

Val Ser Pro Phe Ser Ala Glu Glu Gly Asp Phe His Gln Ile His Ala
965 970 975

Asp Leu Asn Ala Ala Gln Asn Leu Gln Gln Arg Leu Trp Ser Asp Phe
980 985 990

Asp Ile Ser Gln Ile Arg Leu Arg Cys Asp Trp Gly Glu Val Asp Gly
995 1000 1005

Glu Leu Val Leu Ile Pro Arg Leu Thr Gly Lys Arg Thr Ala Asp
1010 1015 1020

Ser Tyr Ser Asn Lys Val Phe Tyr Thr Asn Thr Gly Val Thr Tyr
1025 1030 1035

Tyr Glu Arg Glu Arg Gly Lys Lys Arg Arg Lys Val Phe Ala Gln
1040 1045 1050

Glu Lys Leu Ser Glu Glu Glu Ala Glu Leu Leu Val Glu Ala Asp
1055 1060 1065

Glu Ala Arg Glu Lys Ser Val Val Leu Met Arg Asp Pro Ser Gly

1070 1075 1080

Ile Ile Asn Arg Gly Asn Trp Thr Arg Gln Lys Glu Phe Trp Ser
1085 1090 1095

Met Val Asn Gln Arg Ile Glu Gly Tyr Leu Val Lys Gln Ile Arg
1100 1105 1110

Ser Arg Val Pro Leu Gln Asp Ser Ala Cys Glu Asn Thr Gly Asp
1115 1120 1125

Ile

<210> 27
<211> 1389
<212> PRT
<213> Leptotrichia shahii

<400> 27

Met Gly Asn Leu Phe Gly His Lys Arg Trp Tyr Glu Val Arg Asp Lys
1 5 10 15

Lys Asp Phe Lys Ile Lys Arg Lys Val Lys Val Lys Arg Asn Tyr Asp
20 25 30

Gly Asn Lys Tyr Ile Leu Asn Ile Asn Glu Asn Asn Asn Lys Glu Lys
35 40 45

Ile Asp Asn Asn Lys Phe Ile Arg Lys Tyr Ile Asn Tyr Lys Lys Asn
50 55 60

Asp Asn Ile Leu Lys Glu Phe Thr Arg Lys Phe His Ala Gly Asn Ile
65 70 75 80

Leu Phe Lys Leu Lys Gly Lys Glu Gly Ile Ile Arg Ile Glu Asn Asn
85 90 95

Asp Asp Phe Leu Glu Thr Glu Glu Val Val Leu Tyr Ile Glu Ala Tyr
100 105 110

Gly Lys Ser Glu Lys Leu Lys Ala Leu Gly Ile Thr Lys Lys Lys Ile
115 120 125

Ile Asp Glu Ala Ile Arg Gln Gly Ile Thr Lys Asp Asp Lys Lys Ile
130 135 140

Glu Ile Lys Arg Gln Glu Asn Glu Glu Glu Ile Glu Ile Asp Ile Arg
145 150 155 160

Asp Glu Tyr Thr Asn Lys Thr Leu Asn Asp Cys Ser Ile Ile Leu Arg
165 170 175

Ile Ile Glu Asn Asp Glu Leu Glu Thr Lys Lys Ser Ile Tyr Glu Ile
180 185 190

Phe Lys Asn Ile Asn Met Ser Leu Tyr Lys Ile Ile Glu Lys Ile Ile
195 200 205

Glu Asn Glu Thr Glu Lys Val Phe Glu Asn Arg Tyr Tyr Glu Glu His
210 215 220

Leu Arg Glu Lys Leu Leu Lys Asp Asp Lys Ile Asp Val Ile Leu Thr
225 230 235 240

Asn Phe Met Glu Ile Arg Glu Lys Ile Lys Ser Asn Leu Glu Ile Leu
245 250 255

Gly Phe Val Lys Phe Tyr Leu Asn Val Gly Gly Asp Lys Lys Lys Ser
260 265 270

Lys Asn Lys Lys Met Leu Val Glu Lys Ile Leu Asn Ile Asn Val Asp
275 280 285

Leu Thr Val Glu Asp Ile Ala Asp Phe Val Ile Lys Glu Leu Glu Phe
290 295 300

Trp Asn Ile Thr Lys Arg Ile Glu Lys Val Lys Lys Val Asn Asn Glu
305 310 315 320

```
Phe Leu Glu Lys Arg Arg Asn Arg Thr Tyr Ile Lys Ser Tyr Val Leu
                325                 330                 335

Leu Asp Lys His Glu Lys Phe Lys Ile Glu Arg Glu Asn Lys Lys Asp
            340                 345                 350

Lys Ile Val Lys Phe Phe Val Glu Asn Ile Lys Asn Asn Ser Ile Lys
        355                 360                 365

Glu Lys Ile Glu Lys Ile Leu Ala Glu Phe Lys Ile Asp Glu Leu Ile
    370                 375                 380

Lys Lys Leu Glu Lys Glu Leu Lys Lys Gly Asn Cys Asp Thr Glu Ile
385                 390                 395                 400

Phe Gly Ile Phe Lys Lys His Tyr Lys Val Asn Phe Asp Ser Lys Lys
                405                 410                 415

Phe Ser Lys Lys Ser Asp Glu Glu Lys Glu Leu Tyr Lys Ile Ile Tyr
            420                 425                 430

Arg Tyr Leu Lys Gly Arg Ile Glu Lys Ile Leu Val Asn Glu Gln Lys
        435                 440                 445

Val Arg Leu Lys Lys Met Glu Lys Ile Glu Ile Glu Lys Ile Leu Asn
    450                 455                 460

Glu Ser Ile Leu Ser Glu Lys Ile Leu Lys Arg Val Lys Gln Tyr Thr
465                 470                 475                 480

Leu Glu His Ile Met Tyr Leu Gly Lys Leu Arg His Asn Asp Ile Asp
                485                 490                 495

Met Thr Thr Val Asn Thr Asp Asp Phe Ser Arg Leu His Ala Lys Glu
            500                 505                 510

Glu Leu Asp Leu Glu Leu Ile Thr Phe Phe Ala Ser Thr Asn Met Glu
        515                 520                 525
```

```
Leu Asn Lys Ile Phe Ser Arg Glu Asn Ile Asn Asn Asp Glu Asn Ile
    530                 535                 540

Asp Phe Phe Gly Gly Asp Arg Glu Lys Asn Tyr Val Leu Asp Lys Lys
545                 550                 555                 560

Ile Leu Asn Ser Lys Ile Lys Ile Ile Arg Asp Leu Asp Phe Ile Asp
                565                 570                 575

Asn Lys Asn Asn Ile Thr Asn Asn Phe Ile Arg Lys Phe Thr Lys Ile
            580                 585                 590

Gly Thr Asn Glu Arg Asn Arg Ile Leu His Ala Ile Ser Lys Glu Arg
        595                 600                 605

Asp Leu Gln Gly Thr Gln Asp Asp Tyr Asn Lys Val Ile Asn Ile Ile
    610                 615                 620

Gln Asn Leu Lys Ile Ser Asp Glu Glu Val Ser Lys Ala Leu Asn Leu
625                 630                 635                 640

Asp Val Val Phe Lys Asp Lys Lys Asn Ile Ile Thr Lys Ile Asn Asp
                645                 650                 655

Ile Lys Ile Ser Glu Glu Asn Asn Asn Asp Ile Lys Tyr Leu Pro Ser
            660                 665                 670

Phe Ser Lys Val Leu Pro Glu Ile Leu Asn Leu Tyr Arg Asn Asn Pro
        675                 680                 685

Lys Asn Glu Pro Phe Asp Thr Ile Glu Thr Glu Lys Ile Val Leu Asn
    690                 695                 700

Ala Leu Ile Tyr Val Asn Lys Glu Leu Tyr Lys Lys Leu Ile Leu Glu
705                 710                 715                 720

Asp Asp Leu Glu Glu Asn Glu Ser Lys Asn Ile Phe Leu Gln Glu Leu
                725                 730                 735
```

```
Lys Lys Thr Leu Gly Asn Ile Asp Glu Ile Asp Glu Asn Ile Ile Glu
            740                 745                 750

Asn Tyr Tyr Lys Asn Ala Gln Ile Ser Ala Ser Lys Gly Asn Asn Lys
        755                 760                 765

Ala Ile Lys Lys Tyr Gln Lys Lys Val Ile Glu Cys Tyr Ile Gly Tyr
    770                 775                 780

Leu Arg Lys Asn Tyr Glu Glu Leu Phe Asp Phe Ser Asp Phe Lys Met
785                 790                 795                 800

Asn Ile Gln Glu Ile Lys Lys Gln Ile Lys Asp Ile Asn Asp Asn Lys
                805                 810                 815

Thr Tyr Glu Arg Ile Thr Val Lys Thr Ser Asp Lys Thr Ile Val Ile
            820                 825                 830

Asn Asp Asp Phe Glu Tyr Ile Ile Ser Ile Phe Ala Leu Leu Asn Ser
        835                 840                 845

Asn Ala Val Ile Asn Lys Ile Arg Asn Arg Phe Phe Ala Thr Ser Val
    850                 855                 860

Trp Leu Asn Thr Ser Glu Tyr Gln Asn Ile Ile Asp Ile Leu Asp Glu
865                 870                 875                 880

Ile Met Gln Leu Asn Thr Leu Arg Asn Glu Cys Ile Thr Glu Asn Trp
                885                 890                 895

Asn Leu Asn Leu Glu Glu Phe Ile Gln Lys Met Lys Glu Ile Glu Lys
            900                 905                 910

Asp Phe Asp Asp Phe Lys Ile Gln Thr Lys Lys Glu Ile Phe Asn Asn
        915                 920                 925

Tyr Tyr Glu Asp Ile Lys Asn Asn Ile Leu Thr Glu Phe Lys Asp Asp
    930                 935                 940
```

```
Ile Asn Gly Cys Asp Val Leu Glu Lys Lys Leu Glu Lys Ile Val Ile
945                 950                 955                 960


Phe Asp Asp Glu Thr Lys Phe Glu Ile Asp Lys Lys Ser Asn Ile Leu
                965                 970                 975


Gln Asp Glu Gln Arg Lys Leu Ser Asn Ile Asn Lys Lys Asp Leu Lys
            980                 985                 990


Lys Lys Val Asp Gln Tyr Ile Lys  Asp Lys Asp Gln Glu  Ile Lys Ser
        995                 1000                1005


Lys Ile  Leu Cys Arg Ile Ile  Phe Asn Ser Asp Phe  Leu Lys Lys
    1010                1015                1020


Tyr Lys  Lys Glu Ile Asp Asn  Leu Ile Glu Asp Met  Glu Ser Glu
    1025                1030                1035


Asn Glu  Asn Lys Phe Gln Glu  Ile Tyr Tyr Pro Lys  Glu Arg Lys
    1040                1045                1050


Asn Glu  Leu Tyr Ile Tyr Lys  Lys Asn Leu Phe Leu  Asn Ile Gly
    1055                1060                1065


Asn Pro  Asn Phe Asp Lys Ile  Tyr Gly Leu Ile Ser  Asn Asp Ile
    1070                1075                1080


Lys Met  Ala Asp Ala Lys Phe  Leu Phe Asn Ile Asp  Gly Lys Asn
    1085                1090                1095


Ile Arg  Lys Asn Lys Ile Ser  Glu Ile Asp Ala Ile  Leu Lys Asn
    1100                1105                1110


Leu Asn  Asp Lys Leu Asn Gly  Tyr Ser Lys Glu Tyr  Lys Glu Lys
    1115                1120                1125


Tyr Ile  Lys Lys Leu Lys Glu  Asn Asp Asp Phe Phe  Ala Lys Asn
    1130                1135                1140
```

```
Ile Gln  Asn Lys Asn Tyr Lys  Ser Phe Glu Lys Asp  Tyr Asn Arg
    1145                1150                1155

Val Ser  Glu Tyr Lys Lys Ile  Arg Asp Leu Val Glu  Phe Asn Tyr
    1160                1165                1170

Leu Asn  Lys Ile Glu Ser Tyr  Leu Ile Asp Ile Asn  Trp Lys Leu
    1175                1180                1185

Ala Ile  Gln Met Ala Arg Phe  Glu Arg Asp Met His  Tyr Ile Val
    1190                1195                1200

Asn Gly  Leu Arg Glu Leu Gly  Ile Ile Lys Leu Ser  Gly Tyr Asn
    1205                1210                1215

Thr Gly  Ile Ser Arg Ala Tyr  Pro Lys Arg Asn Gly  Ser Asp Gly
    1220                1225                1230

Phe Tyr  Thr Thr Thr Ala Tyr  Tyr Lys Phe Phe Asp  Glu Glu Ser
    1235                1240                1245

Tyr Lys  Lys Phe Glu Lys Ile  Cys Tyr Gly Phe Gly  Ile Asp Leu
    1250                1255                1260

Ser Glu  Asn Ser Glu Ile Asn  Lys Pro Glu Asn Glu  Ser Ile Arg
    1265                1270                1275

Asn Tyr  Ile Ser His Phe Tyr  Ile Val Arg Asn Pro  Phe Ala Asp
    1280                1285                1290

Tyr Ser  Ile Ala Glu Gln Ile  Asp Arg Val Ser Asn  Leu Leu Ser
    1295                1300                1305

Tyr Ser  Thr Arg Tyr Asn Asn  Ser Thr Tyr Ala Ser  Val Phe Glu
    1310                1315                1320

Val Phe  Lys Lys Asp Val Asn  Leu Asp Tyr Asp Glu  Leu Lys Lys
    1325                1330                1335
```

Lys Phe Lys Leu Ile Gly Asn Asn Asp Ile Leu Glu Arg Leu Met
1340 1345 1350

Lys Pro Lys Lys Val Ser Val Leu Glu Leu Glu Ser Tyr Asn Ser
1355 1360 1365

Asp Tyr Ile Lys Asn Leu Ile Ile Glu Leu Leu Thr Lys Ile Glu
1370 1375 1380

Asn Thr Asn Asp Thr Leu
1385

<210> 28
<211> 1050
<212> PRT
<213> Marine metagenome

<400> 28

Met Arg Ser Asn Tyr His Gly Gly Arg Asn Ala Arg Gln Trp Arg Lys
1 5 10 15

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

Lys Phe Pro Leu Glu Thr Asp Ala Ala Glu Ile Asp Phe Asp Lys Ala
35 40 45

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

Gly Leu Val Cys Ala Phe His Leu Ser Gly Phe Arg Leu Phe Ser Lys
65 70 75 80

Ala Gly Glu Ala Met Ala Phe Arg Asn Arg Ser Arg Tyr Pro Thr Asp
85 90 95

Ala Phe Ala Glu Lys Leu Ser Ala Ile Met Gly Ile Gln Leu Pro Thr
100 105 110

```
Leu Ser Pro Glu Gly Leu Asp Leu Ile Phe Gln Ser Pro Pro Arg Ser
        115                 120                 125

Arg Asp Gly Ile Ala Pro Val Trp Ser Glu Asn Glu Val Arg Asn Arg
    130                 135                 140

Leu Tyr Thr Asn Trp Thr Gly Arg Gly Pro Ala Asn Lys Pro Asp Glu
145                 150                 155                 160

His Leu Leu Glu Ile Ala Gly Glu Ile Ala Lys Gln Val Phe Pro Lys
                165                 170                 175

Phe Gly Gly Trp Asp Asp Leu Ala Ser Asp Pro Asp Lys Ala Leu Ala
            180                 185                 190

Ala Ala Asp Lys Tyr Phe Gln Ser Gln Gly Asp Phe Pro Ser Ile Ala
        195                 200                 205

Ser Leu Pro Ala Ala Ile Met Leu Ser Pro Ala Asn Ser Thr Val Asp
    210                 215                 220

Phe Glu Gly Asp Tyr Ile Ala Ile Asp Pro Ala Ala Glu Thr Leu Leu
225                 230                 235                 240

His Gln Ala Val Ser Arg Cys Ala Ala Arg Leu Gly Arg Glu Arg Pro
                245                 250                 255

Asp Leu Asp Gln Asn Lys Gly Pro Phe Val Ser Ser Leu Gln Asp Ala
            260                 265                 270

Leu Val Ser Ser Gln Asn Asn Gly Leu Ser Trp Leu Phe Gly Val Gly
        275                 280                 285

Phe Gln His Trp Lys Glu Lys Ser Pro Lys Glu Leu Ile Asp Glu Tyr
    290                 295                 300

Lys Val Pro Ala Asp Gln His Gly Ala Val Thr Gln Val Lys Ser Phe
305                 310                 315                 320
```

```
Val Asp Ala Ile Pro Leu Asn Pro Leu Phe Asp Thr Thr His Tyr Gly
                325                 330                 335

Glu Phe Arg Ala Ser Val Ala Gly Lys Val Arg Ser Trp Val Ala Asn
            340                 345                 350

Tyr Trp Lys Arg Leu Leu Asp Leu Lys Ser Leu Leu Ala Thr Thr Glu
        355                 360                 365

Phe Thr Leu Pro Glu Ser Ile Ser Asp Pro Lys Ala Val Ser Leu Phe
    370                 375                 380

Ser Gly Leu Leu Val Asp Pro Gln Gly Leu Lys Lys Val Ala Asp Ser
385                 390                 395                 400

Leu Pro Ala Arg Leu Val Ser Ala Glu Glu Ala Ile Asp Arg Leu Met
                405                 410                 415

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

Ala Asp Glu Ile Gly Ala Phe Ile Gly Gln Val Gln Gln Phe Asn Asn
        435                 440                 445

Gln Val Lys Gln Lys Leu Glu Asn Leu Gln Asp Ala Asp Asp Glu Glu
    450                 455                 460

Phe Leu Lys Gly Leu Lys Ile Glu Leu Pro Ser Gly Asp Lys Glu Pro
465                 470                 475                 480

Pro Ala Ile Asn Arg Ile Ser Gly Gly Ala Pro Asp Ala Ala Ala Glu
                485                 490                 495

Ile Ser Glu Leu Glu Glu Lys Leu Gln Arg Leu Leu Asp Ala Arg Ser
            500                 505                 510

Glu His Phe Gln Thr Ile Ser Glu Trp Ala Glu Glu Asn Ala Val Thr
        515                 520                 525
```

```
Leu Asp Pro Ile Ala Ala Met Val Glu Leu Glu Arg Leu Arg Leu Ala
    530                 535                 540

Glu Arg Gly Ala Thr Gly Asp Pro Glu Glu Tyr Ala Leu Arg Leu Leu
545                 550                 555                 560

Leu Gln Arg Ile Gly Arg Leu Ala Asn Arg Val Ser Pro Val Ser Ala
                565                 570                 575

Gly Ser Ile Arg Glu Leu Leu Lys Pro Val Phe Met Glu Glu Arg Glu
            580                 585                 590

Phe Asn Leu Phe Phe His Asn Arg Leu Gly Ser Leu Tyr Arg Ser Pro
        595                 600                 605

Tyr Ser Thr Ser Arg His Gln Pro Phe Ser Ile Asp Val Gly Lys Ala
    610                 615                 620

Lys Ala Ile Asp Trp Ile Ala Gly Leu Asp Gln Ile Ser Ser Asp Ile
625                 630                 635                 640

Glu Lys Ala Leu Ser Gly Ala Gly Glu Ala Leu Gly Asp Gln Leu Arg
                645                 650                 655

Asp Trp Ile Asn Leu Ala Gly Phe Ala Ile Ser Gln Arg Leu Arg Gly
            660                 665                 670

Leu Pro Asp Thr Val Pro Asn Ala Leu Ala Gln Val Arg Cys Pro Asp
        675                 680                 685

Asp Val Arg Ile Pro Pro Leu Leu Ala Met Leu Leu Glu Glu Asp Asp
    690                 695                 700

Ile Ala Arg Asp Val Cys Leu Lys Ala Phe Asn Leu Tyr Val Ser Ala
705                 710                 715                 720

Ile Asn Gly Cys Leu Phe Gly Ala Leu Arg Glu Gly Phe Ile Val Arg
                725                 730                 735
```

```
Thr Arg Phe Gln Arg Ile Gly Thr Asp Gln Ile His Tyr Val Pro Lys
            740                 745                 750

Asp Lys Ala Trp Glu Tyr Pro Asp Arg Leu Asn Thr Ala Lys Gly Pro
        755                 760                 765

Ile Asn Ala Ala Val Ser Ser Asp Trp Ile Glu Lys Asp Gly Ala Val
    770                 775                 780

Ile Lys Pro Val Glu Thr Val Arg Asn Leu Ser Ser Thr Gly Phe Ala
785                 790                 795                 800

Gly Ala Gly Val Ser Glu Tyr Leu Val Gln Ala Pro His Asp Trp Tyr
                805                 810                 815

Thr Pro Leu Asp Leu Arg Asp Val Ala His Leu Val Thr Gly Leu Pro
            820                 825                 830

Val Glu Lys Asn Ile Thr Lys Leu Lys Arg Leu Thr Asn Arg Thr Ala
        835                 840                 845

Phe Arg Met Val Gly Ala Ser Ser Phe Lys Thr His Leu Asp Ser Val
    850                 855                 860

Leu Leu Ser Asp Lys Ile Lys Leu Gly Asp Phe Thr Ile Ile Ile Asp
865                 870                 875                 880

Gln His Tyr Arg Gln Ser Val Thr Tyr Gly Gly Lys Val Lys Ile Ser
                885                 890                 895

Tyr Glu Pro Glu Arg Leu Gln Val Glu Ala Ala Val Pro Val Val Asp
            900                 905                 910

Thr Arg Asp Arg Thr Val Pro Glu Pro Asp Thr Leu Phe Asp His Ile
        915                 920                 925

Val Ala Ile Asp Leu Gly Glu Arg Ser Val Gly Phe Ala Val Phe Asp
    930                 935                 940
```

```
Ile Lys Ser Cys Leu Arg Thr Gly Glu Val Lys Pro Ile His Asp Asn
945                 950                 955                 960


Asn Gly Asn Pro Val Val Gly Thr Val Ala Val Pro Ser Ile Arg Arg
                965                 970                 975


Leu Met Lys Ala Val Arg Ser His Arg Arg Arg Arg Gln Pro Asn Gln
            980                 985                 990


Lys Val Asn Gln Thr Tyr Ser Thr  Ala Leu Gln Asn Tyr  Arg Glu Asn
        995                 1000                1005


Val Ile  Gly Asp Val Cys Asn  Arg Ile Asp Thr Leu  Met Glu Arg
    1010                1015                1020


Tyr Asn  Ala Phe Pro Val Leu  Glu Phe Gln Ile Lys  Asn Phe Gln
    1025                1030                1035


Ala Gly  Ala Lys Gln Leu Glu  Ile Val Tyr Gly Ser
    1040                1045                1050


<210>  29
<211>  345
<212>  PRT
<213>  Sulfolobus islandicus

<400>  29

Met Glu Val Pro Leu Tyr Asn Ile Phe Gly Asp Asn Tyr Ile Ile Gln
1               5                   10                  15


Val Ala Thr Glu Ala Glu Asn Ser Thr Ile Tyr Asn Asn Lys Val Glu
            20                  25                  30


Ile Asp Asp Glu Glu Leu Arg Asn Val Leu Asn Leu Ala Tyr Lys Ile
        35                  40                  45


Ala Lys Asn Asn Glu Asp Ala Ala Ala Glu Arg Arg Gly Lys Ala Lys
    50                  55                  60
```

```
Lys Lys Lys Gly Glu Glu Gly Glu Thr Thr Thr Ser Asn Ile Ile Leu
65                  70                  75                  80

Pro Leu Ser Gly Asn Asp Lys Asn Pro Trp Thr Glu Thr Leu Lys Cys
                85                  90                  95

Tyr Asn Phe Pro Thr Thr Val Ala Leu Ser Glu Val Phe Lys Asn Phe
            100                 105                 110

Ser Gln Val Lys Glu Cys Glu Glu Val Ser Ala Pro Ser Phe Val Lys
        115                 120                 125

Pro Glu Phe Tyr Glu Phe Gly Arg Ser Pro Gly Met Val Glu Arg Thr
    130                 135                 140

Arg Arg Val Lys Leu Glu Val Glu Pro His Tyr Leu Ile Ile Ala Ala
145                 150                 155                 160

Ala Gly Trp Val Leu Thr Arg Leu Gly Lys Ala Lys Val Ser Glu Gly
                165                 170                 175

Asp Tyr Val Gly Val Asn Val Phe Thr Pro Thr Arg Gly Ile Leu Tyr
            180                 185                 190

Ser Leu Ile Gln Asn Val Asn Gly Ile Val Pro Gly Ile Lys Pro Glu
        195                 200                 205

Thr Ala Phe Gly Leu Trp Ile Ala Arg Lys Val Val Ser Ser Val Thr
    210                 215                 220

Asn Pro Asn Val Ser Val Val Arg Ile Tyr Thr Ile Ser Asp Ala Val
225                 230                 235                 240

Gly Gln Asn Pro Thr Thr Ile Asn Gly Gly Phe Ser Ile Asp Leu Thr
                245                 250                 255

Lys Leu Leu Glu Lys Arg Tyr Leu Leu Ser Glu Arg Leu Glu Ala Ile
            260                 265                 270
```

```
Ala Arg Asn Ala Leu Ser Ile Ser Ser Asn Met Arg Glu Arg Tyr Ile
        275                 280                 285

Val Leu Ala Asn Tyr Ile Tyr Glu Tyr Leu Thr Gly Ser Lys Arg Leu
    290                 295                 300

Glu Asp Leu Leu Tyr Phe Ala Asn Arg Asp Leu Ile Met Asn Leu Asn
305                 310                 315                 320

Ser Asp Asp Gly Lys Val Arg Asp Leu Lys Leu Ile Ser Ala Tyr Val
                325                 330                 335

Asn Gly Glu Leu Ile Arg Gly Glu Gly
            340                 345
```

<210> 30
<211> 345
<212> PRT
<213> Sulfolobus islandicus

<400> 30

```
Met Glu Val Pro Leu Tyr Asn Ile Phe Gly Asp Asn Tyr Ile Ile Gln
1               5                   10                  15

Val Ala Thr Glu Ala Glu Asn Ser Thr Ile Tyr Asn Asn Lys Val Glu
            20                  25                  30

Ile Asp Asp Glu Glu Leu Arg Asn Val Leu Asn Leu Ala Tyr Lys Ile
        35                  40                  45

Ala Lys Asn Asn Glu Asp Ala Ala Ala Glu Arg Arg Gly Lys Ala Lys
    50                  55                  60

Lys Lys Lys Gly Glu Glu Gly Glu Thr Thr Thr Ser Asn Ile Ile Leu
65                  70                  75                  80

Pro Leu Ser Gly Asn Asp Lys Asn Pro Trp Thr Glu Thr Leu Lys Cys
                85                  90                  95

Tyr Asn Phe Pro Thr Thr Val Ala Leu Ser Glu Val Phe Lys Asn Phe
```

100 105 110

Ser Gln Val Lys Glu Cys Glu Glu Val Ser Ala Pro Ser Phe Val Lys
115 120 125

Pro Glu Phe Tyr Lys Phe Gly Arg Ser Pro Gly Met Val Glu Arg Thr
130 135 140

Arg Arg Val Lys Leu Glu Val Glu Pro His Tyr Leu Ile Met Ala Ala
145 150 155 160

Ala Gly Trp Val Leu Thr Arg Leu Gly Lys Ala Lys Val Ser Glu Gly
165 170 175

Asp Tyr Val Gly Val Asn Val Phe Thr Pro Thr Arg Gly Ile Leu Tyr
180 185 190

Ser Leu Ile Gln Asn Val Asn Gly Ile Val Pro Gly Ile Lys Pro Glu
195 200 205

Thr Ala Phe Gly Leu Trp Ile Ala Arg Lys Val Val Ser Ser Val Thr
210 215 220

Asn Pro Asn Val Ser Val Val Ser Ile Tyr Thr Ile Ser Asp Ala Val
225 230 235 240

Gly Gln Asn Pro Thr Thr Ile Asn Gly Gly Phe Ser Ile Asp Leu Thr
245 250 255

Lys Leu Leu Glu Lys Arg Asp Leu Leu Ser Glu Arg Leu Glu Ala Ile
260 265 270

Ala Arg Asn Ala Leu Ser Ile Ser Ser Asn Met Arg Glu Arg Tyr Ile
275 280 285

Val Leu Ala Asn Tyr Ile Tyr Glu Tyr Leu Thr Gly Ser Lys Arg Leu
290 295 300

Glu Asp Leu Leu Tyr Phe Ala Asn Arg Asp Leu Ile Met Asn Leu Asn

305 310 315 320

Ser Asp Asp Gly Lys Val Arg Asp Leu Lys Leu Ile Ser Ala Tyr Val
325 330 335

Asn Gly Glu Leu Ile Arg Gly Glu Gly
340 345

<210> 31
<211> 1210
<212> PRT
<213> uncultured Parcubacteria group bacterium

<400> 31

Met Ser Lys Arg His Pro Arg Ile Ser Gly Val Lys Gly Tyr Arg Leu
1 5 10 15

His Ala Gln Arg Leu Glu Tyr Thr Gly Lys Ser Gly Ala Met Arg Thr
20 25 30

Ile Lys Tyr Pro Leu Tyr Ser Ser Pro Ser Gly Gly Arg Thr Val Pro
35 40 45

Arg Glu Ile Val Ser Ala Ile Asn Asp Asp Tyr Val Gly Leu Tyr Gly
50 55 60

Leu Ser Asn Phe Asp Asp Leu Tyr Asn Ala Glu Lys Arg Asn Glu Glu
65 70 75 80

Lys Val Tyr Ser Val Leu Asp Phe Trp Tyr Asp Cys Val Gln Tyr Gly
85 90 95

Ala Val Phe Ser Tyr Thr Ala Pro Gly Leu Leu Lys Asn Val Ala Glu
100 105 110

Val Arg Gly Gly Ser Tyr Glu Leu Thr Lys Thr Leu Lys Gly Ser His
115 120 125

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

```
Lys Glu Ile Ser Arg Ala Asn Gly Ser Leu Asp Lys Leu Lys Lys Asp
145                 150                 155                 160

Ile Ile Asp Cys Phe Lys Ala Glu Tyr Arg Glu Arg His Lys Asp Gln
                165                 170                 175

Cys Asn Lys Leu Ala Asp Asp Ile Lys Asn Ala Lys Lys Asp Ala Gly
            180                 185                 190

Ala Ser Leu Gly Glu Arg Gln Lys Lys Leu Phe Arg Asp Phe Phe Gly
        195                 200                 205

Ile Ser Glu Gln Ser Glu Asn Asp Lys Pro Ser Phe Thr Asn Pro Leu
    210                 215                 220

Asn Leu Thr Cys Cys Leu Leu Pro Phe Asp Thr Val Asn Asn Asn Arg
225                 230                 235                 240

Asn Arg Gly Glu Val Leu Phe Asn Lys Leu Lys Glu Tyr Ala Gln Lys
                245                 250                 255

Leu Asp Lys Asn Glu Gly Ser Leu Glu Met Trp Glu Tyr Ile Gly Ile
            260                 265                 270

Gly Asn Ser Gly Thr Ala Phe Ser Asn Phe Leu Gly Glu Gly Phe Leu
        275                 280                 285

Gly Arg Leu Arg Glu Asn Lys Ile Thr Glu Leu Lys Lys Ala Met Met
    290                 295                 300

Asp Ile Thr Asp Ala Trp Arg Gly Gln Glu Gln Glu Glu Glu Leu Glu
305                 310                 315                 320

Lys Arg Leu Arg Ile Leu Ala Ala Leu Thr Ile Lys Leu Arg Glu Pro
                325                 330                 335

Lys Phe Asp Asn His Trp Gly Gly Tyr Arg Ser Asp Ile Asn Gly Lys
            340                 345                 350
```

Leu Ser Ser Trp Leu Gln Asn Tyr Ile Asn Gln Thr Val Lys Ile Lys
355 360 365

Glu Asp Leu Lys Gly His Lys Lys Asp Leu Lys Lys Ala Lys Glu Met
370 375 380

Ile Asn Arg Phe Gly Glu Ser Asp Thr Lys Glu Glu Ala Val Val Ser
385 390 395 400

Ser Leu Leu Glu Ser Ile Glu Lys Ile Val Pro Asp Asp Ser Ala Asp
405 410 415

Asp Glu Lys Pro Asp Ile Pro Ala Ile Ala Ile Tyr Arg Arg Phe Leu
420 425 430

Ser Asp Gly Arg Leu Thr Leu Asn Arg Phe Val Gln Arg Glu Asp Val
435 440 445

Gln Glu Ala Leu Ile Lys Glu Arg Leu Glu Ala Glu Lys Lys Lys Lys
450 455 460

Pro Lys Lys Arg Lys Lys Lys Ser Asp Ala Glu Asp Glu Lys Glu Thr
465 470 475 480

Ile Asp Phe Lys Glu Leu Phe Pro His Leu Ala Lys Pro Leu Lys Leu
485 490 495

Val Pro Asn Phe Tyr Gly Asp Ser Lys Arg Glu Leu Tyr Lys Lys Tyr
500 505 510

Lys Asn Ala Ala Ile Tyr Thr Asp Ala Leu Trp Lys Ala Val Glu Lys
515 520 525

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

Thr Asp Phe Asp Lys Asp Phe Phe Ile Lys Arg Leu Gln Lys Ile Phe
545 550 555 560

```
Ser Val Tyr Arg Arg Phe Asn Thr Asp Lys Trp Lys Pro Ile Val Lys
                565                 570                 575

Asn Ser Phe Ala Pro Tyr Cys Asp Ile Val Ser Leu Ala Glu Asn Glu
            580                 585                 590

Val Leu Tyr Lys Pro Lys Gln Ser Arg Ser Arg Lys Ser Ala Ala Ile
        595                 600                 605

Asp Lys Asn Arg Val Arg Leu Pro Ser Thr Glu Asn Ile Ala Lys Ala
    610                 615                 620

Gly Ile Ala Leu Ala Arg Glu Leu Ser Val Ala Gly Phe Asp Trp Lys
625                 630                 635                 640

Asp Leu Leu Lys Lys Glu Glu His Glu Glu Tyr Ile Asp Leu Ile Glu
                645                 650                 655

Leu His Lys Thr Ala Leu Ala Leu Leu Leu Ala Val Thr Glu Thr Gln
            660                 665                 670

Leu Asp Ile Ser Ala Leu Asp Phe Val Glu Asn Gly Thr Val Lys Asp
        675                 680                 685

Phe Met Lys Thr Arg Asp Gly Asn Leu Val Leu Glu Gly Arg Phe Leu
    690                 695                 700

Glu Met Phe Ser Gln Ser Ile Val Phe Ser Glu Leu Arg Gly Leu Ala
705                 710                 715                 720

Gly Leu Met Ser Arg Lys Glu Phe Ile Thr Arg Ser Ala Ile Gln Thr
                725                 730                 735

Met Asn Gly Lys Gln Ala Glu Leu Leu Tyr Ile Pro His Glu Phe Gln
            740                 745                 750

Ser Ala Lys Ile Thr Thr Pro Lys Glu Met Ser Arg Ala Phe Leu Asp
        755                 760                 765
```

```
Leu Ala Pro Ala Glu Phe Ala Thr Ser Leu Glu Pro Glu Ser Leu Ser
    770                 775                 780

Glu Lys Ser Leu Leu Lys Leu Lys Gln Met Arg Tyr Tyr Pro His Tyr
785                 790                 795                 800

Phe Gly Tyr Glu Leu Thr Arg Thr Gly Gln Gly Ile Asp Gly Gly Val
                805                 810                 815

Ala Glu Asn Ala Leu Arg Leu Glu Lys Ser Pro Val Lys Lys Arg Glu
            820                 825                 830

Ile Lys Cys Lys Gln Tyr Lys Thr Leu Gly Arg Gly Gln Asn Lys Ile
        835                 840                 845

Val Leu Tyr Val Arg Ser Ser Tyr Tyr Gln Thr Gln Phe Leu Glu Trp
    850                 855                 860

Phe Leu His Arg Pro Lys Asn Val Gln Thr Asp Val Ala Val Ser Gly
865                 870                 875                 880

Ser Phe Leu Ile Asp Glu Lys Lys Val Lys Thr Arg Trp Asn Tyr Asp
                885                 890                 895

Ala Leu Thr Val Ala Leu Glu Pro Val Ser Gly Ser Glu Arg Val Phe
            900                 905                 910

Val Ser Gln Pro Phe Thr Ile Phe Pro Glu Lys Ser Ala Glu Glu Glu
        915                 920                 925

Gly Gln Arg Tyr Leu Gly Ile Asp Ile Gly Glu Tyr Gly Ile Ala Tyr
    930                 935                 940

Thr Ala Leu Glu Ile Thr Gly Asp Ser Ala Lys Ile Leu Asp Gln Asn
945                 950                 955                 960

Phe Ile Ser Asp Pro Gln Leu Lys Thr Leu Arg Glu Glu Val Lys Gly
                965                 970                 975
```

```
Leu Lys Leu Asp Gln Arg Arg Gly Thr Phe Ala Met Pro Ser Thr Lys
            980                 985                 990

Ile Ala Arg Ile Arg Glu Ser Leu  Val His Ser Leu Arg  Asn Arg Ile
        995                 1000                1005

His His  Leu Ala Leu Lys His  Lys Ala Lys Ile Val  Tyr Glu Leu
    1010                1015                1020

Glu Val  Ser Arg Phe Glu Glu  Gly Lys Gln Lys Ile  Lys Lys Val
    1025                1030                1035

Tyr Ala  Thr Leu Lys Lys Ala  Asp Val Tyr Ser Glu  Ile Asp Ala
    1040                1045                1050

Asp Lys  Asn Leu Gln Thr Thr  Val Trp Gly Lys Leu  Ala Val Ala
    1055                1060                1065

Ser Glu  Ile Ser Ala Ser Tyr  Thr Ser Gln Phe Cys  Gly Ala Cys
    1070                1075                1080

Lys Lys  Leu Trp Arg Ala Glu  Met Gln Val Asp Glu  Thr Ile Thr
    1085                1090                1095

Thr Gln  Glu Leu Ile Gly Thr  Val Arg Val Ile Lys  Gly Gly Thr
    1100                1105                1110

Leu Ile  Asp Ala Ile Lys Asp  Phe Met Arg Pro Pro  Ile Phe Asp
    1115                1120                1125

Glu Asn  Asp Thr Pro Phe Pro  Lys Tyr Arg Asp Phe  Cys Asp Lys
    1130                1135                1140

His His  Ile Ser Lys Lys Met  Arg Gly Asn Ser Cys  Leu Phe Ile
    1145                1150                1155

Cys Pro  Phe Cys Arg Ala Asn  Ala Asp Ala Asp Ile  Gln Ala Ser
    1160                1165                1170
```

```
Gln Thr  Ile Ala Leu Leu Arg  Tyr Val Lys Glu Glu  Lys Lys Val
    1175                1180                1185


Glu Asp  Tyr Phe Glu Arg Phe  Arg Lys Leu Lys Asn  Ile Lys Val
    1190                1195                1200


Leu Gly  Gln Met Lys Lys Ile
    1205                1210
```

<210> 32
<211> 1368
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 32

```
Met Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val
1               5                   10                  15


Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe
            20                  25                  30


Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile
        35                  40                  45


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


Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys
65                  70                  75                  80


Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser
                85                  90                  95


Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys
            100                 105                 110
```

```
His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr
        115                 120                 125

His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp
    130                 135                 140

Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His
145                 150                 155                 160

Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro
                165                 170                 175

Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr
            180                 185                 190

Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala
        195                 200                 205

Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn
    210                 215                 220

Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn
225                 230                 235                 240

Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe
                245                 250                 255

Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp
            260                 265                 270

Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp
        275                 280                 285

Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp
    290                 295                 300

Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser
305                 310                 315                 320
```

```
Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys
                325                 330                 335

Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe
            340                 345                 350

Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser
        355                 360                 365

Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp
    370                 375                 380

Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg
385                 390                 395                 400

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
                405                 410                 415

Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe
            420                 425                 430

Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
        435                 440                 445

Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp
    450                 455                 460

Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu
465                 470                 475                 480

Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr
                485                 490                 495

Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser
            500                 505                 510

Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys
        515                 520                 525
```

```
Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln
    530                 535                 540

Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr
545                 550                 555                 560

Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp
                565                 570                 575

Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly
            580                 585                 590

Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
        595                 600                 605

Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr
    610                 615                 620

Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala
625                 630                 635                 640

His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr
                645                 650                 655

Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp
            660                 665                 670

Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe
        675                 680                 685

Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe
    690                 695                 700

Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu
705                 710                 715                 720

His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
                725                 730                 735
```

```
Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
            740                 745                 750

Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln
        755                 760                 765

Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780

Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
785                 790                 795                 800

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu
                805                 810                 815

Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg
            820                 825                 830

Leu Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe Leu Lys
        835                 840                 845

Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg
    850                 855                 860

Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
865                 870                 875                 880

Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys
                885                 890                 895

Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
            900                 905                 910

Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
        915                 920                 925

Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
    930                 935                 940
```

```
Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
945                 950                 955                 960


Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
                965                 970                 975


Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val
            980                 985                 990


Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
        995                 1000                1005


Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
    1010                1015                1020


Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
    1025                1030                1035


Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
    1040                1045                1050


Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
    1055                1060                1065


Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1070                1075                1080


Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1085                1090                1095


Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
    1100                1105                1110


Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
    1115                1120                1125


Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
    1130                1135                1140
```

```
Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
    1145                1150                1155

Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser
    1160                1165                1170

Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys
    1175                1180                1185

Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu
    1190                1195                1200

Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                1210                1215

Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
    1220                1225                1230

Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu Lys Leu  Lys Gly Ser
    1235                1240                1245

Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe Val Glu  Gln His Lys
    1250                1255                1260

His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile Ser Glu  Phe Ser Lys
    1265                1270                1275

Arg Val  Ile Leu Ala Asp Ala  Asn Leu Asp Lys Val  Leu Ser Ala
    1280                1285                1290

Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg Glu Gln  Ala Glu Asn
    1295                1300                1305

Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu Gly Ala  Pro Ala Ala
    1310                1315                1320

Phe Lys  Tyr Phe Asp Thr Thr  Ile Asp Arg Lys Arg  Tyr Thr Ser
    1325                1330                1335
```

Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His Gln Ser Ile Thr
1340 1345 1350

Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp
1355 1360 1365

<210> 33
<211> 1052
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 33

Lys Arg Asn Tyr Ile Leu Gly Leu Asp Ile Gly Ile Thr Ser Val Gly
1 5 10 15

Tyr Gly Ile Ile Asp Tyr Glu Thr Arg Asp Val Ile Asp Ala Gly Val
20 25 30

Arg Leu Phe Lys Glu Ala Asn Val Glu Asn Asn Glu Gly Arg Arg Ser
35 40 45

Lys Arg Gly Ala Arg Arg Leu Lys Arg Arg Arg Arg His Arg Ile Gln
50 55 60

Arg Val Lys Lys Leu Leu Phe Asp Tyr Asn Leu Leu Thr Asp His Ser
65 70 75 80

Glu Leu Ser Gly Ile Asn Pro Tyr Glu Ala Arg Val Lys Gly Leu Ser
85 90 95

Gln Lys Leu Ser Glu Glu Glu Phe Ser Ala Ala Leu Leu His Leu Ala
100 105 110

Lys Arg Arg Gly Val His Asn Val Asn Glu Val Glu Glu Asp Thr Gly
115 120 125

Asn Glu Leu Ser Thr Lys Glu Gln Ile Ser Arg Asn Ser Lys Ala Leu
130 135 140

```
Glu Glu Lys Tyr Val Ala Glu Leu Gln Leu Glu Arg Leu Lys Lys Asp
145                 150                 155                 160

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

Lys Glu Ala Lys Gln Leu Leu Lys Val Gln Lys Ala Tyr His Gln Leu
            180                 185                 190

Asp Gln Ser Phe Ile Asp Thr Tyr Ile Asp Leu Leu Glu Thr Arg Arg
        195                 200                 205

Thr Tyr Tyr Glu Gly Pro Gly Glu Gly Ser Pro Phe Gly Trp Lys Asp
    210                 215                 220

Ile Lys Glu Trp Tyr Glu Met Leu Met Gly His Cys Thr Tyr Phe Pro
225                 230                 235                 240

Glu Glu Leu Arg Ser Val Lys Tyr Ala Tyr Asn Ala Asp Leu Tyr Asn
                245                 250                 255

Ala Leu Asn Asp Leu Asn Asn Leu Val Ile Thr Arg Asp Glu Asn Glu
            260                 265                 270

Lys Leu Glu Tyr Tyr Glu Lys Phe Gln Ile Ile Glu Asn Val Phe Lys
        275                 280                 285

Gln Lys Lys Lys Pro Thr Leu Lys Gln Ile Ala Lys Glu Ile Leu Val
    290                 295                 300

Asn Glu Glu Asp Ile Lys Gly Tyr Arg Val Thr Ser Thr Gly Lys Pro
305                 310                 315                 320

Glu Phe Thr Asn Leu Lys Val Tyr His Asp Ile Lys Asp Ile Thr Ala
                325                 330                 335

Arg Lys Glu Ile Ile Glu Asn Ala Glu Leu Leu Asp Gln Ile Ala Lys
            340                 345                 350
```

```
Ile Leu Thr Ile Tyr Gln Ser Ser Glu Asp Ile Gln Glu Glu Leu Thr
        355                 360                 365

Asn Leu Asn Ser Glu Leu Thr Gln Glu Glu Ile Glu Gln Ile Ser Asn
    370                 375                 380

Leu Lys Gly Tyr Thr Gly Thr His Asn Leu Ser Leu Lys Ala Ile Asn
385                 390                 395                 400

Leu Ile Leu Asp Glu Leu Trp His Thr Asn Asp Asn Gln Ile Ala Ile
                405                 410                 415

Phe Asn Arg Leu Lys Leu Val Pro Lys Lys Val Asp Leu Ser Gln Gln
            420                 425                 430

Lys Glu Ile Pro Thr Thr Leu Val Asp Asp Phe Ile Leu Ser Pro Val
        435                 440                 445

Val Lys Arg Ser Phe Ile Gln Ser Ile Lys Val Ile Asn Ala Ile Ile
    450                 455                 460

Lys Lys Tyr Gly Leu Pro Asn Asp Ile Ile Ile Glu Leu Ala Arg Glu
465                 470                 475                 480

Lys Asn Ser Lys Asp Ala Gln Lys Met Ile Asn Glu Met Gln Lys Arg
                485                 490                 495

Asn Arg Gln Thr Asn Glu Arg Ile Glu Glu Ile Ile Arg Thr Thr Gly
            500                 505                 510

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

Gln Glu Gly Lys Cys Leu Tyr Ser Leu Glu Ala Ile Pro Leu Glu Asp
    530                 535                 540

Leu Leu Asn Asn Pro Phe Asn Tyr Glu Val Asp His Ile Ile Pro Arg
545                 550                 555                 560
```

Ser Val Ser Phe Asp Asn Ser Phe Asn Asn Lys Val Leu Val Lys Gln
565 570 575

Glu Glu Asn Ser Lys Lys Gly Asn Arg Thr Pro Phe Gln Tyr Leu Ser
580 585 590

Ser Ser Asp Ser Lys Ile Ser Tyr Glu Thr Phe Lys Lys His Ile Leu
595 600 605

Asn Leu Ala Lys Gly Lys Gly Arg Ile Ser Lys Thr Lys Lys Glu Tyr
610 615 620

Leu Leu Glu Glu Arg Asp Ile Asn Arg Phe Ser Val Gln Lys Asp Phe
625 630 635 640

Ile Asn Arg Asn Leu Val Asp Thr Arg Tyr Ala Thr Arg Gly Leu Met
645 650 655

Asn Leu Leu Arg Ser Tyr Phe Arg Val Asn Asn Leu Asp Val Lys Val
660 665 670

Lys Ser Ile Asn Gly Gly Phe Thr Ser Phe Leu Arg Arg Lys Trp Lys
675 680 685

Phe Lys Lys Glu Arg Asn Lys Gly Tyr Lys His His Ala Glu Asp Ala
690 695 700

Leu Ile Ile Ala Asn Ala Asp Phe Ile Phe Lys Glu Trp Lys Lys Leu
705 710 715 720

Asp Lys Ala Lys Lys Val Met Glu Asn Gln Met Phe Glu Glu Lys Gln
725 730 735

Ala Glu Ser Met Pro Glu Ile Glu Thr Glu Gln Glu Tyr Lys Glu Ile
740 745 750

Phe Ile Thr Pro His Gln Ile Lys His Ile Lys Asp Phe Lys Asp Tyr
755 760 765

```
Lys Tyr Ser His Arg Val Asp Lys Lys Pro Asn Arg Glu Leu Ile Asn
    770                 775                 780

Asp Thr Leu Tyr Ser Thr Arg Lys Asp Asp Lys Gly Asn Thr Leu Ile
785                 790                 795                 800

Val Asn Asn Leu Asn Gly Leu Tyr Asp Lys Asp Asn Asp Lys Leu Lys
                805                 810                 815

Lys Leu Ile Asn Lys Ser Pro Glu Lys Leu Leu Met Tyr His His Asp
            820                 825                 830

Pro Gln Thr Tyr Gln Lys Leu Lys Leu Ile Met Glu Gln Tyr Gly Asp
        835                 840                 845

Glu Lys Asn Pro Leu Tyr Lys Tyr Tyr Glu Glu Thr Gly Asn Tyr Leu
    850                 855                 860

Thr Lys Tyr Ser Lys Lys Asp Asn Gly Pro Val Ile Lys Lys Ile Lys
865                 870                 875                 880

Tyr Tyr Gly Asn Lys Leu Asn Ala His Leu Asp Ile Thr Asp Asp Tyr
                885                 890                 895

Pro Asn Ser Arg Asn Lys Val Val Lys Leu Ser Leu Lys Pro Tyr Arg
            900                 905                 910

Phe Asp Val Tyr Leu Asp Asn Gly Val Tyr Lys Phe Val Thr Val Lys
        915                 920                 925

Asn Leu Asp Val Ile Lys Lys Glu Asn Tyr Tyr Glu Val Asn Ser Lys
    930                 935                 940

Cys Tyr Glu Glu Ala Lys Lys Leu Lys Lys Ile Ser Asn Gln Ala Glu
945                 950                 955                 960

Phe Ile Ala Ser Phe Tyr Asn Asn Asp Leu Ile Lys Ile Asn Gly Glu
                965                 970                 975
```

Leu Tyr Arg Val Ile Gly Val Asn Asn Asp Leu Leu Asn Arg Ile Glu
980 985 990

Val Asn Met Ile Asp Ile Thr Tyr Arg Glu Tyr Leu Glu Asn Met Asn
995 1000 1005

Asp Lys Arg Pro Pro Arg Ile Ile Lys Thr Ile Ala Ser Lys Thr
1010 1015 1020

Gln Ser Ile Lys Lys Tyr Ser Thr Asp Ile Leu Gly Asn Leu Tyr
1025 1030 1035

Glu Val Lys Ser Lys Lys His Pro Gln Ile Ile Lys Lys Gly
1040 1045 1050

<210> 34
<211> 1052
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 34

Lys Arg Asn Tyr Ile Leu Gly Leu Ala Ile Gly Ile Thr Ser Val Gly
1 5 10 15

Tyr Gly Ile Ile Asp Tyr Glu Thr Arg Asp Val Ile Asp Ala Gly Val
20 25 30

Arg Leu Phe Lys Glu Ala Asn Val Glu Asn Asn Glu Gly Arg Arg Ser
35 40 45

Lys Arg Gly Ala Arg Arg Leu Lys Arg Arg Arg Arg His Arg Ile Gln
50 55 60

Arg Val Lys Lys Leu Leu Phe Asp Tyr Asn Leu Leu Thr Asp His Ser
65 70 75 80

```
Glu Leu Ser Gly Ile Asn Pro Tyr Glu Ala Arg Val Lys Gly Leu Ser
                85                  90                  95

Gln Lys Leu Ser Glu Glu Glu Phe Ser Ala Ala Leu Leu His Leu Ala
            100                 105                 110

Lys Arg Arg Gly Val His Asn Val Asn Glu Val Glu Glu Asp Thr Gly
        115                 120                 125

Asn Glu Leu Ser Thr Lys Glu Gln Ile Ser Arg Asn Ser Lys Ala Leu
    130                 135                 140

Glu Glu Lys Tyr Val Ala Glu Leu Gln Leu Glu Arg Leu Lys Lys Asp
145                 150                 155                 160

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

Lys Glu Ala Lys Gln Leu Leu Lys Val Gln Lys Ala Tyr His Gln Leu
            180                 185                 190

Asp Gln Ser Phe Ile Asp Thr Tyr Ile Asp Leu Leu Glu Thr Arg Arg
        195                 200                 205

Thr Tyr Tyr Glu Gly Pro Gly Glu Gly Ser Pro Phe Gly Trp Lys Asp
    210                 215                 220

Ile Lys Glu Trp Tyr Glu Met Leu Met Gly His Cys Thr Tyr Phe Pro
225                 230                 235                 240

Glu Glu Leu Arg Ser Val Lys Tyr Ala Tyr Asn Ala Asp Leu Tyr Asn
                245                 250                 255

Ala Leu Asn Asp Leu Asn Asn Leu Val Ile Thr Arg Asp Glu Asn Glu
            260                 265                 270

Lys Leu Glu Tyr Tyr Glu Lys Phe Gln Ile Ile Glu Asn Val Phe Lys
        275                 280                 285
```

```
Gln Lys Lys Lys Pro Thr Leu Lys Gln Ile Ala Lys Glu Ile Leu Val
    290                 295                 300

Asn Glu Glu Asp Ile Lys Gly Tyr Arg Val Thr Ser Thr Gly Lys Pro
305                 310                 315                 320

Glu Phe Thr Asn Leu Lys Val Tyr His Asp Ile Lys Asp Ile Thr Ala
                325                 330                 335

Arg Lys Glu Ile Ile Glu Asn Ala Glu Leu Leu Asp Gln Ile Ala Lys
            340                 345                 350

Ile Leu Thr Ile Tyr Gln Ser Ser Glu Asp Ile Gln Glu Glu Leu Thr
        355                 360                 365

Asn Leu Asn Ser Glu Leu Thr Gln Glu Glu Ile Glu Gln Ile Ser Asn
    370                 375                 380

Leu Lys Gly Tyr Thr Gly Thr His Asn Leu Ser Leu Lys Ala Ile Asn
385                 390                 395                 400

Leu Ile Leu Asp Glu Leu Trp His Thr Asn Asp Asn Gln Ile Ala Ile
                405                 410                 415

Phe Asn Arg Leu Lys Leu Val Pro Lys Lys Val Asp Leu Ser Gln Gln
            420                 425                 430

Lys Glu Ile Pro Thr Thr Leu Val Asp Asp Phe Ile Leu Ser Pro Val
        435                 440                 445

Val Lys Arg Ser Phe Ile Gln Ser Ile Lys Val Ile Asn Ala Ile Ile
    450                 455                 460

Lys Lys Tyr Gly Leu Pro Asn Asp Ile Ile Ile Glu Leu Ala Arg Glu
465                 470                 475                 480

Lys Asn Ser Lys Asp Ala Gln Lys Met Ile Asn Glu Met Gln Lys Arg
                485                 490                 495
```

```
Asn Arg Gln Thr Asn Glu Arg Ile Glu Glu Ile Ile Arg Thr Thr Gly
            500                 505                 510

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

Gln Glu Gly Lys Cys Leu Tyr Ser Leu Glu Ala Ile Pro Leu Glu Asp
    530                 535                 540

Leu Leu Asn Asn Pro Phe Asn Tyr Glu Val Asp His Ile Ile Pro Arg
545                 550                 555                 560

Ser Val Ser Phe Asp Asn Ser Phe Asn Asn Lys Val Leu Val Lys Gln
                565                 570                 575

Glu Glu Asn Ser Lys Lys Gly Asn Arg Thr Pro Phe Gln Tyr Leu Ser
            580                 585                 590

Ser Ser Asp Ser Lys Ile Ser Tyr Glu Thr Phe Lys Lys His Ile Leu
        595                 600                 605

Asn Leu Ala Lys Gly Lys Gly Arg Ile Ser Lys Thr Lys Lys Glu Tyr
    610                 615                 620

Leu Leu Glu Glu Arg Asp Ile Asn Arg Phe Ser Val Gln Lys Asp Phe
625                 630                 635                 640

Ile Asn Arg Asn Leu Val Asp Thr Arg Tyr Ala Thr Arg Gly Leu Met
                645                 650                 655

Asn Leu Leu Arg Ser Tyr Phe Arg Val Asn Asn Leu Asp Val Lys Val
            660                 665                 670

Lys Ser Ile Asn Gly Gly Phe Thr Ser Phe Leu Arg Arg Lys Trp Lys
        675                 680                 685

Phe Lys Lys Glu Arg Asn Lys Gly Tyr Lys His His Ala Glu Asp Ala
    690                 695                 700
```

```
Leu Ile Ile Ala Asn Ala Asp Phe Ile Phe Lys Glu Trp Lys Lys Leu
705                 710                 715                 720


Asp Lys Ala Lys Lys Val Met Glu Asn Gln Met Phe Glu Glu Lys Gln
                725                 730                 735


Ala Glu Ser Met Pro Glu Ile Glu Thr Glu Gln Glu Tyr Lys Glu Ile
            740                 745                 750


Phe Ile Thr Pro His Gln Ile Lys His Ile Lys Asp Phe Lys Asp Tyr
        755                 760                 765


Lys Tyr Ser His Arg Val Asp Lys Lys Pro Asn Arg Glu Leu Ile Asn
    770                 775                 780


Asp Thr Leu Tyr Ser Thr Arg Lys Asp Asp Lys Gly Asn Thr Leu Ile
785                 790                 795                 800


Val Asn Asn Leu Asn Gly Leu Tyr Asp Lys Asp Asn Asp Lys Leu Lys
                805                 810                 815


Lys Leu Ile Asn Lys Ser Pro Glu Lys Leu Leu Met Tyr His His Asp
            820                 825                 830


Pro Gln Thr Tyr Gln Lys Leu Lys Leu Ile Met Glu Gln Tyr Gly Asp
        835                 840                 845


Glu Lys Asn Pro Leu Tyr Lys Tyr Tyr Glu Glu Thr Gly Asn Tyr Leu
    850                 855                 860


Thr Lys Tyr Ser Lys Lys Asp Asn Gly Pro Val Ile Lys Lys Ile Lys
865                 870                 875                 880


Tyr Tyr Gly Asn Lys Leu Asn Ala His Leu Asp Ile Thr Asp Asp Tyr
                885                 890                 895


Pro Asn Ser Arg Asn Lys Val Val Lys Leu Ser Leu Lys Pro Tyr Arg
            900                 905                 910
```

```
Phe Asp Val Tyr Leu Asp Asn Gly Val Tyr Lys Phe Val Thr Val Lys
        915                 920                 925


Asn Leu Asp Val Ile Lys Lys Glu Asn Tyr Tyr Glu Val Asn Ser Lys
    930                 935                 940


Cys Tyr Glu Glu Ala Lys Lys Leu Lys Lys Ile Ser Asn Gln Ala Glu
945                 950                 955                 960


Phe Ile Ala Ser Phe Tyr Asn Asn Asp Leu Ile Lys Ile Asn Gly Glu
                965                 970                 975


Leu Tyr Arg Val Ile Gly Val Asn Asn Asp Leu Leu Asn Arg Ile Glu
            980                 985                 990


Val Asn Met Ile Asp Ile Thr Tyr  Arg Glu Tyr Leu Glu  Asn Met Asn
        995                 1000                1005


Asp Lys  Arg Pro Pro Arg Ile  Ile Lys Thr Ile Ala  Ser Lys Thr
    1010                1015                1020


Gln Ser  Ile Lys Lys Tyr Ser  Thr Asp Ile Leu Gly  Asn Leu Tyr
    1025                1030                1035


Glu Val  Lys Ser Lys Lys His  Pro Gln Ile Ile Lys  Lys Gly
    1040                1045                1050


<210>  35
<211>  1052
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic Polypeptide

<400>  35

Lys Arg Asn Tyr Ile Leu Gly Leu Asp Ile Gly Ile Thr Ser Val Gly
1               5                   10                  15


Tyr Gly Ile Ile Asp Tyr Glu Thr Arg Asp Val Ile Asp Ala Gly Val
            20                  25                  30
```

```
Arg Leu Phe Lys Glu Ala Asn Val Glu Asn Asn Glu Gly Arg Arg Ser
        35                  40                  45

Lys Arg Gly Ala Arg Arg Leu Lys Arg Arg Arg Arg His Arg Ile Gln
    50                  55                  60

Arg Val Lys Lys Leu Leu Phe Asp Tyr Asn Leu Leu Thr Asp His Ser
65                  70                  75                  80

Glu Leu Ser Gly Ile Asn Pro Tyr Glu Ala Arg Val Lys Gly Leu Ser
                85                  90                  95

Gln Lys Leu Ser Glu Glu Glu Phe Ser Ala Ala Leu Leu His Leu Ala
            100                 105                 110

Lys Arg Arg Gly Val His Asn Val Asn Glu Val Glu Glu Asp Thr Gly
        115                 120                 125

Asn Glu Leu Ser Thr Lys Glu Gln Ile Ser Arg Asn Ser Lys Ala Leu
    130                 135                 140

Glu Glu Lys Tyr Val Ala Glu Leu Gln Leu Glu Arg Leu Lys Lys Asp
145                 150                 155                 160

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

Lys Glu Ala Lys Gln Leu Leu Lys Val Gln Lys Ala Tyr His Gln Leu
            180                 185                 190

Asp Gln Ser Phe Ile Asp Thr Tyr Ile Asp Leu Leu Glu Thr Arg Arg
        195                 200                 205

Thr Tyr Tyr Glu Gly Pro Gly Glu Gly Ser Pro Phe Gly Trp Lys Asp
    210                 215                 220

Ile Lys Glu Trp Tyr Glu Met Leu Met Gly His Cys Thr Tyr Phe Pro
225                 230                 235                 240
```

```
Glu Glu Leu Arg Ser Val Lys Tyr Ala Tyr Asn Ala Asp Leu Tyr Asn
                245                 250                 255

Ala Leu Asn Asp Leu Asn Asn Leu Val Ile Thr Arg Asp Glu Asn Glu
            260                 265                 270

Lys Leu Glu Tyr Tyr Glu Lys Phe Gln Ile Ile Glu Asn Val Phe Lys
        275                 280                 285

Gln Lys Lys Lys Pro Thr Leu Lys Gln Ile Ala Lys Glu Ile Leu Val
    290                 295                 300

Asn Glu Glu Asp Ile Lys Gly Tyr Arg Val Thr Ser Thr Gly Lys Pro
305                 310                 315                 320

Glu Phe Thr Asn Leu Lys Val Tyr His Asp Ile Lys Asp Ile Thr Ala
                325                 330                 335

Arg Lys Glu Ile Ile Glu Asn Ala Glu Leu Leu Asp Gln Ile Ala Lys
            340                 345                 350

Ile Leu Thr Ile Tyr Gln Ser Ser Glu Asp Ile Gln Glu Glu Leu Thr
        355                 360                 365

Asn Leu Asn Ser Glu Leu Thr Gln Glu Glu Ile Glu Gln Ile Ser Asn
    370                 375                 380

Leu Lys Gly Tyr Thr Gly Thr His Asn Leu Ser Leu Lys Ala Ile Asn
385                 390                 395                 400

Leu Ile Leu Asp Glu Leu Trp His Thr Asn Asp Asn Gln Ile Ala Ile
                405                 410                 415

Phe Asn Arg Leu Lys Leu Val Pro Lys Lys Val Asp Leu Ser Gln Gln
            420                 425                 430

Lys Glu Ile Pro Thr Thr Leu Val Asp Asp Phe Ile Leu Ser Pro Val
        435                 440                 445
```

```
Val Lys Arg Ser Phe Ile Gln Ser Ile Lys Val Ile Asn Ala Ile Ile
    450                 455                 460

Lys Lys Tyr Gly Leu Pro Asn Asp Ile Ile Ile Glu Leu Ala Arg Glu
465                 470                 475                 480

Lys Asn Ser Lys Asp Ala Gln Lys Met Ile Asn Glu Met Gln Lys Arg
                485                 490                 495

Asn Arg Gln Thr Asn Glu Arg Ile Glu Glu Ile Ile Arg Thr Thr Gly
            500                 505                 510

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

Gln Glu Gly Lys Cys Leu Tyr Ser Leu Glu Ala Ile Pro Leu Glu Asp
    530                 535                 540

Leu Leu Asn Asn Pro Phe Asn Tyr Glu Val Asp His Ile Ile Pro Arg
545                 550                 555                 560

Ser Val Ser Phe Asp Asn Ser Phe Asn Asn Lys Val Leu Val Lys Gln
                565                 570                 575

Glu Glu Ala Ser Lys Lys Gly Asn Arg Thr Pro Phe Gln Tyr Leu Ser
            580                 585                 590

Ser Ser Asp Ser Lys Ile Ser Tyr Glu Thr Phe Lys Lys His Ile Leu
        595                 600                 605

Asn Leu Ala Lys Gly Lys Gly Arg Ile Ser Lys Thr Lys Lys Glu Tyr
    610                 615                 620

Leu Leu Glu Glu Arg Asp Ile Asn Arg Phe Ser Val Gln Lys Asp Phe
625                 630                 635                 640

Ile Asn Arg Asn Leu Val Asp Thr Arg Tyr Ala Thr Arg Gly Leu Met
                645                 650                 655
```

```
Asn Leu Leu Arg Ser Tyr Phe Arg Val Asn Asn Leu Asp Val Lys Val
            660                 665                 670

Lys Ser Ile Asn Gly Gly Phe Thr Ser Phe Leu Arg Arg Lys Trp Lys
        675                 680                 685

Phe Lys Lys Glu Arg Asn Lys Gly Tyr Lys His His Ala Glu Asp Ala
    690                 695                 700

Leu Ile Ile Ala Asn Ala Asp Phe Ile Phe Lys Glu Trp Lys Lys Leu
705                 710                 715                 720

Asp Lys Ala Lys Lys Val Met Glu Asn Gln Met Phe Glu Glu Lys Gln
                725                 730                 735

Ala Glu Ser Met Pro Glu Ile Glu Thr Glu Gln Glu Tyr Lys Glu Ile
            740                 745                 750

Phe Ile Thr Pro His Gln Ile Lys His Ile Lys Asp Phe Lys Asp Tyr
        755                 760                 765

Lys Tyr Ser His Arg Val Asp Lys Lys Pro Asn Arg Glu Leu Ile Asn
    770                 775                 780

Asp Thr Leu Tyr Ser Thr Arg Lys Asp Asp Lys Gly Asn Thr Leu Ile
785                 790                 795                 800

Val Asn Asn Leu Asn Gly Leu Tyr Asp Lys Asp Asn Asp Lys Leu Lys
                805                 810                 815

Lys Leu Ile Asn Lys Ser Pro Glu Lys Leu Leu Met Tyr His His Asp
            820                 825                 830

Pro Gln Thr Tyr Gln Lys Leu Lys Leu Ile Met Glu Gln Tyr Gly Asp
        835                 840                 845

Glu Lys Asn Pro Leu Tyr Lys Tyr Tyr Glu Glu Thr Gly Asn Tyr Leu
    850                 855                 860
```

```
Thr Lys Tyr Ser Lys Lys Asp Asn Gly Pro Val Ile Lys Lys Ile Lys
865                 870                 875                 880

Tyr Tyr Gly Asn Lys Leu Asn Ala His Leu Asp Ile Thr Asp Asp Tyr
                885                 890                 895

Pro Asn Ser Arg Asn Lys Val Val Lys Leu Ser Leu Lys Pro Tyr Arg
            900                 905                 910

Phe Asp Val Tyr Leu Asp Asn Gly Val Tyr Lys Phe Val Thr Val Lys
        915                 920                 925

Asn Leu Asp Val Ile Lys Lys Glu Asn Tyr Tyr Glu Val Asn Ser Lys
    930                 935                 940

Cys Tyr Glu Glu Ala Lys Lys Leu Lys Lys Ile Ser Asn Gln Ala Glu
945                 950                 955                 960

Phe Ile Ala Ser Phe Tyr Asn Asn Asp Leu Ile Lys Ile Asn Gly Glu
                965                 970                 975

Leu Tyr Arg Val Ile Gly Val Asn Asn Asp Leu Leu Asn Arg Ile Glu
            980                 985                 990

Val Asn Met Ile Asp Ile Thr Tyr  Arg Glu Tyr Leu Glu  Asn Met Asn
        995                 1000                1005

Asp Lys  Arg Pro Pro Arg Ile  Ile Lys Thr Ile Ala  Ser Lys Thr
    1010                1015                1020

Gln Ser  Ile Lys Lys Tyr Ser  Thr Asp Ile Leu Gly  Asn Leu Tyr
    1025                1030                1035

Glu Val  Lys Ser Lys Lys His  Pro Gln Ile Ile Lys  Lys Gly
    1040                1045                1050
```

<210> 36
<211> 1052

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 36

Lys Arg Asn Tyr Ile Leu Gly Leu Asp Ile Gly Ile Thr Ser Val Gly
1 5 10 15

Tyr Gly Ile Ile Asp Tyr Glu Thr Arg Asp Val Ile Asp Ala Gly Val
20 25 30

Arg Leu Phe Lys Glu Ala Asn Val Glu Asn Asn Glu Gly Arg Arg Ser
35 40 45

Lys Arg Gly Ala Arg Arg Leu Lys Arg Arg Arg Arg His Arg Ile Gln
50 55 60

Arg Val Lys Lys Leu Leu Phe Asp Tyr Asn Leu Leu Thr Asp His Ser
65 70 75 80

Glu Leu Ser Gly Ile Asn Pro Tyr Glu Ala Arg Val Lys Gly Leu Ser
85 90 95

Gln Lys Leu Ser Glu Glu Glu Phe Ser Ala Ala Leu Leu His Leu Ala
100 105 110

Lys Arg Arg Gly Val His Asn Val Asn Glu Val Glu Glu Asp Thr Gly
115 120 125

Asn Glu Leu Ser Thr Lys Glu Gln Ile Ser Arg Asn Ser Lys Ala Leu
130 135 140

Glu Glu Lys Tyr Val Ala Glu Leu Gln Leu Glu Arg Leu Lys Lys Asp
145 150 155 160

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

```
Lys Glu Ala Lys Gln Leu Leu Lys Val Gln Lys Ala Tyr His Gln Leu
            180                 185                 190

Asp Gln Ser Phe Ile Asp Thr Tyr Ile Asp Leu Leu Glu Thr Arg Arg
        195                 200                 205

Thr Tyr Tyr Glu Gly Pro Gly Glu Gly Ser Pro Phe Gly Trp Lys Asp
    210                 215                 220

Ile Lys Glu Trp Tyr Glu Met Leu Met Gly His Cys Thr Tyr Phe Pro
225                 230                 235                 240

Glu Glu Leu Arg Ser Val Lys Tyr Ala Tyr Asn Ala Asp Leu Tyr Asn
                245                 250                 255

Ala Leu Asn Asp Leu Asn Asn Leu Val Ile Thr Arg Asp Glu Asn Glu
            260                 265                 270

Lys Leu Glu Tyr Tyr Glu Lys Phe Gln Ile Ile Glu Asn Val Phe Lys
        275                 280                 285

Gln Lys Lys Lys Pro Thr Leu Lys Gln Ile Ala Lys Glu Ile Leu Val
    290                 295                 300

Asn Glu Glu Asp Ile Lys Gly Tyr Arg Val Thr Ser Thr Gly Lys Pro
305                 310                 315                 320

Glu Phe Thr Asn Leu Lys Val Tyr His Asp Ile Lys Asp Ile Thr Ala
                325                 330                 335

Arg Lys Glu Ile Ile Glu Asn Ala Glu Leu Leu Asp Gln Ile Ala Lys
            340                 345                 350

Ile Leu Thr Ile Tyr Gln Ser Ser Glu Asp Ile Gln Glu Glu Leu Thr
        355                 360                 365

Asn Leu Asn Ser Glu Leu Thr Gln Glu Glu Ile Glu Gln Ile Ser Asn
    370                 375                 380
```

```
Leu Lys Gly Tyr Thr Gly Thr His Asn Leu Ser Leu Lys Ala Ile Asn
385                 390                 395                 400

Leu Ile Leu Asp Glu Leu Trp His Thr Asn Asp Asn Gln Ile Ala Ile
                405                 410                 415

Phe Asn Arg Leu Lys Leu Val Pro Lys Lys Val Asp Leu Ser Gln Gln
            420                 425                 430

Lys Glu Ile Pro Thr Thr Leu Val Asp Asp Phe Ile Leu Ser Pro Val
        435                 440                 445

Val Lys Arg Ser Phe Ile Gln Ser Ile Lys Val Ile Asn Ala Ile Ile
    450                 455                 460

Lys Lys Tyr Gly Leu Pro Asn Asp Ile Ile Ile Glu Leu Ala Arg Glu
465                 470                 475                 480

Lys Asn Ser Lys Asp Ala Gln Lys Met Ile Asn Glu Met Gln Lys Arg
                485                 490                 495

Asn Arg Gln Thr Asn Glu Arg Ile Glu Glu Ile Ile Arg Thr Thr Gly
            500                 505                 510

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

Gln Glu Gly Lys Cys Leu Tyr Ser Leu Glu Ala Ile Pro Leu Glu Asp
    530                 535                 540

Leu Leu Asn Asn Pro Phe Asn Tyr Glu Val Asp His Ile Ile Pro Arg
545                 550                 555                 560

Ser Val Ser Phe Asp Asn Ser Phe Asn Asn Lys Val Leu Val Lys Gln
                565                 570                 575

Glu Glu Ala Ser Lys Lys Gly Asn Arg Thr Pro Phe Gln Tyr Leu Ser
            580                 585                 590
```

```
Ser Ser Asp Ser Lys Ile Ser Tyr Glu Thr Phe Lys Lys His Ile Leu
        595                 600                 605

Asn Leu Ala Lys Gly Lys Gly Arg Ile Ser Lys Thr Lys Lys Glu Tyr
    610                 615                 620

Leu Leu Glu Glu Arg Asp Ile Asn Arg Phe Ser Val Gln Lys Asp Phe
625                 630                 635                 640

Ile Asn Arg Asn Leu Val Asp Thr Arg Tyr Ala Thr Arg Gly Leu Met
                645                 650                 655

Asn Leu Leu Arg Ser Tyr Phe Arg Val Asn Asn Leu Asp Val Lys Val
            660                 665                 670

Lys Ser Ile Asn Gly Gly Phe Thr Ser Phe Leu Arg Arg Lys Trp Lys
        675                 680                 685

Phe Lys Lys Glu Arg Asn Lys Gly Tyr Lys His His Ala Glu Asp Ala
    690                 695                 700

Leu Ile Ile Ala Asn Ala Asp Phe Ile Phe Lys Glu Trp Lys Lys Leu
705                 710                 715                 720

Asp Lys Ala Lys Lys Val Met Glu Asn Gln Met Phe Glu Glu Lys Gln
                725                 730                 735

Ala Glu Ser Met Pro Glu Ile Glu Thr Glu Gln Glu Tyr Lys Glu Ile
            740                 745                 750

Phe Ile Thr Pro His Gln Ile Lys His Ile Lys Asp Phe Lys Asp Tyr
        755                 760                 765

Lys Tyr Ser His Arg Val Asp Lys Lys Pro Asn Arg Lys Leu Ile Asn
    770                 775                 780

Asp Thr Leu Tyr Ser Thr Arg Lys Asp Asp Lys Gly Asn Thr Leu Ile
785                 790                 795                 800
```

```
Val Asn Asn Leu Asn Gly Leu Tyr Asp Lys Asp Asn Asp Lys Leu Lys
                805                 810                 815

Lys Leu Ile Asn Lys Ser Pro Glu Lys Leu Leu Met Tyr His His Asp
            820                 825                 830

Pro Gln Thr Tyr Gln Lys Leu Lys Leu Ile Met Glu Gln Tyr Gly Asp
        835                 840                 845

Glu Lys Asn Pro Leu Tyr Lys Tyr Tyr Glu Glu Thr Gly Asn Tyr Leu
    850                 855                 860

Thr Lys Tyr Ser Lys Lys Asp Asn Gly Pro Val Ile Lys Lys Ile Lys
865                 870                 875                 880

Tyr Tyr Gly Asn Lys Leu Asn Ala His Leu Asp Ile Thr Asp Asp Tyr
                885                 890                 895

Pro Asn Ser Arg Asn Lys Val Val Lys Leu Ser Leu Lys Pro Tyr Arg
            900                 905                 910

Phe Asp Val Tyr Leu Asp Asn Gly Val Tyr Lys Phe Val Thr Val Lys
        915                 920                 925

Asn Leu Asp Val Ile Lys Lys Glu Asn Tyr Tyr Glu Val Asn Ser Lys
    930                 935                 940

Cys Tyr Glu Glu Ala Lys Lys Leu Lys Lys Ile Ser Asn Gln Ala Glu
945                 950                 955                 960

Phe Ile Ala Ser Phe Tyr Lys Asn Asp Leu Ile Lys Ile Asn Gly Glu
                965                 970                 975

Leu Tyr Arg Val Ile Gly Val Asn Asn Asp Leu Leu Asn Arg Ile Glu
            980                 985                 990

Val Asn Met Ile Asp Ile Thr Tyr  Arg Glu Tyr Leu Glu  Asn Met Asn
        995                 1000                1005
```

Asp Lys Arg Pro Pro His Ile Ile Lys Thr Ile Ala Ser Lys Thr
1010 1015 1020

Gln Ser Ile Lys Lys Tyr Ser Thr Asp Ile Leu Gly Asn Leu Tyr
1025 1030 1035

Glu Val Lys Ser Lys Lys His Pro Gln Ile Ile Lys Lys Gly
1040 1045 1050

<210> 37
<211> 1367
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 37

Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val Gly
1 5 10 15

Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
20 25 30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
35 40 45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
50 55 60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65 70 75 80

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

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
100 105 110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
115 120 125

```
Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
    130                 135                 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145                 150                 155                 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
                165                 170                 175

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335
```

```
Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540
```

```
Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750
```

```
His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
        755                 760                 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815

Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960
```

```
Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
               965                 970                 975

Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
           980                 985                 990

Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                1000                1005

Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020

Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035

Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
    1040                1045                1050

Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065

Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
    1070                1075                1080

Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095

Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110

Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125

Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140

Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155
```

```
Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170

Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                1210                1215

Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230

Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245

Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260

Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275

Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290

Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305

Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                1315                1320

Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Arg Tyr  Thr Ser Thr
    1325                1330                1335

Lys Glu  Val Leu Asp Ala Thr  Leu Ile His Gln Ser  Ile Thr Gly
    1340                1345                1350
```

```
Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln Leu Gly  Gly Asp
    1355                1360                1365


<210>  38
<211>  1367
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic Polypeptide

<400>  38

Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly
1               5                   10                  15


Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
            20                  25                  30


Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
        35                  40                  45


Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
    50                  55                  60


Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65                  70                  75                  80


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


Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
            100                 105                 110


Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
        115                 120                 125


Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
    130                 135                 140
```

```
Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145                 150                 155                 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
                165                 170                 175

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350
```

```
Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560
```

```
Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
        755                 760                 765
```

```
Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815

Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975
```

```
Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990


Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005


Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020


Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035


Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
    1040                1045                1050


Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065


Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
    1070                1075                1080


Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095


Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110


Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125


Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140


Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155


Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170
```

```
Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                1210                1215

Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230

Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245

Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260

Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275

Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290

Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305

Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                1315                1320

Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Arg Tyr  Thr Ser Thr
    1325                1330                1335

Lys Glu  Val Leu Asp Ala Thr  Leu Ile His Gln Ser  Ile Thr Gly
    1340                1345                1350

Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln Leu Gly  Gly Asp
    1355                1360                1365
```

<210> 39
<211> 1367
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 39

```
Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly
1               5                  10                  15


Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
            20                  25                  30


Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
        35                  40                  45


Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
    50                  55                  60


Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65                  70                  75                  80


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


Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
            100                 105                 110


Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
        115                 120                 125


Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
    130                 135                 140


Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145                 150                 155                 160


Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
                165                 170                 175
```

```
Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380
```

```
Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590
```

```
Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
        755                 760                 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800
```

```
Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815

Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975

Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990

Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005
```

Tyr Gly Asp Tyr Lys Val Tyr Asp Val Arg Lys Met Ile Ala Lys
1010 1015 1020

Ser Glu Gln Glu Ile Gly Lys Ala Thr Ala Lys Tyr Phe Phe Tyr
1025 1030 1035

Ser Asn Ile Met Asn Phe Phe Lys Thr Glu Ile Thr Leu Ala Asn
1040 1045 1050

Gly Glu Ile Arg Lys Arg Pro Leu Ile Glu Thr Asn Gly Glu Thr
1055 1060 1065

Gly Glu Ile Val Trp Asp Lys Gly Arg Asp Phe Ala Thr Val Arg
1070 1075 1080

Lys Val Leu Ser Met Pro Gln Val Asn Ile Val Lys Lys Thr Glu
1085 1090 1095

Val Gln Thr Gly Gly Phe Ser Lys Glu Ser Ile Leu Pro Lys Arg
1100 1105 1110

Asn Ser Asp Lys Leu Ile Ala Arg Lys Lys Asp Trp Asp Pro Lys
1115 1120 1125

Lys Tyr Gly Gly Phe Glu Ser Pro Thr Val Ala Tyr Ser Val Leu
1130 1135 1140

Val Val Ala Lys Val Glu Lys Gly Lys Ser Lys Lys Leu Lys Ser
1145 1150 1155

Val Lys Glu Leu Leu Gly Ile Thr Ile Met Glu Arg Ser Ser Phe
1160 1165 1170

Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala Lys Gly Tyr Lys Glu
1175 1180 1185

Val Lys Lys Asp Leu Ile Ile Lys Leu Pro Lys Tyr Ser Leu Phe
1190 1195 1200

```
Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                 1210                 1215

Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                 1225                 1230

Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                 1240                 1245

Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                 1255                 1260

Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                 1270                 1275

Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                 1285                 1290

Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                 1300                 1305

Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                 1315                 1320

Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Gln Tyr  Arg Ser Thr
    1325                 1330                 1335

Lys Glu  Val Leu Asp Ala Thr  Leu Ile His Gln Ser  Ile Thr Gly
    1340                 1345                 1350

Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln Leu Gly  Gly Asp
    1355                 1360                 1365
```

<210> 40
<211> 1367
<212> PRT
<213> Artificial Sequence

<220>

Sequence Listing

<223> Synthetic Polypeptide

<400> 40

```
Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly
1               5                  10                  15

Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
            20                  25                  30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
        35                  40                  45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
    50                  55                  60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65                  70                  75                  80

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

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
            100                 105                 110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
        115                 120                 125

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
    130                 135                 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145                 150                 155                 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
                165                 170                 175

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190
```

```
Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400
```

```
Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605
```

```
Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
        755                 760                 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815
```

```
Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975

Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990

Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005

Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020
```

```
Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035

Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
    1040                1045                1050

Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065

Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
    1070                1075                1080

Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095

Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110

Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125

Lys Tyr  Gly Gly Phe Val Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140

Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155

Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170

Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                1210                1215
```

```
Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230


Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245


Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260


Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275


Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290


Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305


Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                1315                1320


Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Gln Tyr  Arg Ser Thr
    1325                1330                1335


Lys Glu  Val Leu Asp Ala Thr  Leu Ile His Gln Ser  Ile Thr Gly
    1340                1345                1350


Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln Leu Gly  Gly Asp
    1355                1360                1365


<210>  41
<211>  1367
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic Polypeptide

<400>  41

Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly
1               5                  10                  15
```

```
Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
            20                  25                  30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
        35                  40                  45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
    50                  55                  60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65                  70                  75                  80

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

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
            100                 105                 110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
        115                 120                 125

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
    130                 135                 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145                 150                 155                 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
                165                 170                 175

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220
```

```
Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430
```

```
Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640
```

```
Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
        755                 760                 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815

Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845
```

```
Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975

Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990

Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005

Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020

Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035

Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
    1040                1045                1050
```

```
Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065

Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
    1070                1075                1080

Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095

Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110

Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125

Lys Tyr  Gly Gly Phe Val Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140

Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155

Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170

Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Arg Glu
    1205                1210                1215

Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230

Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245
```

```
Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260


Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275


Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290


Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305


Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                1315                1320


Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Glu Tyr  Arg Ser Thr
    1325                1330                1335


Lys Glu  Val Leu Asp Ala Thr  Leu Ile His Gln Ser  Ile Thr Gly
    1340                1345                1350


Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln Leu Gly  Gly Asp
    1355                1360                1365


<210>  42
<211>  1395
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic Polypeptide

<400>  42

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1               5                   10                  15


Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
            20                  25                  30
```

```
Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
        35                  40                  45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
    50                  55                  60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65                  70                  75                  80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
                85                  90                  95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
            100                 105                 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
        115                 120                 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220

Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
225                 230                 235                 240
```

```
Ala Thr Pro Glu Ser Lys Arg Asn Tyr Ile Leu Gly Leu Asp Ile Gly
                245                 250                 255

Ile Thr Ser Val Gly Tyr Gly Ile Ile Asp Tyr Glu Thr Arg Asp Val
            260                 265                 270

Ile Asp Ala Gly Val Arg Leu Phe Lys Glu Ala Asn Val Glu Asn Asn
        275                 280                 285

Glu Gly Arg Arg Ser Lys Arg Gly Ala Arg Arg Leu Lys Arg Arg Arg
    290                 295                 300

Arg His Arg Ile Gln Arg Val Lys Lys Leu Leu Phe Asp Tyr Asn Leu
305                 310                 315                 320

Leu Thr Asp His Ser Glu Leu Ser Gly Ile Asn Pro Tyr Glu Ala Arg
                325                 330                 335

Val Lys Gly Leu Ser Gln Lys Leu Ser Glu Glu Glu Phe Ser Ala Ala
            340                 345                 350

Leu Leu His Leu Ala Lys Arg Arg Gly Val His Asn Val Asn Glu Val
        355                 360                 365

Glu Glu Asp Thr Gly Asn Glu Leu Ser Thr Lys Glu Gln Ile Ser Arg
    370                 375                 380

Asn Ser Lys Ala Leu Glu Glu Lys Tyr Val Ala Glu Leu Gln Leu Glu
385                 390                 395                 400

Arg Leu Lys Lys Asp Gly Glu Val Arg Gly Ser Ile Asn Arg Phe Lys
                405                 410                 415

Thr Ser Asp Tyr Val Lys Glu Ala Lys Gln Leu Leu Lys Val Gln Lys
            420                 425                 430

Ala Tyr His Gln Leu Asp Gln Ser Phe Ile Asp Thr Tyr Ile Asp Leu
        435                 440                 445
```

```
Leu Glu Thr Arg Arg Thr Tyr Tyr Glu Gly Pro Gly Glu Gly Ser Pro
    450                 455                 460

Phe Gly Trp Lys Asp Ile Lys Glu Trp Tyr Glu Met Leu Met Gly His
465                 470                 475                 480

Cys Thr Tyr Phe Pro Glu Glu Leu Arg Ser Val Lys Tyr Ala Tyr Asn
                485                 490                 495

Ala Asp Leu Tyr Asn Ala Leu Asn Asp Leu Asn Asn Leu Val Ile Thr
            500                 505                 510

Arg Asp Glu Asn Glu Lys Leu Glu Tyr Tyr Glu Lys Phe Gln Ile Ile
        515                 520                 525

Glu Asn Val Phe Lys Gln Lys Lys Lys Pro Thr Leu Lys Gln Ile Ala
    530                 535                 540

Lys Glu Ile Leu Val Asn Glu Glu Asp Ile Lys Gly Tyr Arg Val Thr
545                 550                 555                 560

Ser Thr Gly Lys Pro Glu Phe Thr Asn Leu Lys Val Tyr His Asp Ile
                565                 570                 575

Lys Asp Ile Thr Ala Arg Lys Glu Ile Ile Glu Asn Ala Glu Leu Leu
            580                 585                 590

Asp Gln Ile Ala Lys Ile Leu Thr Ile Tyr Gln Ser Ser Glu Asp Ile
        595                 600                 605

Gln Glu Glu Leu Thr Asn Leu Asn Ser Glu Leu Thr Gln Glu Glu Ile
    610                 615                 620

Glu Gln Ile Ser Asn Leu Lys Gly Tyr Thr Gly Thr His Asn Leu Ser
625                 630                 635                 640

Leu Lys Ala Ile Asn Leu Ile Leu Asp Glu Leu Trp His Thr Asn Asp
                645                 650                 655
```

```
Asn Gln Ile Ala Ile Phe Asn Arg Leu Lys Leu Val Pro Lys Lys Val
            660                 665                 670

Asp Leu Ser Gln Gln Lys Glu Ile Pro Thr Thr Leu Val Asp Asp Phe
        675                 680                 685

Ile Leu Ser Pro Val Val Lys Arg Ser Phe Ile Gln Ser Ile Lys Val
    690                 695                 700

Ile Asn Ala Ile Ile Lys Lys Tyr Gly Leu Pro Asn Asp Ile Ile Ile
705                 710                 715                 720

Glu Leu Ala Arg Glu Lys Asn Ser Lys Asp Ala Gln Lys Met Ile Asn
                725                 730                 735

Glu Met Gln Lys Arg Asn Arg Gln Thr Asn Glu Arg Ile Glu Glu Ile
            740                 745                 750

Ile Arg Thr Thr Gly Lys Glu Asn Ala Lys Tyr Leu Ile Glu Lys Ile
        755                 760                 765

Lys Leu His Asp Met Gln Glu Gly Lys Cys Leu Tyr Ser Leu Glu Ala
    770                 775                 780

Ile Pro Leu Glu Asp Leu Leu Asn Asn Pro Phe Asn Tyr Glu Val Asp
785                 790                 795                 800

His Ile Ile Pro Arg Ser Val Ser Phe Asp Asn Ser Phe Asn Asn Lys
                805                 810                 815

Val Leu Val Lys Gln Glu Glu Ala Ser Lys Lys Gly Asn Arg Thr Pro
            820                 825                 830

Phe Gln Tyr Leu Ser Ser Ser Asp Ser Lys Ile Ser Tyr Glu Thr Phe
        835                 840                 845

Lys Lys His Ile Leu Asn Leu Ala Lys Gly Lys Gly Arg Ile Ser Lys
    850                 855                 860
```

```
Thr Lys Lys Glu Tyr Leu Leu Glu Glu Arg Asp Ile Asn Arg Phe Ser
865                 870                 875                 880


Val Gln Lys Asp Phe Ile Asn Arg Asn Leu Val Asp Thr Arg Tyr Ala
                885                 890                 895


Thr Arg Gly Leu Met Asn Leu Leu Arg Ser Tyr Phe Arg Val Asn Asn
            900                 905                 910


Leu Asp Val Lys Val Lys Ser Ile Asn Gly Gly Phe Thr Ser Phe Leu
        915                 920                 925


Arg Arg Lys Trp Lys Phe Lys Lys Glu Arg Asn Lys Gly Tyr Lys His
    930                 935                 940


His Ala Glu Asp Ala Leu Ile Ile Ala Asn Ala Asp Phe Ile Phe Lys
945                 950                 955                 960


Glu Trp Lys Lys Leu Asp Lys Ala Lys Lys Val Met Glu Asn Gln Met
                965                 970                 975


Phe Glu Glu Lys Gln Ala Glu Ser Met Pro Glu Ile Glu Thr Glu Gln
            980                 985                 990


Glu Tyr Lys Glu Ile Phe Ile Thr  Pro His Gln Ile Lys  His Ile Lys
        995                 1000                1005


Asp Phe  Lys Asp Tyr Lys Tyr  Ser His Arg Val Asp  Lys Lys Pro
    1010                1015                1020


Asn Arg  Glu Leu Ile Asn Asp  Thr Leu Tyr Ser Thr  Arg Lys Asp
    1025                1030                1035


Asp Lys  Gly Asn Thr Leu Ile  Val Asn Asn Leu Asn  Gly Leu Tyr
    1040                1045                1050


Asp Lys  Asp Asn Asp Lys Leu  Lys Lys Leu Ile Asn  Lys Ser Pro
    1055                1060                1065
```

```
Glu Lys  Leu Leu Met Tyr His  His Asp Pro Gln Thr  Tyr Gln Lys
    1070                1075                1080

Leu Lys  Leu Ile Met Glu Gln  Tyr Gly Asp Glu Lys  Asn Pro Leu
    1085                1090                1095

Tyr Lys  Tyr Tyr Glu Glu Thr  Gly Asn Tyr Leu Thr  Lys Tyr Ser
    1100                1105                1110

Lys Lys  Asp Asn Gly Pro Val  Ile Lys Lys Ile Lys  Tyr Tyr Gly
    1115                1120                1125

Asn Lys  Leu Asn Ala His Leu  Asp Ile Thr Asp Asp  Tyr Pro Asn
    1130                1135                1140

Ser Arg  Asn Lys Val Val Lys  Leu Ser Leu Lys Pro  Tyr Arg Phe
    1145                1150                1155

Asp Val  Tyr Leu Asp Asn Gly  Val Tyr Lys Phe Val  Thr Val Lys
    1160                1165                1170

Asn Leu  Asp Val Ile Lys Lys  Glu Asn Tyr Tyr Glu  Val Asn Ser
    1175                1180                1185

Lys Cys  Tyr Glu Glu Ala Lys  Lys Leu Lys Lys Ile  Ser Asn Gln
    1190                1195                1200

Ala Glu  Phe Ile Ala Ser Phe  Tyr Asn Asn Asp Leu  Ile Lys Ile
    1205                1210                1215

Asn Gly  Glu Leu Tyr Arg Val  Ile Gly Val Asn Asn  Asp Leu Leu
    1220                1225                1230

Asn Arg  Ile Glu Val Asn Met  Ile Asp Ile Thr Tyr  Arg Glu Tyr
    1235                1240                1245

Leu Glu  Asn Met Asn Asp Lys  Arg Pro Pro Arg Ile  Ile Lys Thr
    1250                1255                1260
```

```
Ile Ala  Ser Lys Thr Gln Ser  Ile Lys Lys Tyr Ser  Thr Asp Ile
    1265                1270                1275


Leu Gly  Asn Leu Tyr Glu Val  Lys Ser Lys Lys His  Pro Gln Ile
    1280                1285                1290


Ile Lys  Lys Gly Ser Gly Gly  Ser Thr Asn Leu Ser  Asp Ile Ile
    1295                1300                1305


Glu Lys  Glu Thr Gly Lys Gln  Leu Val Ile Gln Glu  Ser Ile Leu
    1310                1315                1320


Met Leu  Pro Glu Glu Val Glu  Glu Val Ile Gly Asn  Lys Pro Glu
    1325                1330                1335


Ser Asp  Ile Leu Val His Thr  Ala Tyr Asp Glu Ser  Thr Asp Glu
    1340                1345                1350


Asn Val  Met Leu Leu Thr Ser  Asp Ala Pro Glu Tyr  Lys Pro Trp
    1355                1360                1365


Ala Leu  Val Ile Gln Asp Ser  Asn Gly Glu Asn Lys  Ile Lys Met
    1370                1375                1380


Leu Ser  Gly Gly Ser Pro Lys  Lys Lys Arg Lys Val
    1385                1390                1395


<210>  43
<211>  1395
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic Polypeptide

<400>  43

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1               5                   10                  15


Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
            20                  25                  30
```

```
Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
        35                  40                  45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
    50                  55                  60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65                  70                  75                  80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
                85                  90                  95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
            100                 105                 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
        115                 120                 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220

Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
225                 230                 235                 240
```

```
Ala Thr Pro Glu Ser Lys Arg Asn Tyr Ile Leu Gly Leu Asp Ile Gly
                245                 250                 255

Ile Thr Ser Val Gly Tyr Gly Ile Ile Asp Tyr Glu Thr Arg Asp Val
            260                 265                 270

Ile Asp Ala Gly Val Arg Leu Phe Lys Glu Ala Asn Val Glu Asn Asn
        275                 280                 285

Glu Gly Arg Arg Ser Lys Arg Gly Ala Arg Arg Leu Lys Arg Arg Arg
    290                 295                 300

Arg His Arg Ile Gln Arg Val Lys Lys Leu Leu Phe Asp Tyr Asn Leu
305                 310                 315                 320

Leu Thr Asp His Ser Glu Leu Ser Gly Ile Asn Pro Tyr Glu Ala Arg
                325                 330                 335

Val Lys Gly Leu Ser Gln Lys Leu Ser Glu Glu Glu Phe Ser Ala Ala
            340                 345                 350

Leu Leu His Leu Ala Lys Arg Arg Gly Val His Asn Val Asn Glu Val
        355                 360                 365

Glu Glu Asp Thr Gly Asn Glu Leu Ser Thr Lys Glu Gln Ile Ser Arg
    370                 375                 380

Asn Ser Lys Ala Leu Glu Glu Lys Tyr Val Ala Glu Leu Gln Leu Glu
385                 390                 395                 400

Arg Leu Lys Lys Asp Gly Glu Val Arg Gly Ser Ile Asn Arg Phe Lys
                405                 410                 415

Thr Ser Asp Tyr Val Lys Glu Ala Lys Gln Leu Leu Lys Val Gln Lys
            420                 425                 430

Ala Tyr His Gln Leu Asp Gln Ser Phe Ile Asp Thr Tyr Ile Asp Leu
        435                 440                 445
```

```
Leu Glu Thr Arg Arg Thr Tyr Tyr Glu Gly Pro Gly Glu Gly Ser Pro
    450                 455                 460

Phe Gly Trp Lys Asp Ile Lys Glu Trp Tyr Glu Met Leu Met Gly His
465                 470                 475                 480

Cys Thr Tyr Phe Pro Glu Glu Leu Arg Ser Val Lys Tyr Ala Tyr Asn
                485                 490                 495

Ala Asp Leu Tyr Asn Ala Leu Asn Asp Leu Asn Asn Leu Val Ile Thr
            500                 505                 510

Arg Asp Glu Asn Glu Lys Leu Glu Tyr Tyr Glu Lys Phe Gln Ile Ile
        515                 520                 525

Glu Asn Val Phe Lys Gln Lys Lys Lys Pro Thr Leu Lys Gln Ile Ala
    530                 535                 540

Lys Glu Ile Leu Val Asn Glu Glu Asp Ile Lys Gly Tyr Arg Val Thr
545                 550                 555                 560

Ser Thr Gly Lys Pro Glu Phe Thr Asn Leu Lys Val Tyr His Asp Ile
                565                 570                 575

Lys Asp Ile Thr Ala Arg Lys Glu Ile Ile Glu Asn Ala Glu Leu Leu
            580                 585                 590

Asp Gln Ile Ala Lys Ile Leu Thr Ile Tyr Gln Ser Ser Glu Asp Ile
        595                 600                 605

Gln Glu Glu Leu Thr Asn Leu Asn Ser Glu Leu Thr Gln Glu Glu Ile
    610                 615                 620

Glu Gln Ile Ser Asn Leu Lys Gly Tyr Thr Gly Thr His Asn Leu Ser
625                 630                 635                 640

Leu Lys Ala Ile Asn Leu Ile Leu Asp Glu Leu Trp His Thr Asn Asp
                645                 650                 655
```

```
Asn Gln Ile Ala Ile Phe Asn Arg Leu Lys Leu Val Pro Lys Lys Val
            660                 665                 670

Asp Leu Ser Gln Gln Lys Glu Ile Pro Thr Thr Leu Val Asp Asp Phe
        675                 680                 685

Ile Leu Ser Pro Val Val Lys Arg Ser Phe Ile Gln Ser Ile Lys Val
    690                 695                 700

Ile Asn Ala Ile Ile Lys Lys Tyr Gly Leu Pro Asn Asp Ile Ile Ile
705                 710                 715                 720

Glu Leu Ala Arg Glu Lys Asn Ser Lys Asp Ala Gln Lys Met Ile Asn
                725                 730                 735

Glu Met Gln Lys Arg Asn Arg Gln Thr Asn Glu Arg Ile Glu Glu Ile
            740                 745                 750

Ile Arg Thr Thr Gly Lys Glu Asn Ala Lys Tyr Leu Ile Glu Lys Ile
        755                 760                 765

Lys Leu His Asp Met Gln Glu Gly Lys Cys Leu Tyr Ser Leu Glu Ala
    770                 775                 780

Ile Pro Leu Glu Asp Leu Leu Asn Asn Pro Phe Asn Tyr Glu Val Asp
785                 790                 795                 800

His Ile Ile Pro Arg Ser Val Ser Phe Asp Asn Ser Phe Asn Asn Lys
                805                 810                 815

Val Leu Val Lys Gln Glu Glu Ala Ser Lys Lys Gly Asn Arg Thr Pro
            820                 825                 830

Phe Gln Tyr Leu Ser Ser Ser Asp Ser Lys Ile Ser Tyr Glu Thr Phe
        835                 840                 845

Lys Lys His Ile Leu Asn Leu Ala Lys Gly Lys Gly Arg Ile Ser Lys
    850                 855                 860
```

```
Thr Lys Lys Glu Tyr Leu Leu Glu Glu Arg Asp Ile Asn Arg Phe Ser
865                 870                 875                 880

Val Gln Lys Asp Phe Ile Asn Arg Asn Leu Val Asp Thr Arg Tyr Ala
                885                 890                 895

Thr Arg Gly Leu Met Asn Leu Leu Arg Ser Tyr Phe Arg Val Asn Asn
            900                 905                 910

Leu Asp Val Lys Val Lys Ser Ile Asn Gly Gly Phe Thr Ser Phe Leu
        915                 920                 925

Arg Arg Lys Trp Lys Phe Lys Lys Glu Arg Asn Lys Gly Tyr Lys His
    930                 935                 940

His Ala Glu Asp Ala Leu Ile Ile Ala Asn Ala Asp Phe Ile Phe Lys
945                 950                 955                 960

Glu Trp Lys Lys Leu Asp Lys Ala Lys Lys Val Met Glu Asn Gln Met
                965                 970                 975

Phe Glu Glu Lys Gln Ala Glu Ser Met Pro Glu Ile Glu Thr Glu Gln
            980                 985                 990

Glu Tyr Lys Glu Ile Phe Ile Thr  Pro His Gln Ile Lys  His Ile Lys
        995                 1000                1005

Asp Phe  Lys Asp Tyr Lys Tyr  Ser His Arg Val Asp  Lys Lys Pro
    1010                1015                1020

Asn Arg  Lys Leu Ile Asn Asp  Thr Leu Tyr Ser Thr  Arg Lys Asp
    1025                1030                1035

Asp Lys  Gly Asn Thr Leu Ile  Val Asn Asn Leu Asn  Gly Leu Tyr
    1040                1045                1050

Asp Lys  Asp Asn Asp Lys Leu  Lys Lys Leu Ile Asn  Lys Ser Pro
    1055                1060                1065
```

```
Glu Lys  Leu Leu Met Tyr His  His Asp Pro Gln Thr  Tyr Gln Lys
    1070                1075                1080

Leu Lys  Leu Ile Met Glu Gln  Tyr Gly Asp Glu Lys  Asn Pro Leu
    1085                1090                1095

Tyr Lys  Tyr Tyr Glu Glu Thr  Gly Asn Tyr Leu Thr  Lys Tyr Ser
    1100                1105                1110

Lys Lys  Asp Asn Gly Pro Val  Ile Lys Lys Ile Lys  Tyr Tyr Gly
    1115                1120                1125

Asn Lys  Leu Asn Ala His Leu  Asp Ile Thr Asp Asp  Tyr Pro Asn
    1130                1135                1140

Ser Arg  Asn Lys Val Val Lys  Leu Ser Leu Lys Pro  Tyr Arg Phe
    1145                1150                1155

Asp Val  Tyr Leu Asp Asn Gly  Val Tyr Lys Phe Val  Thr Val Lys
    1160                1165                1170

Asn Leu  Asp Val Ile Lys Lys  Glu Asn Tyr Tyr Glu  Val Asn Ser
    1175                1180                1185

Lys Cys  Tyr Glu Glu Ala Lys  Lys Leu Lys Lys Ile  Ser Asn Gln
    1190                1195                1200

Ala Glu  Phe Ile Ala Ser Phe  Tyr Lys Asn Asp Leu  Ile Lys Ile
    1205                1210                1215

Asn Gly  Glu Leu Tyr Arg Val  Ile Gly Val Asn Asn  Asp Leu Leu
    1220                1225                1230

Asn Arg  Ile Glu Val Asn Met  Ile Asp Ile Thr Tyr  Arg Glu Tyr
    1235                1240                1245

Leu Glu  Asn Met Asn Asp Lys  Arg Pro Pro His Ile  Ile Lys Thr
    1250                1255                1260
```

```
Ile Ala  Ser Lys Thr Gln Ser  Ile Lys Lys Tyr Ser  Thr Asp Ile
    1265                1270                1275


Leu Gly  Asn Leu Tyr Glu Val  Lys Ser Lys Lys His  Pro Gln Ile
    1280                1285                1290


Ile Lys  Lys Gly Ser Gly Gly  Ser Thr Asn Leu Ser  Asp Ile Ile
    1295                1300                1305


Glu Lys  Glu Thr Gly Lys Gln  Leu Val Ile Gln Glu  Ser Ile Leu
    1310                1315                1320


Met Leu  Pro Glu Glu Val Glu  Glu Val Ile Gly Asn  Lys Pro Glu
    1325                1330                1335


Ser Asp  Ile Leu Val His Thr  Ala Tyr Asp Glu Ser  Thr Asp Glu
    1340                1345                1350


Asn Val  Met Leu Leu Thr Ser  Asp Ala Pro Glu Tyr  Lys Pro Trp
    1355                1360                1365


Ala Leu  Val Ile Gln Asp Ser  Asn Gly Glu Asn Lys  Ile Lys Met
    1370                1375                1380


Leu Ser  Gly Gly Ser Pro Lys  Lys Lys Arg Lys Val
    1385                1390                1395


<210>  44
<211>  1710
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic Polypeptide

<400>  44

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1               5                  10                  15
```

```
Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
            20                  25                  30

Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
        35                  40                  45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
    50                  55                  60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65                  70                  75                  80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
                85                  90                  95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
            100                 105                 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
        115                 120                 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220
```

```
Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
225                 230                 235                 240


Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
                245                 250                 255


Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
            260                 265                 270


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


Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
    290                 295                 300


Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys
305                 310                 315                 320


Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
                325                 330                 335


Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
            340                 345                 350


Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp
        355                 360                 365


Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys
    370                 375                 380


Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
385                 390                 395                 400


Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
                405                 410                 415


Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
            420                 425                 430
```

```
Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser
        435                 440                 445

Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg
    450                 455                 460

Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
465                 470                 475                 480

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
                485                 490                 495

Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
            500                 505                 510

Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp
        515                 520                 525

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

Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro
545                 550                 555                 560

Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
                565                 570                 575

Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys
            580                 585                 590

Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
        595                 600                 605

Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
    610                 615                 620

Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
625                 630                 635                 640
```

```
Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His
                645                 650                 655

Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
            660                 665                 670

Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
        675                 680                 685

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
    690                 695                 700

Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
705                 710                 715                 720

Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile
                725                 730                 735

Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
            740                 745                 750

Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu
        755                 760                 765

Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu
    770                 775                 780

Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn
785                 790                 795                 800

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
                805                 810                 815

Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
            820                 825                 830

Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
        835                 840                 845
```

```
Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val
    850                 855                 860

Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu
865                 870                 875                 880

Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
                885                 890                 895

Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn
            900                 905                 910

Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys
        915                 920                 925

Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp
    930                 935                 940

Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln
945                 950                 955                 960

Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala
                965                 970                 975

Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val
            980                 985                 990

Lys Val Met Gly Arg His Lys Pro  Glu Asn Ile Val Ile  Glu Met Ala
        995                 1000                1005

Arg Glu  Asn Gln Thr Thr Gln  Lys Gly Gln Lys Asn  Ser Arg Glu
    1010                1015                1020

Arg Met  Lys Arg Ile Glu Glu  Gly Ile Lys Glu Leu  Gly Ser Gln
    1025                1030                1035

Ile Leu  Lys Glu His Pro Val  Glu Asn Thr Gln Leu  Gln Asn Glu
    1040                1045                1050
```

```
Lys Leu  Tyr Leu Tyr Tyr Leu  Gln Asn Gly Arg Asp  Met Tyr Val
    1055                 1060                 1065

Asp Gln  Glu Leu Asp Ile Asn  Arg Leu Ser Asp Tyr  Asp Val Asp
    1070                 1075                 1080

His Ile  Val Pro Gln Ser Phe  Leu Lys Asp Asp Ser  Ile Asp Asn
    1085                 1090                 1095

Lys Val  Leu Thr Arg Ser Asp  Lys Asn Arg Gly Lys  Ser Asp Asn
    1100                 1105                 1110

Val Pro  Ser Glu Glu Val Val  Lys Lys Met Lys Asn  Tyr Trp Arg
    1115                 1120                 1125

Gln Leu  Leu Asn Ala Lys Leu  Ile Thr Gln Arg Lys  Phe Asp Asn
    1130                 1135                 1140

Leu Thr  Lys Ala Glu Arg Gly  Gly Leu Ser Glu Leu  Asp Lys Ala
    1145                 1150                 1155

Gly Phe  Ile Lys Arg Gln Leu  Val Glu Thr Arg Gln  Ile Thr Lys
    1160                 1165                 1170

His Val  Ala Gln Ile Leu Asp  Ser Arg Met Asn Thr  Lys Tyr Asp
    1175                 1180                 1185

Glu Asn  Asp Lys Leu Ile Arg  Glu Val Lys Val Ile  Thr Leu Lys
    1190                 1195                 1200

Ser Lys  Leu Val Ser Asp Phe  Arg Lys Asp Phe Gln  Phe Tyr Lys
    1205                 1210                 1215

Val Arg  Glu Ile Asn Asn Tyr  His His Ala His Asp  Ala Tyr Leu
    1220                 1225                 1230

Asn Ala  Val Val Gly Thr Ala  Leu Ile Lys Lys Tyr  Pro Lys Leu
    1235                 1240                 1245
```

```
Glu Ser  Glu Phe Val Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg
    1250                1255                1260

Lys Met  Ile Ala Lys Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala
    1265                1270                1275

Lys Tyr  Phe Phe Tyr Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu
    1280                1285                1290

Ile Thr  Leu Ala Asn Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu
    1295                1300                1305

Thr Asn  Gly Glu Thr Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp
    1310                1315                1320

Phe Ala  Thr Val Arg Lys Val  Leu Ser Met Pro Gln  Val Asn Ile
    1325                1330                1335

Val Lys  Lys Thr Glu Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser
    1340                1345                1350

Ile Leu  Pro Lys Arg Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys
    1355                1360                1365

Asp Trp  Asp Pro Lys Lys Tyr  Gly Gly Phe Glu Ser  Pro Thr Val
    1370                1375                1380

Ala Tyr  Ser Val Leu Val Val  Ala Lys Val Glu Lys  Gly Lys Ser
    1385                1390                1395

Lys Lys  Leu Lys Ser Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met
    1400                1405                1410

Glu Arg  Ser Ser Phe Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala
    1415                1420                1425

Lys Gly  Tyr Lys Glu Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro
    1430                1435                1440
```

```
Lys Tyr  Ser Leu Phe Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu
    1445                1450                1455

Ala Ser  Ala Gly Glu Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro
    1460                1465                1470

Ser Lys  Tyr Val Asn Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys
    1475                1480                1485

Leu Lys  Gly Ser Pro Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val
    1490                1495                1500

Glu Gln  His Lys His Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser
    1505                1510                1515

Glu Phe  Ser Lys Arg Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys
    1520                1525                1530

Val Leu  Ser Ala Tyr Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu
    1535                1540                1545

Gln Ala  Glu Asn Ile Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly
    1550                1555                1560

Ala Pro  Ala Ala Phe Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys
    1565                1570                1575

Gln Tyr  Arg Ser Thr Lys Glu  Val Leu Asp Ala Thr  Leu Ile His
    1580                1585                1590

Gln Ser  Ile Thr Gly Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln
    1595                1600                1605

Leu Gly  Gly Asp Ser Gly Gly  Ser Thr Asn Leu Ser  Asp Ile Ile
    1610                1615                1620

Glu Lys  Glu Thr Gly Lys Gln  Leu Val Ile Gln Glu  Ser Ile Leu
    1625                1630                1635
```

Met Leu Pro Glu Glu Val Glu Glu Val Ile Gly Asn Lys Pro Glu
1640 1645 1650

Ser Asp Ile Leu Val His Thr Ala Tyr Asp Glu Ser Thr Asp Glu
1655 1660 1665

Asn Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr Lys Pro Trp
1670 1675 1680

Ala Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile Lys Met
1685 1690 1695

Leu Ser Gly Gly Ser Pro Lys Lys Lys Arg Lys Val
1700 1705 1710

<210> 45
<211> 1710
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 45

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1 5 10 15

Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
20 25 30

Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
35 40 45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
50 55 60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65 70 75 80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
85 90 95

```
Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
            100                 105                 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
        115                 120                 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220

Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
225                 230                 235                 240

Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
                245                 250                 255

Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
            260                 265                 270

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

Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
    290                 295                 300
```

```
Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys
305                 310                 315                 320

Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
                325                 330                 335

Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
            340                 345                 350

Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp
        355                 360                 365

Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys
    370                 375                 380

Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
385                 390                 395                 400

Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
                405                 410                 415

Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
            420                 425                 430

Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser
        435                 440                 445

Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg
    450                 455                 460

Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
465                 470                 475                 480

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
                485                 490                 495

Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
            500                 505                 510
```

```
Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp
        515                 520                 525

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

Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro
545                 550                 555                 560

Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
                565                 570                 575

Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys
            580                 585                 590

Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
        595                 600                 605

Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
    610                 615                 620

Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
625                 630                 635                 640

Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His
                645                 650                 655

Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
            660                 665                 670

Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
        675                 680                 685

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
    690                 695                 700

Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
705                 710                 715                 720
```

```
Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile
                725                 730                 735

Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
            740                 745                 750

Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu
        755                 760                 765

Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu
    770                 775                 780

Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn
785                 790                 795                 800

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
                805                 810                 815

Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
            820                 825                 830

Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
        835                 840                 845

Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val
    850                 855                 860

Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu
865                 870                 875                 880

Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
                885                 890                 895

Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn
            900                 905                 910

Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys
        915                 920                 925
```

```
Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp
    930                 935                 940

Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln
945                 950                 955                 960

Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala
                965                 970                 975

Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val
            980                 985                 990

Lys Val Met Gly Arg His Lys Pro  Glu Asn Ile Val Ile  Glu Met Ala
        995                 1000                1005

Arg Glu  Asn Gln Thr Thr Gln  Lys Gly Gln Lys Asn  Ser Arg Glu
    1010                1015                1020

Arg Met  Lys Arg Ile Glu Glu  Gly Ile Lys Glu Leu  Gly Ser Gln
    1025                1030                1035

Ile Leu  Lys Glu His Pro Val  Glu Asn Thr Gln Leu  Gln Asn Glu
    1040                1045                1050

Lys Leu  Tyr Leu Tyr Tyr Leu  Gln Asn Gly Arg Asp  Met Tyr Val
    1055                1060                1065

Asp Gln  Glu Leu Asp Ile Asn  Arg Leu Ser Asp Tyr  Asp Val Asp
    1070                1075                1080

His Ile  Val Pro Gln Ser Phe  Leu Lys Asp Asp Ser  Ile Asp Asn
    1085                1090                1095

Lys Val  Leu Thr Arg Ser Asp  Lys Asn Arg Gly Lys  Ser Asp Asn
    1100                1105                1110

Val Pro  Ser Glu Glu Val Val  Lys Lys Met Lys Asn  Tyr Trp Arg
    1115                1120                1125
```

```
Gln Leu  Leu Asn Ala Lys Leu  Ile Thr Gln Arg Lys  Phe Asp Asn
    1130                1135                1140

Leu Thr  Lys Ala Glu Arg Gly  Gly Leu Ser Glu Leu  Asp Lys Ala
    1145                1150                1155

Gly Phe  Ile Lys Arg Gln Leu  Val Glu Thr Arg Gln  Ile Thr Lys
    1160                1165                1170

His Val  Ala Gln Ile Leu Asp  Ser Arg Met Asn Thr  Lys Tyr Asp
    1175                1180                1185

Glu Asn  Asp Lys Leu Ile Arg  Glu Val Lys Val Ile  Thr Leu Lys
    1190                1195                1200

Ser Lys  Leu Val Ser Asp Phe  Arg Lys Asp Phe Gln  Phe Tyr Lys
    1205                1210                1215

Val Arg  Glu Ile Asn Asn Tyr  His His Ala His Asp  Ala Tyr Leu
    1220                1225                1230

Asn Ala  Val Val Gly Thr Ala  Leu Ile Lys Lys Tyr  Pro Lys Leu
    1235                1240                1245

Glu Ser  Glu Phe Val Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg
    1250                1255                1260

Lys Met  Ile Ala Lys Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala
    1265                1270                1275

Lys Tyr  Phe Phe Tyr Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu
    1280                1285                1290

Ile Thr  Leu Ala Asn Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu
    1295                1300                1305

Thr Asn  Gly Glu Thr Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp
    1310                1315                1320
```

```
Phe Ala  Thr Val Arg Lys Val  Leu Ser Met Pro Gln  Val Asn Ile
    1325                1330                1335

Val Lys  Lys Thr Glu Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser
    1340                1345                1350

Ile Leu  Pro Lys Arg Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys
    1355                1360                1365

Asp Trp  Asp Pro Lys Lys Tyr  Gly Gly Phe Val Ser  Pro Thr Val
    1370                1375                1380

Ala Tyr  Ser Val Leu Val Val  Ala Lys Val Glu Lys  Gly Lys Ser
    1385                1390                1395

Lys Lys  Leu Lys Ser Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met
    1400                1405                1410

Glu Arg  Ser Ser Phe Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala
    1415                1420                1425

Lys Gly  Tyr Lys Glu Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro
    1430                1435                1440

Lys Tyr  Ser Leu Phe Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu
    1445                1450                1455

Ala Ser  Ala Gly Glu Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro
    1460                1465                1470

Ser Lys  Tyr Val Asn Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys
    1475                1480                1485

Leu Lys  Gly Ser Pro Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val
    1490                1495                1500

Glu Gln  His Lys His Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser
    1505                1510                1515
```

```
Glu Phe  Ser Lys Arg Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys
    1520                1525                1530

Val Leu  Ser Ala Tyr Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu
    1535                1540                1545

Gln Ala  Glu Asn Ile Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly
    1550                1555                1560

Ala Pro  Ala Ala Phe Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys
    1565                1570                1575

Gln Tyr  Arg Ser Thr Lys Glu  Val Leu Asp Ala Thr  Leu Ile His
    1580                1585                1590

Gln Ser  Ile Thr Gly Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln
    1595                1600                1605

Leu Gly  Gly Asp Ser Gly Gly  Ser Thr Asn Leu Ser  Asp Ile Ile
    1610                1615                1620

Glu Lys  Glu Thr Gly Lys Gln  Leu Val Ile Gln Glu  Ser Ile Leu
    1625                1630                1635

Met Leu  Pro Glu Glu Val Glu  Glu Val Ile Gly Asn  Lys Pro Glu
    1640                1645                1650

Ser Asp  Ile Leu Val His Thr  Ala Tyr Asp Glu Ser  Thr Asp Glu
    1655                1660                1665

Asn Val  Met Leu Leu Thr Ser  Asp Ala Pro Glu Tyr  Lys Pro Trp
    1670                1675                1680

Ala Leu  Val Ile Gln Asp Ser  Asn Gly Glu Asn Lys  Ile Lys Met
    1685                1690                1695

Leu Ser  Gly Gly Ser Pro Lys  Lys Lys Arg Lys Val
    1700                1705                1710
```

<210> 46
<211> 1710
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 46

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1 5 10 15

Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
20 25 30

Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
35 40 45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
50 55 60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65 70 75 80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
85 90 95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
100 105 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
115 120 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
130 135 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145 150 155 160

```
Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220

Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
225                 230                 235                 240

Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
                245                 250                 255

Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
            260                 265                 270

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

Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
    290                 295                 300

Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys
305                 310                 315                 320

Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
                325                 330                 335

Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
            340                 345                 350

Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp
        355                 360                 365
```

```
Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys
    370                 375                 380

Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
385                 390                 395                 400

Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
                405                 410                 415

Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
            420                 425                 430

Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser
        435                 440                 445

Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg
    450                 455                 460

Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
465                 470                 475                 480

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
                485                 490                 495

Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
            500                 505                 510

Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp
        515                 520                 525

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

Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro
545                 550                 555                 560

Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
                565                 570                 575
```

```
Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys
            580                 585                 590

Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
        595                 600                 605

Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
    610                 615                 620

Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
625                 630                 635                 640

Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His
                645                 650                 655

Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
            660                 665                 670

Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
        675                 680                 685

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
    690                 695                 700

Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
705                 710                 715                 720

Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile
                725                 730                 735

Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
            740                 745                 750

Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu
        755                 760                 765

Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu
    770                 775                 780
```

```
Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn
785                 790                 795                 800

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
                805                 810                 815

Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
            820                 825                 830

Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
        835                 840                 845

Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val
    850                 855                 860

Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu
865                 870                 875                 880

Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
                885                 890                 895

Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn
            900                 905                 910

Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys
        915                 920                 925

Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp
    930                 935                 940

Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln
945                 950                 955                 960

Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala
                965                 970                 975

Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val
            980                 985                 990
```

```
Lys Val Met Gly Arg His Lys Pro  Glu Asn Ile Val Ile  Glu Met Ala
        995                 1000                1005


Arg Glu  Asn Gln Thr Thr Gln  Lys Gly Gln Lys Asn  Ser Arg Glu
    1010                1015                1020


Arg Met  Lys Arg Ile Glu Glu  Gly Ile Lys Glu Leu  Gly Ser Gln
    1025                1030                1035


Ile Leu  Lys Glu His Pro Val  Glu Asn Thr Gln Leu  Gln Asn Glu
    1040                1045                1050


Lys Leu  Tyr Leu Tyr Tyr Leu  Gln Asn Gly Arg Asp  Met Tyr Val
    1055                1060                1065


Asp Gln  Glu Leu Asp Ile Asn  Arg Leu Ser Asp Tyr  Asp Val Asp
    1070                1075                1080


His Ile  Val Pro Gln Ser Phe  Leu Lys Asp Asp Ser  Ile Asp Asn
    1085                1090                1095


Lys Val  Leu Thr Arg Ser Asp  Lys Asn Arg Gly Lys  Ser Asp Asn
    1100                1105                1110


Val Pro  Ser Glu Glu Val Val  Lys Lys Met Lys Asn  Tyr Trp Arg
    1115                1120                1125


Gln Leu  Leu Asn Ala Lys Leu  Ile Thr Gln Arg Lys  Phe Asp Asn
    1130                1135                1140


Leu Thr  Lys Ala Glu Arg Gly  Gly Leu Ser Glu Leu  Asp Lys Ala
    1145                1150                1155


Gly Phe  Ile Lys Arg Gln Leu  Val Glu Thr Arg Gln  Ile Thr Lys
    1160                1165                1170


His Val  Ala Gln Ile Leu Asp  Ser Arg Met Asn Thr  Lys Tyr Asp
    1175                1180                1185
```

```
Glu Asn  Asp Lys Leu Ile Arg  Glu Val Lys Val Ile  Thr Leu Lys
    1190                 1195                 1200

Ser Lys  Leu Val Ser Asp Phe  Arg Lys Asp Phe Gln  Phe Tyr Lys
    1205                 1210                 1215

Val Arg  Glu Ile Asn Asn Tyr  His His Ala His Asp  Ala Tyr Leu
    1220                 1225                 1230

Asn Ala  Val Val Gly Thr Ala  Leu Ile Lys Lys Tyr  Pro Lys Leu
    1235                 1240                 1245

Glu Ser  Glu Phe Val Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg
    1250                 1255                 1260

Lys Met  Ile Ala Lys Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala
    1265                 1270                 1275

Lys Tyr  Phe Phe Tyr Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu
    1280                 1285                 1290

Ile Thr  Leu Ala Asn Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu
    1295                 1300                 1305

Thr Asn  Gly Glu Thr Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp
    1310                 1315                 1320

Phe Ala  Thr Val Arg Lys Val  Leu Ser Met Pro Gln  Val Asn Ile
    1325                 1330                 1335

Val Lys  Lys Thr Glu Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser
    1340                 1345                 1350

Ile Leu  Pro Lys Arg Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys
    1355                 1360                 1365

Asp Trp  Asp Pro Lys Lys Tyr  Gly Gly Phe Val Ser  Pro Thr Val
    1370                 1375                 1380
```

```
Ala Tyr  Ser Val Leu Val Val  Ala Lys Val Glu Lys  Gly Lys Ser
    1385                1390                1395

Lys Lys  Leu Lys Ser Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met
    1400                1405                1410

Glu Arg  Ser Ser Phe Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala
    1415                1420                1425

Lys Gly  Tyr Lys Glu Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro
    1430                1435                1440

Lys Tyr  Ser Leu Phe Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu
    1445                1450                1455

Ala Ser  Ala Arg Glu Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro
    1460                1465                1470

Ser Lys  Tyr Val Asn Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys
    1475                1480                1485

Leu Lys  Gly Ser Pro Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val
    1490                1495                1500

Glu Gln  His Lys His Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser
    1505                1510                1515

Glu Phe  Ser Lys Arg Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys
    1520                1525                1530

Val Leu  Ser Ala Tyr Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu
    1535                1540                1545

Gln Ala  Glu Asn Ile Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly
    1550                1555                1560

Ala Pro  Ala Ala Phe Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys
    1565                1570                1575
```

```
Glu Tyr  Arg Ser Thr Lys Glu  Val Leu Asp Ala Thr  Leu Ile His
    1580                 1585                 1590


Gln Ser  Ile Thr Gly Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln
    1595                 1600                 1605


Leu Gly  Gly Asp Ser Gly Gly  Ser Thr Asn Leu Ser  Asp Ile Ile
    1610                 1615                 1620


Glu Lys  Glu Thr Gly Lys Gln  Leu Val Ile Gln Glu  Ser Ile Leu
    1625                 1630                 1635


Met Leu  Pro Glu Glu Val Glu  Glu Val Ile Gly Asn  Lys Pro Glu
    1640                 1645                 1650


Ser Asp  Ile Leu Val His Thr  Ala Tyr Asp Glu Ser  Thr Asp Glu
    1655                 1660                 1665


Asn Val  Met Leu Leu Thr Ser  Asp Ala Pro Glu Tyr  Lys Pro Trp
    1670                 1675                 1680


Ala Leu  Val Ile Gln Asp Ser  Asn Gly Glu Asn Lys  Ile Lys Met
    1685                 1690                 1695


Leu Ser  Gly Gly Ser Pro Lys  Lys Lys Arg Lys Val
    1700                 1705                 1710


<210>  47
<211>  1367
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic Polypeptide

<400>  47

Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly
1               5                  10                  15


Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
            20                  25                  30
```

```
Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
        35                  40                  45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
    50                  55                  60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65                  70                  75                  80

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

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
            100                 105                 110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
        115                 120                 125

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
    130                 135                 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145                 150                 155                 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
                165                 170                 175

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240
```

```
Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445
```

```
Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Ala
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655
```

Gly Trp Gly Ala Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
660 665 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
675 680 685

Asn Arg Asn Phe Met Ala Leu Ile His Asp Asp Ser Leu Thr Phe Lys
690 695 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705 710 715 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
725 730 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
740 745 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
755 760 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
770 775 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785 790 795 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
805 810 815

Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
820 825 830

Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys Asp
835 840 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
850 855 860

```
Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Ala Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975

Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990

Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005

Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020

Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035

Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
    1040                1045                1050

Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065
```

```
Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
    1070                1075                1080

Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095

Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110

Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125

Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140

Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155

Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170

Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                1210                1215

Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230

Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245

Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260
```

```
Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275


Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290


Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305


Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                1315                1320


Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Arg Tyr  Thr Ser Thr
    1325                1330                1335


Lys Glu  Val Leu Asp Ala Thr  Leu Ile His Gln Ser  Ile Thr Gly
    1340                1345                1350


Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln Leu Gly  Gly Asp
    1355                1360                1365


<210>  48
<211>  1612
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic Polypeptide

<400>  48

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1               5                   10                  15


Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
            20                  25                  30


Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
        35                  40                  45
```

```
Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
    50                  55                  60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65                  70                  75                  80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
                85                  90                  95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
            100                 105                 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
        115                 120                 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220

Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
225                 230                 235                 240

Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
                245                 250                 255
```

```
Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
            260                 265                 270

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

Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
    290                 295                 300

Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys
305                 310                 315                 320

Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
                325                 330                 335

Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
            340                 345                 350

Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp
        355                 360                 365

Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys
    370                 375                 380

Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
385                 390                 395                 400

Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
                405                 410                 415

Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
            420                 425                 430

Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser
        435                 440                 445

Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg
    450                 455                 460
```

```
Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
465                 470                 475                 480

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
                485                 490                 495

Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
            500                 505                 510

Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp
        515                 520                 525

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

Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro
545                 550                 555                 560

Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
                565                 570                 575

Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys
            580                 585                 590

Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
        595                 600                 605

Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
    610                 615                 620

Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
625                 630                 635                 640

Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His
                645                 650                 655

Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
            660                 665                 670
```

```
Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
        675                 680                 685

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
    690                 695                 700

Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
705                 710                 715                 720

Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile
                725                 730                 735

Glu Arg Met Thr Ala Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
            740                 745                 750

Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu
        755                 760                 765

Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu
    770                 775                 780

Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn
785                 790                 795                 800

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
                805                 810                 815

Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
            820                 825                 830

Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
        835                 840                 845

Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val
    850                 855                 860

Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu
865                 870                 875                 880
```

```
Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
                885                 890                 895


Arg Arg Arg Tyr Thr Gly Trp Gly Ala Leu Ser Arg Lys Leu Ile Asn
            900                 905                 910


Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys
        915                 920                 925


Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Ala Leu Ile His Asp Asp
    930                 935                 940


Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln
945                 950                 955                 960


Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala
                965                 970                 975


Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val
            980                 985                 990


Lys Val Met Gly Arg His Lys Pro  Glu Asn Ile Val Ile  Glu Met Ala
        995                 1000                1005


Arg Glu  Asn Gln Thr Thr Gln  Lys Gly Gln Lys Asn  Ser Arg Glu
    1010                1015                1020


Arg Met  Lys Arg Ile Glu Glu  Gly Ile Lys Glu Leu  Gly Ser Gln
    1025                1030                1035


Ile Leu  Lys Glu His Pro Val  Glu Asn Thr Gln Leu  Gln Asn Glu
    1040                1045                1050


Lys Leu  Tyr Leu Tyr Tyr Leu  Gln Asn Gly Arg Asp  Met Tyr Val
    1055                1060                1065


Asp Gln  Glu Leu Asp Ile Asn  Arg Leu Ser Asp Tyr  Asp Val Asp
    1070                1075                1080
```

```
His Ile  Val Pro Gln Ser Phe  Leu Lys Asp Asp Ser  Ile Asp Asn
    1085                1090                1095

Lys Val  Leu Thr Arg Ser Asp  Lys Asn Arg Gly Lys  Ser Asp Asn
    1100                1105                1110

Val Pro  Ser Glu Glu Val Val  Lys Lys Met Lys Asn  Tyr Trp Arg
    1115                1120                1125

Gln Leu  Leu Asn Ala Lys Leu  Ile Thr Gln Arg Lys  Phe Asp Asn
    1130                1135                1140

Leu Thr  Lys Ala Glu Arg Gly  Gly Leu Ser Glu Leu  Asp Lys Ala
    1145                1150                1155

Gly Phe  Ile Lys Arg Gln Leu  Val Glu Thr Arg Ala  Ile Thr Lys
    1160                1165                1170

His Val  Ala Gln Ile Leu Asp  Ser Arg Met Asn Thr  Lys Tyr Asp
    1175                1180                1185

Glu Asn  Asp Lys Leu Ile Arg  Glu Val Lys Val Ile  Thr Leu Lys
    1190                1195                1200

Ser Lys  Leu Val Ser Asp Phe  Arg Lys Asp Phe Gln  Phe Tyr Lys
    1205                1210                1215

Val Arg  Glu Ile Asn Asn Tyr  His His Ala His Asp  Ala Tyr Leu
    1220                1225                1230

Asn Ala  Val Val Gly Thr Ala  Leu Ile Lys Lys Tyr  Pro Lys Leu
    1235                1240                1245

Glu Ser  Glu Phe Val Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg
    1250                1255                1260

Lys Met  Ile Ala Lys Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala
    1265                1270                1275
```

```
Lys Tyr  Phe Phe Tyr Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu
    1280                1285                1290

Ile Thr  Leu Ala Asn Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu
    1295                1300                1305

Thr Asn  Gly Glu Thr Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp
    1310                1315                1320

Phe Ala  Thr Val Arg Lys Val  Leu Ser Met Pro Gln  Val Asn Ile
    1325                1330                1335

Val Lys  Lys Thr Glu Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser
    1340                1345                1350

Ile Leu  Pro Lys Arg Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys
    1355                1360                1365

Asp Trp  Asp Pro Lys Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val
    1370                1375                1380

Ala Tyr  Ser Val Leu Val Val  Ala Lys Val Glu Lys  Gly Lys Ser
    1385                1390                1395

Lys Lys  Leu Lys Ser Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met
    1400                1405                1410

Glu Arg  Ser Ser Phe Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala
    1415                1420                1425

Lys Gly  Tyr Lys Glu Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro
    1430                1435                1440

Lys Tyr  Ser Leu Phe Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu
    1445                1450                1455

Ala Ser  Ala Gly Glu Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro
    1460                1465                1470
```

Ser Lys Tyr Val Asn Phe Leu Tyr Leu Ala Ser His Tyr Glu Lys
1475 1480 1485

Leu Lys Gly Ser Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val
1490 1495 1500

Glu Gln His Lys His Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser
1505 1510 1515

Glu Phe Ser Lys Arg Val Ile Leu Ala Asp Ala Asn Leu Asp Lys
1520 1525 1530

Val Leu Ser Ala Tyr Asn Lys His Arg Asp Lys Pro Ile Arg Glu
1535 1540 1545

Gln Ala Glu Asn Ile Ile His Leu Phe Thr Leu Thr Asn Leu Gly
1550 1555 1560

Ala Pro Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys
1565 1570 1575

Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His
1580 1585 1590

Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln
1595 1600 1605

Leu Gly Gly Asp
1610

<210> 49
<211> 198
<212> PRT
<213> Homo sapiens

<400> 49

Met Asp Ser Leu Leu Met Asn Arg Arg Lys Phe Leu Tyr Gln Phe Lys
1 5 10 15

Asn Val Arg Trp Ala Lys Gly Arg Arg Glu Thr Tyr Leu Cys Tyr Val

20 25 30

Val Lys Arg Arg Asp Ser Ala Thr Ser Phe Ser Leu Asp Phe Gly Tyr
35 40 45

Leu Arg Asn Lys Asn Gly Cys His Val Glu Leu Leu Phe Leu Arg Tyr
50 55 60

Ile Ser Asp Trp Asp Leu Asp Pro Gly Arg Cys Tyr Arg Val Thr Trp
65 70 75 80

Phe Thr Ser Trp Ser Pro Cys Tyr Asp Cys Ala Arg His Val Ala Asp
85 90 95

Phe Leu Arg Gly Asn Pro Asn Leu Ser Leu Arg Ile Phe Thr Ala Arg
100 105 110

Leu Tyr Phe Cys Glu Asp Arg Lys Ala Glu Pro Glu Gly Leu Arg Arg
115 120 125

Leu His Arg Ala Gly Val Gln Ile Ala Ile Met Thr Phe Lys Asp Tyr
130 135 140

Phe Tyr Cys Trp Asn Thr Phe Val Glu Asn His Glu Arg Thr Phe Lys
145 150 155 160

Ala Trp Glu Gly Leu His Glu Asn Ser Val Arg Leu Ser Arg Gln Leu
165 170 175

Arg Arg Ile Leu Leu Pro Leu Tyr Glu Val Asp Asp Leu Arg Asp Ala
180 185 190

Phe Arg Thr Leu Gly Leu
195

<210> 50
<211> 181
<212> PRT
<213> Homo sapiens

<400> 50

```
Met Asp Ser Leu Leu Met Asn Arg Arg Lys Phe Leu Tyr Gln Phe Lys
1               5                  10                  15

Asn Val Arg Trp Ala Lys Gly Arg Arg Glu Thr Tyr Leu Cys Tyr Val
            20                  25                  30

Val Lys Arg Arg Asp Ser Ala Thr Ser Phe Ser Leu Asp Phe Gly Tyr
        35                  40                  45

Leu Arg Asn Lys Asn Gly Cys His Val Glu Leu Leu Phe Leu Arg Tyr
    50                  55                  60

Ile Ser Asp Trp Asp Leu Asp Pro Gly Arg Cys Tyr Arg Val Thr Trp
65                  70                  75                  80

Phe Thr Ser Trp Ser Pro Cys Tyr Asp Cys Ala Arg His Val Ala Asp
                85                  90                  95

Phe Leu Arg Gly Asn Pro Asn Leu Ser Leu Arg Ile Phe Thr Ala Arg
            100                 105                 110

Leu Tyr Phe Cys Glu Asp Arg Lys Ala Glu Pro Glu Gly Leu Arg Arg
        115                 120                 125

Leu His Arg Ala Gly Val Gln Ile Ala Ile Met Thr Phe Lys Asp Tyr
    130                 135                 140

Phe Tyr Cys Trp Asn Thr Phe Val Glu Asn His Glu Arg Thr Phe Lys
145                 150                 155                 160

Ala Trp Glu Gly Leu His Glu Asn Ser Val Arg Leu Ser Arg Gln Leu
                165                 170                 175

Arg Arg Ile Leu Leu
            180
```

<210> 51
<211> 198

<212> PRT
<213> Mus musculus

<400> 51

```
Met Asp Ser Leu Leu Met Lys Gln Lys Lys Phe Leu Tyr His Phe Lys
1               5                  10                  15

Asn Val Arg Trp Ala Lys Gly Arg His Glu Thr Tyr Leu Cys Tyr Val
            20                  25                  30

Val Lys Arg Arg Asp Ser Ala Thr Ser Cys Ser Leu Asp Phe Gly His
        35                  40                  45

Leu Arg Asn Lys Ser Gly Cys His Val Glu Leu Leu Phe Leu Arg Tyr
    50                  55                  60

Ile Ser Asp Trp Asp Leu Asp Pro Gly Arg Cys Tyr Arg Val Thr Trp
65                  70                  75                  80

Phe Thr Ser Trp Ser Pro Cys Tyr Asp Cys Ala Arg His Val Ala Glu
                85                  90                  95

Phe Leu Arg Trp Asn Pro Asn Leu Ser Leu Arg Ile Phe Thr Ala Arg
            100                 105                 110

Leu Tyr Phe Cys Glu Asp Arg Lys Ala Glu Pro Glu Gly Leu Arg Arg
        115                 120                 125

Leu His Arg Ala Gly Val Gln Ile Gly Ile Met Thr Phe Lys Asp Tyr
    130                 135                 140

Phe Tyr Cys Trp Asn Thr Phe Val Glu Asn Arg Glu Arg Thr Phe Lys
145                 150                 155                 160

Ala Trp Glu Gly Leu His Glu Asn Ser Val Arg Leu Thr Arg Gln Leu
                165                 170                 175

Arg Arg Ile Leu Leu Pro Leu Tyr Glu Val Asp Asp Leu Arg Asp Ala
            180                 185                 190
```

Phe Arg Met Leu Gly Phe
195

<210> 52
<211> 198
<212> PRT
<213> Canis lupus familiaris

<400> 52

Met Asp Ser Leu Leu Met Lys Gln Arg Lys Phe Leu Tyr His Phe Lys
1 5 10 15

Asn Val Arg Trp Ala Lys Gly Arg His Glu Thr Tyr Leu Cys Tyr Val
20 25 30

Val Lys Arg Arg Asp Ser Ala Thr Ser Phe Ser Leu Asp Phe Gly His
35 40 45

Leu Arg Asn Lys Ser Gly Cys His Val Glu Leu Leu Phe Leu Arg Tyr
50 55 60

Ile Ser Asp Trp Asp Leu Asp Pro Gly Arg Cys Tyr Arg Val Thr Trp
65 70 75 80

Phe Thr Ser Trp Ser Pro Cys Tyr Asp Cys Ala Arg His Val Ala Asp
85 90 95

Phe Leu Arg Gly Tyr Pro Asn Leu Ser Leu Arg Ile Phe Ala Ala Arg
100 105 110

Leu Tyr Phe Cys Glu Asp Arg Lys Ala Glu Pro Glu Gly Leu Arg Arg
115 120 125

Leu His Arg Ala Gly Val Gln Ile Ala Ile Met Thr Phe Lys Asp Tyr
130 135 140

Phe Tyr Cys Trp Asn Thr Phe Val Glu Asn Arg Glu Lys Thr Phe Lys
145 150 155 160

```
Ala Trp Glu Gly Leu His Glu Asn Ser Val Arg Leu Ser Arg Gln Leu
                165                 170                 175


Arg Arg Ile Leu Leu Pro Leu Tyr Glu Val Asp Asp Leu Arg Asp Ala
            180                 185                 190


Phe Arg Thr Leu Gly Leu
        195


<210>  53
<211>  199
<212>  PRT
<213>  Bos taurus

<400>  53

Met Asp Ser Leu Leu Lys Lys Gln Arg Gln Phe Leu Tyr Gln Phe Lys
1               5                   10                  15


Asn Val Arg Trp Ala Lys Gly Arg His Glu Thr Tyr Leu Cys Tyr Val
            20                  25                  30


Val Lys Arg Arg Asp Ser Pro Thr Ser Phe Ser Leu Asp Phe Gly His
        35                  40                  45


Leu Arg Asn Lys Ala Gly Cys His Val Glu Leu Leu Phe Leu Arg Tyr
    50                  55                  60


Ile Ser Asp Trp Asp Leu Asp Pro Gly Arg Cys Tyr Arg Val Thr Trp
65                  70                  75                  80


Phe Thr Ser Trp Ser Pro Cys Tyr Asp Cys Ala Arg His Val Ala Asp
                85                  90                  95


Phe Leu Arg Gly Tyr Pro Asn Leu Ser Leu Arg Ile Phe Thr Ala Arg
            100                 105                 110


Leu Tyr Phe Cys Asp Lys Glu Arg Lys Ala Glu Pro Glu Gly Leu Arg
        115                 120                 125


Arg Leu His Arg Ala Gly Val Gln Ile Ala Ile Met Thr Phe Lys Asp
```

130 135 140

Tyr Phe Tyr Cys Trp Asn Thr Phe Val Glu Asn His Glu Arg Thr Phe
145 150 155 160

Lys Ala Trp Glu Gly Leu His Glu Asn Ser Val Arg Leu Ser Arg Gln
165 170 175

Leu Arg Arg Ile Leu Leu Pro Leu Tyr Glu Val Asp Asp Leu Arg Asp
180 185 190

Ala Phe Arg Thr Leu Gly Leu
195

<210> 54
<211> 239
<212> PRT
<213> Rattus norvegicus

<400> 54

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

Glu Arg Glu Arg Ile Trp Cys Phe Leu Cys Ser Thr Gly Leu Gly Thr
20 25 30

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

Asp Pro Val Ser Pro Pro Arg Ser Leu Leu Met Lys Gln Arg Lys Phe
50 55 60

Leu Tyr His Phe Lys Asn Val Arg Trp Ala Lys Gly Arg His Glu Thr
65 70 75 80

Tyr Leu Cys Tyr Val Val Lys Arg Arg Asp Ser Ala Thr Ser Phe Ser
85 90 95

Leu Asp Phe Gly Tyr Leu Arg Asn Lys Ser Gly Cys His Val Glu Leu
100 105 110

```
Leu Phe Leu Arg Tyr Ile Ser Asp Trp Asp Leu Asp Pro Gly Arg Cys
        115                 120                 125

Tyr Arg Val Thr Trp Phe Thr Ser Trp Ser Pro Cys Tyr Asp Cys Ala
    130                 135                 140

Arg His Val Ala Asp Phe Leu Arg Gly Asn Pro Asn Leu Ser Leu Arg
145                 150                 155                 160

Ile Phe Thr Ala Arg Leu Thr Gly Trp Gly Ala Leu Pro Ala Gly Leu
                165                 170                 175

Met Ser Pro Ala Arg Pro Ser Asp Tyr Phe Tyr Cys Trp Asn Thr Phe
            180                 185                 190

Val Glu Asn His Glu Arg Thr Phe Lys Ala Trp Glu Gly Leu His Glu
        195                 200                 205

Asn Ser Val Arg Leu Ser Arg Arg Leu Arg Arg Ile Leu Leu Pro Leu
    210                 215                 220

Tyr Glu Val Asp Asp Leu Arg Asp Ala Phe Arg Thr Leu Gly Leu
225                 230                 235


<210>  55
<211>  429
<212>  PRT
<213>  Mus musculus

<400>  55

Met Gly Pro Phe Cys Leu Gly Cys Ser His Arg Lys Cys Tyr Ser Pro
1               5                   10                  15

Ile Arg Asn Leu Ile Ser Gln Glu Thr Phe Lys Phe His Phe Lys Asn
            20                  25                  30

Leu Gly Tyr Ala Lys Gly Arg Lys Asp Thr Phe Leu Cys Tyr Glu Val
        35                  40                  45
```

```
Thr Arg Lys Asp Cys Asp Ser Pro Val Ser Leu His His Gly Val Phe
    50                  55                  60

Lys Asn Lys Asp Asn Ile His Ala Glu Ile Cys Phe Leu Tyr Trp Phe
65                  70                  75                  80

His Asp Lys Val Leu Lys Val Leu Ser Pro Arg Glu Glu Phe Lys Ile
                85                  90                  95

Thr Trp Tyr Met Ser Trp Ser Pro Cys Phe Glu Cys Ala Glu Gln Ile
            100                 105                 110

Val Arg Phe Leu Ala Thr His His Asn Leu Ser Leu Asp Ile Phe Ser
        115                 120                 125

Ser Arg Leu Tyr Asn Val Gln Asp Pro Glu Thr Gln Gln Asn Leu Cys
    130                 135                 140

Arg Leu Val Gln Glu Gly Ala Gln Val Ala Ala Met Asp Leu Tyr Glu
145                 150                 155                 160

Phe Lys Lys Cys Trp Lys Lys Phe Val Asp Asn Gly Gly Arg Arg Phe
                165                 170                 175

Arg Pro Trp Lys Arg Leu Leu Thr Asn Phe Arg Tyr Gln Asp Ser Lys
            180                 185                 190

Leu Gln Glu Ile Leu Arg Pro Cys Tyr Ile Pro Val Pro Ser Ser Ser
        195                 200                 205

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

Arg Phe Cys Val Glu Gly Arg Arg Met Asp Pro Leu Ser Glu Glu Glu
225                 230                 235                 240

Phe Tyr Ser Gln Phe Tyr Asn Gln Arg Val Lys His Leu Cys Tyr Tyr
                245                 250                 255
```

```
His Arg Met Lys Pro Tyr Leu Cys Tyr Gln Leu Glu Gln Phe Asn Gly
            260                 265                 270

Gln Ala Pro Leu Lys Gly Cys Leu Leu Ser Glu Lys Gly Lys Gln His
        275                 280                 285

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

Val Thr Ile Thr Cys Tyr Leu Thr Trp Ser Pro Cys Pro Asn Cys Ala
305                 310                 315                 320

Trp Gln Leu Ala Ala Phe Lys Arg Asp Arg Pro Asp Leu Ile Leu His
                325                 330                 335

Ile Tyr Thr Ser Arg Leu Tyr Phe His Trp Lys Arg Pro Phe Gln Lys
            340                 345                 350

Gly Leu Cys Ser Leu Trp Gln Ser Gly Ile Leu Val Asp Val Met Asp
        355                 360                 365

Leu Pro Gln Phe Thr Asp Cys Trp Thr Asn Phe Val Asn Pro Lys Arg
    370                 375                 380

Pro Phe Trp Pro Trp Lys Gly Leu Glu Ile Ile Ser Arg Arg Thr Gln
385                 390                 395                 400

Arg Arg Leu Arg Arg Ile Lys Glu Ser Trp Gly Leu Gln Asp Leu Val
                405                 410                 415

Asn Asp Phe Gly Asn Leu Gln Leu Gly Pro Pro Met Ser
            420                 425
```

<210> 56
<211> 429
<212> PRT
<213> Rattus norvegicus

<400> 56

Sequence Listing

```
Met Gly Pro Phe Cys Leu Gly Cys Ser His Arg Lys Cys Tyr Ser Pro
1               5                   10                  15

Ile Arg Asn Leu Ile Ser Gln Glu Thr Phe Lys Phe His Phe Lys Asn
            20                  25                  30

Leu Arg Tyr Ala Ile Asp Arg Lys Asp Thr Phe Leu Cys Tyr Glu Val
        35                  40                  45

Thr Arg Lys Asp Cys Asp Ser Pro Val Ser Leu His His Gly Val Phe
    50                  55                  60

Lys Asn Lys Asp Asn Ile His Ala Glu Ile Cys Phe Leu Tyr Trp Phe
65                  70                  75                  80

His Asp Lys Val Leu Lys Val Leu Ser Pro Arg Glu Glu Phe Lys Ile
                85                  90                  95

Thr Trp Tyr Met Ser Trp Ser Pro Cys Phe Glu Cys Ala Glu Gln Val
            100                 105                 110

Leu Arg Phe Leu Ala Thr His His Asn Leu Ser Leu Asp Ile Phe Ser
        115                 120                 125

Ser Arg Leu Tyr Asn Ile Arg Asp Pro Glu Asn Gln Gln Asn Leu Cys
    130                 135                 140

Arg Leu Val Gln Glu Gly Ala Gln Val Ala Ala Met Asp Leu Tyr Glu
145                 150                 155                 160

Phe Lys Lys Cys Trp Lys Lys Phe Val Asp Asn Gly Gly Arg Arg Phe
                165                 170                 175

Arg Pro Trp Lys Lys Leu Leu Thr Asn Phe Arg Tyr Gln Asp Ser Lys
            180                 185                 190

Leu Gln Glu Ile Leu Arg Pro Cys Tyr Ile Pro Val Pro Ser Ser Ser
        195                 200                 205
```

```
Ser Ser Thr Leu Ser Asn Ile Cys Leu Thr Lys Gly Leu Pro Glu Thr
    210                 215                 220

Arg Phe Cys Val Glu Arg Arg Arg Val His Leu Leu Ser Glu Glu Glu
225                 230                 235                 240

Phe Tyr Ser Gln Phe Tyr Asn Gln Arg Val Lys His Leu Cys Tyr Tyr
                245                 250                 255

His Gly Val Lys Pro Tyr Leu Cys Tyr Gln Leu Glu Gln Phe Asn Gly
            260                 265                 270

Gln Ala Pro Leu Lys Gly Cys Leu Leu Ser Glu Lys Gly Lys Gln His
        275                 280                 285

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

Val Ile Ile Thr Cys Tyr Leu Thr Trp Ser Pro Cys Pro Asn Cys Ala
305                 310                 315                 320

Trp Gln Leu Ala Ala Phe Lys Arg Asp Arg Pro Asp Leu Ile Leu His
                325                 330                 335

Ile Tyr Thr Ser Arg Leu Tyr Phe His Trp Lys Arg Pro Phe Gln Lys
            340                 345                 350

Gly Leu Cys Ser Leu Trp Gln Ser Gly Ile Leu Val Asp Val Met Asp
        355                 360                 365

Leu Pro Gln Phe Thr Asp Cys Trp Thr Asn Phe Val Asn Pro Lys Arg
    370                 375                 380

Pro Phe Trp Pro Trp Lys Gly Leu Glu Ile Ile Ser Arg Arg Thr Gln
385                 390                 395                 400

Arg Arg Leu His Arg Ile Lys Glu Ser Trp Gly Leu Gln Asp Leu Val
                405                 410                 415
```

Asn Asp Phe Gly Asn Leu Gln Leu Gly Pro Pro Met Ser
420 425

<210> 57
<211> 370
<212> PRT
<213> Macaca mulatta

<400> 57

Met Val Glu Pro Met Asp Pro Arg Thr Phe Val Ser Asn Phe Asn Asn
1 5 10 15

Arg Pro Ile Leu Ser Gly Leu Asn Thr Val Trp Leu Cys Cys Glu Val
20 25 30

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

Gly Lys Val Tyr Ser Lys Ala Lys Tyr His Pro Glu Met Arg Phe Leu
50 55 60

Arg Trp Phe His Lys Trp Arg Gln Leu His His Asp Gln Glu Tyr Lys
65 70 75 80

Val Thr Trp Tyr Val Ser Trp Ser Pro Cys Thr Arg Cys Ala Asn Ser
85 90 95

Val Ala Thr Phe Leu Ala Lys Asp Pro Lys Val Thr Leu Thr Ile Phe
100 105 110

Val Ala Arg Leu Tyr Tyr Phe Trp Lys Pro Asp Tyr Gln Gln Ala Leu
115 120 125

Arg Ile Leu Cys Gln Lys Arg Gly Gly Pro His Ala Thr Met Lys Ile
130 135 140

Met Asn Tyr Asn Glu Phe Gln Asp Cys Trp Asn Lys Phe Val Asp Gly
145 150 155 160

Arg Gly Lys Pro Phe Lys Pro Arg Asn Asn Leu Pro Lys His Tyr Thr

165 170 175

Leu Leu Gln Ala Thr Leu Gly Glu Leu Leu Arg His Leu Met Asp Pro
180 185 190

Gly Thr Phe Thr Ser Asn Phe Asn Asn Lys Pro Trp Val Ser Gly Gln
195 200 205

His Glu Thr Tyr Leu Cys Tyr Lys Val Glu Arg Leu His Asn Asp Thr
210 215 220

Trp Val Pro Leu Asn Gln His Arg Gly Phe Leu Arg Asn Gln Ala Pro
225 230 235 240

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

Asp Leu Ile Pro Phe Trp Lys Leu Asp Gly Gln Gln Tyr Arg Val Thr
260 265 270

Cys Phe Thr Ser Trp Ser Pro Cys Phe Ser Cys Ala Gln Glu Met Ala
275 280 285

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

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

His Arg Asp Gly Ala Lys Ile Ala Met Met Asn Tyr Ser Glu Phe Glu
325 330 335

Tyr Cys Trp Asp Thr Phe Val Asp Arg Gln Gly Arg Pro Phe Gln Pro
340 345 350

Trp Asp Gly Leu Asp Glu His Ser Gln Ala Leu Ser Gly Arg Leu Arg
355 360 365

Ala Ile

370

<210> 58
<211> 384
<212> PRT
<213> Pan troglodytes

<400> 58

Met Lys Pro His Phe Arg Asn Pro Val Glu Arg Met Tyr Gln Asp Thr
1 5 10 15

Phe Ser Asp Asn Phe Tyr Asn Arg Pro Ile Leu Ser His Arg Asn Thr
20 25 30

Val Trp Leu Cys Tyr Glu Val Lys Thr Lys Gly Pro Ser Arg Pro Pro
35 40 45

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

His Pro Glu Met Arg Phe Phe His Trp Phe Ser Lys Trp Arg Lys Leu
65 70 75 80

His Arg Asp Gln Glu Tyr Glu Val Thr Trp Tyr Ile Ser Trp Ser Pro
85 90 95

Cys Thr Lys Cys Thr Arg Asp Val Ala Thr Phe Leu Ala Glu Asp Pro
100 105 110

Lys Val Thr Leu Thr Ile Phe Val Ala Arg Leu Tyr Tyr Phe Trp Asp
115 120 125

Pro Asp Tyr Gln Glu Ala Leu Arg Ser Leu Cys Gln Lys Arg Asp Gly
130 135 140

Pro Arg Ala Thr Met Lys Ile Met Asn Tyr Asp Glu Phe Gln His Cys
145 150 155 160

Trp Ser Lys Phe Val Tyr Ser Gln Arg Glu Leu Phe Glu Pro Trp Asn
165 170 175

```
Asn Leu Pro Lys Tyr Tyr Ile Leu Leu His Ile Met Leu Gly Glu Ile
            180                 185                 190

Leu Arg His Ser Met Asp Pro Pro Thr Phe Thr Ser Asn Phe Asn Asn
        195                 200                 205

Glu Leu Trp Val Arg Gly Arg His Glu Thr Tyr Leu Cys Tyr Glu Val
    210                 215                 220

Glu Arg Leu His Asn Asp Thr Trp Val Leu Leu Asn Gln Arg Arg Gly
225                 230                 235                 240

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

His Ala Glu Leu Cys Phe Leu Asp Val Ile Pro Phe Trp Lys Leu Asp
            260                 265                 270

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

Phe Ser Cys Ala Gln Glu Met Ala Lys Phe Ile Ser Asn Asn Lys His
    290                 295                 300

Val Ser Leu Cys Ile Phe Ala Ala Arg Ile Tyr Asp Asp Gln Gly Arg
305                 310                 315                 320

Cys Gln Glu Gly Leu Arg Thr Leu Ala Lys Ala Gly Ala Lys Ile Ser
                325                 330                 335

Ile Met Thr Tyr Ser Glu Phe Lys His Cys Trp Asp Thr Phe Val Asp
            340                 345                 350

His Gln Gly Cys Pro Phe Gln Pro Trp Asp Gly Leu Glu Glu His Ser
        355                 360                 365

Gln Ala Leu Ser Gly Arg Leu Arg Ala Ile Leu Gln Asn Gln Gly Asn
    370                 375                 380
```

<210> 59
<211> 377
<212> PRT
<213> Chlorocebus sabaeus

<400> 59

```
Met Asn Pro Gln Ile Arg Asn Met Val Glu Gln Met Glu Pro Asp Ile
1               5                  10                  15

Phe Val Tyr Tyr Phe Asn Asn Arg Pro Ile Leu Ser Gly Arg Asn Thr
            20                  25                  30

Val Trp Leu Cys Tyr Glu Val Lys Thr Lys Asp Pro Ser Gly Pro Pro
        35                  40                  45

Leu Asp Ala Asn Ile Phe Gln Gly Lys Leu Tyr Pro Glu Ala Lys Asp
    50                  55                  60

His Pro Glu Met Lys Phe Leu His Trp Phe Arg Lys Trp Arg Gln Leu
65                  70                  75                  80

His Arg Asp Gln Glu Tyr Glu Val Thr Trp Tyr Val Ser Trp Ser Pro
                85                  90                  95

Cys Thr Arg Cys Ala Asn Ser Val Ala Thr Phe Leu Ala Glu Asp Pro
            100                 105                 110

Lys Val Thr Leu Thr Ile Phe Val Ala Arg Leu Tyr Tyr Phe Trp Lys
        115                 120                 125

Pro Asp Tyr Gln Gln Ala Leu Arg Ile Leu Cys Gln Glu Arg Gly Gly
    130                 135                 140

Pro His Ala Thr Met Lys Ile Met Asn Tyr Asn Glu Phe Gln His Cys
145                 150                 155                 160

Trp Asn Glu Phe Val Asp Gly Gln Gly Lys Pro Phe Lys Pro Arg Lys
                165                 170                 175
```

```
Asn Leu Pro Lys His Tyr Thr Leu Leu His Ala Thr Leu Gly Glu Leu
            180                 185                 190

Leu Arg His Val Met Asp Pro Gly Thr Phe Thr Ser Asn Phe Asn Asn
        195                 200                 205

Lys Pro Trp Val Ser Gly Gln Arg Glu Thr Tyr Leu Cys Tyr Lys Val
    210                 215                 220

Glu Arg Ser His Asn Asp Thr Trp Val Leu Leu Asn Gln His Arg Gly
225                 230                 235                 240

Phe Leu Arg Asn Gln Ala Pro Asp Arg His Gly Phe Pro Lys Gly Arg
                245                 250                 255

His Ala Glu Leu Cys Phe Leu Asp Leu Ile Pro Phe Trp Lys Leu Asp
            260                 265                 270

Asp Gln Gln Tyr Arg Val Thr Cys Phe Thr Ser Trp Ser Pro Cys Phe
        275                 280                 285

Ser Cys Ala Gln Lys Met Ala Lys Phe Ile Ser Asn Asn Lys His Val
    290                 295                 300

Ser Leu Cys Ile Phe Ala Ala Arg Ile Tyr Asp Asp Gln Gly Arg Cys
305                 310                 315                 320

Gln Glu Gly Leu Arg Thr Leu His Arg Asp Gly Ala Lys Ile Ala Val
                325                 330                 335

Met Asn Tyr Ser Glu Phe Glu Tyr Cys Trp Asp Thr Phe Val Asp Arg
            340                 345                 350

Gln Gly Arg Pro Phe Gln Pro Trp Asp Gly Leu Asp Glu His Ser Gln
        355                 360                 365

Ala Leu Ser Gly Arg Leu Arg Ala Ile
    370                 375
```

<210> 60
<211> 384
<212> PRT
<213> Homo sapiens

<400> 60

```
Met Lys Pro His Phe Arg Asn Thr Val Glu Arg Met Tyr Arg Asp Thr
1               5                   10                  15


Phe Ser Tyr Asn Phe Tyr Asn Arg Pro Ile Leu Ser Arg Arg Asn Thr
            20                  25                  30


Val Trp Leu Cys Tyr Glu Val Lys Thr Lys Gly Pro Ser Arg Pro Pro
        35                  40                  45


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


His Pro Glu Met Arg Phe Phe His Trp Phe Ser Lys Trp Arg Lys Leu
65                  70                  75                  80


His Arg Asp Gln Glu Tyr Glu Val Thr Trp Tyr Ile Ser Trp Ser Pro
                85                  90                  95


Cys Thr Lys Cys Thr Arg Asp Met Ala Thr Phe Leu Ala Glu Asp Pro
            100                 105                 110


Lys Val Thr Leu Thr Ile Phe Val Ala Arg Leu Tyr Tyr Phe Trp Asp
        115                 120                 125


Pro Asp Tyr Gln Glu Ala Leu Arg Ser Leu Cys Gln Lys Arg Asp Gly
    130                 135                 140


Pro Arg Ala Thr Met Lys Ile Met Asn Tyr Asp Glu Phe Gln His Cys
145                 150                 155                 160


Trp Ser Lys Phe Val Tyr Ser Gln Arg Glu Leu Phe Glu Pro Trp Asn
                165                 170                 175
```

```
Asn Leu Pro Lys Tyr Tyr Ile Leu Leu His Ile Met Leu Gly Glu Ile
            180                 185                 190

Leu Arg His Ser Met Asp Pro Pro Thr Phe Thr Phe Asn Phe Asn Asn
        195                 200                 205

Glu Pro Trp Val Arg Gly Arg His Glu Thr Tyr Leu Cys Tyr Glu Val
    210                 215                 220

Glu Arg Met His Asn Asp Thr Trp Val Leu Leu Asn Gln Arg Arg Gly
225                 230                 235                 240

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

His Ala Glu Leu Cys Phe Leu Asp Val Ile Pro Phe Trp Lys Leu Asp
            260                 265                 270

Leu Asp Gln Asp Tyr Arg Val Thr Cys Phe Thr Ser Trp Ser Pro Cys
        275                 280                 285

Phe Ser Cys Ala Gln Glu Met Ala Lys Phe Ile Ser Lys Asn Lys His
    290                 295                 300

Val Ser Leu Cys Ile Phe Thr Ala Arg Ile Tyr Asp Asp Gln Gly Arg
305                 310                 315                 320

Cys Gln Glu Gly Leu Arg Thr Leu Ala Glu Ala Gly Ala Lys Ile Ser
                325                 330                 335

Ile Met Thr Tyr Ser Glu Phe Lys His Cys Trp Asp Thr Phe Val Asp
            340                 345                 350

His Gln Gly Cys Pro Phe Gln Pro Trp Asp Gly Leu Asp Glu His Ser
        355                 360                 365

Gln Asp Leu Ser Gly Arg Leu Arg Ala Ile Leu Gln Asn Gln Glu Asn
    370                 375                 380
```

<210> 61
<211> 373
<212> PRT
<213> Homo sapiens

<400> 61

```
Met Lys Pro His Phe Arg Asn Thr Val Glu Arg Met Tyr Arg Asp Thr
1               5                   10                  15


Phe Ser Tyr Asn Phe Tyr Asn Arg Pro Ile Leu Ser Arg Arg Asn Thr
            20                  25                  30


Val Trp Leu Cys Tyr Glu Val Lys Thr Lys Gly Pro Ser Arg Pro Arg
        35                  40                  45


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


His Ala Glu Met Cys Phe Leu Ser Trp Phe Cys Gly Asn Gln Leu Pro
65                  70                  75                  80


Ala Tyr Lys Cys Phe Gln Ile Thr Trp Phe Val Ser Trp Thr Pro Cys
                85                  90                  95


Pro Asp Cys Val Ala Lys Leu Ala Glu Phe Leu Ala Glu His Pro Asn
            100                 105                 110


Val Thr Leu Thr Ile Ser Ala Ala Arg Leu Tyr Tyr Tyr Trp Glu Arg
        115                 120                 125


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


Lys Ile Met Asp Asp Glu Glu Phe Ala Tyr Cys Trp Glu Asn Phe Val
145                 150                 155                 160


Tyr Ser Glu Gly Gln Pro Phe Met Pro Trp Tyr Lys Phe Asp Asp Asn
                165                 170                 175


Tyr Ala Phe Leu His Arg Thr Leu Lys Glu Ile Leu Arg Asn Pro Met
```

180 185 190

Glu Ala Met Tyr Pro His Ile Phe Tyr Phe His Phe Lys Asn Leu Arg
195 200 205

Lys Ala Tyr Gly Arg Asn Glu Ser Trp Leu Cys Phe Thr Met Glu Val
210 215 220

Val Lys His His Ser Pro Val Ser Trp Lys Arg Gly Val Phe Arg Asn
225 230 235 240

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

Trp Phe Cys Asp Asp Ile Leu Ser Pro Asn Thr Asn Tyr Glu Val Thr
260 265 270

Trp Tyr Thr Ser Trp Ser Pro Cys Pro Glu Cys Ala Gly Glu Val Ala
275 280 285

Glu Phe Leu Ala Arg His Ser Asn Val Asn Leu Thr Ile Phe Thr Ala
290 295 300

Arg Leu Tyr Tyr Phe Trp Asp Thr Asp Tyr Gln Glu Gly Leu Arg Ser
305 310 315 320

Leu Ser Gln Glu Gly Ala Ser Val Glu Ile Met Gly Tyr Lys Asp Phe
325 330 335

Lys Tyr Cys Trp Glu Asn Phe Val Tyr Asn Asp Asp Glu Pro Phe Lys
340 345 350

Pro Trp Lys Gly Leu Lys Tyr Asn Phe Leu Phe Leu Asp Ser Lys Leu
355 360 365

Gln Glu Ile Leu Glu
370

<210> 62

<211> 382
<212> PRT
<213> Homo sapiens

<400> 62

```
Met Asn Pro Gln Ile Arg Asn Pro Met Glu Arg Met Tyr Arg Asp Thr
1               5                  10                  15


Phe Tyr Asp Asn Phe Glu Asn Glu Pro Ile Leu Tyr Gly Arg Ser Tyr
            20                  25                  30


Thr Trp Leu Cys Tyr Glu Val Lys Ile Lys Arg Gly Arg Ser Asn Leu
        35                  40                  45


Leu Trp Asp Thr Gly Val Phe Arg Gly Gln Val Tyr Phe Lys Pro Gln
    50                  55                  60


Tyr His Ala Glu Met Cys Phe Leu Ser Trp Phe Cys Gly Asn Gln Leu
65                  70                  75                  80


Pro Ala Tyr Lys Cys Phe Gln Ile Thr Trp Phe Val Ser Trp Thr Pro
                85                  90                  95


Cys Pro Asp Cys Val Ala Lys Leu Ala Glu Phe Leu Ser Glu His Pro
            100                 105                 110


Asn Val Thr Leu Thr Ile Ser Ala Ala Arg Leu Tyr Tyr Tyr Trp Glu
        115                 120                 125


Arg Asp Tyr Arg Arg Ala Leu Cys Arg Leu Ser Gln Ala Gly Ala Arg
    130                 135                 140


Val Thr Ile Met Asp Tyr Glu Glu Phe Ala Tyr Cys Trp Glu Asn Phe
145                 150                 155                 160


Val Tyr Asn Glu Gly Gln Gln Phe Met Pro Trp Tyr Lys Phe Asp Glu
                165                 170                 175


Asn Tyr Ala Phe Leu His Arg Thr Leu Lys Glu Ile Leu Arg Tyr Leu
            180                 185                 190
```

```
Met Asp Pro Asp Thr Phe Thr Phe Asn Phe Asn Asn Asp Pro Leu Val
        195                 200                 205

Leu Arg Arg Arg Gln Thr Tyr Leu Cys Tyr Glu Val Glu Arg Leu Asp
    210                 215                 220

Asn Gly Thr Trp Val Leu Met Asp Gln His Met Gly Phe Leu Cys Asn
225                 230                 235                 240

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

Arg Phe Leu Asp Leu Val Pro Ser Leu Gln Leu Asp Pro Ala Gln Ile
            260                 265                 270

Tyr Arg Val Thr Trp Phe Ile Ser Trp Ser Pro Cys Phe Ser Trp Gly
        275                 280                 285

Cys Ala Gly Glu Val Arg Ala Phe Leu Gln Glu Asn Thr His Val Arg
    290                 295                 300

Leu Arg Ile Phe Ala Ala Arg Ile Tyr Asp Tyr Asp Pro Leu Tyr Lys
305                 310                 315                 320

Glu Ala Leu Gln Met Leu Arg Asp Ala Gly Ala Gln Val Ser Ile Met
                325                 330                 335

Thr Tyr Asp Glu Phe Glu Tyr Cys Trp Asp Thr Phe Val Tyr Arg Gln
            340                 345                 350

Gly Cys Pro Phe Gln Pro Trp Asp Gly Leu Glu Glu His Ser Gln Ala
        355                 360                 365

Leu Ser Gly Arg Leu Arg Ala Ile Leu Gln Asn Gln Gly Asn
    370                 375                 380
```

<210> 63
<211> 396

<212> PRT
<213> Rattus norvegicus

<400> 63

```
Met Gln Pro Gln Gly Leu Gly Pro Asn Ala Gly Met Gly Pro Val Cys
1               5                  10                  15

Leu Gly Cys Ser His Arg Arg Pro Tyr Ser Pro Ile Arg Asn Pro Leu
            20                  25                  30

Lys Lys Leu Tyr Gln Gln Thr Phe Tyr Phe His Phe Lys Asn Val Arg
        35                  40                  45

Tyr Ala Trp Gly Arg Lys Asn Asn Phe Leu Cys Tyr Glu Val Asn Gly
    50                  55                  60

Met Asp Cys Ala Leu Pro Val Pro Leu Arg Gln Gly Val Phe Arg Lys
65                  70                  75                  80

Gln Gly His Ile His Ala Glu Leu Cys Phe Ile Tyr Trp Phe His Asp
                85                  90                  95

Lys Val Leu Arg Val Leu Ser Pro Met Glu Glu Phe Lys Val Thr Trp
            100                 105                 110

Tyr Met Ser Trp Ser Pro Cys Ser Lys Cys Ala Glu Gln Val Ala Arg
        115                 120                 125

Phe Leu Ala Ala His Arg Asn Leu Ser Leu Ala Ile Phe Ser Ser Arg
    130                 135                 140

Leu Tyr Tyr Tyr Leu Arg Asn Pro Asn Tyr Gln Gln Lys Leu Cys Arg
145                 150                 155                 160

Leu Ile Gln Glu Gly Val His Val Ala Ala Met Asp Leu Pro Glu Phe
                165                 170                 175

Lys Lys Cys Trp Asn Lys Phe Val Asp Asn Asp Gly Gln Pro Phe Arg
            180                 185                 190
```

```
Pro Trp Met Arg Leu Arg Ile Asn Phe Ser Phe Tyr Asp Cys Lys Leu
        195                 200                 205

Gln Glu Ile Phe Ser Arg Met Asn Leu Leu Arg Glu Asp Val Phe Tyr
    210                 215                 220

Leu Gln Phe Asn Asn Ser His Arg Val Lys Pro Val Gln Asn Arg Tyr
225                 230                 235                 240

Tyr Arg Arg Lys Ser Tyr Leu Cys Tyr Gln Leu Glu Arg Ala Asn Gly
                245                 250                 255

Gln Glu Pro Leu Lys Gly Tyr Leu Leu Tyr Lys Lys Gly Glu Gln His
            260                 265                 270

Val Glu Ile Leu Phe Leu Glu Lys Met Arg Ser Met Glu Leu Ser Gln
        275                 280                 285

Val Arg Ile Thr Cys Tyr Leu Thr Trp Ser Pro Cys Pro Asn Cys Ala
    290                 295                 300

Arg Gln Leu Ala Ala Phe Lys Lys Asp His Pro Asp Leu Ile Leu Arg
305                 310                 315                 320

Ile Tyr Thr Ser Arg Leu Tyr Phe Tyr Trp Arg Lys Lys Phe Gln Lys
                325                 330                 335

Gly Leu Cys Thr Leu Trp Arg Ser Gly Ile His Val Asp Val Met Asp
            340                 345                 350

Leu Pro Gln Phe Ala Asp Cys Trp Thr Asn Phe Val Asn Pro Gln Arg
        355                 360                 365

Pro Phe Arg Pro Trp Asn Glu Leu Glu Lys Asn Ser Trp Arg Ile Gln
    370                 375                 380

Arg Arg Leu Arg Arg Ile Lys Glu Ser Trp Gly Leu
385                 390                 395
```

<210> 64
<211> 227
<212> PRT
<213> Bos taurus

<400> 64

```
Asp Gly Trp Glu Val Ala Phe Arg Ser Gly Thr Val Leu Lys Ala Gly
1               5                   10                  15


Val Leu Gly Val Ser Met Thr Glu Gly Trp Ala Gly Ser Gly His Pro
            20                  25                  30


Gly Gln Gly Ala Cys Val Trp Thr Pro Gly Thr Arg Asn Thr Met Asn
        35                  40                  45


Leu Leu Arg Glu Val Leu Phe Lys Gln Gln Phe Gly Asn Gln Pro Arg
    50                  55                  60


Val Pro Ala Pro Tyr Tyr Arg Arg Lys Thr Tyr Leu Cys Tyr Gln Leu
65                  70                  75                  80


Lys Gln Arg Asn Asp Leu Thr Leu Asp Arg Gly Cys Phe Arg Asn Lys
                85                  90                  95


Lys Gln Arg His Ala Glu Ile Arg Phe Ile Asp Lys Ile Asn Ser Leu
            100                 105                 110


Asp Leu Asn Pro Ser Gln Ser Tyr Lys Ile Ile Cys Tyr Ile Thr Trp
        115                 120                 125


Ser Pro Cys Pro Asn Cys Ala Asn Glu Leu Val Asn Phe Ile Thr Arg
    130                 135                 140


Asn Asn His Leu Lys Leu Glu Ile Phe Ala Ser Arg Leu Tyr Phe His
145                 150                 155                 160


Trp Ile Lys Ser Phe Lys Met Gly Leu Gln Asp Leu Gln Asn Ala Gly
                165                 170                 175
```

Ile Ser Val Ala Val Met Thr His Thr Glu Phe Glu Asp Cys Trp Glu
180 185 190

Gln Phe Val Asp Asn Gln Ser Arg Pro Phe Gln Pro Trp Asp Lys Leu
195 200 205

Glu Gln Tyr Ser Ala Ser Ile Arg Arg Arg Leu Gln Arg Ile Leu Thr
210 215 220

Ala Pro Ile
225

<210> 65
<211> 490
<212> PRT
<213> Pan troglodytes

<400> 65

Met Asn Pro Gln Ile Arg Asn Pro Met Glu Trp Met Tyr Gln Arg Thr
1 5 10 15

Phe Tyr Tyr Asn Phe Glu Asn Glu Pro Ile Leu Tyr Gly Arg Ser Tyr
20 25 30

Thr Trp Leu Cys Tyr Glu Val Lys Ile Arg Arg Gly His Ser Asn Leu
35 40 45

Leu Trp Asp Thr Gly Val Phe Arg Gly Gln Met Tyr Ser Gln Pro Glu
50 55 60

His His Ala Glu Met Cys Phe Leu Ser Trp Phe Cys Gly Asn Gln Leu
65 70 75 80

Ser Ala Tyr Lys Cys Phe Gln Ile Thr Trp Phe Val Ser Trp Thr Pro
85 90 95

Cys Pro Asp Cys Val Ala Lys Leu Ala Lys Phe Leu Ala Glu His Pro
100 105 110

Asn Val Thr Leu Thr Ile Ser Ala Ala Arg Leu Tyr Tyr Tyr Trp Glu

```
        115                 120                 125

Arg Asp Tyr Arg Arg Ala Leu Cys Arg Leu Ser Gln Ala Gly Ala Arg
    130                 135                 140

Val Lys Ile Met Asp Asp Glu Glu Phe Ala Tyr Cys Trp Glu Asn Phe
145                 150                 155                 160

Val Tyr Asn Glu Gly Gln Pro Phe Met Pro Trp Tyr Lys Phe Asp Asp
                165                 170                 175

Asn Tyr Ala Phe Leu His Arg Thr Leu Lys Glu Ile Ile Arg His Leu
            180                 185                 190

Met Asp Pro Asp Thr Phe Thr Phe Asn Phe Asn Asn Asp Pro Leu Val
        195                 200                 205

Leu Arg Arg His Gln Thr Tyr Leu Cys Tyr Glu Val Glu Arg Leu Asp
    210                 215                 220

Asn Gly Thr Trp Val Leu Met Asp Gln His Met Gly Phe Leu Cys Asn
225                 230                 235                 240

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

Arg Phe Leu Asp Leu Val Pro Ser Leu Gln Leu Asp Pro Ala Gln Ile
            260                 265                 270

Tyr Arg Val Thr Trp Phe Ile Ser Trp Ser Pro Cys Phe Ser Trp Gly
        275                 280                 285

Cys Ala Gly Gln Val Arg Ala Phe Leu Gln Glu Asn Thr His Val Arg
    290                 295                 300

Leu Arg Ile Phe Ala Ala Arg Ile Tyr Asp Tyr Asp Pro Leu Tyr Lys
305                 310                 315                 320

Glu Ala Leu Gln Met Leu Arg Asp Ala Gly Ala Gln Val Ser Ile Met
```

325 330 335

Thr Tyr Asp Glu Phe Glu Tyr Cys Trp Asp Thr Phe Val Tyr Arg Gln
340 345 350

Gly Cys Pro Phe Gln Pro Trp Asp Gly Leu Glu Glu His Ser Gln Ala
355 360 365

Leu Ser Gly Arg Leu Arg Ala Ile Leu Gln Val Arg Ala Ser Ser Leu
370 375 380

Cys Met Val Pro His Arg Pro Pro Pro Pro Pro Gln Ser Pro Gly Pro
385 390 395 400

Cys Leu Pro Leu Cys Ser Glu Pro Pro Leu Gly Ser Leu Leu Pro Thr
405 410 415

Gly Arg Pro Ala Pro Ser Leu Pro Phe Leu Leu Thr Ala Ser Phe Ser
420 425 430

Phe Pro Pro Pro Ala Ser Leu Pro Pro Leu Pro Ser Leu Ser Leu Ser
435 440 445

Pro Gly His Leu Pro Val Pro Ser Phe His Ser Leu Thr Ser Cys Ser
450 455 460

Ile Gln Pro Pro Cys Ser Ser Arg Ile Arg Glu Thr Glu Gly Trp Ala
465 470 475 480

Ser Val Ser Lys Glu Gly Arg Asp Leu Gly
485 490

<210> 66
<211> 190
<212> PRT
<213> Homo sapiens

<400> 66

Met Asn Pro Gln Ile Arg Asn Pro Met Lys Ala Met Tyr Pro Gly Thr
1 5 10 15

```
Phe Tyr Phe Gln Phe Lys Asn Leu Trp Glu Ala Asn Asp Arg Asn Glu
            20                  25                  30

Thr Trp Leu Cys Phe Thr Val Glu Gly Ile Lys Arg Arg Ser Val Val
        35                  40                  45

Ser Trp Lys Thr Gly Val Phe Arg Asn Gln Val Asp Ser Glu Thr His
    50                  55                  60

Cys His Ala Glu Arg Cys Phe Leu Ser Trp Phe Cys Asp Asp Ile Leu
65                  70                  75                  80

Ser Pro Asn Thr Lys Tyr Gln Val Thr Trp Tyr Thr Ser Trp Ser Pro
                85                  90                  95

Cys Pro Asp Cys Ala Gly Glu Val Ala Glu Phe Leu Ala Arg His Ser
            100                 105                 110

Asn Val Asn Leu Thr Ile Phe Thr Ala Arg Leu Tyr Tyr Phe Gln Tyr
        115                 120                 125

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

Val Glu Ile Met Asp Tyr Glu Asp Phe Lys Tyr Cys Trp Glu Asn Phe
145                 150                 155                 160

Val Tyr Asn Asp Asn Glu Pro Phe Lys Pro Trp Lys Gly Leu Lys Thr
                165                 170                 175

Asn Phe Arg Leu Leu Lys Arg Arg Leu Arg Glu Ser Leu Gln
            180                 185                 190
```

<210> 67
<211> 190
<212> PRT
<213> Gorilla gorilla

<400> 67

```
Met Asn Pro Gln Ile Arg Asn Pro Met Lys Ala Met Tyr Pro Gly Thr
1               5                   10                  15

Phe Tyr Phe Gln Phe Lys Asn Leu Trp Glu Ala Asn Asp Arg Asn Glu
            20                  25                  30

Thr Trp Leu Cys Phe Thr Val Glu Gly Ile Lys Arg Arg Ser Val Val
        35                  40                  45

Ser Trp Lys Thr Gly Val Phe Arg Asn Gln Val Asp Ser Glu Thr His
    50                  55                  60

Cys His Ala Glu Arg Cys Phe Leu Ser Trp Phe Cys Asp Asp Ile Leu
65                  70                  75                  80

Ser Pro Asn Thr Asn Tyr Gln Val Thr Trp Tyr Thr Ser Trp Ser Pro
                85                  90                  95

Cys Pro Glu Cys Ala Gly Glu Val Ala Glu Phe Leu Ala Arg His Ser
            100                 105                 110

Asn Val Asn Leu Thr Ile Phe Thr Ala Arg Leu Tyr Tyr Phe Gln Asp
        115                 120                 125

Thr Asp Tyr Gln Glu Gly Leu Arg Ser Leu Ser Gln Glu Gly Val Ala
    130                 135                 140

Val Lys Ile Met Asp Tyr Lys Asp Phe Lys Tyr Cys Trp Glu Asn Phe
145                 150                 155                 160

Val Tyr Asn Asp Asp Glu Pro Phe Lys Pro Trp Lys Gly Leu Lys Tyr
                165                 170                 175

Asn Phe Arg Phe Leu Lys Arg Arg Leu Gln Glu Ile Leu Glu
            180                 185                 190
```

<210> 68
<211> 199
<212> PRT

<213> Homo sapiens

<400> 68

```
Met Glu Ala Ser Pro Ala Ser Gly Pro Arg His Leu Met Asp Pro His
1               5                  10                  15

Ile Phe Thr Ser Asn Phe Asn Asn Gly Ile Gly Arg His Lys Thr Tyr
            20                  25                  30

Leu Cys Tyr Glu Val Glu Arg Leu Asp Asn Gly Thr Ser Val Lys Met
        35                  40                  45

Asp Gln His Arg Gly Phe Leu His Asn Gln Ala Lys Asn Leu Leu Cys
    50                  55                  60

Gly Phe Tyr Gly Arg His Ala Glu Leu Arg Phe Leu Asp Leu Val Pro
65                  70                  75                  80

Ser Leu Gln Leu Asp Pro Ala Gln Ile Tyr Arg Val Thr Trp Phe Ile
                85                  90                  95

Ser Trp Ser Pro Cys Phe Ser Trp Gly Cys Ala Gly Glu Val Arg Ala
            100                 105                 110

Phe Leu Gln Glu Asn Thr His Val Arg Leu Arg Ile Phe Ala Ala Arg
        115                 120                 125

Ile Tyr Asp Tyr Asp Pro Leu Tyr Lys Glu Ala Leu Gln Met Leu Arg
    130                 135                 140

Asp Ala Gly Ala Gln Val Ser Ile Met Thr Tyr Asp Glu Phe Lys His
145                 150                 155                 160

Cys Trp Asp Thr Phe Val Asp His Gln Gly Cys Pro Phe Gln Pro Trp
                165                 170                 175

Asp Gly Leu Asp Glu His Ser Gln Ala Leu Ser Gly Arg Leu Arg Ala
            180                 185                 190
```

Ile Leu Gln Asn Gln Gly Asn
195

<210> 69
<211> 202
<212> PRT
<213> Macaca mulatta

<400> 69

Met Asp Gly Ser Pro Ala Ser Arg Pro Arg His Leu Met Asp Pro Asn
1 5 10 15

Thr Phe Thr Phe Asn Phe Asn Asn Asp Leu Ser Val Arg Gly Arg His
20 25 30

Gln Thr Tyr Leu Cys Tyr Glu Val Glu Arg Leu Asp Asn Gly Thr Trp
35 40 45

Val Pro Met Asp Glu Arg Arg Gly Phe Leu Cys Asn Lys Ala Lys Asn
50 55 60

Val Pro Cys Gly Asp Tyr Gly Cys His Val Glu Leu Arg Phe Leu Cys
65 70 75 80

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

Trp Phe Ile Ser Trp Ser Pro Cys Phe Arg Arg Gly Cys Ala Gly Gln
100 105 110

Val Arg Val Phe Leu Gln Glu Asn Lys His Val Arg Leu Arg Ile Phe
115 120 125

Ala Ala Arg Ile Tyr Asp Tyr Asp Pro Leu Tyr Gln Glu Ala Leu Arg
130 135 140

Thr Leu Arg Asp Ala Gly Ala Gln Val Ser Ile Met Thr Tyr Glu Glu
145 150 155 160

Phe Lys His Cys Trp Asp Thr Phe Val Asp Arg Gln Gly Arg Pro Phe

165 170 175

Gln Pro Trp Asp Gly Leu Asp Glu His Ser Gln Ala Leu Ser Gly Arg
180 185 190

Leu Arg Ala Ile Leu Gln Asn Gln Gly Asn
195 200

<210> 70
<211> 185
<212> PRT
<213> Bos taurus

<400> 70

Met Asp Glu Tyr Thr Phe Thr Glu Asn Phe Asn Asn Gln Gly Trp Pro
1 5 10 15

Ser Lys Thr Tyr Leu Cys Tyr Glu Met Glu Arg Leu Asp Gly Asp Ala
20 25 30

Thr Ile Pro Leu Asp Glu Tyr Lys Gly Phe Val Arg Asn Lys Gly Leu
35 40 45

Asp Gln Pro Glu Lys Pro Cys His Ala Glu Leu Tyr Phe Leu Gly Lys
50 55 60

Ile His Ser Trp Asn Leu Asp Arg Asn Gln His Tyr Arg Leu Thr Cys
65 70 75 80

Phe Ile Ser Trp Ser Pro Cys Tyr Asp Cys Ala Gln Lys Leu Thr Thr
85 90 95

Phe Leu Lys Glu Asn His His Ile Ser Leu His Ile Leu Ala Ser Arg
100 105 110

Ile Tyr Thr His Asn Arg Phe Gly Cys His Gln Ser Gly Leu Cys Glu
115 120 125

Leu Gln Ala Ala Gly Ala Arg Ile Thr Ile Met Thr Phe Glu Asp Phe
130 135 140

```
Lys His Cys Trp Glu Thr Phe Val Asp His Lys Gly Lys Pro Phe Gln
145                 150                 155                 160


Pro Trp Glu Gly Leu Asn Val Lys Ser Gln Ala Leu Cys Thr Glu Leu
                165                 170                 175


Gln Ala Ile Leu Lys Thr Gln Gln Asn
            180                 185


<210>  71
<211>  200
<212>  PRT
<213>  Homo sapiens

<400>  71

Met Ala Leu Leu Thr Ala Glu Thr Phe Arg Leu Gln Phe Asn Asn Lys
1               5                   10                  15


Arg Arg Leu Arg Arg Pro Tyr Tyr Pro Arg Lys Ala Leu Leu Cys Tyr
            20                  25                  30


Gln Leu Thr Pro Gln Asn Gly Ser Thr Pro Thr Arg Gly Tyr Phe Glu
        35                  40                  45


Asn Lys Lys Lys Cys His Ala Glu Ile Cys Phe Ile Asn Glu Ile Lys
    50                  55                  60


Ser Met Gly Leu Asp Glu Thr Gln Cys Tyr Gln Val Thr Cys Tyr Leu
65                  70                  75                  80


Thr Trp Ser Pro Cys Ser Ser Cys Ala Trp Glu Leu Val Asp Phe Ile
                85                  90                  95


Lys Ala His Asp His Leu Asn Leu Gly Ile Phe Ala Ser Arg Leu Tyr
            100                 105                 110


Tyr His Trp Cys Lys Pro Gln Gln Lys Gly Leu Arg Leu Leu Cys Gly
        115                 120                 125
```

```
Ser Gln Val Pro Val Glu Val Met Gly Phe Pro Lys Phe Ala Asp Cys
    130                 135                 140

Trp Glu Asn Phe Val Asp His Glu Lys Pro Leu Ser Phe Asn Pro Tyr
145                 150                 155                 160

Lys Met Leu Glu Glu Leu Asp Lys Asn Ser Arg Ala Ile Lys Arg Arg
                165                 170                 175

Leu Glu Arg Ile Lys Ile Pro Gly Val Arg Ala Gln Gly Arg Tyr Met
            180                 185                 190

Asp Ile Leu Cys Asp Ala Glu Val
        195                 200
```

<210> 72
<211> 210
<212> PRT
<213> Macaca mulatta

<400> 72

```
Met Ala Leu Leu Thr Ala Lys Thr Phe Ser Leu Gln Phe Asn Asn Lys
1               5                   10                  15

Arg Arg Val Asn Lys Pro Tyr Tyr Pro Arg Lys Ala Leu Leu Cys Tyr
            20                  25                  30

Gln Leu Thr Pro Gln Asn Gly Ser Thr Pro Thr Arg Gly His Leu Lys
        35                  40                  45

Asn Lys Lys Lys Asp His Ala Glu Ile Arg Phe Ile Asn Lys Ile Lys
    50                  55                  60

Ser Met Gly Leu Asp Glu Thr Gln Cys Tyr Gln Val Thr Cys Tyr Leu
65                  70                  75                  80

Thr Trp Ser Pro Cys Pro Ser Cys Ala Gly Glu Leu Val Asp Phe Ile
                85                  90                  95
```

```
Lys Ala His Arg His Leu Asn Leu Arg Ile Phe Ala Ser Arg Leu Tyr
            100                 105                 110

Tyr His Trp Arg Pro Asn Tyr Gln Glu Gly Leu Leu Leu Leu Cys Gly
        115                 120                 125

Ser Gln Val Pro Val Glu Val Met Gly Leu Pro Glu Phe Thr Asp Cys
    130                 135                 140

Trp Glu Asn Phe Val Asp His Lys Glu Pro Pro Ser Phe Asn Pro Ser
145                 150                 155                 160

Glu Lys Leu Glu Glu Leu Asp Lys Asn Ser Gln Ala Ile Lys Arg Arg
                165                 170                 175

Leu Glu Arg Ile Lys Ser Arg Ser Val Asp Val Leu Glu Asn Gly Leu
            180                 185                 190

Arg Ser Leu Gln Leu Gly Pro Val Thr Pro Ser Ser Ser Ile Arg Asn
        195                 200                 205

Ser Arg
    210
```

<210> 73
<211> 386
<212> PRT
<213> Homo sapiens

<400> 73

```
Met Asn Pro Gln Ile Arg Asn Pro Met Glu Arg Met Tyr Arg Asp Thr
1               5                   10                  15

Phe Tyr Asp Asn Phe Glu Asn Glu Pro Ile Leu Tyr Gly Arg Ser Tyr
            20                  25                  30

Thr Trp Leu Cys Tyr Glu Val Lys Ile Lys Arg Gly Arg Ser Asn Leu
        35                  40                  45

Leu Trp Asp Thr Gly Val Phe Arg Gly Pro Val Leu Pro Lys Arg Gln
```

50 55 60

Ser Asn His Arg Gln Glu Val Tyr Phe Arg Phe Glu Asn His Ala Glu
65 70 75 80

Met Cys Phe Leu Ser Trp Phe Cys Gly Asn Arg Leu Pro Ala Asn Arg
85 90 95

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

Val Val Lys Val Thr Lys Phe Leu Ala Glu His Pro Asn Val Thr Leu
115 120 125

Thr Ile Ser Ala Ala Arg Leu Tyr Tyr Tyr Arg Asp Arg Asp Trp Arg
130 135 140

Trp Val Leu Leu Arg Leu His Lys Ala Gly Ala Arg Val Lys Ile Met
145 150 155 160

Asp Tyr Glu Asp Phe Ala Tyr Cys Trp Glu Asn Phe Val Cys Asn Glu
165 170 175

Gly Gln Pro Phe Met Pro Trp Tyr Lys Phe Asp Asp Asn Tyr Ala Ser
180 185 190

Leu His Arg Thr Leu Lys Glu Ile Leu Arg Asn Pro Met Glu Ala Met
195 200 205

Tyr Pro His Ile Phe Tyr Phe His Phe Lys Asn Leu Leu Lys Ala Cys
210 215 220

Gly Arg Asn Glu Ser Trp Leu Cys Phe Thr Met Glu Val Thr Lys His
225 230 235 240

His Ser Ala Val Phe Arg Lys Arg Gly Val Phe Arg Asn Gln Val Asp
245 250 255

Pro Glu Thr His Cys His Ala Glu Arg Cys Phe Leu Ser Trp Phe Cys

260 265 270

Asp Asp Ile Leu Ser Pro Asn Thr Asn Tyr Glu Val Thr Trp Tyr Thr
275 280 285

Ser Trp Ser Pro Cys Pro Glu Cys Ala Gly Glu Val Ala Glu Phe Leu
290 295 300

Ala Arg His Ser Asn Val Asn Leu Thr Ile Phe Thr Ala Arg Leu Cys
305 310 315 320

Tyr Phe Trp Asp Thr Asp Tyr Gln Glu Gly Leu Cys Ser Leu Ser Gln
325 330 335

Glu Gly Ala Ser Val Lys Ile Met Gly Tyr Lys Asp Phe Val Ser Cys
340 345 350

Trp Lys Asn Phe Val Tyr Ser Asp Asp Glu Pro Phe Lys Pro Trp Lys
355 360 365

Gly Leu Gln Thr Asn Phe Arg Leu Leu Lys Arg Arg Leu Arg Glu Ile
370 375 380

Leu Gln
385

<210> 74
<211> 236
<212> PRT
<213> Homo sapiens

<400> 74

Met Thr Ser Glu Lys Gly Pro Ser Thr Gly Asp Pro Thr Leu Arg Arg
1 5 10 15

Arg Ile Glu Pro Trp Glu Phe Asp Val Phe Tyr Asp Pro Arg Glu Leu
20 25 30

Arg Lys Glu Ala Cys Leu Leu Tyr Glu Ile Lys Trp Gly Met Ser Arg
35 40 45

```
Lys Ile Trp Arg Ser Ser Gly Lys Asn Thr Thr Asn His Val Glu Val
    50                  55                  60

Asn Phe Ile Lys Lys Phe Thr Ser Glu Arg Asp Phe His Pro Ser Met
65                  70                  75                  80

Ser Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Trp Glu Cys
                85                  90                  95

Ser Gln Ala Ile Arg Glu Phe Leu Ser Arg His Pro Gly Val Thr Leu
            100                 105                 110

Val Ile Tyr Val Ala Arg Leu Phe Trp His Met Asp Gln Gln Asn Arg
        115                 120                 125

Gln Gly Leu Arg Asp Leu Val Asn Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140

Arg Ala Ser Glu Tyr Tyr His Cys Trp Arg Asn Phe Val Asn Tyr Pro
145                 150                 155                 160

Pro Gly Asp Glu Ala His Trp Pro Gln Tyr Pro Pro Leu Trp Met Met
                165                 170                 175

Leu Tyr Ala Leu Glu Leu His Cys Ile Ile Leu Ser Leu Pro Pro Cys
            180                 185                 190

Leu Lys Ile Ser Arg Arg Trp Gln Asn His Leu Thr Phe Phe Arg Leu
        195                 200                 205

His Leu Gln Asn Cys His Tyr Gln Thr Ile Pro Pro His Ile Leu Leu
    210                 215                 220

Ala Thr Gly Leu Ile His Pro Ser Val Ala Trp Arg
225                 230                 235
```

<210> 75
<211> 229

<212> PRT
<213> Mus musculus

<400> 75

```
Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1               5                  10                  15

Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
            20                  25                  30

Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
        35                  40                  45

Ser Val Trp Arg His Thr Ser Gln Asn Thr Ser Asn His Val Glu Val
    50                  55                  60

Asn Phe Leu Glu Lys Phe Thr Thr Glu Arg Tyr Phe Arg Pro Asn Thr
65                  70                  75                  80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
                85                  90                  95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg His Pro Tyr Val Thr Leu
            100                 105                 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Thr Asp Gln Arg Asn Arg
        115                 120                 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140

Thr Glu Gln Glu Tyr Cys Tyr Cys Trp Arg Asn Phe Val Asn Tyr Pro
145                 150                 155                 160

Pro Ser Asn Glu Ala Tyr Trp Pro Arg Tyr Pro His Leu Trp Val Lys
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190
```

```
Leu Lys Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205


Thr Leu Gln Thr Cys His Tyr Gln Arg Ile Pro Pro His Leu Leu Trp
    210                 215                 220


Ala Thr Gly Leu Lys
225


<210>  76
<211>  229
<212>  PRT
<213>  Rattus norvegicus

<400>  76

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1               5                   10                  15


Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
            20                  25                  30


Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
        35                  40                  45


Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
    50                  55                  60


Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65                  70                  75                  80


Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
                85                  90                  95


Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
            100                 105                 110


Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
        115                 120                 125
```

```
Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220

Ala Thr Gly Leu Lys
225
```

<210> 77
<211> 60
<212> PRT
<213> Homo sapiens

<400> 77

```
Met Ala Gln Lys Glu Glu Ala Ala Val Ala Thr Glu Ala Ala Ser Gln
1               5                   10                  15

Asn Gly Glu Asp Leu Glu Asn Leu Asp Asp Pro Glu Lys Leu Lys Glu
            20                  25                  30

Leu Ile Glu Leu Pro Pro Phe Glu Ile Val Thr Gly Glu Arg Leu Pro
        35                  40                  45

Ala Asn Phe Phe Lys Phe Gln Phe Arg Asn Val Glu
    50                  55                  60
```

<210> 78

<211> 164
<212> PRT
<213> Mus musculus

<400> 78

Tyr Ser Ser Gly Arg Asn Lys Thr Phe Leu Cys Tyr Val Val Glu Ala
1 5 10 15

Gln Gly Lys Gly Gly Gln Val Gln Ala Ser Arg Gly Tyr Leu Glu Asp
20 25 30

Glu His Ala Ala Ala His Ala Glu Glu Ala Phe Phe Asn Thr Ile Leu
35 40 45

Pro Ala Phe Asp Pro Ala Leu Arg Tyr Asn Val Thr Trp Tyr Val Ser
50 55 60

Ser Ser Pro Cys Ala Ala Cys Ala Asp Arg Ile Ile Lys Thr Leu Ser
65 70 75 80

Lys Thr Lys Asn Leu Arg Leu Leu Ile Leu Val Gly Arg Leu Phe Met
85 90 95

Trp Glu Glu Pro Glu Ile Gln Ala Ala Leu Lys Lys Leu Lys Glu Ala
100 105 110

Gly Cys Lys Leu Arg Ile Met Lys Pro Gln Asp Phe Glu Tyr Val Trp
115 120 125

Gln Asn Phe Val Glu Gln Glu Glu Gly Glu Ser Lys Ala Phe Gln Pro
130 135 140

Trp Glu Asp Ile Gln Glu Asn Phe Leu Tyr Tyr Glu Glu Lys Leu Ala
145 150 155 160

Asp Ile Leu Lys

<210> 79
<211> 224

<212> PRT
<213> Rattus norvegicus

<400> 79

```
Met Ala Gln Lys Glu Glu Ala Ala Glu Ala Ala Ala Pro Ala Ser Gln
1               5                  10                  15

Asn Gly Asp Asp Leu Glu Asn Leu Glu Asp Pro Glu Lys Leu Lys Glu
            20                  25                  30

Leu Ile Asp Leu Pro Pro Phe Glu Ile Val Thr Gly Val Arg Leu Pro
        35                  40                  45

Val Asn Phe Phe Lys Phe Gln Phe Arg Asn Val Glu Tyr Ser Ser Gly
    50                  55                  60

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

Gly Gln Val Gln Ala Thr Gln Gly Tyr Leu Glu Asp Glu His Ala Gly
                85                  90                  95

Ala His Ala Glu Glu Ala Phe Phe Asn Thr Ile Leu Pro Ala Phe Asp
            100                 105                 110

Pro Ala Leu Lys Tyr Asn Val Thr Trp Tyr Val Ser Ser Ser Pro Cys
        115                 120                 125

Ala Ala Cys Ala Asp Arg Ile Leu Lys Thr Leu Ser Lys Thr Lys Asn
    130                 135                 140

Leu Arg Leu Leu Ile Leu Val Ser Arg Leu Phe Met Trp Glu Glu Pro
145                 150                 155                 160

Glu Val Gln Ala Ala Leu Lys Lys Leu Lys Glu Ala Gly Cys Lys Leu
                165                 170                 175

Arg Ile Met Lys Pro Gln Asp Phe Glu Tyr Leu Trp Gln Asn Phe Val
            180                 185                 190
```

```
Glu Gln Glu Glu Gly Glu Ser Lys Ala Phe Glu Pro Trp Glu Asp Ile
        195                 200                 205


Gln Glu Asn Phe Leu Tyr Tyr Glu Glu Lys Leu Ala Asp Ile Leu Lys
    210                 215                 220
```

<210> 80
<211> 60
<212> PRT
<213> Bos taurus

<400> 80

```
Met Ala Gln Lys Glu Glu Ala Ala Ala Ala Ala Glu Pro Ala Ser Gln
1               5                   10                  15


Asn Gly Glu Glu Val Glu Asn Leu Glu Asp Pro Glu Lys Leu Lys Glu
            20                  25                  30


Leu Ile Glu Leu Pro Pro Phe Glu Ile Val Thr Gly Glu Arg Leu Pro
        35                  40                  45


Ala His Tyr Phe Lys Phe Gln Phe Arg Asn Val Glu
    50                  55                  60
```

<210> 81
<211> 164
<212> PRT
<213> Petromyzon marinus

<400> 81

```
Tyr Ser Ser Gly Arg Asn Lys Thr Phe Leu Cys Tyr Val Val Glu Ala
1               5                   10                  15


Gln Ser Lys Gly Gly Gln Val Gln Ala Ser Arg Gly Tyr Leu Glu Asp
            20                  25                  30


Glu His Ala Thr Asn His Ala Glu Glu Ala Phe Phe Asn Ser Ile Met
        35                  40                  45


Pro Thr Phe Asp Pro Ala Leu Arg Tyr Met Val Thr Trp Tyr Val Ser
```

50 55 60

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

Lys Thr Lys Asn Leu Arg Leu Leu Ile Leu Val Gly Arg Leu Phe Met
85 90 95

Trp Glu Glu Pro Glu Ile Gln Ala Ala Leu Arg Lys Leu Lys Glu Ala
100 105 110

Gly Cys Arg Leu Arg Ile Met Lys Pro Gln Asp Phe Glu Tyr Ile Trp
115 120 125

Gln Asn Phe Val Glu Gln Glu Glu Gly Glu Ser Lys Ala Phe Glu Pro
130 135 140

Trp Glu Asp Ile Gln Glu Asn Phe Leu Tyr Tyr Glu Glu Lys Leu Ala
145 150 155 160

Asp Ile Leu Lys

<210> 82
<211> 384
<212> PRT
<213> Homo sapiens

<400> 82

Met Lys Pro His Phe Arg Asn Thr Val Glu Arg Met Tyr Arg Asp Thr
1 5 10 15

Phe Ser Tyr Asn Phe Tyr Asn Arg Pro Ile Leu Ser Arg Arg Asn Thr
20 25 30

Val Trp Leu Cys Tyr Glu Val Lys Thr Lys Gly Pro Ser Arg Pro Pro
35 40 45

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

```
His Pro Glu Met Arg Phe Phe His Trp Phe Ser Lys Trp Arg Lys Leu
65                  70                  75                  80

His Arg Asp Gln Glu Tyr Glu Val Thr Trp Tyr Ile Ser Trp Ser Pro
                85                  90                  95

Cys Thr Lys Cys Thr Arg Asp Met Ala Thr Phe Leu Ala Glu Asp Pro
            100                 105                 110

Lys Val Thr Leu Thr Ile Phe Val Ala Arg Leu Tyr Tyr Phe Trp Asp
        115                 120                 125

Pro Asp Tyr Gln Glu Ala Leu Arg Ser Leu Cys Gln Lys Arg Asp Gly
    130                 135                 140

Pro Arg Ala Thr Met Lys Ile Met Asn Tyr Asp Glu Phe Gln His Cys
145                 150                 155                 160

Trp Ser Lys Phe Val Tyr Ser Gln Arg Glu Leu Phe Glu Pro Trp Asn
                165                 170                 175

Asn Leu Pro Lys Tyr Tyr Ile Leu Leu His Ile Met Leu Gly Glu Ile
            180                 185                 190

Leu Arg His Ser Met Asp Pro Pro Thr Phe Thr Phe Asn Phe Asn Asn
        195                 200                 205

Glu Pro Trp Val Arg Gly Arg His Glu Thr Tyr Leu Cys Tyr Glu Val
    210                 215                 220

Glu Arg Met His Asn Asp Thr Trp Val Leu Leu Asn Gln Arg Arg Gly
225                 230                 235                 240

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

His Ala Glu Leu Cys Phe Leu Asp Val Ile Pro Phe Trp Lys Leu Asp
            260                 265                 270
```

```
Leu Asp Gln Asp Tyr Arg Val Thr Cys Phe Thr Ser Trp Ser Pro Cys
        275                 280                 285

Phe Ser Cys Ala Gln Glu Met Ala Lys Phe Ile Ser Lys Asn Lys His
    290                 295                 300

Val Ser Leu Cys Ile Phe Thr Ala Arg Ile Tyr Arg Arg Gln Gly Arg
305                 310                 315                 320

Cys Gln Glu Gly Leu Arg Thr Leu Ala Glu Ala Gly Ala Lys Ile Ser
                325                 330                 335

Ile Met Thr Tyr Ser Glu Phe Lys His Cys Trp Asp Thr Phe Val Asp
            340                 345                 350

His Gln Gly Cys Pro Phe Gln Pro Trp Asp Gly Leu Asp Glu His Ser
        355                 360                 365

Gln Asp Leu Ser Gly Arg Leu Arg Ala Ile Leu Gln Asn Gln Glu Asn
    370                 375                 380
```

<210> 83
<211> 184
<212> PRT
<213> Homo sapiens

<400> 83

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Met Asp Pro Pro Thr Phe Thr Phe Asn Phe Asn Asn Glu Pro Trp Val
1               5                   10                  15

Arg Gly Arg His Glu Thr Tyr Leu Cys Tyr Glu Val Glu Arg Met His
            20                  25                  30

Asn Asp Thr Trp Val Leu Leu Asn Gln Arg Arg Gly Phe Leu Cys Asn
        35                  40                  45

Gln Ala Pro His Lys His Gly Phe Leu Glu Gly Arg His Ala Glu Leu
    50                  55                  60
```

```
Cys Phe Leu Asp Val Ile Pro Phe Trp Lys Leu Asp Leu Asp Gln Asp
65                  70                  75                  80


Tyr Arg Val Thr Cys Phe Thr Ser Trp Ser Pro Cys Phe Ser Cys Ala
                85                  90                  95


Gln Glu Met Ala Lys Phe Ile Ser Lys Asn Lys His Val Ser Leu Cys
            100                 105                 110


Ile Phe Thr Ala Arg Ile Tyr Asp Asp Gln Gly Arg Cys Gln Glu Gly
        115                 120                 125


Leu Arg Thr Leu Ala Glu Ala Gly Ala Lys Ile Ser Ile Met Thr Tyr
    130                 135                 140


Ser Glu Phe Lys His Cys Trp Asp Thr Phe Val Asp His Gln Gly Cys
145                 150                 155                 160


Pro Phe Gln Pro Trp Asp Gly Leu Asp Glu His Ser Gln Asp Leu Ser
                165                 170                 175


Gly Arg Leu Arg Ala Ile Leu Gln
            180


<210>  84
<211>  184
<212>  PRT
<213>  Homo sapiens

<400>  84

Met Asp Pro Pro Thr Phe Thr Phe Asn Phe Asn Asn Glu Pro Trp Val
1               5                   10                  15


Arg Gly Arg His Glu Thr Tyr Leu Cys Tyr Glu Val Glu Arg Met His
            20                  25                  30


Asn Asp Thr Trp Val Leu Leu Asn Gln Arg Arg Gly Phe Leu Cys Asn
        35                  40                  45
```

Gln Ala Pro His Lys His Gly Phe Leu Glu Gly Arg His Ala Glu Leu
50 55 60

Cys Phe Leu Asp Val Ile Pro Phe Trp Lys Leu Asp Leu Asp Gln Asp
65 70 75 80

Tyr Arg Val Thr Cys Phe Thr Ser Trp Ser Pro Cys Phe Ser Cys Ala
85 90 95

Gln Glu Met Ala Lys Phe Ile Ser Lys Asn Lys His Val Ser Leu Cys
100 105 110

Ile Phe Thr Ala Arg Ile Tyr Arg Arg Gln Gly Arg Cys Gln Glu Gly
115 120 125

Leu Arg Thr Leu Ala Glu Ala Gly Ala Lys Ile Ser Ile Met Thr Tyr
130 135 140

Ser Glu Phe Lys His Cys Trp Asp Thr Phe Val Asp His Gln Gly Cys
145 150 155 160

Pro Phe Gln Pro Trp Asp Gly Leu Asp Glu His Ser Gln Asp Leu Ser
165 170 175

Gly Arg Leu Arg Ala Ile Leu Gln
180

<210> 85
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 85
gtaggtagtt aggatgaatg gaaggttggt atagtcccgc ggatttattt atttaatgga 60

tgacctctgg atccatggac 80

<210> 86
<211> 80

<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 86
gtaggtagtt aggatgaatg gaaggttggt atagcttccg cggatttatt tatttatgga 60

tgacctctgg atccatggac 80

<210> 87
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 87
gtaggtagtt aggatgaatg gaaggttggt atagccttcc gcggatttat ttattatgga 60

tgacctctgg atccatggac 80

<210> 88
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 88
gtaggtagtt aggatgaatg gaaggttggt atagccattc cgcggattta tttatttgga 60

tgacctctgg atccatggac 80

<210> 89
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 89
gtaggtagtt aggatgaatg gaaggttggt atagcctatt ccgcggattt atttattgga 60

tgacctctgg atccatggac 80

<210> 90
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 90
gtaggtagtt aggatgaatg gaaggttggt atagccttat tccgcggatt tatttatgga 60

tgacctctgg atccatggac 80

<210> 91
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 91
gtaggtagtt aggatgaatg gaaggttggt atagccatta ttccgcggat ttattttgga 60

tgacctctgg atccatggac 80

<210> 92
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 92
gtaggtagtt aggatgaatg gaaggttggt atagcctatt attccgcgga tttatttgga 60

tgacctctgg atccatggac 80

<210> 93
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 93
gtaggtagtt aggatgaatg gaaggttggt atagccatta tattccgcgg atttattgga 60

tgacctctgg atccatggac 80

<210> 94
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 94
gtaggtagtt aggatgaatg gaaggttggt atagcctatt atattccgcg gatttatgga 60

tgacctctgg atccatggac 80

<210> 95
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 95
gtaggtagtt aggatgaatg gaaggttggt atagccttat tatattccgc ggattttgga 60

tgacctctgg atccatggac 80

<210> 96
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 96
gtaggtagtt aggatgaatg gaaggttggt atagccatta ttatattccg cggatttgga 60

tgacctctgg atccatggac 80

<210> 97
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 97
gtaggtagtt aggatgaatg gaaggttggt atagcctatt attatattcc gcggattgga 60

tgacctctgg atccatggac 80

<210> 98
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 98
gtaggtagtt aggatgaatg gaaggttggt atagccatta ttattattac cgcggatgga 60

tgacctctgg atccatggac 80

<210> 99
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 99
gtaggtagtt aggatgaatg gaaggttggt atagccatta ttattattat taccgctgga 60

tgacctctgg atccatggac 80

<210> 100
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 100
gtaggtagtt aggatgaatg gaaggttggt atagtaatat taatttattt atttaatgga 60

tgacctctgg atccatggac 80

<210> 101
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 101
gtaggtagtt aggatgaatg gaaggttggt gtagattatt atctgcggat ttattggatg 60

acctctggat ccatggacat 80

<210> 102
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 102
gtaggtagtt aggatgaatg gaaggttggt atagccatta ttccgcggat ttattttgga 60

tgacctctgg atccatggac 80

<210> 103
<211> 33
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 103
auuauuccgc ggauuuauuu guuuuagagc uag 33

<210> 104
<211> 33
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 104
cguaggccag gguggucacg guuuuagagc uag 33

<210> 105
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 105
gtaggtagtt aggatgaatg gaaggttggt aactatgctg ccgcccagtg ggactttgga 60

aatacaatgt gtcaactctt 80

<210> 106
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 106
gtaggtagtt aggatgaatg gaaggttggt aaaatacaat gtgtcaactc ttgacagggc 60

tctattttat aggcttcttc 80

<210> 107
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 107
gtaggtagtt aggatgaatg gaaggttggt attttccata cagtcagtat caattctgga 60

agaatttcca gacattaaag 80

<210> 108
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 108
gtaggtagtt aggatgaatg gaaggttggt agcttcggtg tcgaaatgag aagaagaggc 60

acagggctgt gaggcttatc 80

<210> 109
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 109
gtaggtagtt aggatgaatg gaaggttggt agtgagccca gaaggggaca gtaagaagga 60

aaaacaggtc agagatggcc 80

<210> 110
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 110
gtaggtagtt aggatgaatg gaaggttggt atcctgaaca ccttccagga attctttggc 60

ctgaataatt gcagtagctc 80

<210> 111
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 111
gtaggtagtt aggatgaatg gaaggttggt agacatggag gacgtgcgcg gccgcctggt 60

gcagtaccgc ggcgaggtgc 80

<210> 112
<211> 80
<212> DNA
<213> Artificial Sequence

<220>

<223> Synthetic Polynucleotide

<400> 112
gtaggtagtt aggatgaatg gaaggttggt actgcagaag cgcctggcag tgtaccaggc 60

cggggcccgc gagggcgccg 80

<210> 113
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 113
gtaggtagtt aggatgaatg gaaggttggt agccgacaag cagaagaacg gcatcaaggt 60

gaacttcaag atccgccaca 80

<210> 114
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 114
gtaggtagtt aggatgaatg gaaggttggt aaccactacc agcagaacac ccccatcggc 60

gacggccccg tgctgctgcc 80

<210> 115
<211> 81
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 115
gtaggtagtt aggatgaatg gaaggttggt acctcgccct tgctcaccat ctcgagtcgg 60

ccgccagtgt gatggatatc t 81

<210> 116
<211> 79

<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 116
gtaggtagtt aggatgaatg gaaggttggt acacgcgtag gccagggtgg tcacgagggt 60

gggccagggc acgggcagc 79

<210> 117
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 117
gtaggtagtt aggatgaatg gaaggttggt aaagcactgc actccgcagg tcagggtggt 60

cacgagggtt ggccagggca 80

<210> 118
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 118
gtaggtagtt aggatgaatg gaaggttggt acactccgca ggtcagggtg gtcacgaggg 60

ttggccaggg cacgggcagg 80

<210> 119
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 119
gtaggtagtt aggatgaatg gaaggttggt aggatctctt cttcacggtt gcctactggt 60

tcaattactt ttaaaaatgg 80

<210> 120
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 120
gtaggtagtt aggatgaatg gaaggttggt attctcgatt gaggatctct tcttcacggt 60

tgcctactgg ttcaattact 80

<210> 121
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 121
gtaggtagtt aggatgaatg gaaggttggt aaggagctgt ggcagtggca ccagaatgga 60

ttccagagtc caggtaagac 80

<210> 122
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 122
gtaggtagtt aggatgaatg gaaggttggt agtactcctc ccggccggcg gtatccagga 60

tgtccaacag gcacgtctcc 80

<210> 123
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 123
gtaggtagtt aggatgaatg gaaggttggt atgactgctt gcagatggcc atggcgcgga 60

cgcgggtgcc gggcgggggt 80

<210> 124
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 124
gtaggtagtt aggatgaatg gaaggttggt actgttacac atgcagttgt agtggatggt 60

ggtacagtca gagccaacct 80

<210> 125
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 125
gtaggtagtt aggatgaatg gaaggttggt aggaactgtc acacatgtag ttgtagtgga 60

tggtggtaca gtcagagcca 80

<210> 126
<211> 1623
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 126

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1 5 10 15

Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
20 25 30

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Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
        35                  40                  45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
    50                  55                  60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65                  70                  75                  80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
                85                  90                  95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
            100                 105                 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
        115                 120                 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220

Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
225                 230                 235                 240
```

```
Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
                245                 250                 255

Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
            260                 265                 270

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

Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
    290                 295                 300

Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys
305                 310                 315                 320

Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
                325                 330                 335

Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
            340                 345                 350

Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp
        355                 360                 365

Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys
    370                 375                 380

Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
385                 390                 395                 400

Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
                405                 410                 415

Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
            420                 425                 430

Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser
        435                 440                 445
```

```
Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg
    450                 455                 460

Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
465                 470                 475                 480

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
                485                 490                 495

Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
            500                 505                 510

Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp
        515                 520                 525

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

Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro
545                 550                 555                 560

Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
                565                 570                 575

Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys
            580                 585                 590

Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
        595                 600                 605

Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
    610                 615                 620

Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
625                 630                 635                 640

Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His
                645                 650                 655
```

```
Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
            660                 665                 670

Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
        675                 680                 685

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
    690                 695                 700

Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
705                 710                 715                 720

Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile
                725                 730                 735

Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
            740                 745                 750

Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu
        755                 760                 765

Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu
    770                 775                 780

Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn
785                 790                 795                 800

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
                805                 810                 815

Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
            820                 825                 830

Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
        835                 840                 845

Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val
    850                 855                 860
```

```
Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu
865                 870                 875                 880


Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
                885                 890                 895


Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn
            900                 905                 910


Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys
        915                 920                 925


Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp
    930                 935                 940


Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln
945                 950                 955                 960


Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala
                965                 970                 975


Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val
            980                 985                 990


Lys Val Met Gly Arg His Lys Pro  Glu Asn Ile Val Ile  Glu Met Ala
        995                 1000                1005


Arg Glu  Asn Gln Thr Thr Gln  Lys Gly Gln Lys Asn  Ser Arg Glu
    1010                1015                1020


Arg Met  Lys Arg Ile Glu Glu  Gly Ile Lys Glu Leu  Gly Ser Gln
    1025                1030                1035


Ile Leu  Lys Glu His Pro Val  Glu Asn Thr Gln Leu  Gln Asn Glu
    1040                1045                1050


Lys Leu  Tyr Leu Tyr Tyr Leu  Gln Asn Gly Arg Asp  Met Tyr Val
    1055                1060                1065
```

```
Asp Gln  Glu Leu Asp Ile Asn  Arg Leu Ser Asp Tyr  Asp Val Asp
    1070                1075                1080

Ala Ile  Val Pro Gln Ser Phe  Leu Lys Asp Asp Ser  Ile Asp Asn
    1085                1090                1095

Lys Val  Leu Thr Arg Ser Asp  Lys Asn Arg Gly Lys  Ser Asp Asn
    1100                1105                1110

Val Pro  Ser Glu Glu Val Val  Lys Lys Met Lys Asn  Tyr Trp Arg
    1115                1120                1125

Gln Leu  Leu Asn Ala Lys Leu  Ile Thr Gln Arg Lys  Phe Asp Asn
    1130                1135                1140

Leu Thr  Lys Ala Glu Arg Gly  Gly Leu Ser Glu Leu  Asp Lys Ala
    1145                1150                1155

Gly Phe  Ile Lys Arg Gln Leu  Val Glu Thr Arg Gln  Ile Thr Lys
    1160                1165                1170

His Val  Ala Gln Ile Leu Asp  Ser Arg Met Asn Thr  Lys Tyr Asp
    1175                1180                1185

Glu Asn  Asp Lys Leu Ile Arg  Glu Val Lys Val Ile  Thr Leu Lys
    1190                1195                1200

Ser Lys  Leu Val Ser Asp Phe  Arg Lys Asp Phe Gln  Phe Tyr Lys
    1205                1210                1215

Val Arg  Glu Ile Asn Asn Tyr  His His Ala His Asp  Ala Tyr Leu
    1220                1225                1230

Asn Ala  Val Val Gly Thr Ala  Leu Ile Lys Lys Tyr  Pro Lys Leu
    1235                1240                1245

Glu Ser  Glu Phe Val Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg
    1250                1255                1260
```

```
Lys Met  Ile Ala Lys Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala
    1265                1270                1275

Lys Tyr  Phe Phe Tyr Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu
    1280                1285                1290

Ile Thr  Leu Ala Asn Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu
    1295                1300                1305

Thr Asn  Gly Glu Thr Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp
    1310                1315                1320

Phe Ala  Thr Val Arg Lys Val  Leu Ser Met Pro Gln  Val Asn Ile
    1325                1330                1335

Val Lys  Lys Thr Glu Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser
    1340                1345                1350

Ile Leu  Pro Lys Arg Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys
    1355                1360                1365

Asp Trp  Asp Pro Lys Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val
    1370                1375                1380

Ala Tyr  Ser Val Leu Val Val  Ala Lys Val Glu Lys  Gly Lys Ser
    1385                1390                1395

Lys Lys  Leu Lys Ser Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met
    1400                1405                1410

Glu Arg  Ser Ser Phe Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala
    1415                1420                1425

Lys Gly  Tyr Lys Glu Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro
    1430                1435                1440

Lys Tyr  Ser Leu Phe Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu
    1445                1450                1455
```

Ala Ser Ala Gly Glu Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro
1460 1465 1470

Ser Lys Tyr Val Asn Phe Leu Tyr Leu Ala Ser His Tyr Glu Lys
1475 1480 1485

Leu Lys Gly Ser Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val
1490 1495 1500

Glu Gln His Lys His Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser
1505 1510 1515

Glu Phe Ser Lys Arg Val Ile Leu Ala Asp Ala Asn Leu Asp Lys
1520 1525 1530

Val Leu Ser Ala Tyr Asn Lys His Arg Asp Lys Pro Ile Arg Glu
1535 1540 1545

Gln Ala Glu Asn Ile Ile His Leu Phe Thr Leu Thr Asn Leu Gly
1550 1555 1560

Ala Pro Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys
1565 1570 1575

Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His
1580 1585 1590

Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln
1595 1600 1605

Leu Gly Gly Asp Ser Gly Gly Ser Pro Lys Lys Lys Arg Lys Val
1610 1615 1620

<210> 127
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 127
gagtccgagc agaagaagaa ggg 23

<210> 128
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 128
ggaatccctt ctgcagcacc tgg 23

<210> 129
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 129
gaacacaaag catagactgc ggg 23

<210> 130
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<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 130
ggcccagact gagcacgtga tgg 23

<210> 131
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 131
ggcactgcgg ctggaggtcc ggg 23

<210> 132
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 132
gtcatcttag tcattacctg agg 23

<210> 133
<211> 1710
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 133

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1 5 10 15

Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
20 25 30

Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
35 40 45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
50 55 60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65 70 75 80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
85 90 95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
100 105 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
115 120 125

```
Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220

Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
225                 230                 235                 240

Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
                245                 250                 255

Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
            260                 265                 270

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

Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
    290                 295                 300

Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys
305                 310                 315                 320

Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
                325                 330                 335
```

```
Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
            340                 345                 350

Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp
        355                 360                 365

Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys
    370                 375                 380

Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
385                 390                 395                 400

Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
                405                 410                 415

Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
            420                 425                 430

Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser
        435                 440                 445

Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg
    450                 455                 460

Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
465                 470                 475                 480

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
                485                 490                 495

Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
            500                 505                 510

Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp
        515                 520                 525

Gln Tyr Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile
    530                 535                 540
```

```
Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro
545                 550                 555                 560

Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
                565                 570                 575

Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys
            580                 585                 590

Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
        595                 600                 605

Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
    610                 615                 620

Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
625                 630                 635                 640

Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His
                645                 650                 655

Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
            660                 665                 670

Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
        675                 680                 685

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
    690                 695                 700

Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
705                 710                 715                 720

Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile
                725                 730                 735

Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
            740                 745                 750
```

```
Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu
        755                 760                 765

Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu
    770                 775                 780

Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn
785                 790                 795                 800

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
                805                 810                 815

Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
            820                 825                 830

Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
        835                 840                 845

Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val
    850                 855                 860

Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu
865                 870                 875                 880

Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
                885                 890                 895

Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn
            900                 905                 910

Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys
        915                 920                 925

Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp
    930                 935                 940

Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln
945                 950                 955                 960
```

```
Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala
               965                 970                 975

Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val
           980                 985                 990

Lys Val Met Gly Arg His Lys Pro  Glu Asn Ile Val Ile  Glu Met Ala
        995                1000                1005

Arg Glu  Asn Gln Thr Thr Gln  Lys Gly Gln Lys Asn  Ser Arg Glu
    1010                1015                1020

Arg Met  Lys Arg Ile Glu Glu  Gly Ile Lys Glu Leu  Gly Ser Gln
    1025                1030                1035

Ile Leu  Lys Glu His Pro Val  Glu Asn Thr Gln Leu  Gln Asn Glu
    1040                1045                1050

Lys Leu  Tyr Leu Tyr Tyr Leu  Gln Asn Gly Arg Asp  Met Tyr Val
    1055                1060                1065

Asp Gln  Glu Leu Asp Ile Asn  Arg Leu Ser Asp Tyr  Asp Val Asp
    1070                1075                1080

Ala Ile  Val Pro Gln Ser Phe  Leu Lys Asp Asp Ser  Ile Asp Asn
    1085                1090                1095

Lys Val  Leu Thr Arg Ser Asp  Lys Asn Arg Gly Lys  Ser Asp Asn
    1100                1105                1110

Val Pro  Ser Glu Glu Val Val  Lys Lys Met Lys Asn  Tyr Trp Arg
    1115                1120                1125

Gln Leu  Leu Asn Ala Lys Leu  Ile Thr Gln Arg Lys  Phe Asp Asn
    1130                1135                1140

Leu Thr  Lys Ala Glu Arg Gly  Gly Leu Ser Glu Leu  Asp Lys Ala
    1145                1150                1155
```

```
Gly Phe  Ile Lys Arg Gln Leu  Val Glu Thr Arg Gln  Ile Thr Lys
    1160                1165                1170

His Val  Ala Gln Ile Leu Asp  Ser Arg Met Asn Thr  Lys Tyr Asp
    1175                1180                1185

Glu Asn  Asp Lys Leu Ile Arg  Glu Val Lys Val Ile  Thr Leu Lys
    1190                1195                1200

Ser Lys  Leu Val Ser Asp Phe  Arg Lys Asp Phe Gln  Phe Tyr Lys
    1205                1210                1215

Val Arg  Glu Ile Asn Asn Tyr  His His Ala His Asp  Ala Tyr Leu
    1220                1225                1230

Asn Ala  Val Val Gly Thr Ala  Leu Ile Lys Lys Tyr  Pro Lys Leu
    1235                1240                1245

Glu Ser  Glu Phe Val Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg
    1250                1255                1260

Lys Met  Ile Ala Lys Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala
    1265                1270                1275

Lys Tyr  Phe Phe Tyr Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu
    1280                1285                1290

Ile Thr  Leu Ala Asn Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu
    1295                1300                1305

Thr Asn  Gly Glu Thr Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp
    1310                1315                1320

Phe Ala  Thr Val Arg Lys Val  Leu Ser Met Pro Gln  Val Asn Ile
    1325                1330                1335

Val Lys  Lys Thr Glu Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser
    1340                1345                1350
```

```
Ile Leu  Pro Lys Arg Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys
    1355                1360                1365

Asp Trp  Asp Pro Lys Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val
    1370                1375                1380

Ala Tyr  Ser Val Leu Val Val  Ala Lys Val Glu Lys  Gly Lys Ser
    1385                1390                1395

Lys Lys  Leu Lys Ser Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met
    1400                1405                1410

Glu Arg  Ser Ser Phe Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala
    1415                1420                1425

Lys Gly  Tyr Lys Glu Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro
    1430                1435                1440

Lys Tyr  Ser Leu Phe Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu
    1445                1450                1455

Ala Ser  Ala Gly Glu Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro
    1460                1465                1470

Ser Lys  Tyr Val Asn Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys
    1475                1480                1485

Leu Lys  Gly Ser Pro Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val
    1490                1495                1500

Glu Gln  His Lys His Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser
    1505                1510                1515

Glu Phe  Ser Lys Arg Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys
    1520                1525                1530

Val Leu  Ser Ala Tyr Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu
    1535                1540                1545
```

```
Gln Ala  Glu Asn Ile Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly
    1550                1555                1560

Ala Pro  Ala Ala Phe Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys
    1565                1570                1575

Arg Tyr  Thr Ser Thr Lys Glu  Val Leu Asp Ala Thr  Leu Ile His
    1580                1585                1590

Gln Ser  Ile Thr Gly Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln
    1595                1600                1605

Leu Gly  Gly Asp Ser Gly Gly  Ser Thr Asn Leu Ser  Asp Ile Ile
    1610                1615                1620

Glu Lys  Glu Thr Gly Lys Gln  Leu Val Ile Gln Glu  Ser Ile Leu
    1625                1630                1635

Met Leu  Pro Glu Glu Val Glu  Glu Val Ile Gly Asn  Lys Pro Glu
    1640                1645                1650

Ser Asp  Ile Leu Val His Thr  Ala Tyr Asp Glu Ser  Thr Asp Glu
    1655                1660                1665

Asn Val  Met Leu Leu Thr Ser  Asp Ala Pro Glu Tyr  Lys Pro Trp
    1670                1675                1680

Ala Leu  Val Ile Gln Asp Ser  Asn Gly Glu Asn Lys  Ile Lys Met
    1685                1690                1695

Leu Ser  Gly Gly Ser Pro Lys  Lys Lys Arg Lys Val
    1700                1705                1710
```

<210> 134
<211> 84
<212> PRT
<213> Bacillus phage PBS2

<400> 134

```
Met Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys Gln Leu
1               5                  10                  15

Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu Glu Val
            20                  25                  30

Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala Tyr Asp
        35                  40                  45

Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala Pro Glu
    50                  55                  60

Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys
65                  70                  75                  80

Ile Lys Met Leu
```

<210> 135
<211> 181
<212> PRT
<213> Erwinia tasmaniensis

<400> 135

```
Met Ala Ser Arg Gly Val Asn Lys Val Ile Leu Val Gly Asn Leu Gly
1               5                  10                  15

Gln Asp Pro Glu Val Arg Tyr Met Pro Asn Gly Gly Ala Val Ala Asn
            20                  25                  30

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

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

Ala Glu Val Ala Gly Glu Tyr Leu Arg Lys Gly Ser Gln Val Tyr Ile
65                  70                  75                  80
```

```
Glu Gly Ala Leu Gln Thr Arg Lys Trp Thr Asp Gln Ala Gly Val Glu
                85                  90                  95

Lys Tyr Thr Thr Glu Val Val Val Asn Val Gly Gly Thr Met Gln Met
            100                 105                 110

Leu Gly Gly Arg Ser Gln Gly Gly Gly Ala Ser Ala Gly Gly Gln Asn
        115                 120                 125

Gly Gly Ser Asn Asn Gly Trp Gly Gln Pro Gln Gln Pro Gln Gly Gly
    130                 135                 140

Asn Gln Phe Ser Gly Gly Ala Gln Gln Gln Ala Arg Pro Gln Gln Gln
145                 150                 155                 160

Pro Gln Gln Asn Asn Ala Pro Ala Asn Asn Glu Pro Pro Ile Asp Phe
                165                 170                 175

Asp Asp Asp Ile Pro
            180
```

<210> 136
<211> 209
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 136

```
Met Ala Gly Ala Gln Asp Phe Val Pro His Thr Ala Asp Leu Ala Glu
1               5                   10                  15

Leu Ala Ala Ala Ala Gly Glu Cys Arg Gly Cys Gly Leu Tyr Arg Asp
            20                  25                  30

Ala Thr Gln Ala Val Phe Gly Ala Gly Gly Arg Ser Ala Arg Ile Met
        35                  40                  45

Met Ile Gly Glu Gln Pro Gly Asp Lys Glu Asp Leu Ala Gly Leu Pro
    50                  55                  60
```

```
Phe Val Gly Pro Ala Gly Arg Leu Leu Asp Arg Ala Leu Glu Ala Ala
65                  70                  75                  80

Asp Ile Asp Arg Asp Ala Leu Tyr Val Thr Asn Ala Val Lys His Phe
                85                  90                  95

Lys Phe Thr Arg Ala Ala Gly Gly Lys Arg Arg Ile His Lys Thr Pro
            100                 105                 110

Ser Arg Thr Glu Val Val Ala Cys Arg Pro Trp Leu Ile Ala Glu Met
        115                 120                 125

Thr Ser Val Glu Pro Asp Val Val Val Leu Leu Gly Ala Thr Ala Ala
    130                 135                 140

Lys Ala Leu Leu Gly Asn Asp Phe Arg Val Thr Gln His Arg Gly Glu
145                 150                 155                 160

Val Leu His Val Asp Asp Val Pro Gly Asp Pro Ala Leu Val Ala Thr
                165                 170                 175

Val His Pro Ser Ser Leu Leu Arg Gly Pro Lys Glu Glu Arg Glu Ser
            180                 185                 190

Ala Phe Ala Gly Leu Val Asp Asp Leu Arg Val Ala Ala Asp Val Arg
        195                 200                 205

Pro
```

<210> 137
<211> 313
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 137

```
Met Ile Gly Gln Lys Thr Leu Tyr Ser Phe Phe Ser Pro Ser Pro Ala
1               5                  10                  15

Arg Lys Arg His Ala Pro Ser Pro Glu Pro Ala Val Gln Gly Thr Gly
            20                  25                  30

Val Ala Gly Val Pro Glu Glu Ser Gly Asp Ala Ala Ala Ile Pro Ala
        35                  40                  45

Lys Lys Ala Pro Ala Gly Gln Glu Glu Pro Gly Thr Pro Pro Ser Ser
    50                  55                  60

Pro Leu Ser Ala Glu Gln Leu Asp Arg Ile Gln Arg Asn Lys Ala Ala
65                  70                  75                  80

Ala Leu Leu Arg Leu Ala Ala Arg Asn Val Pro Val Gly Phe Gly Glu
                85                  90                  95

Ser Trp Lys Lys His Leu Ser Gly Glu Phe Gly Lys Pro Tyr Phe Ile
            100                 105                 110

Lys Leu Met Gly Phe Val Ala Glu Glu Arg Lys His Tyr Thr Val Tyr
        115                 120                 125

Pro Pro Pro His Gln Val Phe Thr Trp Thr Gln Met Cys Asp Ile Lys
    130                 135                 140

Asp Val Lys Val Val Ile Leu Gly Gln Glu Pro Tyr His Gly Pro Asn
145                 150                 155                 160

Gln Ala His Gly Leu Cys Phe Ser Val Gln Arg Pro Val Pro Pro Pro
                165                 170                 175

Pro Ser Leu Glu Asn Ile Tyr Lys Glu Leu Ser Thr Asp Ile Glu Asp
            180                 185                 190

Phe Val His Pro Gly His Gly Asp Leu Ser Gly Trp Ala Lys Gln Gly
        195                 200                 205
```

```
Val Leu Leu Leu Asn Ala Val Leu Thr Val Arg Ala His Gln Ala Asn
    210                 215                 220

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

Trp Leu Asn Gln Asn Ser Asn Gly Leu Val Phe Leu Leu Trp Gly Ser
                245                 250                 255

Tyr Ala Gln Lys Lys Gly Ser Ala Ile Asp Arg Lys Arg His His Val
            260                 265                 270

Leu Gln Thr Ala His Pro Ser Pro Leu Ser Val Tyr Arg Gly Phe Phe
        275                 280                 285

Gly Cys Arg His Phe Ser Lys Thr Asn Glu Leu Leu Gln Lys Ser Gly
    290                 295                 300

Lys Lys Pro Ile Asp Trp Lys Glu Leu
305                 310
```

<210> 138
<211> 148
<212> PRT
<213> Homo sapiens

<400> 138

```
Met Phe Arg Arg Pro Val Leu Gln Val Leu Arg Gln Phe Val Arg His
1               5                   10                  15

Glu Ser Glu Thr Thr Thr Ser Leu Val Leu Glu Arg Ser Leu Asn Arg
            20                  25                  30

Val His Leu Leu Gly Arg Val Gly Gln Asp Pro Val Leu Arg Gln Val
        35                  40                  45

Glu Gly Lys Asn Pro Val Thr Ile Phe Ser Leu Ala Thr Asn Glu Met
    50                  55                  60

Trp Arg Ser Gly Asp Ser Glu Val Tyr Gln Leu Gly Asp Val Ser Gln
```

65 70 75 80

Lys Thr Thr Trp His Arg Ile Ser Val Phe Arg Pro Gly Leu Arg Asp
85 90 95

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

Lys Ile Asp Tyr Gly Glu Tyr Met Asp Lys Asn Asn Val Arg Arg Gln
115 120 125

Ala Thr Thr Ile Ile Ala Asp Asn Ile Ile Phe Leu Ser Asp Gln Thr
130 135 140

Lys Glu Lys Glu
145

<210> 139
<211> 388
<212> PRT
<213> Mus musculus

<400> 139

Met Phe Ala Lys Gly Lys Gly Ser Ala Val Pro Ser Asp Gly Gln Ala
1 5 10 15

Arg Glu Lys Leu Ala Leu Tyr Val Tyr Glu Tyr Leu Leu His Val Gly
20 25 30

Ala Gln Lys Ser Ala Gln Thr Phe Leu Ser Glu Ile Arg Trp Glu Lys
35 40 45

Asn Ile Thr Leu Gly Glu Pro Pro Gly Phe Leu His Ser Trp Trp Cys
50 55 60

Val Phe Trp Asp Leu Tyr Cys Ala Ala Pro Glu Arg Arg Asp Thr Cys
65 70 75 80

Glu His Ser Ser Glu Ala Lys Ala Phe His Asp Tyr Ser Ala Ala Ala
85 90 95

Ala Pro Ser Pro Val Leu Gly Asn Ile Pro Pro Asn Asp Gly Met Pro
100 105 110

Gly Gly Pro Ile Pro Pro Gly Phe Phe Gln Gly Pro Pro Gly Ser Gln
115 120 125

Pro Ser Pro His Ala Gln Pro Pro Pro His Asn Pro Ser Ser Met Met
130 135 140

Gly Pro His Ser Gln Pro Phe Met Ser Pro Arg Tyr Ala Gly Gly Pro
145 150 155 160

Arg Pro Pro Ile Arg Met Gly Asn Gln Pro Pro Gly Gly Val Pro Gly
165 170 175

Thr Gln Pro Leu Leu Pro Asn Ser Met Asp Pro Thr Arg Gln Gln Gly
180 185 190

His Pro Asn Met Gly Gly Ser Met Gln Arg Met Asn Pro Pro Arg Gly
195 200 205

Met Gly Pro Met Gly Pro Gly Pro Gln Asn Tyr Gly Ser Gly Met Arg
210 215 220

Pro Pro Pro Asn Ser Leu Gly Pro Ala Met Pro Gly Ile Asn Met Gly
225 230 235 240

Pro Gly Ala Gly Arg Pro Trp Pro Asn Pro Asn Ser Ala Asn Ser Ile
245 250 255

Pro Tyr Ser Ser Ser Ser Pro Gly Thr Tyr Val Gly Pro Pro Gly Gly
260 265 270

Gly Gly Pro Pro Gly Thr Pro Ile Met Pro Ser Pro Ala Asp Ser Thr
275 280 285

Asn Ser Ser Asp Asn Ile Tyr Thr Met Ile Asn Pro Val Pro Pro Gly
290 295 300

Gly Ser Arg Ser Asn Phe Pro Met Gly Pro Gly Ser Asp Gly Pro Met
305 310 315 320

Gly Gly Met Gly Gly Met Glu Pro His His Met Asn Gly Ser Leu Gly
325 330 335

Ser Gly Asp Ile Asp Gly Leu Pro Lys Asn Ser Pro Asn Asn Ile Ser
340 345 350

Gly Ile Ser Asn Pro Pro Gly Thr Pro Arg Asp Asp Gly Glu Leu Gly
355 360 365

Gly Asn Phe Leu His Ser Phe Gln Asn Asp Asn Tyr Ser Pro Ser Met
370 375 380

Thr Met Ser Val
385

<210> 140
<211> 616
<212> PRT
<213> Homo sapiens

<400> 140

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

Gly Asp Thr Asn Ile Lys Pro Ile Leu Gln Val Ile Asn Ile Arg Pro
20 25 30

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

Gly Leu Asn Thr Leu Ser Ser Phe Met Leu Ala Thr Gln Leu Asn Pro
50 55 60

Leu Val Glu Glu Glu Gln Leu Ser Ser Asn Cys Val Cys Gln Ile His
65 70 75 80

```
Arg Phe Ile Val Asn Thr Leu Lys Asp Gly Arg Arg Val Val Ile Leu
                85                  90                  95

Met Glu Leu Glu Val Leu Lys Ser Ala Glu Ala Val Gly Val Lys Ile
            100                 105                 110

Gly Asn Pro Val Pro Tyr Asn Glu Gly Leu Gly Gln Pro Gln Val Ala
        115                 120                 125

Pro Pro Ala Pro Ala Ala Ser Pro Ala Ala Ser Ser Arg Pro Gln Pro
    130                 135                 140

Gln Asn Gly Ser Ser Gly Met Gly Ser Thr Val Ser Lys Ala Tyr Gly
145                 150                 155                 160

Ala Ser Lys Thr Phe Gly Lys Ala Ala Gly Pro Ser Leu Ser His Thr
                165                 170                 175

Ser Gly Gly Thr Gln Ser Lys Val Val Pro Ile Ala Ser Leu Thr Pro
            180                 185                 190

Tyr Gln Ser Lys Trp Thr Ile Cys Ala Arg Val Thr Asn Lys Ser Gln
        195                 200                 205

Ile Arg Thr Trp Ser Asn Ser Arg Gly Glu Gly Lys Leu Phe Ser Leu
    210                 215                 220

Glu Leu Val Asp Glu Ser Gly Glu Ile Arg Ala Thr Ala Phe Asn Glu
225                 230                 235                 240

Gln Val Asp Lys Phe Phe Pro Leu Ile Glu Val Asn Lys Val Tyr Tyr
                245                 250                 255

Phe Ser Lys Gly Thr Leu Lys Ile Ala Asn Lys Gln Phe Thr Ala Val
            260                 265                 270

Lys Asn Asp Tyr Glu Met Thr Phe Asn Asn Glu Thr Ser Val Met Pro
        275                 280                 285
```

```
Cys Glu Asp Asp His His Leu Pro Thr Val Gln Phe Asp Phe Thr Gly
    290                 295                 300

Ile Asp Asp Leu Glu Asn Lys Ser Lys Asp Ser Leu Val Asp Ile Ile
305                 310                 315                 320

Gly Ile Cys Lys Ser Tyr Glu Asp Ala Thr Lys Ile Thr Val Arg Ser
                325                 330                 335

Asn Asn Arg Glu Val Ala Lys Arg Asn Ile Tyr Leu Met Asp Thr Ser
            340                 345                 350

Gly Lys Val Val Thr Ala Thr Leu Trp Gly Glu Asp Ala Asp Lys Phe
        355                 360                 365

Asp Gly Ser Arg Gln Pro Val Leu Ala Ile Lys Gly Ala Arg Val Ser
    370                 375                 380

Asp Phe Gly Gly Arg Ser Leu Ser Val Leu Ser Ser Ser Thr Ile Ile
385                 390                 395                 400

Ala Asn Pro Asp Ile Pro Glu Ala Tyr Lys Leu Arg Gly Trp Phe Asp
                405                 410                 415

Ala Glu Gly Gln Ala Leu Asp Gly Val Ser Ile Ser Asp Leu Lys Ser
            420                 425                 430

Gly Gly Val Gly Gly Ser Asn Thr Asn Trp Lys Thr Leu Tyr Glu Val
        435                 440                 445

Lys Ser Glu Asn Leu Gly Gln Gly Asp Lys Pro Asp Tyr Phe Ser Ser
    450                 455                 460

Val Ala Thr Val Val Tyr Leu Arg Lys Glu Asn Cys Met Tyr Gln Ala
465                 470                 475                 480

Cys Pro Thr Gln Asp Cys Asn Lys Lys Val Ile Asp Gln Gln Asn Gly
                485                 490                 495
```

```
Leu Tyr Arg Cys Glu Lys Cys Asp Thr Glu Phe Pro Asn Phe Lys Tyr
            500                 505                 510

Arg Met Ile Leu Ser Val Asn Ile Ala Asp Phe Gln Glu Asn Gln Trp
        515                 520                 525

Val Thr Cys Phe Gln Glu Ser Ala Glu Ala Ile Leu Gly Gln Asn Ala
    530                 535                 540

Ala Tyr Leu Gly Glu Leu Lys Asp Lys Asn Glu Gln Ala Phe Glu Glu
545                 550                 555                 560

Val Phe Gln Asn Ala Asn Phe Arg Ser Phe Ile Phe Arg Val Arg Val
                565                 570                 575

Lys Val Glu Thr Tyr Asn Asp Glu Ser Arg Ile Lys Ala Thr Val Met
            580                 585                 590

Asp Val Lys Pro Val Asp Tyr Arg Glu Tyr Gly Arg Arg Leu Val Met
        595                 600                 605

Ser Ile Arg Arg Ser Ala Leu Met
    610                 615
```

<210> 141
<211> 270
<212> PRT
<213> Homo sapiens

<400> 141

```
Met Trp Asn Ser Gly Phe Glu Ser Tyr Gly Ser Ser Ser Tyr Gly Gly
1               5                   10                  15

Ala Gly Gly Tyr Thr Gln Ser Pro Gly Gly Phe Gly Ser Pro Ala Pro
            20                  25                  30

Ser Gln Ala Glu Lys Lys Ser Arg Ala Arg Ala Gln His Ile Val Pro
        35                  40                  45
```

```
Cys Thr Ile Ser Gln Leu Leu Ser Ala Thr Leu Val Asp Glu Val Phe
    50                  55                  60

Arg Ile Gly Asn Val Glu Ile Ser Gln Val Thr Ile Val Gly Ile Ile
65                  70                  75                  80

Arg His Ala Glu Lys Ala Pro Thr Asn Ile Val Tyr Lys Ile Asp Asp
                85                  90                  95

Met Thr Ala Ala Pro Met Asp Val Arg Gln Trp Val Asp Thr Asp Asp
            100                 105                 110

Thr Ser Ser Glu Asn Thr Val Val Pro Pro Glu Thr Tyr Val Lys Val
        115                 120                 125

Ala Gly His Leu Arg Ser Phe Gln Asn Lys Lys Ser Leu Val Ala Phe
    130                 135                 140

Lys Ile Met Pro Leu Glu Asp Met Asn Glu Phe Thr Thr His Ile Leu
145                 150                 155                 160

Glu Val Ile Asn Ala His Met Val Leu Ser Lys Ala Asn Ser Gln Pro
                165                 170                 175

Ser Ala Gly Arg Ala Pro Ile Ser Asn Pro Gly Met Ser Glu Ala Gly
            180                 185                 190

Asn Phe Gly Gly Asn Ser Phe Met Pro Ala Asn Gly Leu Thr Val Ala
        195                 200                 205

Gln Asn Gln Val Leu Asn Leu Ile Lys Ala Cys Pro Arg Pro Glu Gly
    210                 215                 220

Leu Asn Phe Gln Asp Leu Lys Asn Gln Leu Lys His Met Ser Val Ser
225                 230                 235                 240

Ser Ile Lys Gln Ala Val Asp Phe Leu Ser Asn Glu Gly His Ile Tyr
                245                 250                 255
```

Ser Thr Val Asp Asp Asp His Phe Lys Ser Thr Asp Ala Glu
260 265 270

<210> 142
<211> 121
<212> PRT
<213> Homo sapiens

<400> 142

Met Val Asp Met Met Asp Leu Pro Arg Ser Arg Ile Asn Ala Gly Met
1 5 10 15

Leu Ala Gln Phe Ile Asp Lys Pro Val Cys Phe Val Gly Arg Leu Glu
20 25 30

Lys Ile His Pro Thr Gly Lys Met Phe Ile Leu Ser Asp Gly Glu Gly
35 40 45

Lys Asn Gly Thr Ile Glu Leu Met Glu Pro Leu Asp Glu Glu Ile Ser
50 55 60

Gly Ile Val Glu Val Val Gly Arg Val Thr Ala Lys Ala Thr Ile Leu
65 70 75 80

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

Gly Leu Tyr Asn Glu Ala Val Lys Ile Ile His Asp Phe Pro Gln Phe
100 105 110

Tyr Pro Leu Gly Ile Val Gln His Asp
115 120

<210> 143
<211> 171
<212> PRT
<213> Bacillus subtilis

<400> 143

Met Leu Asn Arg Val Val Leu Val Gly Arg Leu Thr Lys Asp Pro Glu
1 5 10 15

```
Leu Arg Tyr Thr Pro Asn Gly Ala Ala Val Ala Thr Phe Thr Leu Ala
            20                  25                  30

Val Asn Arg Thr Phe Thr Asn Gln Gly Glu Arg Glu Ala Asp Phe Ile
        35                  40                  45

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

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

Tyr Glu Asn Gln Gln Gly Gln Arg Val Phe Val Thr Glu Val Gln Ala
                85                  90                  95

Glu Ser Val Gln Phe Leu Glu Pro Lys Asn Gly Gly Gly Ser Gly Ser
            100                 105                 110

Gly Gly Tyr Asn Glu Gly Asn Ser Gly Gly Gly Gln Tyr Phe Gly Gly
        115                 120                 125

Gly Gln Asn Asp Asn Pro Phe Gly Gly Asn Gln Asn Asn Gln Arg Arg
    130                 135                 140

Asn Gln Gly Asn Ser Phe Asn Asp Asp Pro Phe Ala Asn Asp Gly Lys
145                 150                 155                 160

Pro Ile Asp Ile Ser Asp Asp Asp Leu Pro Phe
                165                 170
```

<210> 144
<211> 199
<212> PRT
<213> Streptomyces coelicolor

<400> 144

```
Met Ala Gly Glu Thr Val Ile Thr Val Val Gly Asn Leu Val Asp Asp
1               5                   10                  15
```

```
Pro Glu Leu Arg Phe Thr Pro Ser Gly Ala Ala Val Ala Lys Phe Arg
            20                  25                  30

Val Ala Ser Thr Pro Arg Thr Phe Asp Arg Gln Thr Asn Glu Trp Lys
        35                  40                  45

Asp Gly Glu Ser Leu Phe Leu Thr Cys Ser Val Trp Arg Gln Ala Ala
    50                  55                  60

Glu Asn Val Ala Glu Ser Leu Gln Arg Gly Met Arg Val Ile Val Gln
65                  70                  75                  80

Gly Arg Leu Lys Gln Arg Ser Tyr Glu Asp Arg Glu Gly Val Lys Arg
                85                  90                  95

Thr Val Tyr Glu Leu Asp Val Asp Glu Val Gly Ala Ser Leu Arg Ser
            100                 105                 110

Ala Thr Ala Lys Val Thr Lys Thr Ser Gly Gln Gly Arg Gly Gly Gln
        115                 120                 125

Gly Gly Tyr Gly Gly Gly Gly Gly Gly Gln Gly Gly Gly Gly Trp Gly
    130                 135                 140

Gly Gly Pro Gly Gly Gly Gln Gln Gly Gly Gly Ala Pro Ala Asp Asp
145                 150                 155                 160

Pro Trp Ala Thr Gly Gly Ala Pro Ala Gly Gly Gln Gln Gly Gly Gly
                165                 170                 175

Gly Gln Gly Gly Gly Gly Trp Gly Gly Gly Ser Gly Gly Gly Gly Gly
            180                 185                 190

Tyr Ser Asp Glu Pro Pro Phe
        195
```

<210> 145
<211> 156
<212> PRT

<213> Streptococcus pneumoniae

<400> 145

Met Ile Asn Asn Val Val Leu Val Gly Arg Met Thr Arg Asp Ala Glu
1 5 10 15

Leu Arg Tyr Thr Pro Ser Asn Val Ala Val Ala Thr Phe Thr Leu Ala
20 25 30

Val Asn Arg Thr Phe Lys Ser Gln Asn Gly Glu Arg Glu Ala Asp Phe
35 40 45

Ile Asn Val Val Met Trp Arg Gln Gln Ala Glu Asn Leu Ala Asn Trp
50 55 60

Ala Lys Lys Gly Ser Leu Ile Gly Val Thr Gly Arg Ile Gln Thr Arg
65 70 75 80

Ser Tyr Asp Asn Gln Gln Gly Gln Arg Val Tyr Val Thr Glu Val Val
85 90 95

Ala Glu Asn Phe Gln Met Leu Glu Ser Arg Ser Val Arg Glu Gly His
100 105 110

Thr Gly Gly Ala Tyr Ser Ala Pro Thr Ala Asn Tyr Ser Ala Pro Thr
115 120 125

Asn Ser Val Pro Asp Phe Ser Arg Asn Glu Asn Pro Phe Gly Ala Thr
130 135 140

Asn Pro Leu Asp Ile Ser Asp Asp Asp Leu Pro Phe
145 150 155

<210> 146
<211> 1196
<212> PRT
<213> Human alphaherpesvirus

<400> 146

Met Glu Thr Lys Pro Lys Thr Ala Thr Thr Ile Lys Val Pro Pro Gly

1 5 10 15

Pro Leu Gly Tyr Val Tyr Ala Arg Ala Cys Pro Ser Glu Gly Ile Glu
20 25 30

Leu Leu Ala Leu Leu Ser Ala Arg Ser Gly Asp Ser Asp Val Ala Val
35 40 45

Ala Pro Leu Val Val Gly Leu Thr Val Glu Ser Gly Phe Glu Ala Asn
50 55 60

Val Ala Val Val Val Gly Ser Arg Thr Thr Gly Leu Gly Gly Thr Ala
65 70 75 80

Val Ser Leu Lys Leu Thr Pro Ser His Tyr Ser Ser Ser Val Tyr Val
85 90 95

Phe His Gly Gly Arg His Leu Asp Pro Ser Thr Gln Ala Pro Asn Leu
100 105 110

Thr Arg Leu Cys Glu Arg Ala Arg Arg His Phe Gly Phe Ser Asp Tyr
115 120 125

Thr Pro Arg Pro Gly Asp Leu Lys His Glu Thr Thr Gly Glu Ala Leu
130 135 140

Cys Glu Arg Leu Gly Leu Asp Pro Asp Arg Ala Leu Leu Tyr Leu Val
145 150 155 160

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

His Leu Gly Gly Ser Asp Lys Val Thr Ile Gly Gly Ala Glu Val His
180 185 190

Arg Ile Pro Val Tyr Pro Leu Gln Leu Phe Met Pro Asp Phe Ser Arg
195 200 205

Val Ile Ala Glu Pro Phe Asn Ala Asn His Arg Ser Ile Gly Glu Asn

210 215 220

Phe Thr Tyr Pro Leu Pro Phe Phe Asn Arg Pro Leu Asn Arg Leu Leu
225 230 235 240

Phe Glu Ala Val Val Gly Pro Ala Ala Val Ala Leu Arg Cys Arg Asn
245 250 255

Val Asp Ala Val Ala Arg Ala Ala Ala His Leu Ala Phe Asp Glu Asn
260 265 270

His Glu Gly Ala Ala Leu Pro Ala Asp Ile Thr Phe Thr Ala Phe Glu
275 280 285

Ala Ser Gln Gly Lys Thr Pro Arg Gly Gly Arg Asp Gly Gly Gly Lys
290 295 300

Gly Pro Ala Gly Gly Phe Glu Gln Arg Leu Ala Ser Val Met Ala Gly
305 310 315 320

Asp Ala Ala Leu Ala Leu Glu Ser Ile Val Ser Met Ala Val Phe Asp
325 330 335

Glu Pro Pro Thr Asp Ile Ser Ala Trp Pro Leu Phe Glu Gly Gln Asp
340 345 350

Thr Ala Ala Ala Arg Ala Asn Ala Val Gly Ala Tyr Leu Ala Arg Ala
355 360 365

Ala Gly Leu Val Gly Ala Met Val Phe Ser Thr Asn Ser Ala Leu His
370 375 380

Leu Thr Glu Val Asp Asp Ala Gly Pro Ala Asp Pro Lys Asp His Ser
385 390 395 400

Lys Pro Ser Phe Tyr Arg Phe Phe Leu Val Pro Gly Thr His Val Ala
405 410 415

Ala Asn Pro Gln Val Asp Arg Glu Gly His Val Val Pro Gly Phe Glu

420 425 430

Gly Arg Pro Thr Ala Pro Leu Val Gly Gly Thr Gln Glu Phe Ala Gly
435 440 445

Glu His Leu Ala Met Leu Cys Gly Phe Ser Pro Ala Leu Leu Ala Lys
450 455 460

Met Leu Phe Tyr Leu Glu Arg Cys Asp Gly Gly Val Ile Val Gly Arg
465 470 475 480

Gln Glu Met Asp Val Phe Arg Tyr Val Ala Asp Ser Asn Gln Thr Asp
485 490 495

Val Pro Cys Asn Leu Cys Thr Phe Asp Thr Arg His Ala Cys Val His
500 505 510

Thr Thr Leu Met Arg Leu Arg Ala Arg His Pro Lys Phe Ala Ser Ala
515 520 525

Ala Arg Gly Ala Ile Gly Val Phe Gly Thr Met Asn Ser Met Tyr Ser
530 535 540

Asp Cys Asp Val Leu Gly Asn Tyr Ala Ala Phe Ser Ala Leu Lys Arg
545 550 555 560

Ala Asp Gly Ser Glu Thr Ala Arg Thr Ile Met Gln Glu Thr Tyr Arg
565 570 575

Ala Ala Thr Glu Arg Val Met Ala Glu Leu Glu Thr Leu Gln Tyr Val
580 585 590

Asp Gln Ala Val Pro Thr Ala Met Gly Arg Leu Glu Thr Ile Ile Thr
595 600 605

Asn Arg Glu Ala Leu His Thr Val Val Asn Asn Val Arg Gln Val Val
610 615 620

Asp Arg Glu Val Glu Gln Leu Met Arg Asn Leu Val Glu Gly Arg Asn

625 630 635 640

Phe Lys Phe Arg Asp Gly Leu Gly Glu Ala Asn His Ala Met Ser Leu
645 650 655

Thr Leu Asp Pro Tyr Ala Cys Gly Pro Cys Pro Leu Leu Gln Leu Leu
660 665 670

Gly Arg Arg Ser Asn Leu Ala Val Tyr Gln Asp Leu Ala Leu Ser Gln
675 680 685

Cys His Gly Val Phe Ala Gly Gln Ser Val Glu Gly Arg Asn Phe Arg
690 695 700

Asn Gln Phe Gln Pro Val Leu Arg Arg Arg Val Met Asp Met Phe Asn
705 710 715 720

Asn Gly Phe Leu Ser Ala Lys Thr Leu Thr Val Ala Leu Ser Glu Gly
725 730 735

Ala Ala Ile Cys Ala Pro Ser Leu Thr Ala Gly Gln Thr Ala Pro Ala
740 745 750

Glu Ser Ser Phe Glu Gly Asp Val Ala Arg Val Thr Leu Gly Phe Pro
755 760 765

Lys Glu Leu Arg Val Lys Ser Arg Val Leu Phe Ala Gly Ala Ser Ala
770 775 780

Asn Ala Ser Glu Ala Ala Lys Ala Arg Val Ala Ser Leu Gln Ser Ala
785 790 795 800

Tyr Gln Lys Pro Asp Lys Arg Val Asp Ile Leu Leu Gly Pro Leu Gly
805 810 815

Phe Leu Leu Lys Gln Phe His Ala Ala Ile Phe Pro Asn Gly Lys Pro
820 825 830

Pro Gly Ser Asn Gln Pro Asn Pro Gln Trp Phe Trp Thr Ala Leu Gln

```
        835                 840                 845

Arg Asn Gln Leu Pro Ala Arg Leu Leu Ser Arg Glu Asp Ile Glu Thr
    850                 855                 860

Ile Ala Phe Ile Lys Lys Phe Ser Leu Asp Tyr Gly Ala Ile Asn Phe
865                 870                 875                 880

Ile Asn Leu Ala Pro Asn Asn Val Ser Glu Leu Ala Met Tyr Tyr Met
                885                 890                 895

Ala Asn Gln Ile Leu Arg Tyr Cys Asp His Ser Thr Tyr Phe Ile Asn
            900                 905                 910

Thr Leu Thr Ala Ile Ile Ala Gly Ser Arg Arg Pro Pro Ser Val Gln
        915                 920                 925

Ala Ala Ala Ala Trp Ser Ala Gln Gly Gly Ala Gly Leu Glu Ala Gly
    930                 935                 940

Ala Arg Ala Leu Met Asp Ala Val Asp Ala His Pro Gly Ala Trp Thr
945                 950                 955                 960

Ser Met Phe Ala Ser Cys Asn Leu Leu Arg Pro Val Met Ala Ala Arg
                965                 970                 975

Pro Met Val Val Leu Gly Leu Ser Ile Ser Lys Tyr Tyr Gly Met Ala
            980                 985                 990

Gly Asn Asp Arg Val Phe Gln Ala  Gly Asn Trp Ala Ser  Leu Met Gly
        995                 1000                1005

Gly Lys  Asn Ala Cys Pro Leu  Leu Ile Phe Asp Arg  Thr Arg Lys
    1010                1015                1020

Phe Val  Leu Ala Cys Pro Arg  Ala Gly Phe Val Cys  Ala Ala Ser
    1025                1030                1035

Ser Leu  Gly Gly Gly Ala His  Glu Ser Ser Leu Cys  Glu Gln Leu
```

1040 1045 1050

Arg Gly Ile Ile Ser Glu Gly Gly Ala Ala Val Ala Ser Ser Val
1055 1060 1065

Phe Val Ala Thr Val Lys Ser Leu Gly Pro Arg Thr Gln Gln Leu
1070 1075 1080

Gln Ile Glu Asp Trp Leu Ala Leu Leu Glu Asp Glu Tyr Leu Ser
1085 1090 1095

Glu Glu Met Met Glu Leu Thr Ala Arg Ala Leu Glu Arg Gly Asn
1100 1105 1110

Gly Glu Trp Ser Thr Asp Ala Ala Leu Glu Val Ala His Glu Ala
1115 1120 1125

Glu Ala Leu Val Ser Gln Leu Gly Asn Ala Gly Glu Val Phe Asn
1130 1135 1140

Phe Gly Asp Phe Gly Cys Glu Asp Asp Asn Ala Thr Pro Phe Gly
1145 1150 1155

Gly Pro Gly Ala Pro Gly Pro Ala Phe Ala Gly Arg Lys Arg Ala
1160 1165 1170

Phe His Gly Asp Asp Pro Phe Gly Glu Gly Pro Pro Asp Lys Lys
1175 1180 1185

Gly Asp Leu Thr Leu Asp Met Leu
1190 1195

<210> 147
<211> 124
<212> PRT
<213> Bacillus virus phi29

<400> 147

Met Glu Asn Thr Asn Ile Val Lys Ala Thr Phe Asp Thr Glu Thr Leu
1 5 10 15

```
Glu Gly Gln Ile Lys Ile Phe Asn Ala Gln Thr Gly Gly Gly Gln Ser
            20                  25                  30

Phe Lys Asn Leu Pro Asp Gly Thr Ile Ile Glu Ala Asn Ala Ile Ala
        35                  40                  45

Gln Tyr Lys Gln Val Ser Asp Thr Tyr Gly Asp Ala Lys Glu Glu Thr
    50                  55                  60

Val Thr Thr Ile Phe Ala Ala Asp Gly Ser Leu Tyr Ser Ala Ile Ser
65                  70                  75                  80

Lys Thr Val Ala Glu Ala Ala Ser Asp Leu Ile Asp Leu Val Thr Arg
                85                  90                  95

His Lys Leu Glu Thr Phe Lys Val Lys Val Val Gln Gly Thr Ser Ser
            100                 105                 110

Lys Gly Asn Val Phe Phe Ser Leu Gln Leu Ser Leu
        115                 120
```

<210> 148
<211> 162
<212> PRT
<213> Burkholderia virus

<400> 148

```
Met Ala Ser Val Asn Lys Val Ile Leu Val Gly Asn Leu Gly Ala Asp
1               5                   10                  15

Pro Glu Thr Arg Tyr Leu Pro Ser Gly Asp Ala Ile Ser Asn Ile Arg
            20                  25                  30

Leu Ala Thr Thr Asp Arg Tyr Lys Asp Lys Ala Ser Gly Glu Met Lys
        35                  40                  45

Glu Ser Thr Glu Trp His Arg Val Ser Phe Phe Gly Arg Leu Ala Glu
    50                  55                  60
```

```
Ile Val Asp Glu Tyr Leu Arg Lys Gly Ala Pro Val Tyr Ile Glu Gly
65                  70                  75                  80


Arg Ile Arg Thr Arg Lys Trp Gln Asp Asn Ala Gly Gln Asp Arg Tyr
                85                  90                  95


Thr Thr Glu Ile Val Ala Glu Lys Met Gln Met Leu Gly Asp Arg Arg
            100                 105                 110


Asp Gly Gly Glu Arg Gln Gln Arg Ala Pro Gln Gln Gln Gln Gln Arg
        115                 120                 125


Thr Gln Arg Asn Gly Tyr Ala Asp Ala Thr Gly Arg Ala Gln Pro Ser
    130                 135                 140


Gln Arg Pro Ala Ala Gly Gly Gly Phe Asp Glu Met Asp Asp Asp Ile
145                 150                 155                 160


Pro Phe
```

<210> 149
<211> 1599
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 149

```
Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1               5                   10                  15


Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
            20                  25                  30


Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
        35                  40                  45


Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
```

50 55 60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65 70 75 80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
85 90 95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
100 105 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
115 120 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
130 135 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145 150 155 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
165 170 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
180 185 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
195 200 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
210 215 220

Ala Thr Gly Leu Lys Gly Gly Ser Asp Lys Lys Tyr Ser Ile Gly Leu
225 230 235 240

Ala Ile Gly Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr
245 250 255

Lys Val Pro Ser Lys Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His

260 265 270

Ser Ile Lys Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu
275 280 285

Thr Ala Glu Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr
290 295 300

Arg Arg Lys Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu
305 310 315 320

Met Ala Lys Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe
325 330 335

Leu Val Glu Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn
340 345 350

Ile Val Asp Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His
355 360 365

Leu Arg Lys Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu
370 375 380

Ile Tyr Leu Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu
385 390 395 400

Ile Glu Gly Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe
405 410 415

Ile Gln Leu Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile
420 425 430

Asn Ala Ser Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser
435 440 445

Lys Ser Arg Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys
450 455 460

Lys Asn Gly Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr

465 470 475 480

Pro Asn Phe Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln
485 490 495

Leu Ser Lys Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln
500 505 510

Ile Gly Asp Gln Tyr Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser
515 520 525

Asp Ala Ile Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr
530 535 540

Lys Ala Pro Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His
545 550 555 560

Gln Asp Leu Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu
565 570 575

Lys Tyr Lys Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly
580 585 590

Tyr Ile Asp Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys
595 600 605

Pro Ile Leu Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu
610 615 620

Asn Arg Glu Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser
625 630 635 640

Ile Pro His Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg
645 650 655

Gln Glu Asp Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu
660 665 670

Lys Ile Leu Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg

675 680 685

Gly Asn Ser Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile
690 695 700

Thr Pro Trp Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln
705 710 715 720

Ser Phe Ile Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu
725 730 735

Lys Val Leu Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr
740 745 750

Asn Glu Leu Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro
755 760 765

Ala Phe Leu Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe
770 775 780

Lys Thr Asn Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe
785 790 795 800

Lys Lys Ile Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp
805 810 815

Arg Phe Asn Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile
820 825 830

Lys Asp Lys Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu
835 840 845

Asp Ile Val Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu
850 855 860

Glu Arg Leu Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys
865 870 875 880

Gln Leu Lys Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys

885 890 895

Leu Ile Asn Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp
900 905 910

Phe Leu Lys Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile
915 920 925

His Asp Asp Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val
930 935 940

Ser Gly Gln Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly
945 950 955 960

Ser Pro Ala Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp
965 970 975

Glu Leu Val Lys Val Met Gly Arg His Lys Pro Glu Asn Ile Val Ile
980 985 990

Glu Met Ala Arg Glu Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser
995 1000 1005

Arg Glu Arg Met Lys Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly
1010 1015 1020

Ser Gln Ile Leu Lys Glu His Pro Val Glu Asn Thr Gln Leu Gln
1025 1030 1035

Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln Asn Gly Arg Asp Met
1040 1045 1050

Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu Ser Asp Tyr Asp
1055 1060 1065

Val Asp Ala Ile Val Pro Gln Ser Phe Leu Lys Asp Asp Ser Ile
1070 1075 1080

Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly Lys Ser

1085 1090 1095

Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn Tyr
1100 1105 1110

Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
1115 1120 1125

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
1130 1135 1140

Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile
1145 1150 1155

Thr Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys
1160 1165 1170

Tyr Asp Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr
1175 1180 1185

Leu Lys Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe
1190 1195 1200

Tyr Lys Val Arg Glu Ile Asn Asn Tyr His His Ala His Asp Ala
1205 1210 1215

Tyr Leu Asn Ala Val Val Gly Thr Ala Leu Ile Lys Lys Tyr Pro
1220 1225 1230

Lys Leu Glu Ser Glu Phe Val Tyr Gly Asp Tyr Lys Val Tyr Asp
1235 1240 1245

Val Arg Lys Met Ile Ala Lys Ser Glu Gln Glu Ile Gly Lys Ala
1250 1255 1260

Thr Ala Lys Tyr Phe Phe Tyr Ser Asn Ile Met Asn Phe Phe Lys
1265 1270 1275

Thr Glu Ile Thr Leu Ala Asn Gly Glu Ile Arg Lys Arg Pro Leu

1280 1285 1290

Ile Glu Thr Asn Gly Glu Thr Gly Glu Ile Val Trp Asp Lys Gly
1295 1300 1305

Arg Asp Phe Ala Thr Val Arg Lys Val Leu Ser Met Pro Gln Val
1310 1315 1320

Asn Ile Val Lys Lys Thr Glu Val Gln Thr Gly Gly Phe Ser Lys
1325 1330 1335

Glu Ser Ile Leu Pro Lys Arg Asn Ser Asp Lys Leu Ile Ala Arg
1340 1345 1350

Lys Lys Asp Trp Asp Pro Lys Lys Tyr Gly Gly Phe Asp Ser Pro
1355 1360 1365

Thr Val Ala Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys Gly
1370 1375 1380

Lys Ser Lys Lys Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr
1385 1390 1395

Ile Met Glu Arg Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu
1400 1405 1410

Glu Ala Lys Gly Tyr Lys Glu Val Lys Lys Asp Leu Ile Ile Lys
1415 1420 1425

Leu Pro Lys Tyr Ser Leu Phe Glu Leu Glu Asn Gly Arg Lys Arg
1430 1435 1440

Met Leu Ala Ser Ala Gly Glu Leu Gln Lys Gly Asn Glu Leu Ala
1445 1450 1455

Leu Pro Ser Lys Tyr Val Asn Phe Leu Tyr Leu Ala Ser His Tyr
1460 1465 1470

Glu Lys Leu Lys Gly Ser Pro Glu Asp Asn Glu Gln Lys Gln Leu

1475 1480 1485

Phe Val Glu Gln His Lys His Tyr Leu Asp Glu Ile Ile Glu Gln
1490 1495 1500

Ile Ser Glu Phe Ser Lys Arg Val Ile Leu Ala Asp Ala Asn Leu
1505 1510 1515

Asp Lys Val Leu Ser Ala Tyr Asn Lys His Arg Asp Lys Pro Ile
1520 1525 1530

Arg Glu Gln Ala Glu Asn Ile Ile His Leu Phe Thr Leu Thr Asn
1535 1540 1545

Leu Gly Ala Pro Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile Asp
1550 1555 1560

Arg Lys Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu
1565 1570 1575

Ile His Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu
1580 1585 1590

Ser Gln Leu Gly Gly Asp
1595

<210> 150
<211> 1606
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 150

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1 5 10 15

Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
20 25 30

```
Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
        35                  40                  45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
    50                  55                  60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65                  70                  75                  80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
                85                  90                  95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
            100                 105                 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
        115                 120                 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220

Ala Thr Gly Leu Lys Gly Gly Ser Gly Gly Ser Gly Gly Ser Met Asp
225                 230                 235                 240
```

```
Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly Trp
                245                 250                 255

Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys Val
            260                 265                 270

Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly Ala
        275                 280                 285

Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys Arg
    290                 295                 300

Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr Leu
305                 310                 315                 320

Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe Phe
                325                 330                 335

His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His Glu
            340                 345                 350

Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His Glu
        355                 360                 365

Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser Thr
    370                 375                 380

Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met Ile
385                 390                 395                 400

Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp Asn
                405                 410                 415

Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn Gln
            420                 425                 430

Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys Ala
        435                 440                 445
```

```
Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu Ile
    450                 455                 460

Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu Ile
465                 470                 475                 480

Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp Leu
                485                 490                 495

Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp Asp
            500                 505                 510

Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu Phe
        515                 520                 525

Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile Leu
    530                 535                 540

Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met Ile
545                 550                 555                 560

Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala Leu
                565                 570                 575

Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp Gln
            580                 585                 590

Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln Glu
        595                 600                 605

Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly Thr
    610                 615                 620

Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys Gln
625                 630                 635                 640

Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly Glu
                645                 650                 655
```

```
Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu Lys
            660                 665                 670

Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro Tyr
        675                 680                 685

Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met Thr
    690                 695                 700

Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val Val
705                 710                 715                 720

Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn Phe
                725                 730                 735

Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu Leu
            740                 745                 750

Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr Val
        755                 760                 765

Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys Lys
    770                 775                 780

Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val Lys
785                 790                 795                 800

Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser Val
                805                 810                 815

Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr Tyr
            820                 825                 830

His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn Glu
        835                 840                 845

Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu Phe
    850                 855                 860
```

```
Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His Leu
865                 870                 875                 880


Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr Gly
                885                 890                 895


Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys Gln
            900                 905                 910


Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala Asn
        915                 920                 925


Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys Glu
    930                 935                 940


Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His Glu
945                 950                 955                 960


His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile Leu
                965                 970                 975


Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg His
            980                 985                 990


Lys Pro Glu Asn Ile Val Ile Glu  Met Ala Arg Glu Asn  Gln Thr Thr
        995                 1000                1005


Gln Lys  Gly Gln Lys Asn Ser  Arg Glu Arg Met Lys  Arg Ile Glu
    1010                1015                1020


Glu Gly  Ile Lys Glu Leu Gly  Ser Gln Ile Leu Lys  Glu His Pro
    1025                1030                1035


Val Glu  Asn Thr Gln Leu Gln  Asn Glu Lys Leu Tyr  Leu Tyr Tyr
    1040                1045                1050


Leu Gln  Asn Gly Arg Asp Met  Tyr Val Asp Gln Glu  Leu Asp Ile
    1055                1060                1065
```

```
Asn Arg  Leu Ser Asp Tyr Asp  Val Asp Ala Ile Val  Pro Gln Ser
    1070                1075                1080

Phe Leu  Lys Asp Asp Ser Ile  Asp Asn Lys Val Leu  Thr Arg Ser
    1085                1090                1095

Asp Lys  Asn Arg Gly Lys Ser  Asp Asn Val Pro Ser  Glu Glu Val
    1100                1105                1110

Val Lys  Lys Met Lys Asn Tyr  Trp Arg Gln Leu Leu  Asn Ala Lys
    1115                1120                1125

Leu Ile  Thr Gln Arg Lys Phe  Asp Asn Leu Thr Lys  Ala Glu Arg
    1130                1135                1140

Gly Gly  Leu Ser Glu Leu Asp  Lys Ala Gly Phe Ile  Lys Arg Gln
    1145                1150                1155

Leu Val  Glu Thr Arg Gln Ile  Thr Lys His Val Ala  Gln Ile Leu
    1160                1165                1170

Asp Ser  Arg Met Asn Thr Lys  Tyr Asp Glu Asn Asp  Lys Leu Ile
    1175                1180                1185

Arg Glu  Val Lys Val Ile Thr  Leu Lys Ser Lys Leu  Val Ser Asp
    1190                1195                1200

Phe Arg  Lys Asp Phe Gln Phe  Tyr Lys Val Arg Glu  Ile Asn Asn
    1205                1210                1215

Tyr His  His Ala His Asp Ala  Tyr Leu Asn Ala Val  Val Gly Thr
    1220                1225                1230

Ala Leu  Ile Lys Lys Tyr Pro  Lys Leu Glu Ser Glu  Phe Val Tyr
    1235                1240                1245

Gly Asp  Tyr Lys Val Tyr Asp  Val Arg Lys Met Ile  Ala Lys Ser
    1250                1255                1260
```

```
Glu Gln  Glu Ile Gly Lys Ala  Thr Ala Lys Tyr Phe  Phe Tyr Ser
    1265                1270                1275

Asn Ile  Met Asn Phe Phe Lys  Thr Glu Ile Thr Leu  Ala Asn Gly
    1280                1285                1290

Glu Ile  Arg Lys Arg Pro Leu  Ile Glu Thr Asn Gly  Glu Thr Gly
    1295                1300                1305

Glu Ile  Val Trp Asp Lys Gly  Arg Asp Phe Ala Thr  Val Arg Lys
    1310                1315                1320

Val Leu  Ser Met Pro Gln Val  Asn Ile Val Lys Lys  Thr Glu Val
    1325                1330                1335

Gln Thr  Gly Gly Phe Ser Lys  Glu Ser Ile Leu Pro  Lys Arg Asn
    1340                1345                1350

Ser Asp  Lys Leu Ile Ala Arg  Lys Lys Asp Trp Asp  Pro Lys Lys
    1355                1360                1365

Tyr Gly  Gly Phe Asp Ser Pro  Thr Val Ala Tyr Ser  Val Leu Val
    1370                1375                1380

Val Ala  Lys Val Glu Lys Gly  Lys Ser Lys Lys Leu  Lys Ser Val
    1385                1390                1395

Lys Glu  Leu Leu Gly Ile Thr  Ile Met Glu Arg Ser  Ser Phe Glu
    1400                1405                1410

Lys Asn  Pro Ile Asp Phe Leu  Glu Ala Lys Gly Tyr  Lys Glu Val
    1415                1420                1425

Lys Lys  Asp Leu Ile Ile Lys  Leu Pro Lys Tyr Ser  Leu Phe Glu
    1430                1435                1440

Leu Glu  Asn Gly Arg Lys Arg  Met Leu Ala Ser Ala  Gly Glu Leu
    1445                1450                1455
```

```
Gln Lys  Gly Asn Glu Leu Ala  Leu Pro Ser Lys Tyr  Val Asn Phe
    1460                 1465                 1470

Leu Tyr  Leu Ala Ser His Tyr  Glu Lys Leu Lys Gly  Ser Pro Glu
    1475                 1480                 1485

Asp Asn  Glu Gln Lys Gln Leu  Phe Val Glu Gln His  Lys His Tyr
    1490                 1495                 1500

Leu Asp  Glu Ile Ile Glu Gln  Ile Ser Glu Phe Ser  Lys Arg Val
    1505                 1510                 1515

Ile Leu  Ala Asp Ala Asn Leu  Asp Lys Val Leu Ser  Ala Tyr Asn
    1520                 1525                 1530

Lys His  Arg Asp Lys Pro Ile  Arg Glu Gln Ala Glu  Asn Ile Ile
    1535                 1540                 1545

His Leu  Phe Thr Leu Thr Asn  Leu Gly Ala Pro Ala  Ala Phe Lys
    1550                 1555                 1560

Tyr Phe  Asp Thr Thr Ile Asp  Arg Lys Arg Tyr Thr  Ser Thr Lys
    1565                 1570                 1575

Glu Val  Leu Asp Ala Thr Leu  Ile His Gln Ser Ile  Thr Gly Leu
    1580                 1585                 1590

Tyr Glu  Thr Arg Ile Asp Leu  Ser Gln Leu Gly Gly  Asp
    1595                 1600                 1605
```

<210> 151
<211> 1599
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 151

```
Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly
```

1 5 10 15

Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
20 25 30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
35 40 45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
50 55 60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65 70 75 80

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

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
100 105 110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
115 120 125

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
130 135 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145 150 155 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
165 170 175

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
180 185 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
195 200 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu

210 215 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225 230 235 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
245 250 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
260 265 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
275 280 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
290 295 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305 310 315 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
325 330 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
340 345 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
355 360 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
370 375 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385 390 395 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
405 410 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu

420 425 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
435 440 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
450 455 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465 470 475 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
485 490 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
500 505 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
515 520 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
530 535 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545 550 555 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
565 570 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
580 585 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
595 600 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
610 615 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His

625 630 635 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
645 650 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
660 665 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
675 680 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
690 695 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705 710 715 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
725 730 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
740 745 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
755 760 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
770 775 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785 790 795 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
805 810 815

Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
820 825 830

Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe Leu Lys Asp

```
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975

Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990

Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005

Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020

Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035

Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
```

1040 1045 1050

Gly Glu Ile Arg Lys Arg Pro Leu Ile Glu Thr Asn Gly Glu Thr
1055 1060 1065

Gly Glu Ile Val Trp Asp Lys Gly Arg Asp Phe Ala Thr Val Arg
1070 1075 1080

Lys Val Leu Ser Met Pro Gln Val Asn Ile Val Lys Lys Thr Glu
1085 1090 1095

Val Gln Thr Gly Gly Phe Ser Lys Glu Ser Ile Leu Pro Lys Arg
1100 1105 1110

Asn Ser Asp Lys Leu Ile Ala Arg Lys Lys Asp Trp Asp Pro Lys
1115 1120 1125

Lys Tyr Gly Gly Phe Asp Ser Pro Thr Val Ala Tyr Ser Val Leu
1130 1135 1140

Val Val Ala Lys Val Glu Lys Gly Lys Ser Lys Lys Leu Lys Ser
1145 1150 1155

Val Lys Glu Leu Leu Gly Ile Thr Ile Met Glu Arg Ser Ser Phe
1160 1165 1170

Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala Lys Gly Tyr Lys Glu
1175 1180 1185

Val Lys Lys Asp Leu Ile Ile Lys Leu Pro Lys Tyr Ser Leu Phe
1190 1195 1200

Glu Leu Glu Asn Gly Arg Lys Arg Met Leu Ala Ser Ala Gly Glu
1205 1210 1215

Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro Ser Lys Tyr Val Asn
1220 1225 1230

Phe Leu Tyr Leu Ala Ser His Tyr Glu Lys Leu Lys Gly Ser Pro

1235 1240 1245

Glu Asp Asn Glu Gln Lys Gln Leu Phe Val Glu Gln His Lys His
1250 1255 1260

Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser Glu Phe Ser Lys Arg
1265 1270 1275

Val Ile Leu Ala Asp Ala Asn Leu Asp Lys Val Leu Ser Ala Tyr
1280 1285 1290

Asn Lys His Arg Asp Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile
1295 1300 1305

Ile His Leu Phe Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala Phe
1310 1315 1320

Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser Thr
1325 1330 1335

Lys Glu Val Leu Asp Ala Thr Leu Ile His Gln Ser Ile Thr Gly
1340 1345 1350

Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp Gly
1355 1360 1365

Gly Ser Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr
1370 1375 1380

Leu Arg Arg Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp
1385 1390 1395

Pro Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn
1400 1405 1410

Trp Gly Gly Arg His Ser Ile Trp Arg His Thr Ser Gln Asn Thr
1415 1420 1425

Asn Lys His Val Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu

1430 1435 1440

Arg Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu
1445 1450 1455

Ser Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe
1460 1465 1470

Leu Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg
1475 1480 1485

Leu Tyr His His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp
1490 1495 1500

Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met Thr Glu Gln Glu
1505 1510 1515

Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn
1520 1525 1530

Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg Leu Tyr
1535 1540 1545

Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys Leu
1550 1555 1560

Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
1565 1570 1575

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu
1580 1585 1590

Trp Ala Thr Gly Leu Lys
1595

<210> 152
<211> 1605
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 152

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Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly
1               5                   10                  15


Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
            20                  25                  30


Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
        35                  40                  45


Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
    50                  55                  60


Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65                  70                  75                  80


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


Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
            100                 105                 110


Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
        115                 120                 125


Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
    130                 135                 140


Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145                 150                 155                 160


Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
                165                 170                 175


Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190
```

```
Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400
```

```
Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605
```

```
Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
        755                 760                 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815
```

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Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975

Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990

Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005

Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020
```

```
Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035

Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
    1040                1045                1050

Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065

Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
    1070                1075                1080

Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095

Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110

Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125

Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140

Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155

Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170

Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                1210                1215
```

```
Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230

Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245

Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260

Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275

Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290

Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305

Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                1315                1320

Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Arg Tyr  Thr Ser Thr
    1325                1330                1335

Lys Glu  Val Leu Asp Ala Thr  Leu Ile His Gln Ser  Ile Thr Gly
    1340                1345                1350

Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln Leu Gly  Gly Asp Gly
    1355                1360                1365

Gly Ser  Gly Gly Ser Gly Gly  Ser Met Ser Ser Glu  Thr Gly Pro
    1370                1375                1380

Val Ala  Val Asp Pro Thr Leu  Arg Arg Arg Ile Glu  Pro His Glu
    1385                1390                1395

Phe Glu  Val Phe Phe Asp Pro  Arg Glu Leu Arg Lys  Glu Thr Cys
    1400                1405                1410
```

```
Leu Leu  Tyr Glu Ile Asn Trp  Gly Gly Arg His Ser  Ile Trp Arg
    1415                 1420                 1425

His Thr  Ser Gln Asn Thr Asn  Lys His Val Glu Val  Asn Phe Ile
    1430                 1435                 1440

Glu Lys  Phe Thr Thr Glu Arg  Tyr Phe Cys Pro Asn  Thr Arg Cys
    1445                 1450                 1455

Ser Ile  Thr Trp Phe Leu Ser  Trp Ser Pro Cys Gly  Glu Cys Ser
    1460                 1465                 1470

Arg Ala  Ile Thr Glu Phe Leu  Ser Arg Tyr Pro His  Val Thr Leu
    1475                 1480                 1485

Phe Ile  Tyr Ile Ala Arg Leu  Tyr His His Ala Asp  Pro Arg Asn
    1490                 1495                 1500

Arg Gln  Gly Leu Arg Asp Leu  Ile Ser Ser Gly Val  Thr Ile Gln
    1505                 1510                 1515

Ile Met  Thr Glu Gln Glu Ser  Gly Tyr Cys Trp Arg  Asn Phe Val
    1520                 1525                 1530

Asn Tyr  Ser Pro Ser Asn Glu  Ala His Trp Pro Arg  Tyr Pro His
    1535                 1540                 1545

Leu Trp  Val Arg Leu Tyr Val  Leu Glu Leu Tyr Cys  Ile Ile Leu
    1550                 1555                 1560

Gly Leu  Pro Pro Cys Leu Asn  Ile Leu Arg Arg Lys  Gln Pro Gln
    1565                 1570                 1575

Leu Thr  Phe Phe Thr Ile Ala  Leu Gln Ser Cys His  Tyr Gln Arg
    1580                 1585                 1590

Leu Pro  Pro His Ile Leu Trp  Ala Thr Gly Leu Lys
    1595                 1600                 1605
```

<210> 153
<211> 1612
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 153

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1 5 10 15

Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
20 25 30

Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
35 40 45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
50 55 60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65 70 75 80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
85 90 95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
100 105 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
115 120 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
130 135 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145 150 155 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg

165 170 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
180 185 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
195 200 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
210 215 220

Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
225 230 235 240

Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
245 250 255

Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
260 265 270

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

Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
290 295 300

Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys
305 310 315 320

Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
325 330 335

Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
340 345 350

Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp
355 360 365

Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys

```
    370                 375                 380

Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
385                 390                 395                 400

Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
                405                 410                 415

Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
            420                 425                 430

Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser
        435                 440                 445

Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg
    450                 455                 460

Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
465                 470                 475                 480

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
                485                 490                 495

Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
            500                 505                 510

Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp
        515                 520                 525

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

Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro
545                 550                 555                 560

Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
                565                 570                 575

Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys
```

580 585 590

Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
595 600 605

Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
610 615 620

Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
625 630 635 640

Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His
645 650 655

Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
660 665 670

Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
675 680 685

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
690 695 700

Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
705 710 715 720

Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile
725 730 735

Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
740 745 750

Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu
755 760 765

Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu
770 775 780

Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn

785 790 795 800

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
805 810 815

Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
820 825 830

Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
835 840 845

Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val
850 855 860

Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu
865 870 875 880

Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
885 890 895

Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn
900 905 910

Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys
915 920 925

Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp
930 935 940

Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln
945 950 955 960

Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala
965 970 975

Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val
980 985 990

Lys Val Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala

995 1000 1005

Arg Glu Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu
1010 1015 1020

Arg Met Lys Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln
1025 1030 1035

Ile Leu Lys Glu His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu
1040 1045 1050

Lys Leu Tyr Leu Tyr Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val
1055 1060 1065

Asp Gln Glu Leu Asp Ile Asn Arg Leu Ser Asp Tyr Asp Val Asp
1070 1075 1080

Ala Ile Val Pro Gln Ser Phe Leu Lys Asp Asp Ser Ile Asp Asn
1085 1090 1095

Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly Lys Ser Asp Asn
1100 1105 1110

Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn Tyr Trp Arg
1115 1120 1125

Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe Asp Asn
1130 1135 1140

Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys Ala
1145 1150 1155

Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
1160 1165 1170

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
1175 1180 1185

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys

1190 1195 1200

Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
1205 1210 1215

Val Arg Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu
1220 1225 1230

Asn Ala Val Val Gly Thr Ala Leu Ile Lys Lys Tyr Pro Lys Leu
1235 1240 1245

Glu Ser Glu Phe Val Tyr Gly Asp Tyr Lys Val Tyr Asp Val Arg
1250 1255 1260

Lys Met Ile Ala Lys Ser Glu Gln Glu Ile Gly Lys Ala Thr Ala
1265 1270 1275

Lys Tyr Phe Phe Tyr Ser Asn Ile Met Asn Phe Phe Lys Thr Glu
1280 1285 1290

Ile Thr Leu Ala Asn Gly Glu Ile Arg Lys Arg Pro Leu Ile Glu
1295 1300 1305

Thr Asn Gly Glu Thr Gly Glu Ile Val Trp Asp Lys Gly Arg Asp
1310 1315 1320

Phe Ala Thr Val Arg Lys Val Leu Ser Met Pro Gln Val Asn Ile
1325 1330 1335

Val Lys Lys Thr Glu Val Gln Thr Gly Gly Phe Ser Lys Glu Ser
1340 1345 1350

Ile Leu Pro Lys Arg Asn Ser Asp Lys Leu Ile Ala Arg Lys Lys
1355 1360 1365

Asp Trp Asp Pro Lys Lys Tyr Gly Gly Phe Asp Ser Pro Thr Val
1370 1375 1380

Ala Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys Gly Lys Ser

1385 1390 1395

Lys Lys Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr Ile Met
1400 1405 1410

Glu Arg Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala
1415 1420 1425

Lys Gly Tyr Lys Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro
1430 1435 1440

Lys Tyr Ser Leu Phe Glu Leu Glu Asn Gly Arg Lys Arg Met Leu
1445 1450 1455

Ala Ser Ala Gly Glu Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro
1460 1465 1470

Ser Lys Tyr Val Asn Phe Leu Tyr Leu Ala Ser His Tyr Glu Lys
1475 1480 1485

Leu Lys Gly Ser Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val
1490 1495 1500

Glu Gln His Lys His Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser
1505 1510 1515

Glu Phe Ser Lys Arg Val Ile Leu Ala Asp Ala Asn Leu Asp Lys
1520 1525 1530

Val Leu Ser Ala Tyr Asn Lys His Arg Asp Lys Pro Ile Arg Glu
1535 1540 1545

Gln Ala Glu Asn Ile Ile His Leu Phe Thr Leu Thr Asn Leu Gly
1550 1555 1560

Ala Pro Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys
1565 1570 1575

Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His

1580 1585 1590

Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln
1595 1600 1605

Leu Gly Gly Asp
1610

<210> 154
<211> 772
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 154

Met Gly Ser Ser His His His His His His Met Ser Ser Glu Thr Gly
1 5 10 15

Pro Val Ala Val Asp Pro Thr Leu Arg Arg Arg Ile Glu Pro His Glu
20 25 30

Phe Glu Val Glu Phe Asp Pro Arg Glu Leu Arg Lys Glu Thr Cys Leu
35 40 45

Leu Tyr Glu Ile Asn Trp Gly Gly Arg His Ser Ile Trp Arg His Thr
50 55 60

Ser Gln Asn Thr Asn Lys His Val Glu Val Asn Phe Ile Glu Lys Phe
65 70 75 80

Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp
85 90 95

Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu
100 105 110

Phe Leu Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg
115 120 125

```
Leu Tyr His His Ala Asp Pro Arg Asn Arg Gln Gly Leu Val Lys Val
    130                 135                 140

Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu
145                 150                 155                 160

Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys
                165                 170                 175

Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu
            180                 185                 190

His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr
        195                 200                 205

Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile
    210                 215                 220

Asn Arg Leu Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe
225                 230                 235                 240

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

Asn Arg Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys
            260                 265                 270

Met Lys Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln
        275                 280                 285

Arg Lys Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu
    290                 295                 300

Leu Asp Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln
305                 310                 315                 320

Ile Thr Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys
                325                 330                 335
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Tyr Asp Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu
            340                 345                 350

Lys Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
        355                 360                 365

Val Arg Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn
    370                 375                 380

Ala Val Val Gly Thr Ala Leu Ile Lys Lys Tyr Pro Lys Leu Glu Ser
385                 390                 395                 400

Glu Phe Val Tyr Gly Asp Tyr Lys Val Tyr Asp Val Arg Lys Met Ile
                405                 410                 415

Ala Lys Ser Glu Gln Glu Ile Gly Lys Ala Thr Ala Lys Tyr Phe Phe
            420                 425                 430

Tyr Ser Asn Ile Met Asn Phe Phe Lys Thr Glu Ile Leu Ala Asn Gly
        435                 440                 445

Glu Ile Arg Lys Arg Pro Leu Ile Glu Thr Asn Gly Glu Thr Gly Glu
    450                 455                 460

Ile Val Trp Asp Lys Gly Arg Asp Phe Ala Thr Val Arg Lys Val Leu
465                 470                 475                 480

Ser Met Pro Gln Val Asn Ile Val Lys Lys Thr Glu Val Gln Thr Gly
                485                 490                 495

Gly Phe Ser Lys Glu Ser Ile Leu Pro Lys Arg Asn Ser Asp Lys Leu
            500                 505                 510

Ile Ala Arg Lys Lys Asp Trp Asp Pro Lys Lys Tyr Gly Gly Phe Asp
        515                 520                 525

Ser Pro Thr Val Ala Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys
    530                 535                 540
```

```
Gly Lys Ser Lys Lys Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr
545                 550                 555                 560

Ile Met Glu Arg Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu
                565                 570                 575

Ala Lys Gly Tyr Lys Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro
            580                 585                 590

Lys Tyr Ser Leu Phe Glu Leu Glu Asn Gly Arg Lys Arg Met Leu Ala
        595                 600                 605

Ser Ala Gly Glu Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro Ser Lys
    610                 615                 620

Tyr Val Asn Phe Leu Tyr Leu Ala Ser His Tyr Glu Lys Leu Lys Gly
625                 630                 635                 640

Ser Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val Glu Gln His Lys
                645                 650                 655

His Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser Glu Phe Ser Lys Arg
            660                 665                 670

Val Ile Leu Ala Asp Ala Asn Leu Asp Lys Val Leu Ser Ala Tyr Asn
        675                 680                 685

Lys His Arg Asp Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile Ile His
    690                 695                 700

Leu Phe Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala Phe Lys Tyr Phe
705                 710                 715                 720

Asp Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser Thr Lys Glu Val Leu
                725                 730                 735

Asp Ala Thr Leu Ile His Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg
            740                 745                 750
```

Ile Asp Leu Ser Gln Leu Gly Gly Asp Ser Gly Gly Ser Pro Lys Lys
755 760 765

Lys Arg Lys Val
770

<210> 155
<211> 1622
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 155

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1 5 10 15

Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
20 25 30

Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
35 40 45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
50 55 60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65 70 75 80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
85 90 95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
100 105 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
115 120 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met

```
    130                 135                 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220

Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
225                 230                 235                 240

Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
                245                 250                 255

Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
            260                 265                 270

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

Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
    290                 295                 300

Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys
305                 310                 315                 320

Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
                325                 330                 335

Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
```

340 345 350

Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp
355 360 365

Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys
370 375 380

Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
385 390 395 400

Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
405 410 415

Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
420 425 430

Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser
435 440 445

Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg
450 455 460

Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
465 470 475 480

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
485 490 495

Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
500 505 510

Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp
515 520 525

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

Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro

545 550 555 560

Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
565 570 575

Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys
580 585 590

Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
595 600 605

Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
610 615 620

Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
625 630 635 640

Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His
645 650 655

Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
660 665 670

Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
675 680 685

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
690 695 700

Arg Phe Ala Trp Met Phe Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
705 710 715 720

Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile
725 730 735

Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
740 745 750

Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu

```
        755                 760                 765

Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu
    770                 775                 780

Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn
785                 790                 795                 800

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
                805                 810                 815

Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
            820                 825                 830

Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
        835                 840                 845

Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val
    850                 855                 860

Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu
865                 870                 875                 880

Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
                885                 890                 895

Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Lys Leu Ile Asn Gly
            900                 905                 910

Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser
        915                 920                 925

Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser
    930                 935                 940

Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly
945                 950                 955                 960

Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile
```

965 970 975

Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys
980 985 990

Val Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg
995 1000 1005

Glu Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg
1010 1015 1020

Met Lys Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile
1025 1030 1035

Leu Lys Glu His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu Lys
1040 1045 1050

Leu Tyr Leu Tyr Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val Asp
1055 1060 1065

Gln Glu Leu Asp Ile Asn Arg Leu Ser Asp Tyr Asp Val Asp Ala
1070 1075 1080

Ile Val Pro Gln Ser Phe Leu Lys Asp Asp Ser Ile Asp Asn Lys
1085 1090 1095

Val Leu Thr Arg Ser Asp Lys Asn Arg Gly Lys Ser Asp Asn Val
1100 1105 1110

Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn Tyr Trp Arg Gln
1115 1120 1125

Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe Asp Asn Leu
1130 1135 1140

Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys Ala Gly
1145 1150 1155

Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys His

1160 1165 1170

Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
1175 1180 1185

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
1190 1195 1200

Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val
1205 1210 1215

Arg Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn
1220 1225 1230

Ala Val Val Gly Thr Ala Leu Ile Lys Lys Tyr Pro Lys Leu Glu
1235 1240 1245

Ser Glu Phe Val Tyr Gly Asp Tyr Lys Val Tyr Asp Val Arg Lys
1250 1255 1260

Met Ile Ala Lys Ser Glu Gln Glu Ile Gly Lys Ala Thr Ala Lys
1265 1270 1275

Tyr Phe Phe Tyr Ser Asn Ile Met Asn Phe Phe Lys Thr Glu Ile
1280 1285 1290

Thr Leu Ala Asn Gly Glu Ile Arg Lys Arg Pro Leu Ile Glu Thr
1295 1300 1305

Asn Gly Glu Thr Gly Glu Ile Val Trp Asp Lys Gly Arg Asp Phe
1310 1315 1320

Ala Thr Val Arg Lys Val Leu Ser Met Pro Gln Val Asn Ile Val
1325 1330 1335

Lys Lys Thr Glu Val Gln Thr Gly Gly Phe Ser Lys Glu Ser Ile
1340 1345 1350

Leu Pro Lys Arg Asn Ser Asp Lys Leu Ile Ala Arg Lys Lys Asp

1355 1360 1365

Trp Asp Pro Lys Lys Tyr Gly Gly Phe Asp Ser Pro Thr Val Ala
1370 1375 1380

Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys Gly Lys Ser Lys
1385 1390 1395

Lys Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr Ile Met Glu
1400 1405 1410

Arg Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala Lys
1415 1420 1425

Gly Tyr Lys Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro Lys
1430 1435 1440

Tyr Ser Leu Phe Glu Leu Glu Asn Gly Arg Lys Arg Met Leu Ala
1445 1450 1455

Ser Ala Gly Glu Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro Ser
1460 1465 1470

Lys Tyr Val Asn Phe Leu Tyr Leu Ala Ser His Tyr Glu Lys Leu
1475 1480 1485

Lys Gly Ser Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val Glu
1490 1495 1500

Gln His Lys His Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser Glu
1505 1510 1515

Phe Ser Lys Arg Val Ile Leu Ala Asp Ala Asn Leu Asp Lys Val
1520 1525 1530

Leu Ser Ala Tyr Asn Lys His Arg Asp Lys Pro Ile Arg Glu Gln
1535 1540 1545

Ala Glu Asn Ile Ile His Leu Phe Thr Leu Thr Asn Leu Gly Ala

1550 1555 1560

Pro Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys Arg
1565 1570 1575

Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His Gln
1580 1585 1590

Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu
1595 1600 1605

Gly Gly Asp Ser Gly Gly Ser Pro Lys Lys Lys Arg Lys Val
1610 1615 1620

<210> 156
<211> 1709
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 156

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1 5 10 15

Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
20 25 30

Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
35 40 45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
50 55 60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65 70 75 80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
85 90 95

```
Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
            100                 105                 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
        115                 120                 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220

Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
225                 230                 235                 240

Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
                245                 250                 255

Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
            260                 265                 270

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

Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
    290                 295                 300
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```
Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys
305                 310                 315                 320

Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
                325                 330                 335

Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
            340                 345                 350

Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp
        355                 360                 365

Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys
    370                 375                 380

Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
385                 390                 395                 400

Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
                405                 410                 415

Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
            420                 425                 430

Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser
        435                 440                 445

Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg
    450                 455                 460

Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
465                 470                 475                 480

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
                485                 490                 495

Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
            500                 505                 510
```

```
Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp
        515                 520                 525

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

Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro
545                 550                 555                 560

Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
                565                 570                 575

Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Glu
            580                 585                 590

Ile Leu Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
        595                 600                 605

Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
    610                 615                 620

Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
625                 630                 635                 640

Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His
                645                 650                 655

Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
            660                 665                 670

Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
        675                 680                 685

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
    690                 695                 700

Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
705                 710                 715                 720
```

```
Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile
                725                 730                 735

Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
            740                 745                 750

Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu
        755                 760                 765

Tyr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu
    770                 775                 780

Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn
785                 790                 795                 800

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
                805                 810                 815

Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
            820                 825                 830

Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
        835                 840                 845

Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val
    850                 855                 860

Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu
865                 870                 875                 880

Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
                885                 890                 895

Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn
            900                 905                 910

Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys
        915                 920                 925
```

```
Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp
    930                 935                 940

Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln
945                 950                 955                 960

Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala
                965                 970                 975

Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val
            980                 985                 990

Lys Val Met Gly Arg His Lys Pro  Glu Asn Ile Val Ile  Glu Met Ala
        995                 1000                1005

Arg Glu  Asn Gln Thr Thr Gln  Lys Gly Gln Lys Asn  Ser Arg Glu
    1010                1015                1020

Arg Met  Lys Arg Ile Glu Glu  Gly Ile Lys Glu Leu  Gly Ser Gln
    1025                1030                1035

Ile Leu  Lys Glu His Pro Val  Glu Asn Thr Gln Leu  Gln Asn Glu
    1040                1045                1050

Lys Leu  Tyr Leu Tyr Tyr Leu  Gln Asn Gly Arg Asp  Met Tyr Val
    1055                1060                1065

Asp Gln  Glu Leu Asp Ile Asn  Arg Leu Ser Asp Tyr  Asp Val Asp
    1070                1075                1080

Ala Ile  Val Pro Gln Ser Phe  Leu Lys Asp Asp Ser  Ile Asp Asn
    1085                1090                1095

Lys Val  Leu Thr Arg Ser Asp  Lys Asn Arg Gly Lys  Ser Asp Asn
    1100                1105                1110

Val Pro  Ser Glu Glu Val Val  Lys Lys Met Lys Asn  Tyr Trp Arg
    1115                1120                1125
```

```
Gln Leu  Leu Asn Ala Lys Leu  Ile Thr Gln Arg Lys  Phe Asp Asn
    1130                1135                1140

Leu Thr  Lys Ala Glu Arg Gly  Gly Leu Ser Glu Leu  Asp Lys Ala
    1145                1150                1155

Gly Phe  Ile Lys Arg Gln Leu  Val Glu Thr Arg Gln  Ile Thr Lys
    1160                1165                1170

His Val  Ala Gln Ile Leu Asp  Ser Arg Met Asn Thr  Lys Tyr Asp
    1175                1180                1185

Glu Asn  Asp Lys Leu Ile Arg  Glu Val Lys Val Ile  Thr Leu Lys
    1190                1195                1200

Ser Lys  Leu Val Ser Asp Phe  Arg Lys Asp Phe Gln  Phe Tyr Lys
    1205                1210                1215

Val Arg  Glu Ile Asn Asn Tyr  His His Ala His Asp  Ala Tyr Leu
    1220                1225                1230

Asn Ala  Val Val Gly Tyr Ala  Leu Ile Lys Lys Tyr  Pro Lys Leu
    1235                1240                1245

Glu Ser  Glu Phe Val Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg
    1250                1255                1260

Lys Met  Ile Ala Lys Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala
    1265                1270                1275

Lys Tyr  Phe Phe Tyr Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu
    1280                1285                1290

Ile Thr  Leu Ala Asn Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu
    1295                1300                1305

Thr Asn  Gly Glu Thr Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp
    1310                1315                1320
```

```
Phe Ala  Thr Val Arg Lys Val  Leu Ser Met Pro Gln  Val Asn Ile
    1325                1330                1335

Val Lys  Lys Thr Glu Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser
    1340                1345                1350

Ile Leu  Pro Lys Arg Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys
    1355                1360                1365

Asp Trp  Asp Pro Lys Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val
    1370                1375                1380

Ala Tyr  Ser Val Leu Val Val  Ala Lys Val Glu Lys  Gly Lys Ser
    1385                1390                1395

Lys Lys  Leu Lys Ser Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met
    1400                1405                1410

Glu Arg  Ser Ser Phe Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala
    1415                1420                1425

Lys Gly  Tyr Lys Glu Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro
    1430                1435                1440

Lys Tyr  Ser Leu Phe Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu
    1445                1450                1455

Ala Ser  Ala Gly Glu Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro
    1460                1465                1470

Ser Lys  Tyr Val Asn Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys
    1475                1480                1485

Leu Lys  Gly Ser Pro Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val
    1490                1495                1500

Glu Gln  His Lys His Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser
    1505                1510                1515
```

```
Glu Phe  Ser Lys Arg Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys
    1520                1525                1530

Val Leu  Ser Ala Tyr Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu
    1535                1540                1545

Gln Ala  Glu Asn Ile Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly
    1550                1555                1560

Ala Pro  Ala Ala Phe Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys
    1565                1570                1575

Arg Tyr  Thr Ser Thr Lys Glu  Val Leu Asp Ala Thr  Leu Ile His
    1580                1585                1590

Gln Ser  Ile Thr Gly Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln
    1595                1600                1605

Leu Gly  Gly Asp Ser Gly Gly  Ser Thr Asn Leu Ser  Asp Ile Ile
    1610                1615                1620

Glu Lys  Glu Thr Gly Lys Gln  Leu Val Ile Gln Glu  Ser Ile Leu
    1625                1630                1635

Met Leu  Pro Glu Glu Val Glu  Glu Val Ile Gly Asn  Lys Pro Glu
    1640                1645                1650

Ser Asp  Ile Leu Val His Thr  Ala Tyr Asp Glu Ser  Thr Asp Glu
    1655                1660                1665

Asn Val  Met Leu Leu Ser Asp  Ala Pro Glu Tyr Lys  Pro Trp Ala
    1670                1675                1680

Leu Val  Ile Gln Asp Ser Asn  Gly Glu Asn Lys Ile  Lys Met Leu
    1685                1690                1695

Ser Gly  Gly Ser Pro Lys Lys  Lys Arg Lys Val
    1700                1705
```

<210> 157
<211> 1708
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 157

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Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1               5                  10                  15


Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
            20                  25                  30


Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
        35                  40                  45


Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
    50                  55                  60


Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65                  70                  75                  80


Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
                85                  90                  95


Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
            100                 105                 110


Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
        115                 120                 125


Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140


Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160


Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
```

165 170 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
180 185 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
195 200 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
210 215 220

Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
225 230 235 240

Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
245 250 255

Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
260 265 270

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

Lys Asn Leu Ile Gly Ala Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala
290 295 300

Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn
305 310 315 320

Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val
325 330 335

Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu
340 345 350

Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu
355 360 365

Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys

```
    370                 375                 380

Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala
385                 390                 395                 400

Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp
                405                 410                 415

Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val
            420                 425                 430

Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly
        435                 440                 445

Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg
    450                 455                 460

Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu
465                 470                 475                 480

Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys
                485                 490                 495

Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp
            500                 505                 510

Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln
        515                 520                 525

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

Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu
545                 550                 555                 560

Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr
                565                 570                 575

Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu
```

580 585 590

Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly
595 600 605

Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu
610 615 620

Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp
625 630 635 640

Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln
645 650 655

Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe
660 665 670

Tyr Pro Phe Leu Lys Asp Asn Arg Glu Asp Ile Glu Lys Ile Leu Thr
675 680 685

Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg
690 695 700

Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn
705 710 715 720

Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu
725 730 735

Arg Met Thr Asn Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys
740 745 750

His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys
755 760 765

Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Ser
770 775 780

Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg

785 790 795 800

Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu
805 810 815

Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala
820 825 830

Ser Leu Gly Thr Tyr Gly Asp Leu Leu Lys Ile Ile Lys Asp Ile Asp
835 840 845

Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu
850 855 860

Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys
865 870 875 880

Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg
885 890 895

Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly
900 905 910

Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser
915 920 925

Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser
930 935 940

Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly
945 950 955 960

Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile
965 970 975

Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys
980 985 990

Val Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg

995 1000 1005

Glu Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg
1010 1015 1020

Met Lys Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile
1025 1030 1035

Leu Lys Glu His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu Lys
1040 1045 1050

Leu Tyr Leu Tyr Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val Asp
1055 1060 1065

Gln Glu Leu Asp Ile Asn Arg Leu Ser Asp Tyr Asp Val Asp His
1070 1075 1080

Ile Val Pro Gln Ser Phe Leu Lys Asp Asp Ser Ile Asp Asn Lys
1085 1090 1095

Val Leu Thr Arg Ser Asp Lys Asn Arg Gly Lys Ser Asp Asn Val
1100 1105 1110

Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn Tyr Trp Arg Gln
1115 1120 1125

Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe Asp Leu Thr
1130 1135 1140

Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys Ala Gly Phe
1145 1150 1155

Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys His Val
1160 1165 1170

Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu Asn
1175 1180 1185

Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys

1190 1195 1200

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
1205 1210 1215

Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala
1220 1225 1230

Val Val Gly Thr Ala Leu Ile Lys Lys Tyr Pro Lys Leu Glu Ser
1235 1240 1245

Glu Phe Val Tyr Gly Asp Tyr Lys Val Tyr Asp Val Arg Lys Met
1250 1255 1260

Ile Ala Lys Ser Glu Gln Glu Ile Gly Lys Ala Thr Ala Lys Tyr
1265 1270 1275

Phe Phe Tyr Ser Asn Ile Met Asn Phe Phe Lys Thr Glu Ile Thr
1280 1285 1290

Leu Ala Asn Gly Glu Ile Arg Lys Arg Pro Leu Ile Glu Thr Asn
1295 1300 1305

Gly Glu Thr Gly Glu Ile Val Trp Asp Lys Gly Arg Asp Phe Ala
1310 1315 1320

Thr Val Arg Lys Val Leu Ser Met Pro Gln Val Asn Ile Val Lys
1325 1330 1335

Lys Thr Glu Val Gln Thr Gly Gly Phe Ser Lys Glu Ser Ile Leu
1340 1345 1350

Pro Lys Arg Asn Ser Asp Lys Leu Ile Ala Arg Lys Lys Asp Trp
1355 1360 1365

Asp Pro Lys Lys Tyr Gly Gly Phe Asp Ser Pro Thr Val Ala Tyr
1370 1375 1380

Ser Val Leu Val Val Ala Lys Val Glu Lys Gly Lys Ser Lys Lys

1385 1390 1395

Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr Ile Met Glu Arg
1400 1405 1410

Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala Lys Gly
1415 1420 1425

Tyr Lys Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro Lys Tyr
1430 1435 1440

Ser Leu Phe Glu Leu Glu Asn Gly Arg Lys Arg Met Leu Ala Ser
1445 1450 1455

Ala Gly Glu Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro Ser Lys
1460 1465 1470

Tyr Val Asn Phe Leu Tyr Leu Ala Ser His Tyr Glu Lys Leu Lys
1475 1480 1485

Gly Ser Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val Glu Gln
1490 1495 1500

His Lys His Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser Glu Phe
1505 1510 1515

Ser Lys Arg Val Ile Leu Ala Asp Ala Asn Leu Asp Lys Val Leu
1520 1525 1530

Ser Ala Tyr Asn Lys His Arg Asp Lys Pro Ile Arg Glu Gln Ala
1535 1540 1545

Glu Asn Ile Ile His Leu Phe Thr Leu Thr Asn Leu Gly Ala Pro
1550 1555 1560

Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys Arg Tyr
1565 1570 1575

Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His Gln Ser

1580 1585 1590

Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly
1595 1600 1605

Gly Asp Ser Gly Gly Ser Thr Asn Leu Ser Asp Ile Ile Glu Lys
1610 1615 1620

Glu Thr Gly Lys Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu
1625 1630 1635

Pro Glu Glu Val Glu Glu Val Ile Gly Asn Lys Pro Glu Ser Asp
1640 1645 1650

Ile Leu Val His Thr Ala Tyr Asp Glu Ser Thr Asp Glu Asn Val
1655 1660 1665

Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr Lys Pro Trp Ala Leu
1670 1675 1680

Val Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile Lys Met Leu Ser
1685 1690 1695

Gly Gly Ser Pro Lys Lys Lys Arg Lys Val
1700 1705

<210> 158
<211> 1629
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 158

Met Thr Ser Glu Lys Gly Pro Ser Thr Gly Asp Pro Thr Leu Arg Arg
1 5 10 15

Arg Ile Glu Pro Trp Glu Phe Asp Val Phe Tyr Asp Pro Arg Glu Leu
20 25 30

```
Arg Lys Glu Ala Cys Leu Leu Tyr Glu Ile Lys Trp Gly Met Ser Arg
        35                  40                  45

Lys Ile Trp Arg Ser Ser Gly Lys Asn Thr Thr Asn His Val Glu Val
    50                  55                  60

Asn Phe Ile Lys Lys Phe Thr Ser Glu Arg Asp Phe His Pro Ser Met
65                  70                  75                  80

Ser Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Trp Glu Cys
                85                  90                  95

Ser Gln Ala Ile Arg Glu Phe Leu Ser Arg His Pro Gly Val Thr Leu
            100                 105                 110

Val Ile Tyr Val Ala Arg Leu Phe Trp His Met Asp Gln Gln Asn Arg
        115                 120                 125

Gln Gly Leu Arg Asp Leu Val Asn Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140

Arg Ala Ser Glu Tyr Tyr His Cys Trp Arg Asn Phe Val Asn Tyr Pro
145                 150                 155                 160

Pro Gly Asp Glu Ala His Trp Pro Gln Tyr Pro Pro Leu Trp Met Met
                165                 170                 175

Leu Tyr Ala Leu Glu Leu His Cys Ile Ile Leu Ser Leu Pro Pro Cys
            180                 185                 190

Leu Lys Ile Ser Arg Arg Trp Gln Asn His Leu Thr Phe Phe Arg Leu
        195                 200                 205

His Leu Gln Asn Cys His Tyr Gln Thr Ile Pro Pro His Ile Leu Leu
    210                 215                 220

Ala Thr Gly Leu Ile His Pro Ser Val Ala Trp Arg Gly Ser Glu Thr
225                 230                 235                 240
```

```
Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser
                245                 250                 255

Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly Trp Ala Val Ile Thr
            260                 265                 270

Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys Val Leu Gly Asn Thr
        275                 280                 285

Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp
    290                 295                 300

Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg
305                 310                 315                 320

Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe
                325                 330                 335

Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe Phe His Arg Leu Glu
            340                 345                 350

Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His Glu Arg His Pro Ile
        355                 360                 365

Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His Glu Lys Tyr Pro Thr
    370                 375                 380

Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser Thr Asp Lys Ala Asp
385                 390                 395                 400

Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met Ile Lys Phe Arg Gly
                405                 410                 415

His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp Asn Ser Asp Val Asp
            420                 425                 430

Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu
        435                 440                 445
```

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

Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro
465                 470                 475                 480

Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu
                485                 490                 495

Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala
            500                 505                 510

Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu
        515                 520                 525

Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu Phe Leu Ala Ala Lys
    530                 535                 540

Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile Leu Arg Val Asn Thr
545                 550                 555                 560

Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp
                565                 570                 575

Glu His His Gln Asp Leu Thr Leu Leu Lys Ala Leu Val Arg Gln Gln
            580                 585                 590

Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly
        595                 600                 605

Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys
    610                 615                 620

Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly Thr Glu Glu Leu Leu
625                 630                 635                 640

Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp
                645                 650                 655
```

```
Asn Gly Ser Ile Pro His Gln Ile His Leu Gly Glu Leu His Ala Ile
            660                 665                 670

Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu
        675                 680                 685

Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro
    690                 695                 700

Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met Thr Arg Lys Ser Glu
705                 710                 715                 720

Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val Val Asp Lys Gly Ala
                725                 730                 735

Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn Phe Asp Lys Asn Leu
            740                 745                 750

Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe
        755                 760                 765

Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr Val Thr Glu Gly Met
    770                 775                 780

Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys Lys Ala Ile Val Asp
785                 790                 795                 800

Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val Lys Gln Leu Lys Glu
                805                 810                 815

Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser Val Glu Ile Ser Gly
            820                 825                 830

Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr Tyr His Asp Leu Leu
        835                 840                 845

Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp
    850                 855                 860
```

```
Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu
865                 870                 875                 880

Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His Leu Phe Asp Asp Lys
                885                 890                 895

Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu
            900                 905                 910

Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr
        915                 920                 925

Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala Asn Arg Asn Phe Met
    930                 935                 940

Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys
945                 950                 955                 960

Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His Glu His Ile Ala Asn
                965                 970                 975

Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile Leu Gln Thr Val Lys
            980                 985                 990

Val Val Asp Glu Leu Val Lys Val  Met Gly Arg His Lys  Pro Glu Asn
        995                 1000                1005

Ile Val  Ile Glu Met Ala Arg  Glu Asn Gln Thr Thr  Gln Lys Gly
    1010                1015                1020

Gln Lys  Asn Ser Arg Glu Arg  Met Lys Arg Ile Glu  Glu Gly Ile
    1025                1030                1035

Lys Glu  Leu Gly Ser Gln Ile  Leu Lys Glu His Pro  Val Glu Asn
    1040                1045                1050

Thr Gln  Leu Gln Asn Glu Lys  Leu Tyr Leu Tyr Tyr  Leu Gln Asn
    1055                1060                1065
```

```
Gly Arg  Asp Met Tyr Val Asp  Gln Glu Leu Asp Ile  Asn Arg Leu
    1070                1075                1080

Ser Asp  Tyr Asp Val Asp Ala  Ile Val Pro Gln Ser  Phe Leu Lys
    1085                1090                1095

Asp Asp  Ser Ile Asp Asn Lys  Val Leu Thr Arg Ser  Asp Lys Asn
    1100                1105                1110

Arg Gly  Lys Ser Asp Asn Val  Pro Ser Glu Glu Val  Val Lys Lys
    1115                1120                1125

Met Lys  Asn Tyr Trp Arg Gln  Leu Leu Asn Ala Lys  Leu Ile Thr
    1130                1135                1140

Gln Arg  Lys Phe Asp Asn Leu  Thr Lys Ala Glu Arg  Gly Gly Leu
    1145                1150                1155

Ser Glu  Leu Asp Lys Ala Gly  Phe Ile Lys Arg Gln  Leu Val Glu
    1160                1165                1170

Thr Arg  Gln Ile Thr Lys His  Val Ala Gln Ile Leu  Asp Ser Arg
    1175                1180                1185

Met Asn  Thr Lys Tyr Asp Glu  Asn Asp Lys Leu Ile  Arg Glu Val
    1190                1195                1200

Lys Val  Ile Thr Leu Lys Ser  Lys Leu Val Ser Asp  Phe Arg Lys
    1205                1210                1215

Asp Phe  Gln Phe Tyr Lys Val  Arg Glu Ile Asn Asn  Tyr His His
    1220                1225                1230

Ala His  Asp Ala Tyr Leu Asn  Ala Val Val Gly Thr  Ala Leu Ile
    1235                1240                1245

Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe Val Tyr  Gly Asp Tyr
    1250                1255                1260
```

```
Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala Lys Ser  Glu Gln Glu
    1265                1270                1275

Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe Tyr Ser  Asn Ile Met
    1280                1285                1290

Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala Asn Gly  Glu Ile Arg
    1295                1300                1305

Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu Thr Gly  Glu Ile Val
    1310                1315                1320

Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val Arg Lys  Val Leu Ser
    1325                1330                1335

Met Pro  Gln Val Asn Ile Val  Lys Lys Thr Glu Val  Gln Thr Gly
    1340                1345                1350

Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys Arg Asn  Ser Asp Lys
    1355                1360                1365

Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro Lys Lys  Tyr Gly Gly
    1370                1375                1380

Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val Leu Val  Val Ala Lys
    1385                1390                1395

Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys Ser Val  Lys Glu Leu
    1400                1405                1410

Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser Phe Glu  Lys Asn Pro
    1415                1420                1425

Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys Glu Val  Lys Lys Asp
    1430                1435                1440

Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu Phe Glu  Leu Glu Asn
    1445                1450                1455
```

Gly Arg Lys Arg Met Leu Ala Ser Ala Gly Glu Leu Gln Lys Gly
1460 1465 1470

Asn Glu Leu Ala Leu Pro Ser Lys Tyr Val Asn Phe Leu Tyr Leu
1475 1480 1485

Ala Ser His Tyr Glu Lys Leu Lys Gly Ser Pro Glu Asp Asn Glu
1490 1495 1500

Gln Lys Gln Leu Phe Val Glu Gln His Lys His Tyr Leu Asp Glu
1505 1510 1515

Ile Ile Glu Gln Ile Ser Glu Phe Ser Lys Arg Val Ile Leu Ala
1520 1525 1530

Asp Ala Asn Leu Asp Lys Val Leu Ser Ala Tyr Asn Lys His Arg
1535 1540 1545

Asp Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile Ile His Leu Phe
1550 1555 1560

Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala Phe Lys Tyr Phe Asp
1565 1570 1575

Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser Thr Lys Glu Val Leu
1580 1585 1590

Asp Ala Thr Leu Ile His Gln Ser Ile Thr Gly Leu Tyr Glu Thr
1595 1600 1605

Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp Ser Gly Gly Ser Pro
1610 1615 1620

Lys Lys Lys Arg Lys Val
1625

<210> 159
<211> 1679
<212> PRT

<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 159

```
Met Thr Asp Ala Glu Tyr Val Arg Ile His Glu Lys Leu Asp Ile Tyr
1               5                  10                  15


Thr Phe Lys Lys Gln Phe Phe Asn Asn Lys Lys Ser Val Ser His Arg
            20                  25                  30


Cys Tyr Val Leu Phe Glu Leu Lys Arg Arg Gly Glu Arg Arg Ala Cys
        35                  40                  45


Phe Trp Gly Tyr Ala Val Asn Lys Pro Gln Ser Gly Thr Glu Arg Gly
    50                  55                  60


Ile His Ala Glu Ile Phe Ser Ile Arg Lys Val Glu Glu Tyr Leu Arg
65                  70                  75                  80


Asp Asn Pro Gly Gln Phe Thr Ile Asn Trp Tyr Ser Ser Trp Ser Pro
                85                  90                  95


Cys Ala Asp Cys Ala Glu Lys Ile Leu Glu Trp Tyr Asn Gln Glu Leu
            100                 105                 110


Arg Gly Asn Gly His Thr Leu Lys Ile Trp Ala Cys Lys Leu Tyr Tyr
        115                 120                 125


Glu Lys Asn Ala Arg Asn Gln Ile Gly Leu Trp Asn Leu Arg Asp Asn
    130                 135                 140


Gly Val Gly Leu Asn Val Met Val Ser Glu His Tyr Gln Cys Cys Arg
145                 150                 155                 160


Lys Ile Phe Ile Gln Ser Ser His Asn Gln Leu Asn Glu Asn Arg Trp
                165                 170                 175


Leu Glu Lys Thr Leu Lys Arg Ala Glu Lys Arg Arg Ser Glu Leu Ser
```

180 185 190

Ile Met Ile Gln Val Lys Ile Leu His Thr Thr Lys Ser Pro Ala Val
195 200 205

Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser
210 215 220

Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly
225 230 235 240

Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
245 250 255

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
260 265 270

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
275 280 285

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
290 295 300

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe
305 310 315 320

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
325 330 335

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
340 345 350

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
355 360 365

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
370 375 380

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp

385 390 395 400

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
405 410 415

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
420 425 430

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
435 440 445

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
450 455 460

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
465 470 475 480

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
485 490 495

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
500 505 510

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
515 520 525

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
530 535 540

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
545 550 555 560

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
565 570 575

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
580 585 590

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly

595 600 605

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
610 615 620

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
625 630 635 640

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
645 650 655

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
660 665 670

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
675 680 685

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
690 695 700

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
705 710 715 720

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
725 730 735

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
740 745 750

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
755 760 765

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
770 775 780

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
785 790 795 800

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr

805 810 815

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
820 825 830

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
835 840 845

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
850 855 860

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
865 870 875 880

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
885 890 895

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
900 905 910

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
915 920 925

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
930 935 940

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
945 950 955 960

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
965 970 975

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
980 985 990

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
995 1000 1005

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro

1010 1015 1020

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr
1025 1030 1035

Leu Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile
1040 1045 1050

Asn Arg Leu Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser
1055 1060 1065

Phe Leu Lys Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser
1070 1075 1080

Asp Lys Asn Arg Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val
1085 1090 1095

Val Lys Lys Met Lys Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys
1100 1105 1110

Leu Ile Thr Gln Arg Lys Phe Asp Asn Leu Thr Lys Ala Glu Arg
1115 1120 1125

Gly Gly Leu Ser Glu Leu Asp Lys Ala Gly Phe Ile Lys Arg Gln
1130 1135 1140

Leu Val Glu Thr Arg Gln Ile Thr Lys His Val Ala Gln Ile Leu
1145 1150 1155

Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu Asn Asp Lys Leu Ile
1160 1165 1170

Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys Leu Val Ser Asp
1175 1180 1185

Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu Ile Asn Asn
1190 1195 1200

Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val Gly Thr

1205 1210 1215

Ala Leu Ile Lys Lys Tyr Pro Lys Leu Glu Ser Glu Phe Val Tyr
1220 1225 1230

Gly Asp Tyr Lys Val Tyr Asp Val Arg Lys Met Ile Ala Lys Ser
1235 1240 1245

Glu Gln Glu Ile Gly Lys Ala Thr Ala Lys Tyr Phe Phe Tyr Ser
1250 1255 1260

Asn Ile Met Asn Phe Phe Lys Thr Glu Ile Thr Leu Ala Asn Gly
1265 1270 1275

Glu Ile Arg Lys Arg Pro Leu Ile Glu Thr Asn Gly Glu Thr Gly
1280 1285 1290

Glu Ile Val Trp Asp Lys Gly Arg Asp Phe Ala Thr Val Arg Lys
1295 1300 1305

Val Leu Ser Met Pro Gln Val Asn Ile Val Lys Lys Thr Glu Val
1310 1315 1320

Gln Thr Gly Gly Phe Ser Lys Glu Ser Ile Leu Pro Lys Arg Asn
1325 1330 1335

Ser Asp Lys Leu Ile Ala Arg Lys Lys Asp Trp Asp Pro Lys Lys
1340 1345 1350

Tyr Gly Gly Phe Asp Ser Pro Thr Val Ala Tyr Ser Val Leu Val
1355 1360 1365

Val Ala Lys Val Glu Lys Gly Lys Ser Lys Lys Leu Lys Ser Val
1370 1375 1380

Lys Glu Leu Leu Gly Ile Thr Ile Met Glu Arg Ser Ser Phe Glu
1385 1390 1395

Lys Asn Pro Ile Asp Phe Leu Glu Ala Lys Gly Tyr Lys Glu Val

1400 1405 1410

Lys Lys Asp Leu Ile Ile Lys Leu Pro Lys Tyr Ser Leu Phe Glu
1415 1420 1425

Leu Glu Asn Gly Arg Lys Arg Met Leu Ala Ser Ala Gly Glu Leu
1430 1435 1440

Gln Lys Gly Asn Glu Leu Ala Leu Pro Ser Lys Tyr Val Asn Phe
1445 1450 1455

Leu Tyr Leu Ala Ser His Tyr Glu Lys Leu Lys Gly Ser Pro Glu
1460 1465 1470

Asp Asn Glu Gln Lys Gln Leu Phe Val Glu Gln His Lys His Tyr
1475 1480 1485

Leu Asp Glu Ile Ile Glu Gln Ile Ser Glu Phe Ser Lys Arg Val
1490 1495 1500

Ile Leu Ala Asp Ala Asn Leu Asp Lys Val Leu Ser Ala Tyr Asn
1505 1510 1515

Lys His Arg Asp Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile Ile
1520 1525 1530

His Leu Phe Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala Phe Lys
1535 1540 1545

Tyr Phe Asp Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser Thr Lys
1550 1555 1560

Glu Val Leu Asp Ala Thr Leu Ile His Gln Ser Ile Thr Gly Leu
1565 1570 1575

Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp Ser Gly
1580 1585 1590

Gly Ser Met Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly

1595 1600 1605

Lys Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu
1610 1615 1620

Val Glu Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val
1625 1630 1635

His Thr Ala Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu
1640 1645 1650

Thr Ser Asp Ala Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln
1655 1660 1665

Asp Ser Asn Gly Glu Asn Lys Ile Lys Met Leu
1670 1675

<210> 160
<211> 1689
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 160

Met Thr Asp Ala Glu Tyr Val Arg Ile His Glu Lys Leu Asp Ile Tyr
1 5 10 15

Thr Phe Lys Lys Gln Phe Phe Asn Asn Lys Lys Ser Val Ser His Arg
20 25 30

Cys Tyr Val Leu Phe Glu Leu Lys Arg Arg Gly Glu Arg Arg Ala Cys
35 40 45

Phe Trp Gly Tyr Ala Val Asn Lys Pro Gln Ser Gly Thr Glu Arg Gly
50 55 60

Ile His Ala Glu Ile Phe Ser Ile Arg Lys Val Glu Glu Tyr Leu Arg
65 70 75 80

```
Asp Asn Pro Gly Gln Phe Thr Ile Asn Trp Tyr Ser Ser Trp Ser Pro
                85                  90                  95

Cys Ala Asp Cys Ala Glu Lys Ile Leu Glu Trp Tyr Asn Gln Glu Leu
            100                 105                 110

Arg Gly Asn Gly His Thr Leu Lys Ile Trp Ala Cys Lys Leu Tyr Tyr
        115                 120                 125

Glu Lys Asn Ala Arg Asn Gln Ile Gly Leu Trp Asn Leu Arg Asp Asn
    130                 135                 140

Gly Val Gly Leu Asn Val Met Val Ser Glu His Tyr Gln Cys Cys Arg
145                 150                 155                 160

Lys Ile Phe Ile Gln Ser Ser His Asn Gln Leu Asn Glu Asn Arg Trp
                165                 170                 175

Leu Glu Lys Thr Leu Lys Arg Ala Glu Lys Arg Arg Ser Glu Leu Ser
            180                 185                 190

Ile Met Ile Gln Val Lys Ile Leu His Thr Thr Lys Ser Pro Ala Val
        195                 200                 205

Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser
    210                 215                 220

Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly
225                 230                 235                 240

Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
                245                 250                 255

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
            260                 265                 270

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
        275                 280                 285
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Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
    290                 295                 300

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe
305                 310                 315                 320

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
                325                 330                 335

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
            340                 345                 350

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
        355                 360                 365

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
    370                 375                 380

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

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
                405                 410                 415

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
            420                 425                 430

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
        435                 440                 445

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
    450                 455                 460

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
465                 470                 475                 480

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
                485                 490                 495
```

```
Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
            500                 505                 510

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
        515                 520                 525

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
    530                 535                 540

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
545                 550                 555                 560

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
                565                 570                 575

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
            580                 585                 590

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
        595                 600                 605

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
    610                 615                 620

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
625                 630                 635                 640

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
                645                 650                 655

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
            660                 665                 670

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
        675                 680                 685

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
    690                 695                 700
```

```
Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
705                 710                 715                 720

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
                725                 730                 735

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
            740                 745                 750

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
        755                 760                 765

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
    770                 775                 780

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
785                 790                 795                 800

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
                805                 810                 815

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
            820                 825                 830

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
        835                 840                 845

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
    850                 855                 860

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
865                 870                 875                 880

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
                885                 890                 895

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
            900                 905                 910
```

```
Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
        915                 920                 925

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
    930                 935                 940

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
945                 950                 955                 960

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
                965                 970                 975

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
            980                 985                 990

Thr Gln Lys Gly Gln Lys Asn Ser  Arg Glu Arg Met Lys  Arg Ile Glu
        995                 1000                1005

Glu Gly  Ile Lys Glu Leu Gly  Ser Gln Ile Leu Lys  Glu His Pro
    1010                1015                1020

Val Glu  Asn Thr Gln Leu Gln  Asn Glu Lys Leu Tyr  Leu Tyr Tyr
    1025                1030                1035

Leu Gln  Asn Gly Arg Asp Met  Tyr Val Asp Gln Glu  Leu Asp Ile
    1040                1045                1050

Asn Arg  Leu Ser Asp Tyr Asp  Val Asp His Ile Val  Pro Gln Ser
    1055                1060                1065

Phe Leu  Lys Asp Asp Ser Ile  Asp Asn Lys Val Leu  Thr Arg Ser
    1070                1075                1080

Asp Lys  Asn Arg Gly Lys Ser  Asp Asn Val Pro Ser  Glu Glu Val
    1085                1090                1095

Val Lys  Lys Met Lys Asn Tyr  Trp Arg Gln Leu Leu  Asn Ala Lys
    1100                1105                1110
```

```
Leu Ile  Thr Gln Arg Lys Phe  Asp Asn Leu Thr Lys  Ala Glu Arg
    1115                1120                1125

Gly Gly  Leu Ser Glu Leu Asp  Lys Ala Gly Phe Ile  Lys Arg Gln
    1130                1135                1140

Leu Val  Glu Thr Arg Gln Ile  Thr Lys His Val Ala  Gln Ile Leu
    1145                1150                1155

Asp Ser  Arg Met Asn Thr Lys  Tyr Asp Glu Asn Asp  Lys Leu Ile
    1160                1165                1170

Arg Glu  Val Lys Val Ile Thr  Leu Lys Ser Lys Leu  Val Ser Asp
    1175                1180                1185

Phe Arg  Lys Asp Phe Gln Phe  Tyr Lys Val Arg Glu  Ile Asn Asn
    1190                1195                1200

Tyr His  His Ala His Asp Ala  Tyr Leu Asn Ala Val  Val Gly Thr
    1205                1210                1215

Ala Leu  Ile Lys Lys Tyr Pro  Lys Leu Glu Ser Glu  Phe Val Tyr
    1220                1225                1230

Gly Asp  Tyr Lys Val Tyr Asp  Val Arg Lys Met Ile  Ala Lys Ser
    1235                1240                1245

Glu Gln  Glu Ile Gly Lys Ala  Thr Ala Lys Tyr Phe  Phe Tyr Ser
    1250                1255                1260

Asn Ile  Met Asn Phe Phe Lys  Thr Glu Ile Thr Leu  Ala Asn Gly
    1265                1270                1275

Glu Ile  Arg Lys Arg Pro Leu  Ile Glu Thr Asn Gly  Glu Thr Gly
    1280                1285                1290

Glu Ile  Val Trp Asp Lys Gly  Arg Asp Phe Ala Thr  Val Arg Lys
    1295                1300                1305
```

```
Val Leu  Ser Met Pro Gln Val  Asn Ile Val Lys Lys  Thr Glu Val
    1310                1315                1320

Gln Thr  Gly Gly Phe Ser Lys  Glu Ser Ile Leu Pro  Lys Arg Asn
    1325                1330                1335

Ser Asp  Lys Leu Ile Ala Arg  Lys Lys Asp Trp Asp  Pro Lys Lys
    1340                1345                1350

Tyr Gly  Gly Phe Asp Ser Pro  Thr Val Ala Tyr Ser  Val Leu Val
    1355                1360                1365

Val Ala  Lys Val Glu Lys Gly  Lys Ser Lys Lys Leu  Lys Ser Val
    1370                1375                1380

Lys Glu  Leu Leu Gly Ile Thr  Ile Met Glu Arg Ser  Ser Phe Glu
    1385                1390                1395

Lys Asn  Pro Ile Asp Phe Leu  Glu Ala Lys Gly Tyr  Lys Glu Val
    1400                1405                1410

Lys Lys  Asp Leu Ile Ile Lys  Leu Pro Lys Tyr Ser  Leu Phe Glu
    1415                1420                1425

Leu Glu  Asn Gly Arg Lys Arg  Met Leu Ala Ser Ala  Gly Glu Leu
    1430                1435                1440

Gln Lys  Gly Asn Glu Leu Ala  Leu Pro Ser Lys Tyr  Val Asn Phe
    1445                1450                1455

Leu Tyr  Leu Ala Ser His Tyr  Glu Lys Leu Lys Gly  Ser Pro Glu
    1460                1465                1470

Asp Asn  Glu Gln Lys Gln Leu  Phe Val Glu Gln His  Lys His Tyr
    1475                1480                1485

Leu Asp  Glu Ile Ile Glu Gln  Ile Ser Glu Phe Ser  Lys Arg Val
    1490                1495                1500
```

```
Ile Leu  Ala Asp Ala Asn Leu  Asp Lys Val Leu Ser  Ala Tyr Asn
    1505                1510                1515

Lys His  Arg Asp Lys Pro Ile  Arg Glu Gln Ala Glu  Asn Ile Ile
    1520                1525                1530

His Leu  Phe Thr Leu Thr Asn  Leu Gly Ala Pro Ala  Ala Phe Lys
    1535                1540                1545

Tyr Phe  Asp Thr Thr Ile Asp  Arg Lys Arg Tyr Thr  Ser Thr Lys
    1550                1555                1560

Glu Val  Leu Asp Ala Thr Leu  Ile His Gln Ser Ile  Thr Gly Leu
    1565                1570                1575

Tyr Glu  Thr Arg Ile Asp Leu  Ser Gln Leu Gly Gly  Asp Ser Gly
    1580                1585                1590

Gly Ser  Thr Asn Leu Ser Asp  Ile Ile Glu Lys Glu  Thr Gly Lys
    1595                1600                1605

Gln Leu  Val Ile Gln Glu Ser  Ile Leu Met Leu Pro  Glu Glu Val
    1610                1615                1620

Glu Glu  Val Ile Gly Asn Lys  Pro Glu Ser Asp Ile  Leu Val His
    1625                1630                1635

Thr Ala  Tyr Asp Glu Ser Thr  Asp Glu Asn Val Met  Leu Leu Thr
    1640                1645                1650

Ser Asp  Ala Pro Glu Tyr Lys  Pro Trp Ala Leu Val  Ile Gln Asp
    1655                1660                1665

Ser Asn  Gly Glu Asn Lys Ile  Lys Met Leu Ser Gly  Gly Ser Pro
    1670                1675                1680

Lys Lys  Lys Arg Lys Val
    1685
```

<210> 161
<211> 1655
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 161

```
Met Asp Pro Pro Thr Phe Thr Phe Asn Phe Asn Asn Glu Pro Trp Val
1               5                   10                  15


Arg Gly Arg His Glu Thr Tyr Leu Cys Tyr Glu Val Glu Arg Met His
            20                  25                  30


Asn Asp Thr Trp Val Leu Leu Asn Gln Arg Arg Gly Phe Leu Cys Asn
        35                  40                  45


Gln Ala Pro His Lys His Gly Phe Leu Glu Gly Arg His Ala Glu Leu
    50                  55                  60


Cys Phe Leu Asp Val Ile Pro Phe Trp Lys Leu Asp Leu Asp Gln Asp
65                  70                  75                  80


Tyr Arg Val Thr Cys Phe Thr Ser Trp Ser Pro Cys Phe Ser Cys Ala
                85                  90                  95


Gln Glu Met Ala Lys Phe Ile Ser Lys Asn Lys His Val Ser Leu Cys
            100                 105                 110


Ile Phe Thr Ala Arg Ile Tyr Asp Asp Gln Gly Arg Cys Gln Glu Gly
        115                 120                 125


Leu Arg Thr Leu Ala Glu Ala Gly Ala Lys Ile Ser Ile Met Thr Tyr
    130                 135                 140


Ser Glu Phe Lys His Cys Trp Asp Thr Phe Val Asp His Gln Gly Cys
145                 150                 155                 160


Pro Phe Gln Pro Trp Asp Gly Leu Asp Glu His Ser Gln Asp Leu Ser
```

```
                165                 170                 175

Gly Arg Leu Arg Ala Ile Leu Gln Ser Gly Ser Glu Thr Pro Gly Thr
            180                 185                 190

Ser Glu Ser Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu
        195                 200                 205

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

Lys Val Pro Ser Lys Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His
225                 230                 235                 240

Ser Ile Lys Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu
                245                 250                 255

Thr Ala Glu Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr
            260                 265                 270

Arg Arg Lys Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu
        275                 280                 285

Met Ala Lys Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe
    290                 295                 300

Leu Val Glu Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn
305                 310                 315                 320

Ile Val Asp Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His
                325                 330                 335

Leu Arg Lys Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu
            340                 345                 350

Ile Tyr Leu Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu
        355                 360                 365

Ile Glu Gly Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe
```

```
    370                 375                 380

Ile Gln Leu Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile
385                 390                 395                 400

Asn Ala Ser Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser
                405                 410                 415

Lys Ser Arg Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys
            420                 425                 430

Lys Asn Gly Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr
        435                 440                 445

Pro Asn Phe Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln
    450                 455                 460

Leu Ser Lys Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln
465                 470                 475                 480

Ile Gly Asp Gln Tyr Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser
                485                 490                 495

Asp Ala Ile Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr
            500                 505                 510

Lys Ala Pro Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His
        515                 520                 525

Gln Asp Leu Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu
    530                 535                 540

Lys Tyr Lys Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly
545                 550                 555                 560

Tyr Ile Asp Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys
                565                 570                 575

Pro Ile Leu Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu
```

580 585 590

Asn Arg Glu Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser
595 600 605

Ile Pro His Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg
610 615 620

Gln Glu Asp Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu
625 630 635 640

Lys Ile Leu Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg
645 650 655

Gly Asn Ser Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile
660 665 670

Thr Pro Trp Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln
675 680 685

Ser Phe Ile Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu
690 695 700

Lys Val Leu Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr
705 710 715 720

Asn Glu Leu Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro
725 730 735

Ala Phe Leu Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe
740 745 750

Lys Thr Asn Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe
755 760 765

Lys Lys Ile Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp
770 775 780

Arg Phe Asn Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile

785 790 795 800

Lys Asp Lys Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu
805 810 815

Asp Ile Val Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu
820 825 830

Glu Arg Leu Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys
835 840 845

Gln Leu Lys Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys
850 855 860

Leu Ile Asn Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp
865 870 875 880

Phe Leu Lys Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile
885 890 895

His Asp Asp Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val
900 905 910

Ser Gly Gln Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly
915 920 925

Ser Pro Ala Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp
930 935 940

Glu Leu Val Lys Val Met Gly Arg His Lys Pro Glu Asn Ile Val Ile
945 950 955 960

Glu Met Ala Arg Glu Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser
965 970 975

Arg Glu Arg Met Lys Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser
980 985 990

Gln Ile Leu Lys Glu His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu

995 1000 1005

Lys Leu Tyr Leu Tyr Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val
1010 1015 1020

Asp Gln Glu Leu Asp Ile Asn Arg Leu Ser Asp Tyr Asp Val Asp
1025 1030 1035

Ala Ile Val Pro Gln Ser Phe Leu Lys Asp Asp Ser Ile Asp Asn
1040 1045 1050

Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly Lys Ser Asp Asn
1055 1060 1065

Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn Tyr Trp Arg
1070 1075 1080

Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe Asp Asn
1085 1090 1095

Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys Ala
1100 1105 1110

Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
1115 1120 1125

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
1130 1135 1140

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys
1145 1150 1155

Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
1160 1165 1170

Val Arg Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu
1175 1180 1185

Asn Ala Val Val Gly Thr Ala Leu Ile Lys Lys Tyr Pro Lys Leu

1190 1195 1200

Glu Ser Glu Phe Val Tyr Gly Asp Tyr Lys Val Tyr Asp Val Arg
1205 1210 1215

Lys Met Ile Ala Lys Ser Glu Gln Glu Ile Gly Lys Ala Thr Ala
1220 1225 1230

Lys Tyr Phe Phe Tyr Ser Asn Ile Met Asn Phe Phe Lys Thr Glu
1235 1240 1245

Ile Thr Leu Ala Asn Gly Glu Ile Arg Lys Arg Pro Leu Ile Glu
1250 1255 1260

Thr Asn Gly Glu Thr Gly Glu Ile Val Trp Asp Lys Gly Arg Asp
1265 1270 1275

Phe Ala Thr Val Arg Lys Val Leu Ser Met Pro Gln Val Asn Ile
1280 1285 1290

Val Lys Lys Thr Glu Val Gln Thr Gly Gly Phe Ser Lys Glu Ser
1295 1300 1305

Ile Leu Pro Lys Arg Asn Ser Asp Lys Leu Ile Ala Arg Lys Lys
1310 1315 1320

Asp Trp Asp Pro Lys Lys Tyr Gly Gly Phe Asp Ser Pro Thr Val
1325 1330 1335

Ala Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys Gly Lys Ser
1340 1345 1350

Lys Lys Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr Ile Met
1355 1360 1365

Glu Arg Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala
1370 1375 1380

Lys Gly Tyr Lys Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro

1385 1390 1395

Lys Tyr Ser Leu Phe Glu Leu Glu Asn Gly Arg Lys Arg Met Leu
1400 1405 1410

Ala Ser Ala Gly Glu Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro
1415 1420 1425

Ser Lys Tyr Val Asn Phe Leu Tyr Leu Ala Ser His Tyr Glu Lys
1430 1435 1440

Leu Lys Gly Ser Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val
1445 1450 1455

Glu Gln His Lys His Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser
1460 1465 1470

Glu Phe Ser Lys Arg Val Ile Leu Ala Asp Ala Asn Leu Asp Lys
1475 1480 1485

Val Leu Ser Ala Tyr Asn Lys His Arg Asp Lys Pro Ile Arg Glu
1490 1495 1500

Gln Ala Glu Asn Ile Ile His Leu Phe Thr Leu Thr Asn Leu Gly
1505 1510 1515

Ala Pro Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys
1520 1525 1530

Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His
1535 1540 1545

Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln
1550 1555 1560

Leu Gly Gly Asp Ser Gly Gly Ser Met Thr Asn Leu Ser Asp Ile
1565 1570 1575

Ile Glu Lys Glu Thr Gly Lys Gln Leu Val Ile Gln Glu Ser Ile

1580 1585 1590

Leu Met Leu Pro Glu Glu Val Glu Glu Val Ile Gly Asn Lys Pro
1595 1600 1605

Glu Ser Asp Ile Leu Val His Thr Ala Tyr Asp Glu Ser Thr Asp
1610 1615 1620

Glu Asn Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr Lys Pro
1625 1630 1635

Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile Lys
1640 1645 1650

Met Leu
1655

<210> 162
<211> 1665
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 162

Met Asp Pro Pro Thr Phe Thr Phe Asn Phe Asn Asn Glu Pro Trp Val
1 5 10 15

Arg Gly Arg His Glu Thr Tyr Leu Cys Tyr Glu Val Glu Arg Met His
20 25 30

Asn Asp Thr Trp Val Leu Leu Asn Gln Arg Arg Gly Phe Leu Cys Asn
35 40 45

Gln Ala Pro His Lys His Gly Phe Leu Glu Gly Arg His Ala Glu Leu
50 55 60

Cys Phe Leu Asp Val Ile Pro Phe Trp Lys Leu Asp Leu Asp Gln Asp
65 70 75 80

```
Tyr Arg Val Thr Cys Phe Thr Ser Trp Ser Pro Cys Phe Ser Cys Ala
                85                  90                  95

Gln Glu Met Ala Lys Phe Ile Ser Lys Asn Lys His Val Ser Leu Cys
            100                 105                 110

Ile Phe Thr Ala Arg Ile Tyr Asp Asp Gln Gly Arg Cys Gln Glu Gly
        115                 120                 125

Leu Arg Thr Leu Ala Glu Ala Gly Ala Lys Ile Ser Ile Met Thr Tyr
    130                 135                 140

Ser Glu Phe Lys His Cys Trp Asp Thr Phe Val Asp His Gln Gly Cys
145                 150                 155                 160

Pro Phe Gln Pro Trp Asp Gly Leu Asp Glu His Ser Gln Asp Leu Ser
                165                 170                 175

Gly Arg Leu Arg Ala Ile Leu Gln Ser Gly Ser Glu Thr Pro Gly Thr
            180                 185                 190

Ser Glu Ser Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu
        195                 200                 205

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

Lys Val Pro Ser Lys Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His
225                 230                 235                 240

Ser Ile Lys Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu
                245                 250                 255

Thr Ala Glu Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr
            260                 265                 270

Arg Arg Lys Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu
        275                 280                 285
```

```
Met Ala Lys Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe
    290                 295                 300

Leu Val Glu Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn
305                 310                 315                 320

Ile Val Asp Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His
                325                 330                 335

Leu Arg Lys Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu
            340                 345                 350

Ile Tyr Leu Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu
        355                 360                 365

Ile Glu Gly Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe
    370                 375                 380

Ile Gln Leu Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile
385                 390                 395                 400

Asn Ala Ser Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser
                405                 410                 415

Lys Ser Arg Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys
            420                 425                 430

Lys Asn Gly Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr
        435                 440                 445

Pro Asn Phe Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln
    450                 455                 460

Leu Ser Lys Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln
465                 470                 475                 480

Ile Gly Asp Gln Tyr Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser
                485                 490                 495
```

```
Asp Ala Ile Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr
            500                 505                 510

Lys Ala Pro Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His
        515                 520                 525

Gln Asp Leu Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu
    530                 535                 540

Lys Tyr Lys Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly
545                 550                 555                 560

Tyr Ile Asp Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys
                565                 570                 575

Pro Ile Leu Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu
            580                 585                 590

Asn Arg Glu Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser
        595                 600                 605

Ile Pro His Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg
    610                 615                 620

Gln Glu Asp Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu
625                 630                 635                 640

Lys Ile Leu Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg
                645                 650                 655

Gly Asn Ser Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile
            660                 665                 670

Thr Pro Trp Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln
        675                 680                 685

Ser Phe Ile Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu
    690                 695                 700
```

```
Lys Val Leu Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr
705                 710                 715                 720

Asn Glu Leu Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro
                725                 730                 735

Ala Phe Leu Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe
            740                 745                 750

Lys Thr Asn Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe
        755                 760                 765

Lys Lys Ile Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp
    770                 775                 780

Arg Phe Asn Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile
785                 790                 795                 800

Lys Asp Lys Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu
                805                 810                 815

Asp Ile Val Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu
            820                 825                 830

Glu Arg Leu Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys
        835                 840                 845

Gln Leu Lys Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys
    850                 855                 860

Leu Ile Asn Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp
865                 870                 875                 880

Phe Leu Lys Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile
                885                 890                 895

His Asp Asp Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val
            900                 905                 910
```

```
Ser Gly Gln Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly
        915                 920                 925

Ser Pro Ala Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp
    930                 935                 940

Glu Leu Val Lys Val Met Gly Arg His Lys Pro Glu Asn Ile Val Ile
945                 950                 955                 960

Glu Met Ala Arg Glu Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser
                965                 970                 975

Arg Glu Arg Met Lys Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser
            980                 985                 990

Gln Ile Leu Lys Glu His Pro Val  Glu Asn Thr Gln Leu  Gln Asn Glu
        995                 1000                1005

Lys Leu  Tyr Leu Tyr Tyr Leu  Gln Asn Gly Arg Asp  Met Tyr Val
    1010                1015                1020

Asp Gln  Glu Leu Asp Ile Asn  Arg Leu Ser Asp Tyr  Asp Val Asp
    1025                1030                1035

His Ile  Val Pro Gln Ser Phe  Leu Lys Asp Asp Ser  Ile Asp Asn
    1040                1045                1050

Lys Val  Leu Thr Arg Ser Asp  Lys Asn Arg Gly Lys  Ser Asp Asn
    1055                1060                1065

Val Pro  Ser Glu Glu Val Val  Lys Lys Met Lys Asn  Tyr Trp Arg
    1070                1075                1080

Gln Leu  Leu Asn Ala Lys Leu  Ile Thr Gln Arg Lys  Phe Asp Asn
    1085                1090                1095

Leu Thr  Lys Ala Glu Arg Gly  Gly Leu Ser Glu Leu  Asp Lys Ala
    1100                1105                1110
```

```
Gly Phe  Ile Lys Arg Gln Leu  Val Glu Thr Arg Gln  Ile Thr Lys
    1115                1120                1125

His Val  Ala Gln Ile Leu Asp  Ser Arg Met Asn Thr  Lys Tyr Asp
    1130                1135                1140

Glu Asn  Asp Lys Leu Ile Arg  Glu Val Lys Val Ile  Thr Leu Lys
    1145                1150                1155

Ser Lys  Leu Val Ser Asp Phe  Arg Lys Asp Phe Gln  Phe Tyr Lys
    1160                1165                1170

Val Arg  Glu Ile Asn Asn Tyr  His His Ala His Asp  Ala Tyr Leu
    1175                1180                1185

Asn Ala  Val Val Gly Thr Ala  Leu Ile Lys Lys Tyr  Pro Lys Leu
    1190                1195                1200

Glu Ser  Glu Phe Val Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg
    1205                1210                1215

Lys Met  Ile Ala Lys Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala
    1220                1225                1230

Lys Tyr  Phe Phe Tyr Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu
    1235                1240                1245

Ile Thr  Leu Ala Asn Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu
    1250                1255                1260

Thr Asn  Gly Glu Thr Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp
    1265                1270                1275

Phe Ala  Thr Val Arg Lys Val  Leu Ser Met Pro Gln  Val Asn Ile
    1280                1285                1290

Val Lys  Lys Thr Glu Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser
    1295                1300                1305
```

```
Ile Leu  Pro Lys Arg Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys
    1310                1315                1320

Asp Trp  Asp Pro Lys Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val
    1325                1330                1335

Ala Tyr  Ser Val Leu Val Val  Ala Lys Val Glu Lys  Gly Lys Ser
    1340                1345                1350

Lys Lys  Leu Lys Ser Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met
    1355                1360                1365

Glu Arg  Ser Ser Phe Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala
    1370                1375                1380

Lys Gly  Tyr Lys Glu Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro
    1385                1390                1395

Lys Tyr  Ser Leu Phe Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu
    1400                1405                1410

Ala Ser  Ala Gly Glu Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro
    1415                1420                1425

Ser Lys  Tyr Val Asn Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys
    1430                1435                1440

Leu Lys  Gly Ser Pro Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val
    1445                1450                1455

Glu Gln  His Lys His Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser
    1460                1465                1470

Glu Phe  Ser Lys Arg Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys
    1475                1480                1485

Val Leu  Ser Ala Tyr Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu
    1490                1495                1500
```

```
Gln Ala  Glu Asn Ile Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly
    1505                1510                1515


Ala Pro  Ala Ala Phe Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys
    1520                1525                1530


Arg Tyr  Thr Ser Thr Lys Glu  Val Leu Asp Ala Thr  Leu Ile His
    1535                1540                1545


Gln Ser  Ile Thr Gly Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln
    1550                1555                1560


Leu Gly  Gly Asp Ser Gly Gly  Ser Thr Asn Leu Ser  Asp Ile Ile
    1565                1570                1575


Glu Lys  Glu Thr Gly Lys Gln  Leu Val Ile Gln Glu  Ser Ile Leu
    1580                1585                1590


Met Leu  Pro Glu Glu Val Glu  Glu Val Ile Gly Asn  Lys Pro Glu
    1595                1600                1605


Ser Asp  Ile Leu Val His Thr  Ala Tyr Asp Glu Ser  Thr Asp Glu
    1610                1615                1620


Asn Val  Met Leu Leu Thr Ser  Asp Ala Pro Glu Tyr  Lys Pro Trp
    1625                1630                1635


Ala Leu  Val Ile Gln Asp Ser  Asn Gly Glu Asn Lys  Ile Lys Met
    1640                1645                1650


Leu Ser  Gly Gly Ser Pro Lys  Lys Lys Arg Lys Val
    1655                1660                1665


<210>  163
<211>  1665
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic Polypeptide
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<400> 163

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Met Asp Pro Pro Thr Phe Thr Phe Asn Phe Asn Asn Glu Pro Trp Val
1               5                  10                  15

Arg Gly Arg His Glu Thr Tyr Leu Cys Tyr Glu Val Glu Arg Met His
            20                  25                  30

Asn Asp Thr Trp Val Leu Leu Asn Gln Arg Arg Gly Phe Leu Cys Asn
        35                  40                  45

Gln Ala Pro His Lys His Gly Phe Leu Glu Gly Arg His Ala Glu Leu
    50                  55                  60

Cys Phe Leu Asp Val Ile Pro Phe Trp Lys Leu Asp Leu Asp Gln Asp
65                  70                  75                  80

Tyr Arg Val Thr Cys Phe Thr Ser Trp Ser Pro Cys Phe Ser Cys Ala
                85                  90                  95

Gln Glu Met Ala Lys Phe Ile Ser Lys Asn Lys His Val Ser Leu Cys
            100                 105                 110

Ile Phe Thr Ala Arg Ile Tyr Arg Arg Gln Gly Arg Cys Gln Glu Gly
        115                 120                 125

Leu Arg Thr Leu Ala Glu Ala Gly Ala Lys Ile Ser Ile Met Thr Tyr
    130                 135                 140

Ser Glu Phe Lys His Cys Trp Asp Thr Phe Val Asp His Gln Gly Cys
145                 150                 155                 160

Pro Phe Gln Pro Trp Asp Gly Leu Asp Glu His Ser Gln Asp Leu Ser
                165                 170                 175

Gly Arg Leu Arg Ala Ile Leu Gln Ser Gly Ser Glu Thr Pro Gly Thr
            180                 185                 190

Ser Glu Ser Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu
```

195 200 205

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

Lys Val Pro Ser Lys Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His
225 230 235 240

Ser Ile Lys Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu
245 250 255

Thr Ala Glu Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr
260 265 270

Arg Arg Lys Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu
275 280 285

Met Ala Lys Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe
290 295 300

Leu Val Glu Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn
305 310 315 320

Ile Val Asp Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His
325 330 335

Leu Arg Lys Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu
340 345 350

Ile Tyr Leu Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu
355 360 365

Ile Glu Gly Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe
370 375 380

Ile Gln Leu Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile
385 390 395 400

Asn Ala Ser Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser

405 410 415

Lys Ser Arg Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys
420 425 430

Lys Asn Gly Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr
435 440 445

Pro Asn Phe Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln
450 455 460

Leu Ser Lys Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln
465 470 475 480

Ile Gly Asp Gln Tyr Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser
485 490 495

Asp Ala Ile Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr
500 505 510

Lys Ala Pro Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His
515 520 525

Gln Asp Leu Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu
530 535 540

Lys Tyr Lys Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly
545 550 555 560

Tyr Ile Asp Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys
565 570 575

Pro Ile Leu Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu
580 585 590

Asn Arg Glu Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser
595 600 605

Ile Pro His Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg

610 615 620

Gln Glu Asp Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu
625 630 635 640

Lys Ile Leu Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg
645 650 655

Gly Asn Ser Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile
660 665 670

Thr Pro Trp Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln
675 680 685

Ser Phe Ile Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu
690 695 700

Lys Val Leu Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr
705 710 715 720

Asn Glu Leu Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro
725 730 735

Ala Phe Leu Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe
740 745 750

Lys Thr Asn Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe
755 760 765

Lys Lys Ile Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp
770 775 780

Arg Phe Asn Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile
785 790 795 800

Lys Asp Lys Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu
805 810 815

Asp Ile Val Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu

820 825 830

Glu Arg Leu Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys
835 840 845

Gln Leu Lys Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys
850 855 860

Leu Ile Asn Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp
865 870 875 880

Phe Leu Lys Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile
885 890 895

His Asp Asp Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val
900 905 910

Ser Gly Gln Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly
915 920 925

Ser Pro Ala Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp
930 935 940

Glu Leu Val Lys Val Met Gly Arg His Lys Pro Glu Asn Ile Val Ile
945 950 955 960

Glu Met Ala Arg Glu Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser
965 970 975

Arg Glu Arg Met Lys Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser
980 985 990

Gln Ile Leu Lys Glu His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu
995 1000 1005

Lys Leu Tyr Leu Tyr Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val
1010 1015 1020

Asp Gln Glu Leu Asp Ile Asn Arg Leu Ser Asp Tyr Asp Val Asp

1025 1030 1035

His Ile Val Pro Gln Ser Phe Leu Lys Asp Asp Ser Ile Asp Asn
1040 1045 1050

Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly Lys Ser Asp Asn
1055 1060 1065

Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn Tyr Trp Arg
1070 1075 1080

Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe Asp Asn
1085 1090 1095

Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys Ala
1100 1105 1110

Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
1115 1120 1125

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
1130 1135 1140

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys
1145 1150 1155

Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
1160 1165 1170

Val Arg Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu
1175 1180 1185

Asn Ala Val Val Gly Thr Ala Leu Ile Lys Lys Tyr Pro Lys Leu
1190 1195 1200

Glu Ser Glu Phe Val Tyr Gly Asp Tyr Lys Val Tyr Asp Val Arg
1205 1210 1215

Lys Met Ile Ala Lys Ser Glu Gln Glu Ile Gly Lys Ala Thr Ala

1220 1225 1230

Lys Tyr Phe Phe Tyr Ser Asn Ile Met Asn Phe Phe Lys Thr Glu
1235 1240 1245

Ile Thr Leu Ala Asn Gly Glu Ile Arg Lys Arg Pro Leu Ile Glu
1250 1255 1260

Thr Asn Gly Glu Thr Gly Glu Ile Val Trp Asp Lys Gly Arg Asp
1265 1270 1275

Phe Ala Thr Val Arg Lys Val Leu Ser Met Pro Gln Val Asn Ile
1280 1285 1290

Val Lys Lys Thr Glu Val Gln Thr Gly Gly Phe Ser Lys Glu Ser
1295 1300 1305

Ile Leu Pro Lys Arg Asn Ser Asp Lys Leu Ile Ala Arg Lys Lys
1310 1315 1320

Asp Trp Asp Pro Lys Lys Tyr Gly Gly Phe Asp Ser Pro Thr Val
1325 1330 1335

Ala Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys Gly Lys Ser
1340 1345 1350

Lys Lys Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr Ile Met
1355 1360 1365

Glu Arg Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala
1370 1375 1380

Lys Gly Tyr Lys Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro
1385 1390 1395

Lys Tyr Ser Leu Phe Glu Leu Glu Asn Gly Arg Lys Arg Met Leu
1400 1405 1410

Ala Ser Ala Gly Glu Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro

1415 1420 1425

Ser Lys Tyr Val Asn Phe Leu Tyr Leu Ala Ser His Tyr Glu Lys
1430 1435 1440

Leu Lys Gly Ser Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val
1445 1450 1455

Glu Gln His Lys His Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser
1460 1465 1470

Glu Phe Ser Lys Arg Val Ile Leu Ala Asp Ala Asn Leu Asp Lys
1475 1480 1485

Val Leu Ser Ala Tyr Asn Lys His Arg Asp Lys Pro Ile Arg Glu
1490 1495 1500

Gln Ala Glu Asn Ile Ile His Leu Phe Thr Leu Thr Asn Leu Gly
1505 1510 1515

Ala Pro Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys
1520 1525 1530

Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His
1535 1540 1545

Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln
1550 1555 1560

Leu Gly Gly Asp Ser Gly Gly Ser Thr Asn Leu Ser Asp Ile Ile
1565 1570 1575

Glu Lys Glu Thr Gly Lys Gln Leu Val Ile Gln Glu Ser Ile Leu
1580 1585 1590

Met Leu Pro Glu Glu Val Glu Glu Val Ile Gly Asn Lys Pro Glu
1595 1600 1605

Ser Asp Ile Leu Val His Thr Ala Tyr Asp Glu Ser Thr Asp Glu

1610 1615 1620

Asn Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr Lys Pro Trp
1625 1630 1635

Ala Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile Lys Met
1640 1645 1650

Leu Ser Gly Gly Ser Pro Lys Lys Lys Arg Lys Val
1655 1660 1665

<210> 164
<211> 246
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 164
gcggacatgg aggacgtgcg cggccgcctg gtgcagtacc gcggcgaggt gcaggccatg 60

ctcggccaga gcaccgagga gctgcgggtg cgcctcgcct cccacctgcg caagctgcgt 120

aagcggctcc tccgcgatgc cgatgacctg cagaagcgcc tggcagtgta ccaggccggg 180

gcccgcgagg gcgccgagcg cggcctcagc gccatccgcg agcgcctggg gcccctggtg 240

gaacag 246

<210> 165
<211> 1689
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 165

Met Thr Asp Ala Glu Tyr Val Arg Ile His Glu Lys Leu Asp Ile Tyr
1 5 10 15

Thr Phe Lys Lys Gln Phe Phe Asn Asn Lys Lys Ser Val Ser His Arg
20 25 30

```
Cys Tyr Val Leu Phe Glu Leu Lys Arg Arg Gly Glu Arg Arg Ala Cys
        35                  40                  45

Phe Trp Gly Tyr Ala Val Asn Lys Pro Gln Ser Gly Thr Glu Arg Gly
    50                  55                  60

Ile His Ala Glu Ile Phe Ser Ile Arg Lys Val Glu Glu Tyr Leu Arg
65                  70                  75                  80

Asp Asn Pro Gly Gln Phe Thr Ile Asn Trp Tyr Ser Ser Trp Ser Pro
                85                  90                  95

Cys Ala Asp Cys Ala Glu Lys Ile Leu Glu Trp Tyr Asn Gln Glu Leu
            100                 105                 110

Arg Gly Asn Gly His Thr Leu Lys Ile Trp Ala Cys Lys Leu Tyr Tyr
        115                 120                 125

Glu Lys Asn Ala Arg Asn Gln Ile Gly Leu Trp Asn Leu Arg Asp Asn
    130                 135                 140

Gly Val Gly Leu Asn Val Met Val Ser Glu His Tyr Gln Cys Cys Arg
145                 150                 155                 160

Lys Ile Phe Ile Gln Ser Ser His Asn Gln Leu Asn Glu Asn Arg Trp
                165                 170                 175

Leu Glu Lys Thr Leu Lys Arg Ala Glu Lys Arg Arg Ser Glu Leu Ser
            180                 185                 190

Ile Met Ile Gln Val Lys Ile Leu His Thr Thr Lys Ser Pro Ala Val
        195                 200                 205

Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser
    210                 215                 220

Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly
225                 230                 235                 240
```

```
Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
                245                 250                 255

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
            260                 265                 270

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
        275                 280                 285

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
    290                 295                 300

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe
305                 310                 315                 320

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
                325                 330                 335

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
            340                 345                 350

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
        355                 360                 365

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
    370                 375                 380

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

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
                405                 410                 415

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
            420                 425                 430

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
        435                 440                 445
```

```
Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
    450                 455                 460

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
465                 470                 475                 480

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
                485                 490                 495

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
            500                 505                 510

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
        515                 520                 525

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
    530                 535                 540

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
545                 550                 555                 560

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
                565                 570                 575

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
            580                 585                 590

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
        595                 600                 605

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
    610                 615                 620

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
625                 630                 635                 640

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
                645                 650                 655
```

```
Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
            660                 665                 670

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
        675                 680                 685

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
    690                 695                 700

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
705                 710                 715                 720

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
                725                 730                 735

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
            740                 745                 750

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
        755                 760                 765

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
    770                 775                 780

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
785                 790                 795                 800

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
                805                 810                 815

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
            820                 825                 830

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
        835                 840                 845

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
    850                 855                 860
```

```
Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
865                 870                 875                 880

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
                885                 890                 895

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
            900                 905                 910

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
        915                 920                 925

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
    930                 935                 940

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
945                 950                 955                 960

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
                965                 970                 975

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
            980                 985                 990

Thr Gln Lys Gly Gln Lys Asn Ser  Arg Glu Arg Met Lys  Arg Ile Glu
        995                 1000                1005

Glu Gly  Ile Lys Glu Leu Gly  Ser Gln Ile Leu Lys  Glu His Pro
    1010                1015                1020

Val Glu  Asn Thr Gln Leu Gln  Asn Glu Lys Leu Tyr  Leu Tyr Tyr
    1025                1030                1035

Leu Gln  Asn Gly Arg Asp Met  Tyr Val Asp Gln Glu  Leu Asp Ile
    1040                1045                1050

Asn Arg  Leu Ser Asp Tyr Asp  Val Asp His Ile Val  Pro Gln Ser
    1055                1060                1065
```

```
Phe Leu  Lys Asp Asp Ser Ile  Asp Asn Lys Val Leu  Thr Arg Ser
    1070                1075                1080

Asp Lys  Asn Arg Gly Lys Ser  Asp Asn Val Pro Ser  Glu Glu Val
    1085                1090                1095

Val Lys  Lys Met Lys Asn Tyr  Trp Arg Gln Leu Leu  Asn Ala Lys
    1100                1105                1110

Leu Ile  Thr Gln Arg Lys Phe  Asp Asn Leu Thr Lys  Ala Glu Arg
    1115                1120                1125

Gly Gly  Leu Ser Glu Leu Asp  Lys Ala Gly Phe Ile  Lys Arg Gln
    1130                1135                1140

Leu Val  Glu Thr Arg Gln Ile  Thr Lys His Val Ala  Gln Ile Leu
    1145                1150                1155

Asp Ser  Arg Met Asn Thr Lys  Tyr Asp Glu Asn Asp  Lys Leu Ile
    1160                1165                1170

Arg Glu  Val Lys Val Ile Thr  Leu Lys Ser Lys Leu  Val Ser Asp
    1175                1180                1185

Phe Arg  Lys Asp Phe Gln Phe  Tyr Lys Val Arg Glu  Ile Asn Asn
    1190                1195                1200

Tyr His  His Ala His Asp Ala  Tyr Leu Asn Ala Val  Val Gly Thr
    1205                1210                1215

Ala Leu  Ile Lys Lys Tyr Pro  Lys Leu Glu Ser Glu  Phe Val Tyr
    1220                1225                1230

Gly Asp  Tyr Lys Val Tyr Asp  Val Arg Lys Met Ile  Ala Lys Ser
    1235                1240                1245

Glu Gln  Glu Ile Gly Lys Ala  Thr Ala Lys Tyr Phe  Phe Tyr Ser
    1250                1255                1260
```

```
Asn Ile  Met Asn Phe Phe Lys  Thr Glu Ile Thr Leu  Ala Asn Gly
    1265                1270                1275

Glu Ile  Arg Lys Arg Pro Leu  Ile Glu Thr Asn Gly  Glu Thr Gly
    1280                1285                1290

Glu Ile  Val Trp Asp Lys Gly  Arg Asp Phe Ala Thr  Val Arg Lys
    1295                1300                1305

Val Leu  Ser Met Pro Gln Val  Asn Ile Val Lys Lys  Thr Glu Val
    1310                1315                1320

Gln Thr  Gly Gly Phe Ser Lys  Glu Ser Ile Leu Pro  Lys Arg Asn
    1325                1330                1335

Ser Asp  Lys Leu Ile Ala Arg  Lys Lys Asp Trp Asp  Pro Lys Lys
    1340                1345                1350

Tyr Gly  Gly Phe Asp Ser Pro  Thr Val Ala Tyr Ser  Val Leu Val
    1355                1360                1365

Val Ala  Lys Val Glu Lys Gly  Lys Ser Lys Lys Leu  Lys Ser Val
    1370                1375                1380

Lys Glu  Leu Leu Gly Ile Thr  Ile Met Glu Arg Ser  Ser Phe Glu
    1385                1390                1395

Lys Asn  Pro Ile Asp Phe Leu  Glu Ala Lys Gly Tyr  Lys Glu Val
    1400                1405                1410

Lys Lys  Asp Leu Ile Ile Lys  Leu Pro Lys Tyr Ser  Leu Phe Glu
    1415                1420                1425

Leu Glu  Asn Gly Arg Lys Arg  Met Leu Ala Ser Ala  Gly Glu Leu
    1430                1435                1440

Gln Lys  Gly Asn Glu Leu Ala  Leu Pro Ser Lys Tyr  Val Asn Phe
    1445                1450                1455
```

```
Leu Tyr  Leu Ala Ser His Tyr  Glu Lys Leu Lys Gly  Ser Pro Glu
    1460                1465                1470

Asp Asn  Glu Gln Lys Gln Leu  Phe Val Glu Gln His  Lys His Tyr
    1475                1480                1485

Leu Asp  Glu Ile Ile Glu Gln  Ile Ser Glu Phe Ser  Lys Arg Val
    1490                1495                1500

Ile Leu  Ala Asp Ala Asn Leu  Asp Lys Val Leu Ser  Ala Tyr Asn
    1505                1510                1515

Lys His  Arg Asp Lys Pro Ile  Arg Glu Gln Ala Glu  Asn Ile Ile
    1520                1525                1530

His Leu  Phe Thr Leu Thr Asn  Leu Gly Ala Pro Ala  Ala Phe Lys
    1535                1540                1545

Tyr Phe  Asp Thr Thr Ile Asp  Arg Lys Arg Tyr Thr  Ser Thr Lys
    1550                1555                1560

Glu Val  Leu Asp Ala Thr Leu  Ile His Gln Ser Ile  Thr Gly Leu
    1565                1570                1575

Tyr Glu  Thr Arg Ile Asp Leu  Ser Gln Leu Gly Gly  Asp Ser Gly
    1580                1585                1590

Gly Ser  Thr Asn Leu Ser Asp  Ile Ile Glu Lys Glu  Thr Gly Lys
    1595                1600                1605

Gln Leu  Val Ile Gln Glu Ser  Ile Leu Met Leu Pro  Glu Glu Val
    1610                1615                1620

Glu Glu  Val Ile Gly Asn Lys  Pro Glu Ser Asp Ile  Leu Val His
    1625                1630                1635

Thr Ala  Tyr Asp Glu Ser Thr  Asp Glu Asn Val Met  Leu Leu Thr
    1640                1645                1650
```

```
Ser Asp  Ala Pro Glu Tyr Lys  Pro Trp Ala Leu Val  Ile Gln Asp
    1655                 1660                 1665


Ser Asn  Gly Glu Asn Lys Ile  Lys Met Leu Ser Gly  Gly Ser Pro
    1670                 1675                 1680


Lys Lys  Lys Arg Lys Val
    1685
```

<210> 166
<211> 1679
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 166

```
Met Asp Ser Leu Leu Met Asn Arg Arg Lys Phe Leu Tyr Gln Phe Lys
1               5                  10                  15


Asn Val Arg Trp Ala Lys Gly Arg Arg Glu Thr Tyr Leu Cys Tyr Val
            20                  25                  30


Val Lys Arg Arg Asp Ser Ala Thr Ser Phe Ser Leu Asp Phe Gly Tyr
        35                  40                  45


Leu Arg Asn Lys Asn Gly Cys His Val Glu Leu Leu Phe Leu Arg Tyr
    50                  55                  60


Ile Ser Asp Trp Asp Leu Asp Pro Gly Arg Cys Tyr Arg Val Thr Trp
65                  70                  75                  80


Phe Thr Ser Trp Ser Pro Cys Tyr Asp Cys Ala Arg His Val Ala Asp
                85                  90                  95


Phe Leu Arg Gly Asn Pro Asn Leu Ser Leu Arg Ile Phe Thr Ala Arg
            100                 105                 110


Leu Tyr Phe Cys Glu Asp Arg Lys Ala Glu Pro Glu Gly Leu Arg Arg
```

115 120 125

Leu His Arg Ala Gly Val Gln Ile Ala Ile Met Thr Phe Lys Asp Tyr
130 135 140

Phe Tyr Cys Trp Asn Thr Phe Val Glu Asn His Glu Arg Thr Phe Lys
145 150 155 160

Ala Trp Glu Gly Leu His Glu Asn Ser Val Arg Leu Ser Arg Gln Leu
165 170 175

Arg Arg Ile Leu Leu Pro Leu Tyr Glu Val Asp Asp Leu Arg Asp Ala
180 185 190

Phe Arg Thr Leu Gly Leu Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu
195 200 205

Ser Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile
210 215 220

Gly Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val
225 230 235 240

Pro Ser Lys Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile
245 250 255

Lys Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala
260 265 270

Glu Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg
275 280 285

Lys Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala
290 295 300

Lys Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val
305 310 315 320

Glu Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val

325 330 335

Asp Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg
340 345 350

Lys Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr
355 360 365

Leu Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu
370 375 380

Gly Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln
385 390 395 400

Leu Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala
405 410 415

Ser Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser
420 425 430

Arg Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn
435 440 445

Gly Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn
450 455 460

Phe Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser
465 470 475 480

Lys Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly
485 490 495

Asp Gln Tyr Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala
500 505 510

Ile Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala
515 520 525

Pro Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp

530 535 540

Leu Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr
545 550 555 560

Lys Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile
565 570 575

Asp Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile
580 585 590

Leu Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg
595 600 605

Glu Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro
610 615 620

His Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu
625 630 635 640

Asp Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile
645 650 655

Leu Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn
660 665 670

Ser Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro
675 680 685

Trp Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe
690 695 700

Ile Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val
705 710 715 720

Leu Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu
725 730 735

Leu Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe

740 745 750

Leu Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr
755 760 765

Asn Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys
770 775 780

Ile Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe
785 790 795 800

Asn Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp
805 810 815

Lys Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile
820 825 830

Val Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg
835 840 845

Leu Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu
850 855 860

Lys Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile
865 870 875 880

Asn Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu
885 890 895

Lys Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp
900 905 910

Asp Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly
915 920 925

Gln Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro
930 935 940

Ala Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu

945 950 955 960

Val Lys Val Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met
965 970 975

Ala Arg Glu Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu
980 985 990

Arg Met Lys Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile
995 1000 1005

Leu Lys Glu His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu Lys
1010 1015 1020

Leu Tyr Leu Tyr Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val Asp
1025 1030 1035

Gln Glu Leu Asp Ile Asn Arg Leu Ser Asp Tyr Asp Val Asp His
1040 1045 1050

Ile Val Pro Gln Ser Phe Leu Lys Asp Asp Ser Ile Asp Asn Lys
1055 1060 1065

Val Leu Thr Arg Ser Asp Lys Asn Arg Gly Lys Ser Asp Asn Val
1070 1075 1080

Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn Tyr Trp Arg Gln
1085 1090 1095

Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe Asp Asn Leu
1100 1105 1110

Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys Ala Gly
1115 1120 1125

Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys His
1130 1135 1140

Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu

1145 1150 1155

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
1160 1165 1170

Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val
1175 1180 1185

Arg Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn
1190 1195 1200

Ala Val Val Gly Thr Ala Leu Ile Lys Lys Tyr Pro Lys Leu Glu
1205 1210 1215

Ser Glu Phe Val Tyr Gly Asp Tyr Lys Val Tyr Asp Val Arg Lys
1220 1225 1230

Met Ile Ala Lys Ser Glu Gln Glu Ile Gly Lys Ala Thr Ala Lys
1235 1240 1245

Tyr Phe Phe Tyr Ser Asn Ile Met Asn Phe Phe Lys Thr Glu Ile
1250 1255 1260

Thr Leu Ala Asn Gly Glu Ile Arg Lys Arg Pro Leu Ile Glu Thr
1265 1270 1275

Asn Gly Glu Thr Gly Glu Ile Val Trp Asp Lys Gly Arg Asp Phe
1280 1285 1290

Ala Thr Val Arg Lys Val Leu Ser Met Pro Gln Val Asn Ile Val
1295 1300 1305

Lys Lys Thr Glu Val Gln Thr Gly Gly Phe Ser Lys Glu Ser Ile
1310 1315 1320

Leu Pro Lys Arg Asn Ser Asp Lys Leu Ile Ala Arg Lys Lys Asp
1325 1330 1335

Trp Asp Pro Lys Lys Tyr Gly Gly Phe Asp Ser Pro Thr Val Ala

1340 1345 1350

Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys Gly Lys Ser Lys
1355 1360 1365

Lys Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr Ile Met Glu
1370 1375 1380

Arg Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala Lys
1385 1390 1395

Gly Tyr Lys Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro Lys
1400 1405 1410

Tyr Ser Leu Phe Glu Leu Glu Asn Gly Arg Lys Arg Met Leu Ala
1415 1420 1425

Ser Ala Gly Glu Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro Ser
1430 1435 1440

Lys Tyr Val Asn Phe Leu Tyr Leu Ala Ser His Tyr Glu Lys Leu
1445 1450 1455

Lys Gly Ser Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val Glu
1460 1465 1470

Gln His Lys His Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser Glu
1475 1480 1485

Phe Ser Lys Arg Val Ile Leu Ala Asp Ala Asn Leu Asp Lys Val
1490 1495 1500

Leu Ser Ala Tyr Asn Lys His Arg Asp Lys Pro Ile Arg Glu Gln
1505 1510 1515

Ala Glu Asn Ile Ile His Leu Phe Thr Leu Thr Asn Leu Gly Ala
1520 1525 1530

Pro Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys Arg

1535 1540 1545

Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His Gln
1550 1555 1560

Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu
1565 1570 1575

Gly Gly Asp Ser Gly Gly Ser Thr Asn Leu Ser Asp Ile Ile Glu
1580 1585 1590

Lys Glu Thr Gly Lys Gln Leu Val Ile Gln Glu Ser Ile Leu Met
1595 1600 1605

Leu Pro Glu Glu Val Glu Glu Val Ile Gly Asn Lys Pro Glu Ser
1610 1615 1620

Asp Ile Leu Val His Thr Ala Tyr Asp Glu Ser Thr Asp Glu Asn
1625 1630 1635

Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr Lys Pro Trp Ala
1640 1645 1650

Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile Lys Met Leu
1655 1660 1665

Ser Gly Gly Ser Pro Lys Lys Lys Arg Lys Val
1670 1675

<210> 167
<211> 1824
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 167

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1 5 10 15

```
Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
            20                  25                  30

Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
        35                  40                  45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
    50                  55                  60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65                  70                  75                  80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
                85                  90                  95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
            100                 105                 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
        115                 120                 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220
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```
Ala Thr Gly Leu Lys Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Ser
225                 230                 235                 240

Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Ser Gly Gly
                245                 250                 255

Ser Ser Gly Gly Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
            260                 265                 270

Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
        275                 280                 285

Ser Lys Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys
    290                 295                 300

Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
305                 310                 315                 320

Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys
                325                 330                 335

Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
            340                 345                 350

Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
        355                 360                 365

Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp
    370                 375                 380

Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys
385                 390                 395                 400

Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
                405                 410                 415

Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
            420                 425                 430
```

```
Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
        435                 440                 445

Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser
    450                 455                 460

Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg
465                 470                 475                 480

Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
                485                 490                 495

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
            500                 505                 510

Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
        515                 520                 525

Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp
    530                 535                 540

Gln Tyr Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile
545                 550                 555                 560

Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro
                565                 570                 575

Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
            580                 585                 590

Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys
        595                 600                 605

Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
    610                 615                 620

Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
625                 630                 635                 640
```

```
Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
                645                 650                 655

Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His
            660                 665                 670

Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
        675                 680                 685

Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
    690                 695                 700

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
705                 710                 715                 720

Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
                725                 730                 735

Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile
            740                 745                 750

Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
        755                 760                 765

Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu
    770                 775                 780

Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu
785                 790                 795                 800

Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn
                805                 810                 815

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
            820                 825                 830

Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
        835                 840                 845
```

```
Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
    850                 855                 860

Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val
865                 870                 875                 880

Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu
                885                 890                 895

Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
            900                 905                 910

Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn
        915                 920                 925

Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys
    930                 935                 940

Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp
945                 950                 955                 960

Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln
                965                 970                 975

Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala
            980                 985                 990

Ile Lys Lys Gly Ile Leu Gln Thr  Val Lys Val Val Asp  Glu Leu Val
        995                 1000                1005

Lys Val  Met Gly Arg His Lys  Pro Glu Asn Ile Val  Ile Glu Met
    1010                1015                1020

Ala Arg  Glu Asn Gln Thr Thr  Gln Lys Gly Gln Lys  Asn Ser Arg
    1025                1030                1035

Glu Arg  Met Lys Arg Ile Glu  Glu Gly Ile Lys Glu  Leu Gly Ser
    1040                1045                1050
```

```
Gln Ile  Leu Lys Glu His Pro  Val Glu Asn Thr Gln  Leu Gln Asn
    1055                1060                1065

Glu Lys  Leu Tyr Leu Tyr Tyr  Leu Gln Asn Gly Arg  Asp Met Tyr
    1070                1075                1080

Val Asp  Gln Glu Leu Asp Ile  Asn Arg Leu Ser Asp  Tyr Asp Val
    1085                1090                1095

Asp His  Ile Val Pro Gln Ser  Phe Leu Lys Asp Asp  Ser Ile Asp
    1100                1105                1110

Asn Lys  Val Leu Thr Arg Ser  Asp Lys Asn Arg Gly  Lys Ser Asp
    1115                1120                1125

Asn Val  Pro Ser Glu Glu Val  Val Lys Lys Met Lys  Asn Tyr Trp
    1130                1135                1140

Arg Gln  Leu Leu Asn Ala Lys  Leu Ile Thr Gln Arg  Lys Phe Asp
    1145                1150                1155

Asn Leu  Thr Lys Ala Glu Arg  Gly Gly Leu Ser Glu  Leu Asp Lys
    1160                1165                1170

Ala Gly  Phe Ile Lys Arg Gln  Leu Val Glu Thr Arg  Gln Ile Thr
    1175                1180                1185

Lys His  Val Ala Gln Ile Leu  Asp Ser Arg Met Asn  Thr Lys Tyr
    1190                1195                1200

Asp Glu  Asn Asp Lys Leu Ile  Arg Glu Val Lys Val  Ile Thr Leu
    1205                1210                1215

Lys Ser  Lys Leu Val Ser Asp  Phe Arg Lys Asp Phe  Gln Phe Tyr
    1220                1225                1230

Lys Val  Arg Glu Ile Asn Asn  Tyr His His Ala His  Asp Ala Tyr
    1235                1240                1245
```

```
Leu Asn  Ala Val Val Gly Thr  Ala Leu Ile Lys Lys  Tyr Pro Lys
    1250                 1255                 1260

Leu Glu  Ser Glu Phe Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val
    1265                 1270                 1275

Arg Lys  Met Ile Ala Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr
    1280                 1285                 1290

Ala Lys  Tyr Phe Phe Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr
    1295                 1300                 1305

Glu Ile  Thr Leu Ala Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile
    1310                 1315                 1320

Glu Thr  Asn Gly Glu Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg
    1325                 1330                 1335

Asp Phe  Ala Thr Val Arg Lys  Val Leu Ser Met Pro  Gln Val Asn
    1340                 1345                 1350

Ile Val  Lys Lys Thr Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu
    1355                 1360                 1365

Ser Ile  Leu Pro Lys Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys
    1370                 1375                 1380

Lys Asp  Trp Asp Pro Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr
    1385                 1390                 1395

Val Ala  Tyr Ser Val Leu Val  Val Ala Lys Val Glu  Lys Gly Lys
    1400                 1405                 1410

Ser Lys  Lys Leu Lys Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile
    1415                 1420                 1425

Met Glu  Arg Ser Ser Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu
    1430                 1435                 1440
```

```
Ala Lys  Gly Tyr Lys Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu
    1445                1450                1455

Pro Lys  Tyr Ser Leu Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met
    1460                1465                1470

Leu Ala  Ser Ala Gly Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu
    1475                1480                1485

Pro Ser  Lys Tyr Val Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu
    1490                1495                1500

Lys Leu  Lys Gly Ser Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe
    1505                1510                1515

Val Glu  Gln His Lys His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile
    1520                1525                1530

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

Lys Val  Leu Ser Ala Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg
    1550                1555                1560

Glu Gln  Ala Glu Asn Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu
    1565                1570                1575

Gly Ala  Pro Ala Ala Phe Lys  Tyr Phe Asp Thr Thr  Ile Asp Arg
    1580                1585                1590

Lys Arg  Tyr Thr Ser Thr Lys  Glu Val Leu Asp Ala  Thr Leu Ile
    1595                1600                1605

His Gln  Ser Ile Thr Gly Leu  Tyr Glu Thr Arg Ile  Asp Leu Ser
    1610                1615                1620

Gln Leu  Gly Gly Asp Ser Gly  Gly Ser Gly Gly Ser  Gly Gly Ser
    1625                1630                1635
```

```
Thr Asn  Leu Ser Asp Ile Ile  Glu Lys Glu Thr Gly  Lys Gln Leu
    1640                1645                1650

Val Ile  Gln Glu Ser Ile Leu  Met Leu Pro Glu Glu  Val Glu Glu
    1655                1660                1665

Val Ile  Gly Asn Lys Pro Glu  Ser Asp Ile Leu Val  His Thr Ala
    1670                1675                1680

Tyr Asp  Glu Ser Thr Asp Glu  Asn Val Met Leu Leu  Thr Ser Asp
    1685                1690                1695

Ala Pro  Glu Tyr Lys Pro Trp  Ala Leu Val Ile Gln  Asp Ser Asn
    1700                1705                1710

Gly Glu  Asn Lys Ile Lys Met  Leu Ser Gly Gly Ser  Gly Gly Ser
    1715                1720                1725

Gly Gly  Ser Thr Asn Leu Ser  Asp Ile Ile Glu Lys  Glu Thr Gly
    1730                1735                1740

Lys Gln  Leu Val Ile Gln Glu  Ser Ile Leu Met Leu  Pro Glu Glu
    1745                1750                1755

Val Glu  Glu Val Ile Gly Asn  Lys Pro Glu Ser Asp  Ile Leu Val
    1760                1765                1770

His Thr  Ala Tyr Asp Glu Ser  Thr Asp Glu Asn Val  Met Leu Leu
    1775                1780                1785

Thr Ser  Asp Ala Pro Glu Tyr  Lys Pro Trp Ala Leu  Val Ile Gln
    1790                1795                1800

Asp Ser  Asn Gly Glu Asn Lys  Ile Lys Met Leu Ser  Gly Gly Ser
    1805                1810                1815

Pro Lys  Lys Lys Arg Lys
    1820
```

<210> 168
<211> 1544
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 168

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Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1               5                  10                  15


Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
            20                  25                  30


Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
        35                  40                  45


Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
    50                  55                  60


Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65                  70                  75                  80


Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
                85                  90                  95


Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
            100                 105                 110


Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
        115                 120                 125


Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140


Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160


Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
```

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                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220

Ala Thr Gly Leu Lys Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Ser
225                 230                 235                 240

Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Ser Gly Gly
                245                 250                 255

Ser Ser Gly Gly Ser Gly Lys Arg Asn Tyr Ile Leu Gly Leu Ala Ile
            260                 265                 270

Gly Ile Thr Ser Val Gly Tyr Gly Ile Ile Asp Tyr Glu Thr Arg Asp
        275                 280                 285

Val Ile Asp Ala Gly Val Arg Leu Phe Lys Glu Ala Asn Val Glu Asn
    290                 295                 300

Asn Glu Gly Arg Arg Ser Lys Arg Gly Ala Arg Arg Leu Lys Arg Arg
305                 310                 315                 320

Arg Arg His Arg Ile Gln Arg Val Lys Lys Leu Leu Phe Asp Tyr Asn
                325                 330                 335

Leu Leu Thr Asp His Ser Glu Leu Ser Gly Ile Asn Pro Tyr Glu Ala
            340                 345                 350

Arg Val Lys Gly Leu Ser Gln Lys Leu Ser Glu Glu Glu Phe Ser Ala
        355                 360                 365

Ala Leu Leu His Leu Ala Lys Arg Arg Gly Val His Asn Val Asn Glu
```

370 375 380

Val Glu Glu Asp Thr Gly Asn Glu Leu Ser Thr Lys Glu Gln Ile Ser
385 390 395 400

Arg Asn Ser Lys Ala Leu Glu Glu Lys Tyr Val Ala Glu Leu Gln Leu
405 410 415

Glu Arg Leu Lys Lys Asp Gly Glu Val Arg Gly Ser Ile Asn Arg Phe
420 425 430

Lys Thr Ser Asp Tyr Val Lys Glu Ala Lys Gln Leu Leu Lys Val Gln
435 440 445

Lys Ala Tyr His Gln Leu Asp Gln Ser Phe Ile Asp Thr Tyr Ile Asp
450 455 460

Leu Leu Glu Thr Arg Arg Thr Tyr Tyr Glu Gly Pro Gly Glu Gly Ser
465 470 475 480

Pro Phe Gly Trp Lys Asp Ile Lys Glu Trp Tyr Glu Met Leu Met Gly
485 490 495

His Cys Thr Tyr Phe Pro Glu Glu Leu Arg Ser Val Lys Tyr Ala Tyr
500 505 510

Asn Ala Asp Leu Tyr Asn Ala Leu Asn Asp Leu Asn Asn Leu Val Ile
515 520 525

Thr Arg Asp Glu Asn Glu Lys Leu Glu Tyr Tyr Glu Lys Phe Gln Ile
530 535 540

Ile Glu Asn Val Phe Lys Gln Lys Lys Lys Pro Thr Leu Lys Gln Ile
545 550 555 560

Ala Lys Glu Ile Leu Val Asn Glu Glu Asp Ile Lys Gly Tyr Arg Val
565 570 575

Thr Ser Thr Gly Lys Pro Glu Phe Thr Asn Leu Lys Val Tyr His Asp

580 585 590

Ile Lys Asp Ile Thr Ala Arg Lys Glu Ile Ile Glu Asn Ala Glu Leu
595 600 605

Leu Asp Gln Ile Ala Lys Ile Leu Thr Ile Tyr Gln Ser Ser Glu Asp
610 615 620

Ile Gln Glu Glu Leu Thr Asn Leu Asn Ser Glu Leu Thr Gln Glu Glu
625 630 635 640

Ile Glu Gln Ile Ser Asn Leu Lys Gly Tyr Thr Gly Thr His Asn Leu
645 650 655

Ser Leu Lys Ala Ile Asn Leu Ile Leu Asp Glu Leu Trp His Thr Asn
660 665 670

Asp Asn Gln Ile Ala Ile Phe Asn Arg Leu Lys Leu Val Pro Lys Lys
675 680 685

Val Asp Leu Ser Gln Gln Lys Glu Ile Pro Thr Thr Leu Val Asp Asp
690 695 700

Phe Ile Leu Ser Pro Val Val Lys Arg Ser Phe Ile Gln Ser Ile Lys
705 710 715 720

Val Ile Asn Ala Ile Ile Lys Lys Tyr Gly Leu Pro Asn Asp Ile Ile
725 730 735

Ile Glu Leu Ala Arg Glu Lys Asn Ser Lys Asp Ala Gln Lys Met Ile
740 745 750

Asn Glu Met Gln Lys Arg Asn Arg Gln Thr Asn Glu Arg Ile Glu Glu
755 760 765

Ile Ile Arg Thr Thr Gly Lys Glu Asn Ala Lys Tyr Leu Ile Glu Lys
770 775 780

Ile Lys Leu His Asp Met Gln Glu Gly Lys Cys Leu Tyr Ser Leu Glu

785 790 795 800

Ala Ile Pro Leu Glu Asp Leu Leu Asn Asn Pro Phe Asn Tyr Glu Val
805 810 815

Asp His Ile Ile Pro Arg Ser Val Ser Phe Asp Asn Ser Phe Asn Asn
820 825 830

Lys Val Leu Val Lys Gln Glu Glu Asn Ser Lys Lys Gly Asn Arg Thr
835 840 845

Pro Phe Gln Tyr Leu Ser Ser Ser Asp Ser Lys Ile Ser Tyr Glu Thr
850 855 860

Phe Lys Lys His Ile Leu Asn Leu Ala Lys Gly Lys Gly Arg Ile Ser
865 870 875 880

Lys Thr Lys Lys Glu Tyr Leu Leu Glu Glu Arg Asp Ile Asn Arg Phe
885 890 895

Ser Val Gln Lys Asp Phe Ile Asn Arg Asn Leu Val Asp Thr Arg Tyr
900 905 910

Ala Thr Arg Gly Leu Met Asn Leu Leu Arg Ser Tyr Phe Arg Val Asn
915 920 925

Asn Leu Asp Val Lys Val Lys Ser Ile Asn Gly Gly Phe Thr Ser Phe
930 935 940

Leu Arg Arg Lys Trp Lys Phe Lys Lys Glu Arg Asn Lys Gly Tyr Lys
945 950 955 960

His His Ala Glu Asp Ala Leu Ile Ile Ala Asn Ala Asp Phe Ile Phe
965 970 975

Lys Glu Trp Lys Lys Leu Asp Lys Ala Lys Lys Val Met Glu Asn Gln
980 985 990

Met Phe Glu Glu Lys Gln Ala Glu Ser Met Pro Glu Ile Glu Thr Glu

995 1000 1005

Gln Glu Tyr Lys Glu Ile Phe Ile Thr Pro His Gln Ile Lys His
1010 1015 1020

Ile Lys Asp Phe Lys Asp Tyr Lys Tyr Ser His Arg Val Asp Lys
1025 1030 1035

Lys Pro Asn Arg Glu Leu Ile Asn Asp Thr Leu Tyr Ser Thr Arg
1040 1045 1050

Lys Asp Asp Lys Gly Asn Thr Leu Ile Val Asn Asn Leu Asn Gly
1055 1060 1065

Leu Tyr Asp Lys Asp Asn Asp Lys Leu Lys Lys Leu Ile Asn Lys
1070 1075 1080

Ser Pro Glu Lys Leu Leu Met Tyr His His Asp Pro Gln Thr Tyr
1085 1090 1095

Gln Lys Leu Lys Leu Ile Met Glu Gln Tyr Gly Asp Glu Lys Asn
1100 1105 1110

Pro Leu Tyr Lys Tyr Tyr Glu Glu Thr Gly Asn Tyr Leu Thr Lys
1115 1120 1125

Tyr Ser Lys Lys Asp Asn Gly Pro Val Ile Lys Lys Ile Lys Tyr
1130 1135 1140

Tyr Gly Asn Lys Leu Asn Ala His Leu Asp Ile Thr Asp Asp Tyr
1145 1150 1155

Pro Asn Ser Arg Asn Lys Val Val Lys Leu Ser Leu Lys Pro Tyr
1160 1165 1170

Arg Phe Asp Val Tyr Leu Asp Asn Gly Val Tyr Lys Phe Val Thr
1175 1180 1185

Val Lys Asn Leu Asp Val Ile Lys Lys Glu Asn Tyr Tyr Glu Val

1190 1195 1200

Asn Ser Lys Cys Tyr Glu Glu Ala Lys Lys Leu Lys Lys Ile Ser
1205 1210 1215

Asn Gln Ala Glu Phe Ile Ala Ser Phe Tyr Asn Asn Asp Leu Ile
1220 1225 1230

Lys Ile Asn Gly Glu Leu Tyr Arg Val Ile Gly Val Asn Asn Asp
1235 1240 1245

Leu Leu Asn Arg Ile Glu Val Asn Met Ile Asp Ile Thr Tyr Arg
1250 1255 1260

Glu Tyr Leu Glu Asn Met Asn Asp Lys Arg Pro Pro Arg Ile Ile
1265 1270 1275

Lys Thr Ile Ala Ser Lys Thr Gln Ser Ile Lys Lys Tyr Ser Thr
1280 1285 1290

Asp Ile Leu Gly Asn Leu Tyr Glu Val Lys Ser Lys Lys His Pro
1295 1300 1305

Gln Ile Ile Lys Lys Gly Gly Ser Pro Lys Lys Lys Arg Lys Val
1310 1315 1320

Ser Ser Asp Tyr Lys Asp His Asp Gly Asp Tyr Lys Asp His Asp
1325 1330 1335

Ile Asp Tyr Lys Asp Asp Asp Asp Lys Ser Gly Gly Ser Gly Gly
1340 1345 1350

Ser Gly Gly Ser Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr
1355 1360 1365

Gly Lys Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu
1370 1375 1380

Glu Val Glu Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu

1385 1390 1395

Val His Thr Ala Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu
1400 1405 1410

Leu Thr Ser Asp Ala Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile
1415 1420 1425

Gln Asp Ser Asn Gly Glu Asn Lys Ile Lys Met Leu Ser Gly Gly
1430 1435 1440

Ser Gly Gly Ser Gly Gly Ser Thr Asn Leu Ser Asp Ile Ile Glu
1445 1450 1455

Lys Glu Thr Gly Lys Gln Leu Val Ile Gln Glu Ser Ile Leu Met
1460 1465 1470

Leu Pro Glu Glu Val Glu Glu Val Ile Gly Asn Lys Pro Glu Ser
1475 1480 1485

Asp Ile Leu Val His Thr Ala Tyr Asp Glu Ser Thr Asp Glu Asn
1490 1495 1500

Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr Lys Pro Trp Ala
1505 1510 1515

Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile Lys Met Leu
1520 1525 1530

Ser Gly Gly Ser Pro Lys Lys Lys Arg Lys Val
1535 1540

<210> 169
<211> 661
<212> DNA
<213> Homo sapiens

<400> 169
catccttggt accgagctcg gatccagcca ccatggatag cctcttgatg aatagacgca 60

agttcctgta tcagtttaaa aacgtgagat gggcaaaagg ccgacgagag acatatctgt 120

gctatgtcgt taagcgcaga gattcagcca ccagtttctc tctcgacttc ggctacctgc 180

ggaacaagaa tggttgccat gttgagctcc tgttcctgag gtatatcagc gactgggatt 240

tggacccagg gcggtgctat agggtgacat ggtttacctc ctggtcacct tgttatgact 300

gcgcgcggca tgttgccgat tttctgagag ggaaccctaa cctgtctctg aggatcttca 360

ccgcgcgact gtacttctgt gaggaccgga aagccgaacc cgagggactg agacgcctcc 420

acagagcggg tgtgcagatt gccataatga cctttaagga ctacttctac tgctggaaca 480

ccttcgtcga aaatcacgag cggactttca aggcttggga aggattgcat gaaaacagcg 540

tcaggctttc caggcagctt cgccgcattc ttctcccgtt gtacgaggtt gatgacctca 600

gagatgcctt tagaacactg ggactgtagg cggccgctcg attggtttgg tgtggctcta 660

a 661

<210> 170
<211> 755
<212> DNA
<213> Homo sapiens

<400> 170
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tggaccccac attgagacgg cggatcgagc cccatgagtt tgaggtattc ttcgatccga 120

gagagctccg caaggagacc tgcctgcttt acgaaattaa ttgggggggc cggcactcca 180

tttggcgaca tacatcacag aacactaaca agcacgtcga agtcaacttc atcgagaagt 240

tcacgacaga aagatatttc tgtccgaaca caaggtgcag cattacctgg tttctcagct 300

ggagcccatg cgggcgaatg tagtagggcc atcactgaat tcctgtcaag gtatccccac 360

gtcactctgt ttatttacat cgcaaggctg taccaccacg ctgacccccg caatcgacaa 420

ggcctgcggg atttgatctc ttcaggtgtg actatccaaa ttatgactga gcaggagtca 480

ggatactgct ggagaaactt tctgaattat agcccgagta atgaagccca ctggcctagg 540

tatccccatc tgtgggtacg actgtacgtt cttgaactgt actgcatcat actgggcctg 600

cctccttgtc tcaacattct gagaaggaag cagccacagc tgacattctt taccatcgct 660

cttcagtctt gtcattacca gcgactgccc ccacacattc tctgggccac cgggttgaaa 720

tgagcggccg ctcgattggt ttggtgtggc tctaa 755

<210> 171
<211> 574
<212> DNA
<213> Petromyzon marinus

<400> 171
ctcacagatg ctatgtcctg ttcgaactca agagaagagg agagaaaggc gggcctgttt 60

ctgggggtac gcggttaata aaccccagtc cgggaccgag agggggggatt cacgccgaga 120

tcttttcaat taggaaggtt gaagagtatc ttcgcgacaa tcccggtcag ttcacaatta 180

actggtacag ctcctggagc ccttgcgctg attgcgccga gaaaatactc gaatggtaca 240

accaggactt gagaggcaat ggccacactc tcaagatttg ggcttgcaag ctttactacg 300

agaagaacgc gagaaatcag attggcttgt ggaacctcag ggacaacggg gtcgggttga 360

atgttatggt gtccgaacat taccagtgct gtagaaagat cttcattcag tccagtcaca 420

atcagctgaa cgagaacaga tggctggaga aaacactgaa acgggcagag aaaaggcgct 480

cagagctgag tatcatgatc caggtcaaaa tcctgcatac aaccaaaagc ccggctgtat 540

aagcggccgc tcgattggtt tggtgtggct ctaa 574

<210> 172
<211> 1045
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 172
catccttggt accgagctcg gatccagcca ccatggagct gaagtatcac cctgagatgc 60

ggtttttcca ctggtttagt aagtggcgca aacttcatcg ggatcaggag tatgaagtga 120

cctggtatat ctcttggtct ccctgcacaa aatgtacacg cgavatggaa acatttctgg 180

ccgaggatcc aaaggtgacg ctcacaaatc tttgtggccc gcctgtatta tttctgggac 240

ccggattatc aggaggcact taggtcattg tgccaaaagc gcgacggacc acgggcgact 300

atgaaaatca tgaattatga cgaattccag cattgctgga gtaagtttgt gtacagccag 360

cgggagctgt tcgagccctg gaacaatctt cccaagtact acatactgct tcacattatg 420

ttgggggaga tccttcggca ctctatggat cctcctaccc tttacgttta aactttaata 480

atgagccttg ggttcgcggg cgccatgaaa cctatttgtg ctacgaggtc gagcggatcc 540

ataatgatac gtgggtcctg ctgaatcaga ggagggggtt tctgtgtaac caggctccac 600

ataaagatgg atttctcgag gggcggcacg ccgaactgtg tttccttgat gtgatacctt 660

tctggaagct cgaccttgat caagattaca gggtgacgtg tttcacctcc tggtcaccct 720

gcttcagttg cgcccaagag atggctaaat ttagcagtaa gaacaagcat gtgtccctct 780

gtatttttac agccagaatt tatgatgacc agggccggtg ccaggagggg ctgcggacac 840

tcgctgaggc gggcgcgaag atcagcataa tgacatactc cgaattcaaa cactgttggg 900

acacttttgt ggaccaccag ggctgcccat ttcagccgtg ggatgggctc gacgaacata 960

gtcaggatct ctcaggccgg ctgcgagcca tattgcagaa ccaggagaat taggcggccg 1020

ctcgattggt ttggtgtggc tctaa 1045

<210> 173
<211> 785
<212> DNA
<213> Escherichia coli

<400> 173
ggccggggat tctagaaata attttgttta actttaagaa ggagatatac catggatgtc 60

ttctgaaacc ggtccggttg cggttgaccc gaccctgcgt cgtcgtatcg aaccgcacga 120

attcgaagtt ttcttcgacc ccgcgtgaac tgcgtaaaga aacctgcctg ctgtacgaaa 180

tcaactgggg tggtcgtcac tctatctggc gtcacacctc tcagaacacc aacaaacacg 240

ttgaagttaa cttcatcgaa aaattcacca ccgaacgtta cttctgcccg aacacccgtt 300

gctctatcac ctggttcctg tcttggtctc cgtgcggtga atgctcctcg tgcgatcacc 360

gaattcctgt ctcgttaccc gcacgttacc ctgttcatct acatcgcgcg tctgtaccac 420

cacgcggacc cgcgtaaccg tcagggtctg cgtgacctga tctcttctgg tgttaccatc 480

cagatcatga ccgaacagga atctggttac tgctggcgta acttcgttaa ctactctccg 540

tctaacgaag cgcactggcc gcgttacccg cacctgtggg ttcgtctgta cgttctggaa 600

ctgtactgca tcatcctggg tctgccgccg tgcctgaaca tcctgcgtcg taaacagccg 660

cagctgacct cttcaccatc gcgctgcagt cttgccacta ccagcgtctg ccgccgcaca 720

tcctgtgggc gaccggtctg aaaggtggta gtggagggag cggcggttca atggataaga 780

aatac 785

<210> 174
<211> 1710
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 174

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1 5 10 15

Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
20 25 30

Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
35 40 45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
50 55 60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65 70 75 80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
85 90 95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
100 105 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
115 120 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
130 135 140

```
Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220

Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
225                 230                 235                 240

Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
                245                 250                 255

Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
            260                 265                 270

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

Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
    290                 295                 300

Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys
305                 310                 315                 320

Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
                325                 330                 335

Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
            340                 345                 350
```

```
Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp
        355                 360                 365

Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys
    370                 375                 380

Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
385                 390                 395                 400

Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
                405                 410                 415

Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
            420                 425                 430

Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser
        435                 440                 445

Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg
    450                 455                 460

Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
465                 470                 475                 480

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
                485                 490                 495

Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
            500                 505                 510

Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp
        515                 520                 525

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

Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro
545                 550                 555                 560
```

```
Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
                565                 570                 575

Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys
            580                 585                 590

Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
        595                 600                 605

Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
    610                 615                 620

Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
625                 630                 635                 640

Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His
                645                 650                 655

Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
            660                 665                 670

Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
        675                 680                 685

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
    690                 695                 700

Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
705                 710                 715                 720

Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile
                725                 730                 735

Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
            740                 745                 750

Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu
        755                 760                 765
```

```
Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu
    770                 775                 780

Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn
785                 790                 795                 800

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
                805                 810                 815

Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
            820                 825                 830

Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
        835                 840                 845

Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val
    850                 855                 860

Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu
865                 870                 875                 880

Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
                885                 890                 895

Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn
            900                 905                 910

Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys
        915                 920                 925

Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp
    930                 935                 940

Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln
945                 950                 955                 960

Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala
                965                 970                 975
```

```
Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val
            980                 985                 990


Lys Val Met Gly Arg His Lys Pro  Glu Asn Ile Val Ile  Glu Met Ala
        995                 1000                1005


Arg Glu  Asn Gln Thr Thr Gln  Lys Gly Gln Lys Asn  Ser Arg Glu
    1010                1015                1020


Arg Met  Lys Arg Ile Glu Glu  Gly Ile Lys Glu Leu  Gly Ser Gln
    1025                1030                1035


Ile Leu  Lys Glu His Pro Val  Glu Asn Thr Gln Leu  Gln Asn Glu
    1040                1045                1050


Lys Leu  Tyr Leu Tyr Tyr Leu  Gln Asn Gly Arg Asp  Met Tyr Val
    1055                1060                1065


Asp Gln  Glu Leu Asp Ile Asn  Arg Leu Ser Asp Tyr  Asp Val Asp
    1070                1075                1080


His Ile  Val Pro Gln Ser Phe  Leu Lys Asp Asp Ser  Ile Asp Asn
    1085                1090                1095


Lys Val  Leu Thr Arg Ser Asp  Lys Asn Arg Gly Lys  Ser Asp Asn
    1100                1105                1110


Val Pro  Ser Glu Glu Val Val  Lys Lys Met Lys Asn  Tyr Trp Arg
    1115                1120                1125


Gln Leu  Leu Asn Ala Lys Leu  Ile Thr Gln Arg Lys  Phe Asp Asn
    1130                1135                1140


Leu Thr  Lys Ala Glu Arg Gly  Gly Leu Ser Glu Leu  Asp Lys Ala
    1145                1150                1155


Gly Phe  Ile Lys Arg Gln Leu  Val Glu Thr Arg Gln  Ile Thr Lys
    1160                1165                1170
```

```
His Val  Ala Gln Ile Leu Asp  Ser Arg Met Asn Thr  Lys Tyr Asp
    1175                1180                1185

Glu Asn  Asp Lys Leu Ile Arg  Glu Val Lys Val Ile  Thr Leu Lys
    1190                1195                1200

Ser Lys  Leu Val Ser Asp Phe  Arg Lys Asp Phe Gln  Phe Tyr Lys
    1205                1210                1215

Val Arg  Glu Ile Asn Asn Tyr  His His Ala His Asp  Ala Tyr Leu
    1220                1225                1230

Asn Ala  Val Val Gly Thr Ala  Leu Ile Lys Lys Tyr  Pro Lys Leu
    1235                1240                1245

Glu Ser  Glu Phe Val Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg
    1250                1255                1260

Lys Met  Ile Ala Lys Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala
    1265                1270                1275

Lys Tyr  Phe Phe Tyr Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu
    1280                1285                1290

Ile Thr  Leu Ala Asn Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu
    1295                1300                1305

Thr Asn  Gly Glu Thr Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp
    1310                1315                1320

Phe Ala  Thr Val Arg Lys Val  Leu Ser Met Pro Gln  Val Asn Ile
    1325                1330                1335

Val Lys  Lys Thr Glu Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser
    1340                1345                1350

Ile Leu  Pro Lys Arg Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys
    1355                1360                1365
```

```
Asp Trp  Asp Pro Lys Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val
    1370                1375                1380

Ala Tyr  Ser Val Leu Val Val  Ala Lys Val Glu Lys  Gly Lys Ser
    1385                1390                1395

Lys Lys  Leu Lys Ser Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met
    1400                1405                1410

Glu Arg  Ser Ser Phe Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala
    1415                1420                1425

Lys Gly  Tyr Lys Glu Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro
    1430                1435                1440

Lys Tyr  Ser Leu Phe Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu
    1445                1450                1455

Ala Ser  Ala Gly Glu Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro
    1460                1465                1470

Ser Lys  Tyr Val Asn Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys
    1475                1480                1485

Leu Lys  Gly Ser Pro Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val
    1490                1495                1500

Glu Gln  His Lys His Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser
    1505                1510                1515

Glu Phe  Ser Lys Arg Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys
    1520                1525                1530

Val Leu  Ser Ala Tyr Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu
    1535                1540                1545

Gln Ala  Glu Asn Ile Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly
    1550                1555                1560
```

```
Ala Pro  Ala Ala Phe Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys
    1565                1570                1575


Arg Tyr  Thr Ser Thr Lys Glu  Val Leu Asp Ala Thr  Leu Ile His
    1580                1585                1590


Gln Ser  Ile Thr Gly Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln
    1595                1600                1605


Leu Gly  Gly Asp Ser Gly Gly  Ser Thr Asn Leu Ser  Asp Ile Ile
    1610                1615                1620


Glu Lys  Glu Thr Gly Lys Gln  Leu Val Ile Gln Glu  Ser Ile Leu
    1625                1630                1635


Met Leu  Pro Glu Glu Val Glu  Glu Val Ile Gly Asn  Lys Pro Glu
    1640                1645                1650


Ser Asp  Ile Leu Val His Thr  Ala Tyr Asp Glu Ser  Thr Asp Glu
    1655                1660                1665


Asn Val  Met Leu Leu Thr Ser  Asp Ala Pro Glu Tyr  Lys Pro Trp
    1670                1675                1680


Ala Leu  Val Ile Gln Asp Ser  Asn Gly Glu Asn Lys  Ile Lys Met
    1685                1690                1695


Leu Ser  Gly Gly Ser Pro Lys  Lys Lys Arg Lys Val
    1700                1705                1710


<210>  175
<211>  1689
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic Polypeptide

<400>  175

Met Thr Asp Ala Glu Tyr Val Arg Ile His Glu Lys Leu Asp Ile Tyr
```

1 5 10 15

Thr Phe Lys Lys Gln Phe Phe Asn Asn Lys Lys Ser Val Ser His Arg
20 25 30

Cys Tyr Val Leu Phe Glu Leu Lys Arg Arg Gly Glu Arg Arg Ala Cys
35 40 45

Phe Trp Gly Tyr Ala Val Asn Lys Pro Gln Ser Gly Thr Glu Arg Gly
50 55 60

Ile His Ala Glu Ile Phe Ser Ile Arg Lys Val Glu Glu Tyr Leu Arg
65 70 75 80

Asp Asn Pro Gly Gln Phe Thr Ile Asn Trp Tyr Ser Ser Trp Ser Pro
85 90 95

Cys Ala Asp Cys Ala Glu Lys Ile Leu Glu Trp Tyr Asn Gln Glu Leu
100 105 110

Arg Gly Asn Gly His Thr Leu Lys Ile Trp Ala Cys Lys Leu Tyr Tyr
115 120 125

Glu Lys Asn Ala Arg Asn Gln Ile Gly Leu Trp Asn Leu Arg Asp Asn
130 135 140

Gly Val Gly Leu Asn Val Met Val Ser Glu His Tyr Gln Cys Cys Arg
145 150 155 160

Lys Ile Phe Ile Gln Ser Ser His Asn Gln Leu Asn Glu Asn Arg Trp
165 170 175

Leu Glu Lys Thr Leu Lys Arg Ala Glu Lys Arg Arg Ser Glu Leu Ser
180 185 190

Ile Met Ile Gln Val Lys Ile Leu His Thr Thr Lys Ser Pro Ala Val
195 200 205

Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser

210 215 220

Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly
225 230 235 240

Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
245 250 255

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
260 265 270

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
275 280 285

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
290 295 300

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe
305 310 315 320

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
325 330 335

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
340 345 350

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
355 360 365

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
370 375 380

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

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
405 410 415

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys

420 425 430

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
435 440 445

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
450 455 460

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
465 470 475 480

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
485 490 495

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
500 505 510

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
515 520 525

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
530 535 540

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
545 550 555 560

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
565 570 575

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
580 585 590

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
595 600 605

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
610 615 620

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly

625 630 635 640

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
645 650 655

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
660 665 670

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
675 680 685

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
690 695 700

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
705 710 715 720

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
725 730 735

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
740 745 750

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
755 760 765

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
770 775 780

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
785 790 795 800

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
805 810 815

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
820 825 830

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu

```
        835                 840                 845

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
    850                 855                 860

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
865                 870                 875                 880

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
                885                 890                 895

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
            900                 905                 910

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
        915                 920                 925

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
    930                 935                 940

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
945                 950                 955                 960

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
                965                 970                 975

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
            980                 985                 990

Thr Gln Lys Gly Gln Lys Asn Ser  Arg Glu Arg Met Lys  Arg Ile Glu
        995                 1000                1005

Glu Gly  Ile Lys Glu Leu Gly  Ser Gln Ile Leu Lys  Glu His Pro
    1010                1015                1020

Val Glu  Asn Thr Gln Leu Gln  Asn Glu Lys Leu Tyr  Leu Tyr Tyr
    1025                1030                1035

Leu Gln  Asn Gly Arg Asp Met  Tyr Val Asp Gln Glu  Leu Asp Ile
```

1040 1045 1050

Asn Arg Leu Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser
1055 1060 1065

Phe Leu Lys Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser
1070 1075 1080

Asp Lys Asn Arg Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val
1085 1090 1095

Val Lys Lys Met Lys Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys
1100 1105 1110

Leu Ile Thr Gln Arg Lys Phe Asp Asn Leu Thr Lys Ala Glu Arg
1115 1120 1125

Gly Gly Leu Ser Glu Leu Asp Lys Ala Gly Phe Ile Lys Arg Gln
1130 1135 1140

Leu Val Glu Thr Arg Gln Ile Thr Lys His Val Ala Gln Ile Leu
1145 1150 1155

Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu Asn Asp Lys Leu Ile
1160 1165 1170

Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys Leu Val Ser Asp
1175 1180 1185

Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu Ile Asn Asn
1190 1195 1200

Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val Gly Thr
1205 1210 1215

Ala Leu Ile Lys Lys Tyr Pro Lys Leu Glu Ser Glu Phe Val Tyr
1220 1225 1230

Gly Asp Tyr Lys Val Tyr Asp Val Arg Lys Met Ile Ala Lys Ser

1235 1240 1245

Glu Gln Glu Ile Gly Lys Ala Thr Ala Lys Tyr Phe Phe Tyr Ser
1250 1255 1260

Asn Ile Met Asn Phe Phe Lys Thr Glu Ile Thr Leu Ala Asn Gly
1265 1270 1275

Glu Ile Arg Lys Arg Pro Leu Ile Glu Thr Asn Gly Glu Thr Gly
1280 1285 1290

Glu Ile Val Trp Asp Lys Gly Arg Asp Phe Ala Thr Val Arg Lys
1295 1300 1305

Val Leu Ser Met Pro Gln Val Asn Ile Val Lys Lys Thr Glu Val
1310 1315 1320

Gln Thr Gly Gly Phe Ser Lys Glu Ser Ile Leu Pro Lys Arg Asn
1325 1330 1335

Ser Asp Lys Leu Ile Ala Arg Lys Lys Asp Trp Asp Pro Lys Lys
1340 1345 1350

Tyr Gly Gly Phe Asp Ser Pro Thr Val Ala Tyr Ser Val Leu Val
1355 1360 1365

Val Ala Lys Val Glu Lys Gly Lys Ser Lys Lys Leu Lys Ser Val
1370 1375 1380

Lys Glu Leu Leu Gly Ile Thr Ile Met Glu Arg Ser Ser Phe Glu
1385 1390 1395

Lys Asn Pro Ile Asp Phe Leu Glu Ala Lys Gly Tyr Lys Glu Val
1400 1405 1410

Lys Lys Asp Leu Ile Ile Lys Leu Pro Lys Tyr Ser Leu Phe Glu
1415 1420 1425

Leu Glu Asn Gly Arg Lys Arg Met Leu Ala Ser Ala Gly Glu Leu

1430 1435 1440

Gln Lys Gly Asn Glu Leu Ala Leu Pro Ser Lys Tyr Val Asn Phe
1445 1450 1455

Leu Tyr Leu Ala Ser His Tyr Glu Lys Leu Lys Gly Ser Pro Glu
1460 1465 1470

Asp Asn Glu Gln Lys Gln Leu Phe Val Glu Gln His Lys His Tyr
1475 1480 1485

Leu Asp Glu Ile Ile Glu Gln Ile Ser Glu Phe Ser Lys Arg Val
1490 1495 1500

Ile Leu Ala Asp Ala Asn Leu Asp Lys Val Leu Ser Ala Tyr Asn
1505 1510 1515

Lys His Arg Asp Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile Ile
1520 1525 1530

His Leu Phe Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala Phe Lys
1535 1540 1545

Tyr Phe Asp Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser Thr Lys
1550 1555 1560

Glu Val Leu Asp Ala Thr Leu Ile His Gln Ser Ile Thr Gly Leu
1565 1570 1575

Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp Ser Gly
1580 1585 1590

Gly Ser Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys
1595 1600 1605

Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val
1610 1615 1620

Glu Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His

1625 1630 1635

Thr Ala Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr
1640 1645 1650

Ser Asp Ala Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp
1655 1660 1665

Ser Asn Gly Glu Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Pro
1670 1675 1680

Lys Lys Lys Arg Lys Val
1685

<210> 176
<211> 1679
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 176

Met Asp Ser Leu Leu Met Asn Arg Arg Lys Phe Leu Tyr Gln Phe Lys
1 5 10 15

Asn Val Arg Trp Ala Lys Gly Arg Arg Glu Thr Tyr Leu Cys Tyr Val
20 25 30

Val Lys Arg Arg Asp Ser Ala Thr Ser Phe Ser Leu Asp Phe Gly Tyr
35 40 45

Leu Arg Asn Lys Asn Gly Cys His Val Glu Leu Leu Phe Leu Arg Tyr
50 55 60

Ile Ser Asp Trp Asp Leu Asp Pro Gly Arg Cys Tyr Arg Val Thr Trp
65 70 75 80

Phe Thr Ser Trp Ser Pro Cys Tyr Asp Cys Ala Arg His Val Ala Asp
85 90 95

```
Phe Leu Arg Gly Asn Pro Asn Leu Ser Leu Arg Ile Phe Thr Ala Arg
            100                 105                 110

Leu Tyr Phe Cys Glu Asp Arg Lys Ala Glu Pro Glu Gly Leu Arg Arg
        115                 120                 125

Leu His Arg Ala Gly Val Gln Ile Ala Ile Met Thr Phe Lys Asp Tyr
    130                 135                 140

Phe Tyr Cys Trp Asn Thr Phe Val Glu Asn His Glu Arg Thr Phe Lys
145                 150                 155                 160

Ala Trp Glu Gly Leu His Glu Asn Ser Val Arg Leu Ser Arg Gln Leu
                165                 170                 175

Arg Arg Ile Leu Leu Pro Leu Tyr Glu Val Asp Asp Leu Arg Asp Ala
            180                 185                 190

Phe Arg Thr Leu Gly Leu Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu
        195                 200                 205

Ser Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile
    210                 215                 220

Gly Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val
225                 230                 235                 240

Pro Ser Lys Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile
                245                 250                 255

Lys Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala
            260                 265                 270

Glu Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg
        275                 280                 285

Lys Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala
    290                 295                 300
```

```
Lys Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val
305                 310                 315                 320

Glu Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val
                325                 330                 335

Asp Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg
            340                 345                 350

Lys Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr
        355                 360                 365

Leu Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu
    370                 375                 380

Gly Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln
385                 390                 395                 400

Leu Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala
                405                 410                 415

Ser Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser
            420                 425                 430

Arg Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn
        435                 440                 445

Gly Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn
    450                 455                 460

Phe Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser
465                 470                 475                 480

Lys Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly
                485                 490                 495

Asp Gln Tyr Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala
            500                 505                 510
```

```
Ile Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala
        515                 520                 525

Pro Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp
    530                 535                 540

Leu Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr
545                 550                 555                 560

Lys Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile
                565                 570                 575

Asp Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile
            580                 585                 590

Leu Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg
        595                 600                 605

Glu Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro
    610                 615                 620

His Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu
625                 630                 635                 640

Asp Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile
                645                 650                 655

Leu Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn
            660                 665                 670

Ser Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro
        675                 680                 685

Trp Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe
    690                 695                 700

Ile Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val
705                 710                 715                 720
```

```
Leu Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu
                725                 730                 735

Leu Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe
            740                 745                 750

Leu Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr
        755                 760                 765

Asn Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys
    770                 775                 780

Ile Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe
785                 790                 795                 800

Asn Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp
                805                 810                 815

Lys Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile
            820                 825                 830

Val Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg
        835                 840                 845

Leu Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu
    850                 855                 860

Lys Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile
865                 870                 875                 880

Asn Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu
                885                 890                 895

Lys Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp
            900                 905                 910

Asp Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly
        915                 920                 925
```

```
Gln Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro
    930                 935                 940

Ala Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu
945                 950                 955                 960

Val Lys Val Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met
                965                 970                 975

Ala Arg Glu Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu
            980                 985                 990

Arg Met Lys Arg Ile Glu Glu Gly  Ile Lys Glu Leu Gly  Ser Gln Ile
        995                 1000                1005

Leu Lys  Glu His Pro Val Glu  Asn Thr Gln Leu Gln  Asn Glu Lys
    1010                1015                1020

Leu Tyr  Leu Tyr Tyr Leu Gln  Asn Gly Arg Asp Met  Tyr Val Asp
    1025                1030                1035

Gln Glu  Leu Asp Ile Asn Arg  Leu Ser Asp Tyr Asp  Val Asp His
    1040                1045                1050

Ile Val  Pro Gln Ser Phe Leu  Lys Asp Asp Ser Ile  Asp Asn Lys
    1055                1060                1065

Val Leu  Thr Arg Ser Asp Lys  Asn Arg Gly Lys Ser  Asp Asn Val
    1070                1075                1080

Pro Ser  Glu Glu Val Val Lys  Lys Met Lys Asn Tyr  Trp Arg Gln
    1085                1090                1095

Leu Leu  Asn Ala Lys Leu Ile  Thr Gln Arg Lys Phe  Asp Asn Leu
    1100                1105                1110

Thr Lys  Ala Glu Arg Gly Gly  Leu Ser Glu Leu Asp  Lys Ala Gly
    1115                1120                1125
```

```
Phe Ile  Lys Arg Gln Leu Val  Glu Thr Arg Gln Ile  Thr Lys His
    1130                1135                1140


Val Ala  Gln Ile Leu Asp Ser  Arg Met Asn Thr Lys  Tyr Asp Glu
    1145                1150                1155


Asn Asp  Lys Leu Ile Arg Glu  Val Lys Val Ile Thr  Leu Lys Ser
    1160                1165                1170


Lys Leu  Val Ser Asp Phe Arg  Lys Asp Phe Gln Phe  Tyr Lys Val
    1175                1180                1185


Arg Glu  Ile Asn Asn Tyr His  His Ala His Asp Ala  Tyr Leu Asn
    1190                1195                1200


Ala Val  Val Gly Thr Ala Leu  Ile Lys Lys Tyr Pro  Lys Leu Glu
    1205                1210                1215


Ser Glu  Phe Val Tyr Gly Asp  Tyr Lys Val Tyr Asp  Val Arg Lys
    1220                1225                1230


Met Ile  Ala Lys Ser Glu Gln  Glu Ile Gly Lys Ala  Thr Ala Lys
    1235                1240                1245


Tyr Phe  Phe Tyr Ser Asn Ile  Met Asn Phe Phe Lys  Thr Glu Ile
    1250                1255                1260


Thr Leu  Ala Asn Gly Glu Ile  Arg Lys Arg Pro Leu  Ile Glu Thr
    1265                1270                1275


Asn Gly  Glu Thr Gly Glu Ile  Val Trp Asp Lys Gly  Arg Asp Phe
    1280                1285                1290


Ala Thr  Val Arg Lys Val Leu  Ser Met Pro Gln Val  Asn Ile Val
    1295                1300                1305


Lys Lys  Thr Glu Val Gln Thr  Gly Gly Phe Ser Lys  Glu Ser Ile
    1310                1315                1320
```

```
Leu Pro  Lys Arg Asn Ser Asp  Lys Leu Ile Ala Arg  Lys Lys Asp
    1325                 1330                 1335

Trp Asp  Pro Lys Lys Tyr Gly  Gly Phe Asp Ser Pro  Thr Val Ala
    1340                 1345                 1350

Tyr Ser  Val Leu Val Val Ala  Lys Val Glu Lys Gly  Lys Ser Lys
    1355                 1360                 1365

Lys Leu  Lys Ser Val Lys Glu  Leu Leu Gly Ile Thr  Ile Met Glu
    1370                 1375                 1380

Arg Ser  Ser Phe Glu Lys Asn  Pro Ile Asp Phe Leu  Glu Ala Lys
    1385                 1390                 1395

Gly Tyr  Lys Glu Val Lys Lys  Asp Leu Ile Ile Lys  Leu Pro Lys
    1400                 1405                 1410

Tyr Ser  Leu Phe Glu Leu Glu  Asn Gly Arg Lys Arg  Met Leu Ala
    1415                 1420                 1425

Ser Ala  Gly Glu Leu Gln Lys  Gly Asn Glu Leu Ala  Leu Pro Ser
    1430                 1435                 1440

Lys Tyr  Val Asn Phe Leu Tyr  Leu Ala Ser His Tyr  Glu Lys Leu
    1445                 1450                 1455

Lys Gly  Ser Pro Glu Asp Asn  Glu Gln Lys Gln Leu  Phe Val Glu
    1460                 1465                 1470

Gln His  Lys His Tyr Leu Asp  Glu Ile Ile Glu Gln  Ile Ser Glu
    1475                 1480                 1485

Phe Ser  Lys Arg Val Ile Leu  Ala Asp Ala Asn Leu  Asp Lys Val
    1490                 1495                 1500

Leu Ser  Ala Tyr Asn Lys His  Arg Asp Lys Pro Ile  Arg Glu Gln
    1505                 1510                 1515
```

```
Ala Glu  Asn Ile Ile His Leu  Phe Thr Leu Thr Asn  Leu Gly Ala
    1520                1525                1530

Pro Ala  Ala Phe Lys Tyr Phe  Asp Thr Thr Ile Asp  Arg Lys Arg
    1535                1540                1545

Tyr Thr  Ser Thr Lys Glu Val  Leu Asp Ala Thr Leu  Ile His Gln
    1550                1555                1560

Ser Ile  Thr Gly Leu Tyr Glu  Thr Arg Ile Asp Leu  Ser Gln Leu
    1565                1570                1575

Gly Gly  Asp Ser Gly Gly Ser  Thr Asn Leu Ser Asp  Ile Ile Glu
    1580                1585                1590

Lys Glu  Thr Gly Lys Gln Leu  Val Ile Gln Glu Ser  Ile Leu Met
    1595                1600                1605

Leu Pro  Glu Glu Val Glu Glu  Val Ile Gly Asn Lys  Pro Glu Ser
    1610                1615                1620

Asp Ile  Leu Val His Thr Ala  Tyr Asp Glu Ser Thr  Asp Glu Asn
    1625                1630                1635

Val Met  Leu Leu Thr Ser Asp  Ala Pro Glu Tyr Lys  Pro Trp Ala
    1640                1645                1650

Leu Val  Ile Gln Asp Ser Asn  Gly Glu Asn Lys Ile  Lys Met Leu
    1655                1660                1665

Ser Gly  Gly Ser Pro Lys Lys  Lys Arg Lys Val
    1670                1675
```

<210> 177
<211> 1806
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 177

Met Glu Leu Lys Tyr His Pro Glu Met Arg Phe Phe His Trp Phe Ser
1 5 10 15

Lys Trp Arg Lys Leu His Arg Asp Gln Glu Tyr Glu Val Thr Trp Tyr
20 25 30

Ile Ser Trp Ser Pro Cys Thr Lys Cys Thr Arg Asp Met Ala Thr Phe
35 40 45

Leu Ala Glu Asp Pro Lys Val Thr Leu Thr Ile Phe Val Ala Arg Leu
50 55 60

Tyr Tyr Phe Trp Asp Pro Asp Tyr Gln Glu Ala Leu Arg Ser Leu Cys
65 70 75 80

Gln Lys Arg Asp Gly Pro Arg Ala Thr Met Lys Ile Met Asn Tyr Asp
85 90 95

Glu Phe Gln His Cys Trp Ser Lys Phe Val Tyr Ser Gln Arg Glu Leu
100 105 110

Phe Glu Pro Trp Asn Asn Leu Pro Lys Tyr Tyr Ile Leu Leu His Ile
115 120 125

Met Leu Gly Glu Ile Leu Arg His Ser Met Asp Pro Pro Thr Phe Thr
130 135 140

Phe Asn Phe Asn Asn Glu Pro Trp Val Arg Gly Arg His Glu Thr Tyr
145 150 155 160

Leu Cys Tyr Glu Val Glu Arg Met His Asn Asp Thr Trp Val Leu Leu
165 170 175

Asn Gln Arg Arg Gly Phe Leu Cys Asn Gln Ala Pro His Lys His Gly
180 185 190

Phe Leu Glu Gly Arg His Ala Glu Leu Cys Phe Leu Asp Val Ile Pro

195 200 205

Phe Trp Lys Leu Asp Leu Asp Gln Asp Tyr Arg Val Thr Cys Phe Thr
210 215 220

Ser Trp Ser Pro Cys Phe Ser Cys Ala Gln Glu Met Ala Lys Phe Ile
225 230 235 240

Ser Lys Asn Lys His Val Ser Leu Cys Ile Phe Thr Ala Arg Ile Tyr
245 250 255

Asp Asp Gln Gly Arg Cys Gln Glu Gly Leu Arg Thr Leu Ala Glu Ala
260 265 270

Gly Ala Lys Ile Ser Ile Met Thr Tyr Ser Glu Phe Lys His Cys Trp
275 280 285

Asp Thr Phe Val Asp His Gln Gly Cys Pro Phe Gln Pro Trp Asp Gly
290 295 300

Leu Asp Glu His Ser Gln Asp Leu Ser Gly Arg Leu Arg Ala Ile Leu
305 310 315 320

Gln Asn Gln Glu Asn Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
325 330 335

Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
340 345 350

Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
355 360 365

Ser Lys Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys
370 375 380

Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
385 390 395 400

Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys

405 410 415

Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
420 425 430

Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
435 440 445

Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp
450 455 460

Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys
465 470 475 480

Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
485 490 495

Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
500 505 510

Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
515 520 525

Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser
530 535 540

Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg
545 550 555 560

Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
565 570 575

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
580 585 590

Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
595 600 605

Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp

610 615 620

Gln Tyr Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile
625 630 635 640

Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro
645 650 655

Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
660 665 670

Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys
675 680 685

Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
690 695 700

Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
705 710 715 720

Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
725 730 735

Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His
740 745 750

Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
755 760 765

Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
770 775 780

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
785 790 795 800

Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
805 810 815

Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile

820 825 830

Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
835 840 845

Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu
850 855 860

Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu
865 870 875 880

Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn
885 890 895

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
900 905 910

Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
915 920 925

Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
930 935 940

Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val
945 950 955 960

Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu
965 970 975

Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
980 985 990

Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn
995 1000 1005

Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu
1010 1015 1020

Lys Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His

1025 1030 1035

Asp Asp Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val
1040 1045 1050

Ser Gly Gln Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala
1055 1060 1065

Gly Ser Pro Ala Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val
1070 1075 1080

Val Asp Glu Leu Val Lys Val Met Gly Arg His Lys Pro Glu Asn
1085 1090 1095

Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr Thr Gln Lys Gly
1100 1105 1110

Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu Glu Gly Ile
1115 1120 1125

Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val Glu Asn
1130 1135 1140

Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln Asn
1145 1150 1155

Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
1160 1165 1170

Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys
1175 1180 1185

Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn
1190 1195 1200

Arg Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys
1205 1210 1215

Met Lys Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr

1220 1225 1230

Gln Arg Lys Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu
1235 1240 1245

Ser Glu Leu Asp Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu
1250 1255 1260

Thr Arg Gln Ile Thr Lys His Val Ala Gln Ile Leu Asp Ser Arg
1265 1270 1275

Met Asn Thr Lys Tyr Asp Glu Asn Asp Lys Leu Ile Arg Glu Val
1280 1285 1290

Lys Val Ile Thr Leu Lys Ser Lys Leu Val Ser Asp Phe Arg Lys
1295 1300 1305

Asp Phe Gln Phe Tyr Lys Val Arg Glu Ile Asn Asn Tyr His His
1310 1315 1320

Ala His Asp Ala Tyr Leu Asn Ala Val Val Gly Thr Ala Leu Ile
1325 1330 1335

Lys Lys Tyr Pro Lys Leu Glu Ser Glu Phe Val Tyr Gly Asp Tyr
1340 1345 1350

Lys Val Tyr Asp Val Arg Lys Met Ile Ala Lys Ser Glu Gln Glu
1355 1360 1365

Ile Gly Lys Ala Thr Ala Lys Tyr Phe Phe Tyr Ser Asn Ile Met
1370 1375 1380

Asn Phe Phe Lys Thr Glu Ile Thr Leu Ala Asn Gly Glu Ile Arg
1385 1390 1395

Lys Arg Pro Leu Ile Glu Thr Asn Gly Glu Thr Gly Glu Ile Val
1400 1405 1410

Trp Asp Lys Gly Arg Asp Phe Ala Thr Val Arg Lys Val Leu Ser

1415 1420 1425

Met Pro Gln Val Asn Ile Val Lys Lys Thr Glu Val Gln Thr Gly
1430 1435 1440

Gly Phe Ser Lys Glu Ser Ile Leu Pro Lys Arg Asn Ser Asp Lys
1445 1450 1455

Leu Ile Ala Arg Lys Lys Asp Trp Asp Pro Lys Lys Tyr Gly Gly
1460 1465 1470

Phe Asp Ser Pro Thr Val Ala Tyr Ser Val Leu Val Val Ala Lys
1475 1480 1485

Val Glu Lys Gly Lys Ser Lys Lys Leu Lys Ser Val Lys Glu Leu
1490 1495 1500

Leu Gly Ile Thr Ile Met Glu Arg Ser Ser Phe Glu Lys Asn Pro
1505 1510 1515

Ile Asp Phe Leu Glu Ala Lys Gly Tyr Lys Glu Val Lys Lys Asp
1520 1525 1530

Leu Ile Ile Lys Leu Pro Lys Tyr Ser Leu Phe Glu Leu Glu Asn
1535 1540 1545

Gly Arg Lys Arg Met Leu Ala Ser Ala Gly Glu Leu Gln Lys Gly
1550 1555 1560

Asn Glu Leu Ala Leu Pro Ser Lys Tyr Val Asn Phe Leu Tyr Leu
1565 1570 1575

Ala Ser His Tyr Glu Lys Leu Lys Gly Ser Pro Glu Asp Asn Glu
1580 1585 1590

Gln Lys Gln Leu Phe Val Glu Gln His Lys His Tyr Leu Asp Glu
1595 1600 1605

Ile Ile Glu Gln Ile Ser Glu Phe Ser Lys Arg Val Ile Leu Ala

1610 1615 1620

Asp Ala Asn Leu Asp Lys Val Leu Ser Ala Tyr Asn Lys His Arg
1625 1630 1635

Asp Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile Ile His Leu Phe
1640 1645 1650

Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala Phe Lys Tyr Phe Asp
1655 1660 1665

Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser Thr Lys Glu Val Leu
1670 1675 1680

Asp Ala Thr Leu Ile His Gln Ser Ile Thr Gly Leu Tyr Glu Thr
1685 1690 1695

Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp Ser Gly Gly Ser Thr
1700 1705 1710

Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys Gln Leu Val
1715 1720 1725

Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu Glu Val
1730 1735 1740

Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala Tyr
1745 1750 1755

Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala
1760 1765 1770

Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly
1775 1780 1785

Glu Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Pro Lys Lys Lys
1790 1795 1800

Arg Lys Val

<210> 178
<211> 1709
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 178

Met Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys Gln Leu
1 5 10 15

Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu Glu Val
20 25 30

Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala Tyr Asp
35 40 45

Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala Pro Glu
50 55 60

Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys
65 70 75 80

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

Asp Pro Thr Leu Arg Arg Arg Ile Glu Pro His Glu Phe Glu Val Phe
100 105 110

Phe Asp Pro Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile
115 120 125

Asn Trp Gly Gly Arg His Ser Ile Trp Arg His Thr Ser Gln Asn Thr
130 135 140

Asn Lys His Val Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg
145 150 155 160

```
Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp
                165                 170                 175

Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg
            180                 185                 190

Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr His His
        195                 200                 205

Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly
    210                 215                 220

Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg
225                 230                 235                 240

Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu Ala His Trp Pro Arg Tyr
                245                 250                 255

Pro His Leu Trp Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile
            260                 265                 270

Leu Gly Leu Pro Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln
        275                 280                 285

Leu Thr Phe Phe Thr Ile Ala Leu Gln Ser Cys His Tyr Gln Arg Leu
    290                 295                 300

Pro Pro His Ile Leu Trp Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr
305                 310                 315                 320

Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser
                325                 330                 335

Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly Trp Ala Val Ile Thr
            340                 345                 350

Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys Val Leu Gly Asn Thr
        355                 360                 365
```

```
Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp
    370                 375                 380

Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg
385                 390                 395                 400

Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe
                405                 410                 415

Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe Phe His Arg Leu Glu
            420                 425                 430

Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His Glu Arg His Pro Ile
        435                 440                 445

Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His Glu Lys Tyr Pro Thr
    450                 455                 460

Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser Thr Asp Lys Ala Asp
465                 470                 475                 480

Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met Ile Lys Phe Arg Gly
                485                 490                 495

His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp Asn Ser Asp Val Asp
            500                 505                 510

Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu
        515                 520                 525

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

Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro
545                 550                 555                 560

Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu
                565                 570                 575
```

```
Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala
            580                 585                 590

Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu
        595                 600                 605

Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu Phe Leu Ala Ala Lys
    610                 615                 620

Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile Leu Arg Val Asn Thr
625                 630                 635                 640

Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp
                645                 650                 655

Glu His His Gln Asp Leu Thr Leu Leu Lys Ala Leu Val Arg Gln Gln
            660                 665                 670

Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly
        675                 680                 685

Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys
    690                 695                 700

Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly Thr Glu Glu Leu Leu
705                 710                 715                 720

Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp
                725                 730                 735

Asn Gly Ser Ile Pro His Gln Ile His Leu Gly Glu Leu His Ala Ile
            740                 745                 750

Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu
        755                 760                 765

Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro
    770                 775                 780
```

```
Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met Thr Arg Lys Ser Glu
785                 790                 795                 800

Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val Val Asp Lys Gly Ala
                805                 810                 815

Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn Phe Asp Lys Asn Leu
            820                 825                 830

Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe
        835                 840                 845

Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr Val Thr Glu Gly Met
    850                 855                 860

Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys Lys Ala Ile Val Asp
865                 870                 875                 880

Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val Lys Gln Leu Lys Glu
                885                 890                 895

Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser Val Glu Ile Ser Gly
            900                 905                 910

Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr Tyr His Asp Leu Leu
        915                 920                 925

Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp
    930                 935                 940

Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu
945                 950                 955                 960

Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His Leu Phe Asp Asp Lys
                965                 970                 975

Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu
            980                 985                 990
```

```
Ser Arg Lys Leu Ile Asn Gly Ile  Arg Asp Lys Gln Ser  Gly Lys Thr
        995                 1000                1005


Ile Leu  Asp Phe Leu Lys Ser  Asp Gly Phe Ala Asn  Arg Asn Phe
    1010                1015                1020


Met Gln  Leu Ile His Asp Asp  Ser Leu Thr Phe Lys  Glu Asp Ile
    1025                1030                1035


Gln Lys  Ala Gln Val Ser Gly  Gln Gly Asp Ser Leu  His Glu His
    1040                1045                1050


Ile Ala  Asn Leu Ala Gly Ser  Pro Ala Ile Lys Lys  Gly Ile Leu
    1055                1060                1065


Gln Thr  Val Lys Val Val Asp  Glu Leu Val Lys Val  Met Gly Arg
    1070                1075                1080


His Lys  Pro Glu Asn Ile Val  Ile Glu Met Ala Arg  Glu Asn Gln
    1085                1090                1095


Thr Thr  Gln Lys Gly Gln Lys  Asn Ser Arg Glu Arg  Met Lys Arg
    1100                1105                1110


Ile Glu  Glu Gly Ile Lys Glu  Leu Gly Ser Gln Ile  Leu Lys Glu
    1115                1120                1125


His Pro  Val Glu Asn Thr Gln  Leu Gln Asn Glu Lys  Leu Tyr Leu
    1130                1135                1140


Tyr Tyr  Leu Gln Asn Gly Arg  Asp Met Tyr Val Asp  Gln Glu Leu
    1145                1150                1155


Asp Ile  Asn Arg Leu Ser Asp  Tyr Asp Val Asp His  Ile Val Pro
    1160                1165                1170


Gln Ser  Phe Leu Lys Asp Asp  Ser Ile Asp Asn Lys  Val Leu Thr
    1175                1180                1185
```

```
Arg Ser  Asp Lys Asn Arg Gly  Lys Ser Asp Asn Val  Pro Ser Glu
    1190                 1195                 1200

Glu Val  Val Lys Lys Met Lys  Asn Tyr Trp Arg Gln  Leu Leu Asn
    1205                 1210                 1215

Ala Lys  Leu Ile Thr Gln Arg  Lys Phe Asp Asn Leu  Thr Lys Ala
    1220                 1225                 1230

Glu Arg  Gly Gly Leu Ser Glu  Leu Asp Lys Ala Gly  Phe Ile Lys
    1235                 1240                 1245

Arg Gln  Leu Val Glu Thr Arg  Gln Ile Thr Lys His  Val Ala Gln
    1250                 1255                 1260

Ile Leu  Asp Ser Arg Met Asn  Thr Lys Tyr Asp Glu  Asn Asp Lys
    1265                 1270                 1275

Leu Ile  Arg Glu Val Lys Val  Ile Thr Leu Lys Ser  Lys Leu Val
    1280                 1285                 1290

Ser Asp  Phe Arg Lys Asp Phe  Gln Phe Tyr Lys Val  Arg Glu Ile
    1295                 1300                 1305

Asn Asn  Tyr His His Ala His  Asp Ala Tyr Leu Asn  Ala Val Val
    1310                 1315                 1320

Gly Thr  Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
    1325                 1330                 1335

Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
    1340                 1345                 1350

Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
    1355                 1360                 1365

Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
    1370                 1375                 1380
```

```
Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
    1385                1390                1395

Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1400                1405                1410

Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1415                1420                1425

Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
    1430                1435                1440

Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
    1445                1450                1455

Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
    1460                1465                1470

Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
    1475                1480                1485

Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser
    1490                1495                1500

Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys
    1505                1510                1515

Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu
    1520                1525                1530

Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1535                1540                1545

Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
    1550                1555                1560

Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu Lys Leu  Lys Gly Ser
    1565                1570                1575
```

```
Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe Val Glu  Gln His Lys
    1580                 1585                 1590


His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile Ser Glu  Phe Ser Lys
    1595                 1600                 1605


Arg Val  Ile Leu Ala Asp Ala  Asn Leu Asp Lys Val  Leu Ser Ala
    1610                 1615                 1620


Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg Glu Gln  Ala Glu Asn
    1625                 1630                 1635


Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu Gly Ala  Pro Ala Ala
    1640                 1645                 1650


Phe Lys  Tyr Phe Asp Thr Thr  Ile Asp Arg Lys Arg  Tyr Thr Ser
    1655                 1660                 1665


Thr Lys  Glu Val Leu Asp Ala  Thr Leu Ile His Gln  Ser Ile Thr
    1670                 1675                 1680


Gly Leu  Tyr Glu Thr Arg Ile  Asp Leu Ser Gln Leu  Gly Gly Asp
    1685                 1690                 1695


Ser Gly  Gly Ser Pro Lys Lys  Lys Arg Lys Val
    1700                 1705
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<210> 179
<211> 1810
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 179

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Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1               5                  10                  15


Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
```

20 25 30

Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
35 40 45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
50 55 60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65 70 75 80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
85 90 95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
100 105 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
115 120 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
130 135 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145 150 155 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
165 170 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
180 185 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
195 200 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
210 215 220

Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser

225 230 235 240

Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
245 250 255

Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
260 265 270

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

Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
290 295 300

Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys
305 310 315 320

Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
325 330 335

Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
340 345 350

Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp
355 360 365

Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys
370 375 380

Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
385 390 395 400

Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
405 410 415

Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
420 425 430

Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser

435 440 445

Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg
450 455 460

Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
465 470 475 480

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
485 490 495

Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
500 505 510

Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp
515 520 525

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

Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro
545 550 555 560

Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
565 570 575

Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys
580 585 590

Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
595 600 605

Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
610 615 620

Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
625 630 635 640

Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His

645 650 655

Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
660 665 670

Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
675 680 685

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
690 695 700

Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
705 710 715 720

Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile
725 730 735

Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
740 745 750

Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu
755 760 765

Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu
770 775 780

Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn
785 790 795 800

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
805 810 815

Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
820 825 830

Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
835 840 845

Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val

```
    850                 855                 860

Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu
865                 870                 875                 880

Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
                885                 890                 895

Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn
            900                 905                 910

Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys
        915                 920                 925

Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp
    930                 935                 940

Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln
945                 950                 955                 960

Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala
                965                 970                 975

Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val
            980                 985                 990

Lys Val Met Gly Arg His Lys Pro  Glu Asn Ile Val Ile  Glu Met Ala
        995                 1000                1005

Arg Glu  Asn Gln Thr Thr Gln  Lys Gly Gln Lys Asn  Ser Arg Glu
    1010                1015                1020

Arg Met  Lys Arg Ile Glu Glu  Gly Ile Lys Glu Leu  Gly Ser Gln
    1025                1030                1035

Ile Leu  Lys Glu His Pro Val  Glu Asn Thr Gln Leu  Gln Asn Glu
    1040                1045                1050

Lys Leu  Tyr Leu Tyr Tyr Leu  Gln Asn Gly Arg Asp  Met Tyr Val
```

1055 1060 1065

Asp Gln Glu Leu Asp Ile Asn Arg Leu Ser Asp Tyr Asp Val Asp
1070 1075 1080

His Ile Val Pro Gln Ser Phe Leu Lys Asp Asp Ser Ile Asp Asn
1085 1090 1095

Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly Lys Ser Asp Asn
1100 1105 1110

Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn Tyr Trp Arg
1115 1120 1125

Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe Asp Asn
1130 1135 1140

Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys Ala
1145 1150 1155

Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
1160 1165 1170

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
1175 1180 1185

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys
1190 1195 1200

Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
1205 1210 1215

Val Arg Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu
1220 1225 1230

Asn Ala Val Val Gly Thr Ala Leu Ile Lys Lys Tyr Pro Lys Leu
1235 1240 1245

Glu Ser Glu Phe Val Tyr Gly Asp Tyr Lys Val Tyr Asp Val Arg

1250 1255 1260

Lys Met Ile Ala Lys Ser Glu Gln Glu Ile Gly Lys Ala Thr Ala
1265 1270 1275

Lys Tyr Phe Phe Tyr Ser Asn Ile Met Asn Phe Phe Lys Thr Glu
1280 1285 1290

Ile Thr Leu Ala Asn Gly Glu Ile Arg Lys Arg Pro Leu Ile Glu
1295 1300 1305

Thr Asn Gly Glu Thr Gly Glu Ile Val Trp Asp Lys Gly Arg Asp
1310 1315 1320

Phe Ala Thr Val Arg Lys Val Leu Ser Met Pro Gln Val Asn Ile
1325 1330 1335

Val Lys Lys Thr Glu Val Gln Thr Gly Gly Phe Ser Lys Glu Ser
1340 1345 1350

Ile Leu Pro Lys Arg Asn Ser Asp Lys Leu Ile Ala Arg Lys Lys
1355 1360 1365

Asp Trp Asp Pro Lys Lys Tyr Gly Gly Phe Asp Ser Pro Thr Val
1370 1375 1380

Ala Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys Gly Lys Ser
1385 1390 1395

Lys Lys Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr Ile Met
1400 1405 1410

Glu Arg Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala
1415 1420 1425

Lys Gly Tyr Lys Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro
1430 1435 1440

Lys Tyr Ser Leu Phe Glu Leu Glu Asn Gly Arg Lys Arg Met Leu

1445 1450 1455

Ala Ser Ala Gly Glu Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro
1460 1465 1470

Ser Lys Tyr Val Asn Phe Leu Tyr Leu Ala Ser His Tyr Glu Lys
1475 1480 1485

Leu Lys Gly Ser Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val
1490 1495 1500

Glu Gln His Lys His Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser
1505 1510 1515

Glu Phe Ser Lys Arg Val Ile Leu Ala Asp Ala Asn Leu Asp Lys
1520 1525 1530

Val Leu Ser Ala Tyr Asn Lys His Arg Asp Lys Pro Ile Arg Glu
1535 1540 1545

Gln Ala Glu Asn Ile Ile His Leu Phe Thr Leu Thr Asn Leu Gly
1550 1555 1560

Ala Pro Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys
1565 1570 1575

Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His
1580 1585 1590

Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln
1595 1600 1605

Leu Gly Gly Asp Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Ala
1610 1615 1620

Ser Arg Gly Val Asn Lys Val Ile Leu Val Gly Asn Leu Gly Gln
1625 1630 1635

Asp Pro Glu Val Arg Tyr Met Pro Asn Gly Gly Ala Val Ala Asn

1640 1645 1650

Ile Thr Leu Ala Thr Ser Glu Ser Trp Arg Asp Lys Ala Thr Gly
1655 1660 1665

Glu Met Lys Glu Gln Thr Glu Trp His Arg Val Val Leu Phe Gly
1670 1675 1680

Lys Leu Ala Glu Val Ala Ser Glu Tyr Leu Arg Lys Gly Ser Gln
1685 1690 1695

Val Tyr Ile Glu Gly Gln Leu Arg Thr Arg Lys Trp Thr Asp Gln
1700 1705 1710

Ser Gly Gln Asp Arg Tyr Thr Thr Glu Val Val Val Asn Val Gly
1715 1720 1725

Gly Thr Met Gln Met Leu Gly Gly Arg Gln Gly Gly Gly Ala Pro
1730 1735 1740

Ala Gly Gly Asn Ile Gly Gly Gly Gln Pro Gln Gly Gly Trp Gly
1745 1750 1755

Gln Pro Gln Gln Pro Gln Gly Gly Asn Gln Phe Ser Gly Gly Ala
1760 1765 1770

Gln Ser Arg Pro Gln Gln Ser Ala Pro Ala Ala Pro Ser Asn Glu
1775 1780 1785

Pro Pro Met Asp Phe Asp Asp Asp Ile Pro Phe Ser Gly Gly Ser
1790 1795 1800

Pro Lys Lys Lys Arg Lys Val
1805 1810

<210> 180
<211> 1716
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 180

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Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1               5                  10                  15


Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
            20                  25                  30


Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
        35                  40                  45


Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
    50                  55                  60


Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65                  70                  75                  80


Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
                85                  90                  95


Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
            100                 105                 110


Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
        115                 120                 125


Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140


Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160


Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175


Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190
```

```
Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220

Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
225                 230                 235                 240

Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
                245                 250                 255

Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
            260                 265                 270

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

Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
    290                 295                 300

Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys
305                 310                 315                 320

Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
                325                 330                 335

Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
            340                 345                 350

Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp
        355                 360                 365

Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys
    370                 375                 380

Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
385                 390                 395                 400
```

```
Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
                405                 410                 415

Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
            420                 425                 430

Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser
        435                 440                 445

Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg
    450                 455                 460

Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
465                 470                 475                 480

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
                485                 490                 495

Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
            500                 505                 510

Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp
        515                 520                 525

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

Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro
545                 550                 555                 560

Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
                565                 570                 575

Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys
            580                 585                 590

Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
        595                 600                 605
```

```
Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
    610                 615                 620

Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
625                 630                 635                 640

Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His
                645                 650                 655

Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
            660                 665                 670

Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
        675                 680                 685

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
    690                 695                 700

Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
705                 710                 715                 720

Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile
                725                 730                 735

Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
            740                 745                 750

Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu
        755                 760                 765

Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu
    770                 775                 780

Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn
785                 790                 795                 800

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
                805                 810                 815
```

```
Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
            820                 825                 830

Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
        835                 840                 845

Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val
    850                 855                 860

Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu
865                 870                 875                 880

Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
                885                 890                 895

Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn
            900                 905                 910

Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys
        915                 920                 925

Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp
    930                 935                 940

Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln
945                 950                 955                 960

Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala
                965                 970                 975

Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val
            980                 985                 990

Lys Val Met Gly Arg His Lys Pro  Glu Asn Ile Val Ile  Glu Met Ala
        995                 1000                1005

Arg Glu  Asn Gln Thr Thr Gln  Lys Gly Gln Lys Asn  Ser Arg Glu
    1010                1015                1020
```

```
Arg Met  Lys Arg Ile Glu Glu  Gly Ile Lys Glu Leu  Gly Ser Gln
    1025                1030                1035

Ile Leu  Lys Glu His Pro Val  Glu Asn Thr Gln Leu  Gln Asn Glu
    1040                1045                1050

Lys Leu  Tyr Leu Tyr Tyr Leu  Gln Asn Gly Arg Asp  Met Tyr Val
    1055                1060                1065

Asp Gln  Glu Leu Asp Ile Asn  Arg Leu Ser Asp Tyr  Asp Val Asp
    1070                1075                1080

His Ile  Val Pro Gln Ser Phe  Leu Lys Asp Asp Ser  Ile Asp Asn
    1085                1090                1095

Lys Val  Leu Thr Arg Ser Asp  Lys Asn Arg Gly Lys  Ser Asp Asn
    1100                1105                1110

Val Pro  Ser Glu Glu Val Val  Lys Lys Met Lys Asn  Tyr Trp Arg
    1115                1120                1125

Gln Leu  Leu Asn Ala Lys Leu  Ile Thr Gln Arg Lys  Phe Asp Asn
    1130                1135                1140

Leu Thr  Lys Ala Glu Arg Gly  Gly Leu Ser Glu Leu  Asp Lys Ala
    1145                1150                1155

Gly Phe  Ile Lys Arg Gln Leu  Val Glu Thr Arg Gln  Ile Thr Lys
    1160                1165                1170

His Val  Ala Gln Ile Leu Asp  Ser Arg Met Asn Thr  Lys Tyr Asp
    1175                1180                1185

Glu Asn  Asp Lys Leu Ile Arg  Glu Val Lys Val Ile  Thr Leu Lys
    1190                1195                1200

Ser Lys  Leu Val Ser Asp Phe  Arg Lys Asp Phe Gln  Phe Tyr Lys
    1205                1210                1215
```

```
Val Arg  Glu Ile Asn Asn Tyr  His His Ala His Asp  Ala Tyr Leu
    1220                1225                1230

Asn Ala  Val Val Gly Thr Ala  Leu Ile Lys Lys Tyr  Pro Lys Leu
    1235                1240                1245

Glu Ser  Glu Phe Val Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg
    1250                1255                1260

Lys Met  Ile Ala Lys Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala
    1265                1270                1275

Lys Tyr  Phe Phe Tyr Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu
    1280                1285                1290

Ile Thr  Leu Ala Asn Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu
    1295                1300                1305

Thr Asn  Gly Glu Thr Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp
    1310                1315                1320

Phe Ala  Thr Val Arg Lys Val  Leu Ser Met Pro Gln  Val Asn Ile
    1325                1330                1335

Val Lys  Lys Thr Glu Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser
    1340                1345                1350

Ile Leu  Pro Lys Arg Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys
    1355                1360                1365

Asp Trp  Asp Pro Lys Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val
    1370                1375                1380

Ala Tyr  Ser Val Leu Val Val  Ala Lys Val Glu Lys  Gly Lys Ser
    1385                1390                1395

Lys Lys  Leu Lys Ser Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met
    1400                1405                1410
```

```
Glu Arg  Ser Ser Phe Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala
    1415                 1420                 1425

Lys Gly  Tyr Lys Glu Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro
    1430                 1435                 1440

Lys Tyr  Ser Leu Phe Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu
    1445                 1450                 1455

Ala Ser  Ala Gly Glu Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro
    1460                 1465                 1470

Ser Lys  Tyr Val Asn Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys
    1475                 1480                 1485

Leu Lys  Gly Ser Pro Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val
    1490                 1495                 1500

Glu Gln  His Lys His Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser
    1505                 1510                 1515

Glu Phe  Ser Lys Arg Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys
    1520                 1525                 1530

Val Leu  Ser Ala Tyr Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu
    1535                 1540                 1545

Gln Ala  Glu Asn Ile Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly
    1550                 1555                 1560

Ala Pro  Ala Ala Phe Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys
    1565                 1570                 1575

Arg Tyr  Thr Ser Thr Lys Glu  Val Leu Asp Ala Thr  Leu Ile His
    1580                 1585                 1590

Gln Ser  Ile Thr Gly Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln
    1595                 1600                 1605
```

```
Leu Gly  Gly Asp Ser Gly Gly  Ser Gly Gly Ser Gly  Gly Ser Thr
    1610                 1615                 1620


Asn Leu  Ser Asp Ile Ile Glu  Lys Glu Thr Gly Lys  Gln Leu Val
    1625                 1630                 1635


Ile Gln  Glu Ser Ile Leu Met  Leu Pro Glu Glu Val  Glu Glu Val
    1640                 1645                 1650


Ile Gly  Asn Lys Pro Glu Ser  Asp Ile Leu Val His  Thr Ala Tyr
    1655                 1660                 1665


Asp Glu  Ser Thr Asp Glu Asn  Val Met Leu Leu Thr  Ser Asp Ala
    1670                 1675                 1680


Pro Glu  Tyr Lys Pro Trp Ala  Leu Val Ile Gln Asp  Ser Asn Gly
    1685                 1690                 1695


Glu Asn  Lys Ile Lys Met Leu  Ser Gly Gly Ser Pro  Lys Lys Lys
    1700                 1705                 1710


Arg Lys  Val
    1715


<210>  181
<211>  1722
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic Polypeptide

<400>  181

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1               5                  10                  15


Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
            20                  25                  30


Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
```

35 40 45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
50 55 60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65 70 75 80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
85 90 95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
100 105 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
115 120 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
130 135 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145 150 155 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
165 170 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
180 185 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
195 200 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
210 215 220

Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
225 230 235 240

Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly

245 250 255

Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
260 265 270

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

Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
290 295 300

Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys
305 310 315 320

Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
325 330 335

Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
340 345 350

Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp
355 360 365

Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys
370 375 380

Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
385 390 395 400

Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
405 410 415

Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
420 425 430

Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser
435 440 445

Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg

```
    450                 455                 460

Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
465                 470                 475                 480

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
                485                 490                 495

Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
            500                 505                 510

Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp
        515                 520                 525

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

Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro
545                 550                 555                 560

Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
                565                 570                 575

Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys
            580                 585                 590

Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
        595                 600                 605

Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
    610                 615                 620

Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
625                 630                 635                 640

Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His
                645                 650                 655

Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
```

660 665 670

Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
675 680 685

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
690 695 700

Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
705 710 715 720

Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile
725 730 735

Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
740 745 750

Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu
755 760 765

Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu
770 775 780

Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn
785 790 795 800

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
805 810 815

Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
820 825 830

Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
835 840 845

Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val
850 855 860

Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu

865 870 875 880

Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
885 890 895

Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn
900 905 910

Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys
915 920 925

Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp
930 935 940

Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln
945 950 955 960

Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala
965 970 975

Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val
980 985 990

Lys Val Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala
995 1000 1005

Arg Glu Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu
1010 1015 1020

Arg Met Lys Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln
1025 1030 1035

Ile Leu Lys Glu His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu
1040 1045 1050

Lys Leu Tyr Leu Tyr Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val
1055 1060 1065

Asp Gln Glu Leu Asp Ile Asn Arg Leu Ser Asp Tyr Asp Val Asp

1070 1075 1080

His Ile Val Pro Gln Ser Phe Leu Lys Asp Asp Ser Ile Asp Asn
1085 1090 1095

Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly Lys Ser Asp Asn
1100 1105 1110

Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn Tyr Trp Arg
1115 1120 1125

Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe Asp Asn
1130 1135 1140

Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys Ala
1145 1150 1155

Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
1160 1165 1170

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
1175 1180 1185

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys
1190 1195 1200

Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
1205 1210 1215

Val Arg Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu
1220 1225 1230

Asn Ala Val Val Gly Thr Ala Leu Ile Lys Lys Tyr Pro Lys Leu
1235 1240 1245

Glu Ser Glu Phe Val Tyr Gly Asp Tyr Lys Val Tyr Asp Val Arg
1250 1255 1260

Lys Met Ile Ala Lys Ser Glu Gln Glu Ile Gly Lys Ala Thr Ala

1265 1270 1275

Lys Tyr Phe Phe Tyr Ser Asn Ile Met Asn Phe Phe Lys Thr Glu
1280 1285 1290

Ile Thr Leu Ala Asn Gly Glu Ile Arg Lys Arg Pro Leu Ile Glu
1295 1300 1305

Thr Asn Gly Glu Thr Gly Glu Ile Val Trp Asp Lys Gly Arg Asp
1310 1315 1320

Phe Ala Thr Val Arg Lys Val Leu Ser Met Pro Gln Val Asn Ile
1325 1330 1335

Val Lys Lys Thr Glu Val Gln Thr Gly Gly Phe Ser Lys Glu Ser
1340 1345 1350

Ile Leu Pro Lys Arg Asn Ser Asp Lys Leu Ile Ala Arg Lys Lys
1355 1360 1365

Asp Trp Asp Pro Lys Lys Tyr Gly Gly Phe Asp Ser Pro Thr Val
1370 1375 1380

Ala Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys Gly Lys Ser
1385 1390 1395

Lys Lys Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr Ile Met
1400 1405 1410

Glu Arg Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala
1415 1420 1425

Lys Gly Tyr Lys Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro
1430 1435 1440

Lys Tyr Ser Leu Phe Glu Leu Glu Asn Gly Arg Lys Arg Met Leu
1445 1450 1455

Ala Ser Ala Gly Glu Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro

1460 1465 1470

Ser Lys Tyr Val Asn Phe Leu Tyr Leu Ala Ser His Tyr Glu Lys
1475 1480 1485

Leu Lys Gly Ser Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val
1490 1495 1500

Glu Gln His Lys His Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser
1505 1510 1515

Glu Phe Ser Lys Arg Val Ile Leu Ala Asp Ala Asn Leu Asp Lys
1520 1525 1530

Val Leu Ser Ala Tyr Asn Lys His Arg Asp Lys Pro Ile Arg Glu
1535 1540 1545

Gln Ala Glu Asn Ile Ile His Leu Phe Thr Leu Thr Asn Leu Gly
1550 1555 1560

Ala Pro Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys
1565 1570 1575

Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His
1580 1585 1590

Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln
1595 1600 1605

Leu Gly Gly Asp Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
1610 1615 1620

Ala Thr Pro Glu Ser Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu
1625 1630 1635

Thr Gly Lys Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro
1640 1645 1650

Glu Glu Val Glu Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile

1655 1660 1665

Leu Val His Thr Ala Tyr Asp Glu Ser Thr Asp Glu Asn Val Met
1670 1675 1680

Leu Leu Thr Ser Asp Ala Pro Glu Tyr Lys Pro Trp Ala Leu Val
1685 1690 1695

Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile Lys Met Leu Ser Gly
1700 1705 1710

Gly Ser Pro Lys Lys Lys Arg Lys Val
1715 1720

<210> 182
<211> 1726
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 182

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1 5 10 15

Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
20 25 30

Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
35 40 45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
50 55 60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65 70 75 80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
85 90 95

```
Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
            100                 105                 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
        115                 120                 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220

Ala Thr Gly Leu Lys Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Ser
225                 230                 235                 240

Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Ser Gly Gly
                245                 250                 255

Ser Ser Gly Gly Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
            260                 265                 270

Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
        275                 280                 285

Ser Lys Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys
    290                 295                 300
```

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Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
305                 310                 315                 320

Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys
                325                 330                 335

Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
            340                 345                 350

Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
        355                 360                 365

Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp
    370                 375                 380

Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys
385                 390                 395                 400

Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
                405                 410                 415

Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
            420                 425                 430

Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
        435                 440                 445

Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser
    450                 455                 460

Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg
465                 470                 475                 480

Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
                485                 490                 495

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
            500                 505                 510
```

```
Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
        515                 520                 525

Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp
    530                 535                 540

Gln Tyr Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile
545                 550                 555                 560

Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro
                565                 570                 575

Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
            580                 585                 590

Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys
        595                 600                 605

Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
    610                 615                 620

Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
625                 630                 635                 640

Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
                645                 650                 655

Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His
            660                 665                 670

Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
        675                 680                 685

Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
    690                 695                 700

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
705                 710                 715                 720
```

```
Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
                725                 730                 735

Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile
            740                 745                 750

Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
        755                 760                 765

Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu
    770                 775                 780

Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu
785                 790                 795                 800

Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn
                805                 810                 815

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
            820                 825                 830

Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
        835                 840                 845

Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
    850                 855                 860

Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val
865                 870                 875                 880

Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu
                885                 890                 895

Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
            900                 905                 910

Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn
        915                 920                 925
```

```
Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys
    930                 935                 940

Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp
945                 950                 955                 960

Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln
                965                 970                 975

Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala
            980                 985                 990

Ile Lys Lys Gly Ile Leu Gln Thr  Val Lys Val Val Asp  Glu Leu Val
        995                 1000                1005

Lys Val  Met Gly Arg His Lys  Pro Glu Asn Ile Val  Ile Glu Met
    1010                1015                1020

Ala Arg  Glu Asn Gln Thr Thr  Gln Lys Gly Gln Lys  Asn Ser Arg
    1025                1030                1035

Glu Arg  Met Lys Arg Ile Glu  Glu Gly Ile Lys Glu  Leu Gly Ser
    1040                1045                1050

Gln Ile  Leu Lys Glu His Pro  Val Glu Asn Thr Gln  Leu Gln Asn
    1055                1060                1065

Glu Lys  Leu Tyr Leu Tyr Tyr  Leu Gln Asn Gly Arg  Asp Met Tyr
    1070                1075                1080

Val Asp  Gln Glu Leu Asp Ile  Asn Arg Leu Ser Asp  Tyr Asp Val
    1085                1090                1095

Asp His  Ile Val Pro Gln Ser  Phe Leu Lys Asp Asp  Ser Ile Asp
    1100                1105                1110

Asn Lys  Val Leu Thr Arg Ser  Asp Lys Asn Arg Gly  Lys Ser Asp
    1115                1120                1125
```

```
Asn Val  Pro Ser Glu Glu Val  Val Lys Lys Met Lys  Asn Tyr Trp
    1130                1135                1140

Arg Gln  Leu Leu Asn Ala Lys  Leu Ile Thr Gln Arg  Lys Phe Asp
    1145                1150                1155

Asn Leu  Thr Lys Ala Glu Arg  Gly Gly Leu Ser Glu  Leu Asp Lys
    1160                1165                1170

Ala Gly  Phe Ile Lys Arg Gln  Leu Val Glu Thr Arg  Gln Ile Thr
    1175                1180                1185

Lys His  Val Ala Gln Ile Leu  Asp Ser Arg Met Asn  Thr Lys Tyr
    1190                1195                1200

Asp Glu  Asn Asp Lys Leu Ile  Arg Glu Val Lys Val  Ile Thr Leu
    1205                1210                1215

Lys Ser  Lys Leu Val Ser Asp  Phe Arg Lys Asp Phe  Gln Phe Tyr
    1220                1225                1230

Lys Val  Arg Glu Ile Asn Asn  Tyr His His Ala His  Asp Ala Tyr
    1235                1240                1245

Leu Asn  Ala Val Val Gly Thr  Ala Leu Ile Lys Lys  Tyr Pro Lys
    1250                1255                1260

Leu Glu  Ser Glu Phe Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val
    1265                1270                1275

Arg Lys  Met Ile Ala Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr
    1280                1285                1290

Ala Lys  Tyr Phe Phe Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr
    1295                1300                1305

Glu Ile  Thr Leu Ala Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile
    1310                1315                1320
```

```
Glu Thr  Asn Gly Glu Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg
    1325                1330                1335

Asp Phe  Ala Thr Val Arg Lys  Val Leu Ser Met Pro  Gln Val Asn
    1340                1345                1350

Ile Val  Lys Lys Thr Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu
    1355                1360                1365

Ser Ile  Leu Pro Lys Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys
    1370                1375                1380

Lys Asp  Trp Asp Pro Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr
    1385                1390                1395

Val Ala  Tyr Ser Val Leu Val  Val Ala Lys Val Glu  Lys Gly Lys
    1400                1405                1410

Ser Lys  Lys Leu Lys Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile
    1415                1420                1425

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

Ala Lys  Gly Tyr Lys Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu
    1445                1450                1455

Pro Lys  Tyr Ser Leu Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met
    1460                1465                1470

Leu Ala  Ser Ala Gly Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu
    1475                1480                1485

Pro Ser  Lys Tyr Val Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu
    1490                1495                1500

Lys Leu  Lys Gly Ser Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe
    1505                1510                1515
```

```
Val Glu  Gln His Lys His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile
    1520                1525                1530

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

Lys Val  Leu Ser Ala Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg
    1550                1555                1560

Glu Gln  Ala Glu Asn Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu
    1565                1570                1575

Gly Ala  Pro Ala Ala Phe Lys  Tyr Phe Asp Thr Thr  Ile Asp Arg
    1580                1585                1590

Lys Arg  Tyr Thr Ser Thr Lys  Glu Val Leu Asp Ala  Thr Leu Ile
    1595                1600                1605

His Gln  Ser Ile Thr Gly Leu  Tyr Glu Thr Arg Ile  Asp Leu Ser
    1610                1615                1620

Gln Leu  Gly Gly Asp Ser Gly  Gly Ser Thr Asn Leu  Ser Asp Ile
    1625                1630                1635

Ile Glu  Lys Glu Thr Gly Lys  Gln Leu Val Ile Gln  Glu Ser Ile
    1640                1645                1650

Leu Met  Leu Pro Glu Glu Val  Glu Glu Val Ile Gly  Asn Lys Pro
    1655                1660                1665

Glu Ser  Asp Ile Leu Val His  Thr Ala Tyr Asp Glu  Ser Thr Asp
    1670                1675                1680

Glu Asn  Val Met Leu Leu Thr  Ser Asp Ala Pro Glu  Tyr Lys Pro
    1685                1690                1695

Trp Ala  Leu Val Ile Gln Asp  Ser Asn Gly Glu Asn  Lys Ile Lys
    1700                1705                1710
```

Met Leu Ser Gly Gly Ser Pro Lys Lys Lys Arg Lys Val
1715 1720 1725

<210> 183
<211> 1797
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 183

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1 5 10 15

Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
20 25 30

Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
35 40 45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
50 55 60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65 70 75 80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
85 90 95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
100 105 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
115 120 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
130 135 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser

145 150 155 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
165 170 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
180 185 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
195 200 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
210 215 220

Ala Thr Gly Leu Lys Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
225 230 235 240

Ala Thr Pro Glu Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
245 250 255

Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
260 265 270

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

Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
290 295 300

Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys
305 310 315 320

Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
325 330 335

Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
340 345 350

Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp

```
        355                 360                 365

Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys
    370                 375                 380

Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
385                 390                 395                 400

Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
                405                 410                 415

Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
            420                 425                 430

Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser
        435                 440                 445

Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg
    450                 455                 460

Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
465                 470                 475                 480

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
                485                 490                 495

Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
            500                 505                 510

Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp
        515                 520                 525

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

Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro
545                 550                 555                 560

Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
```

565 570 575

Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys
580 585 590

Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
595 600 605

Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
610 615 620

Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
625 630 635 640

Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His
645 650 655

Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
660 665 670

Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
675 680 685

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
690 695 700

Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
705 710 715 720

Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile
725 730 735

Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
740 745 750

Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu
755 760 765

Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu

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    770                 775                 780

Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn
785                 790                 795                 800

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
                805                 810                 815

Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
            820                 825                 830

Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
        835                 840                 845

Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val
    850                 855                 860

Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu
865                 870                 875                 880

Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
                885                 890                 895

Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn
            900                 905                 910

Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys
        915                 920                 925

Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp
    930                 935                 940

Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln
945                 950                 955                 960

Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala
                965                 970                 975

Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val
```

980 985 990

Lys Val Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala
995 1000 1005

Arg Glu Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu
1010 1015 1020

Arg Met Lys Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln
1025 1030 1035

Ile Leu Lys Glu His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu
1040 1045 1050

Lys Leu Tyr Leu Tyr Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val
1055 1060 1065

Asp Gln Glu Leu Asp Ile Asn Arg Leu Ser Asp Tyr Asp Val Asp
1070 1075 1080

His Ile Val Pro Gln Ser Phe Leu Lys Asp Asp Ser Ile Asp Asn
1085 1090 1095

Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly Lys Ser Asp Asn
1100 1105 1110

Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn Tyr Trp Arg
1115 1120 1125

Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe Asp Asn
1130 1135 1140

Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys Ala
1145 1150 1155

Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
1160 1165 1170

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp

1175 1180 1185

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys
1190 1195 1200

Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
1205 1210 1215

Val Arg Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu
1220 1225 1230

Asn Ala Val Val Gly Thr Ala Leu Ile Lys Lys Tyr Pro Lys Leu
1235 1240 1245

Glu Ser Glu Phe Val Tyr Gly Asp Tyr Lys Val Tyr Asp Val Arg
1250 1255 1260

Lys Met Ile Ala Lys Ser Glu Gln Glu Ile Gly Lys Ala Thr Ala
1265 1270 1275

Lys Tyr Phe Phe Tyr Ser Asn Ile Met Asn Phe Phe Lys Thr Glu
1280 1285 1290

Ile Thr Leu Ala Asn Gly Glu Ile Arg Lys Arg Pro Leu Ile Glu
1295 1300 1305

Thr Asn Gly Glu Thr Gly Glu Ile Val Trp Asp Lys Gly Arg Asp
1310 1315 1320

Phe Ala Thr Val Arg Lys Val Leu Ser Met Pro Gln Val Asn Ile
1325 1330 1335

Val Lys Lys Thr Glu Val Gln Thr Gly Gly Phe Ser Lys Glu Ser
1340 1345 1350

Ile Leu Pro Lys Arg Asn Ser Asp Lys Leu Ile Ala Arg Lys Lys
1355 1360 1365

Asp Trp Asp Pro Lys Lys Tyr Gly Gly Phe Asp Ser Pro Thr Val

1370 1375 1380

Ala Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys Gly Lys Ser
1385 1390 1395

Lys Lys Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr Ile Met
1400 1405 1410

Glu Arg Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala
1415 1420 1425

Lys Gly Tyr Lys Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro
1430 1435 1440

Lys Tyr Ser Leu Phe Glu Leu Glu Asn Gly Arg Lys Arg Met Leu
1445 1450 1455

Ala Ser Ala Gly Glu Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro
1460 1465 1470

Ser Lys Tyr Val Asn Phe Leu Tyr Leu Ala Ser His Tyr Glu Lys
1475 1480 1485

Leu Lys Gly Ser Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val
1490 1495 1500

Glu Gln His Lys His Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser
1505 1510 1515

Glu Phe Ser Lys Arg Val Ile Leu Ala Asp Ala Asn Leu Asp Lys
1520 1525 1530

Val Leu Ser Ala Tyr Asn Lys His Arg Asp Lys Pro Ile Arg Glu
1535 1540 1545

Gln Ala Glu Asn Ile Ile His Leu Phe Thr Leu Thr Asn Leu Gly
1550 1555 1560

Ala Pro Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys

1565 1570 1575

Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His
1580 1585 1590

Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln
1595 1600 1605

Leu Gly Gly Asp Ser Gly Gly Ser Thr Asn Leu Ser Asp Ile Ile
1610 1615 1620

Glu Lys Glu Thr Gly Lys Gln Leu Val Ile Gln Glu Ser Ile Leu
1625 1630 1635

Met Leu Pro Glu Glu Val Glu Glu Val Ile Gly Asn Lys Pro Glu
1640 1645 1650

Ser Asp Ile Leu Val His Thr Ala Tyr Asp Glu Ser Thr Asp Glu
1655 1660 1665

Asn Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr Lys Pro Trp
1670 1675 1680

Ala Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile Lys Met
1685 1690 1695

Leu Ser Gly Gly Ser Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu
1700 1705 1710

Thr Gly Lys Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro
1715 1720 1725

Glu Glu Val Glu Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile
1730 1735 1740

Leu Val His Thr Ala Tyr Asp Glu Ser Thr Asp Glu Asn Val Met
1745 1750 1755

Leu Leu Thr Ser Asp Ala Pro Glu Tyr Lys Pro Trp Ala Leu Val

1760 1765 1770

Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile Lys Met Leu Ser Gly
1775 1780 1785

Gly Ser Pro Lys Lys Lys Arg Lys Val
1790 1795

<210> 184
<211> 1825
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 184

Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
1 5 10 15

Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu
20 25 30

Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His
35 40 45

Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
50 55 60

Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65 70 75 80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
85 90 95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
100 105 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
115 120 125

```
Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
        195                 200                 205

Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
    210                 215                 220

Ala Thr Gly Leu Lys Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Ser
225                 230                 235                 240

Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Ser Gly Gly
                245                 250                 255

Ser Ser Gly Gly Ser Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly
            260                 265                 270

Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro
        275                 280                 285

Ser Lys Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys
    290                 295                 300

Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu
305                 310                 315                 320

Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys
                325                 330                 335
```

```
Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys
            340                 345                 350

Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu
        355                 360                 365

Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp
    370                 375                 380

Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys
385                 390                 395                 400

Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu
                405                 410                 415

Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly
            420                 425                 430

Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu
        435                 440                 445

Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser
    450                 455                 460

Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg
465                 470                 475                 480

Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly
                485                 490                 495

Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe
            500                 505                 510

Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys
        515                 520                 525

Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp
    530                 535                 540
```

```
Gln Tyr Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile
545                 550                 555                 560

Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro
                565                 570                 575

Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu
            580                 585                 590

Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys
        595                 600                 605

Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp
    610                 615                 620

Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu
625                 630                 635                 640

Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu
                645                 650                 655

Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His
            660                 665                 670

Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp
        675                 680                 685

Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu
    690                 695                 700

Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser
705                 710                 715                 720

Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp
                725                 730                 735

Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile
            740                 745                 750
```

```
Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu
        755                 760                 765

Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu
    770                 775                 780

Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu
785                 790                 795                 800

Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn
                805                 810                 815

Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile
            820                 825                 830

Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn
        835                 840                 845

Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys
    850                 855                 860

Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val
865                 870                 875                 880

Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu
                885                 890                 895

Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys
            900                 905                 910

Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn
        915                 920                 925

Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys
    930                 935                 940

Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp
945                 950                 955                 960
```

```
Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln
               965                 970                 975

Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala
           980                 985                 990

Ile Lys Lys Gly Ile Leu Gln Thr  Val Lys Val Val Asp  Glu Leu Val
        995                1000                1005

Lys Val  Met Gly Arg His Lys  Pro Glu Asn Ile Val  Ile Glu Met
    1010                1015                1020

Ala Arg  Glu Asn Gln Thr Thr  Gln Lys Gly Gln Lys  Asn Ser Arg
    1025                1030                1035

Glu Arg  Met Lys Arg Ile Glu  Glu Gly Ile Lys Glu  Leu Gly Ser
    1040                1045                1050

Gln Ile  Leu Lys Glu His Pro  Val Glu Asn Thr Gln  Leu Gln Asn
    1055                1060                1065

Glu Lys  Leu Tyr Leu Tyr Tyr  Leu Gln Asn Gly Arg  Asp Met Tyr
    1070                1075                1080

Val Asp  Gln Glu Leu Asp Ile  Asn Arg Leu Ser Asp  Tyr Asp Val
    1085                1090                1095

Asp His  Ile Val Pro Gln Ser  Phe Leu Lys Asp Asp  Ser Ile Asp
    1100                1105                1110

Asn Lys  Val Leu Thr Arg Ser  Asp Lys Asn Arg Gly  Lys Ser Asp
    1115                1120                1125

Asn Val  Pro Ser Glu Glu Val  Val Lys Lys Met Lys  Asn Tyr Trp
    1130                1135                1140

Arg Gln  Leu Leu Asn Ala Lys  Leu Ile Thr Gln Arg  Lys Phe Asp
    1145                1150                1155
```

```
Asn Leu  Thr Lys Ala Glu Arg  Gly Gly Leu Ser Glu  Leu Asp Lys
    1160                1165                1170

Ala Gly  Phe Ile Lys Arg Gln  Leu Val Glu Thr Arg  Gln Ile Thr
    1175                1180                1185

Lys His  Val Ala Gln Ile Leu  Asp Ser Arg Met Asn  Thr Lys Tyr
    1190                1195                1200

Asp Glu  Asn Asp Lys Leu Ile  Arg Glu Val Lys Val  Ile Thr Leu
    1205                1210                1215

Lys Ser  Lys Leu Val Ser Asp  Phe Arg Lys Asp Phe  Gln Phe Tyr
    1220                1225                1230

Lys Val  Arg Glu Ile Asn Asn  Tyr His His Ala His  Asp Ala Tyr
    1235                1240                1245

Leu Asn  Ala Val Val Gly Thr  Ala Leu Ile Lys Lys  Tyr Pro Lys
    1250                1255                1260

Leu Glu  Ser Glu Phe Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val
    1265                1270                1275

Arg Lys  Met Ile Ala Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr
    1280                1285                1290

Ala Lys  Tyr Phe Phe Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr
    1295                1300                1305

Glu Ile  Thr Leu Ala Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile
    1310                1315                1320

Glu Thr  Asn Gly Glu Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg
    1325                1330                1335

Asp Phe  Ala Thr Val Arg Lys  Val Leu Ser Met Pro  Gln Val Asn
    1340                1345                1350
```

```
Ile Val  Lys Lys Thr Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu
    1355                1360                1365

Ser Ile  Leu Pro Lys Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys
    1370                1375                1380

Lys Asp  Trp Asp Pro Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr
    1385                1390                1395

Val Ala  Tyr Ser Val Leu Val  Val Ala Lys Val Glu  Lys Gly Lys
    1400                1405                1410

Ser Lys  Lys Leu Lys Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile
    1415                1420                1425

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

Ala Lys  Gly Tyr Lys Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu
    1445                1450                1455

Pro Lys  Tyr Ser Leu Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met
    1460                1465                1470

Leu Ala  Ser Ala Gly Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu
    1475                1480                1485

Pro Ser  Lys Tyr Val Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu
    1490                1495                1500

Lys Leu  Lys Gly Ser Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe
    1505                1510                1515

Val Glu  Gln His Lys His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile
    1520                1525                1530

Ser Glu  Phe Ser Lys Arg Val  Ile Leu Ala Asp Ala  Asn Leu Asp
    1535                1540                1545
```

```
Lys Val  Leu Ser Ala Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg
    1550                1555                1560

Glu Gln  Ala Glu Asn Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu
    1565                1570                1575

Gly Ala  Pro Ala Ala Phe Lys  Tyr Phe Asp Thr Thr  Ile Asp Arg
    1580                1585                1590

Lys Arg  Tyr Thr Ser Thr Lys  Glu Val Leu Asp Ala  Thr Leu Ile
    1595                1600                1605

His Gln  Ser Ile Thr Gly Leu  Tyr Glu Thr Arg Ile  Asp Leu Ser
    1610                1615                1620

Gln Leu  Gly Gly Asp Ser Gly  Gly Ser Gly Gly Ser  Gly Gly Ser
    1625                1630                1635

Thr Asn  Leu Ser Asp Ile Ile  Glu Lys Glu Thr Gly  Lys Gln Leu
    1640                1645                1650

Val Ile  Gln Glu Ser Ile Leu  Met Leu Pro Glu Glu  Val Glu Glu
    1655                1660                1665

Val Ile  Gly Asn Lys Pro Glu  Ser Asp Ile Leu Val  His Thr Ala
    1670                1675                1680

Tyr Asp  Glu Ser Thr Asp Glu  Asn Val Met Leu Leu  Thr Ser Asp
    1685                1690                1695

Ala Pro  Glu Tyr Lys Pro Trp  Ala Leu Val Ile Gln  Asp Ser Asn
    1700                1705                1710

Gly Glu  Asn Lys Ile Lys Met  Leu Ser Gly Gly Ser  Gly Gly Ser
    1715                1720                1725

Gly Gly  Ser Thr Asn Leu Ser  Asp Ile Ile Glu Lys  Glu Thr Gly
    1730                1735                1740
```

```
Lys Gln  Leu Val Ile Gln Glu  Ser Ile Leu Met Leu  Pro Glu Glu
    1745                1750                1755


Val Glu  Glu Val Ile Gly Asn  Lys Pro Glu Ser Asp  Ile Leu Val
    1760                1765                1770


His Thr  Ala Tyr Asp Glu Ser  Thr Asp Glu Asn Val  Met Leu Leu
    1775                1780                1785


Thr Ser  Asp Ala Pro Glu Tyr  Lys Pro Trp Ala Leu  Val Ile Gln
    1790                1795                1800


Asp Ser  Asn Gly Glu Asn Lys  Ile Lys Met Leu Ser  Gly Gly Ser
    1805                1810                1815


Pro Lys  Lys Lys Arg Lys Val
    1820                1825
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<210> 185
<211> 1719
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 185

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Met Gly Ser Ser His His His His His His Ser Ser Glu Thr Gly Pro
1               5                  10                  15


Val Ala Val Asp Pro Thr Leu Arg Arg Arg Ile Glu Pro His Glu Phe
            20                  25                  30


Glu Val Phe Phe Asp Pro Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu
        35                  40                  45


Tyr Glu Ile Asn Trp Gly Gly Arg His Ser Ile Trp Arg His Thr Ser
    50                  55                  60


Gln Asn Thr Asn Lys His Val Glu Val Asn Phe Ile Glu Lys Phe Thr
```

```
65                  70                  75                  80

Thr Glu Arg Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe
                85                  90                  95

Leu Ser Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe
            100                 105                 110

Leu Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu
        115                 120                 125

Tyr His His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu Ile
    130                 135                 140

Ser Ser Gly Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser Gly Tyr
145                 150                 155                 160

Cys Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu Ala His Trp
                165                 170                 175

Pro Arg Tyr Pro His Leu Trp Val Arg Leu Tyr Val Leu Glu Leu Tyr
            180                 185                 190

Cys Ile Ile Leu Gly Leu Pro Pro Cys Leu Asn Ile Leu Arg Arg Lys
        195                 200                 205

Gln Pro Gln Leu Thr Phe Phe Thr Ile Ala Leu Gln Ser Cys His Tyr
    210                 215                 220

Gln Arg Leu Pro Pro His Ile Leu Trp Ala Thr Gly Leu Lys Ser Gly
225                 230                 235                 240

Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Asp Lys
                245                 250                 255

Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly Trp Ala
            260                 265                 270

Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys Val Leu
```

275 280 285

Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly Ala Leu
290 295 300

Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys Arg Thr
305 310 315 320

Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr Leu Gln
325 330 335

Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe Phe His
340 345 350

Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His Glu Arg
355 360 365

His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His Glu Lys
370 375 380

Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser Thr Asp
385 390 395 400

Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met Ile Lys
405 410 415

Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp Asn Ser
420 425 430

Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn Gln Leu
435 440 445

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

Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu Ile Ala
465 470 475 480

Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu Ile Ala

485 490 495

Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp Leu Ala
500 505 510

Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp Asp Leu
515 520 525

Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu Phe Leu
530 535 540

Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile Leu Arg
545 550 555 560

Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met Ile Lys
565 570 575

Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala Leu Val
580 585 590

Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp Gln Ser
595 600 605

Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln Glu Glu
610 615 620

Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly Thr Glu
625 630 635 640

Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys Gln Arg
645 650 655

Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly Glu Leu
660 665 670

His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu Lys Asp
675 680 685

Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro Tyr Tyr

690 695 700

Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met Thr Arg
705 710 715 720

Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val Val Asp
725 730 735

Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn Phe Asp
740 745 750

Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu Leu Tyr
755 760 765

Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr Val Thr
770 775 780

Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys Lys Ala
785 790 795 800

Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val Lys Gln
805 810 815

Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser Val Glu
820 825 830

Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr Tyr His
835 840 845

Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn Glu Glu
850 855 860

Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu Phe Glu
865 870 875 880

Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His Leu Phe
885 890 895

Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr Gly Trp

900 905 910

Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys Gln Ser
915 920 925

Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala Asn Arg
930 935 940

Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys Glu Asp
945 950 955 960

Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His Glu His
965 970 975

Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile Leu Gln
980 985 990

Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg His Lys
995 1000 1005

Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr Thr
1010 1015 1020

Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
1025 1030 1035

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
1040 1045 1050

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr
1055 1060 1065

Leu Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile
1070 1075 1080

Asn Arg Leu Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser
1085 1090 1095

Phe Leu Lys Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser

1100 1105 1110

Asp Lys Asn Arg Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val
1115 1120 1125

Val Lys Lys Met Lys Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys
1130 1135 1140

Leu Ile Thr Gln Arg Lys Phe Asp Asn Leu Thr Lys Ala Glu Arg
1145 1150 1155

Gly Gly Leu Ser Glu Leu Asp Lys Ala Gly Phe Ile Lys Arg Gln
1160 1165 1170

Leu Val Glu Thr Arg Gln Ile Thr Lys His Val Ala Gln Ile Leu
1175 1180 1185

Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu Asn Asp Lys Leu Ile
1190 1195 1200

Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys Leu Val Ser Asp
1205 1210 1215

Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu Ile Asn Asn
1220 1225 1230

Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val Gly Thr
1235 1240 1245

Ala Leu Ile Lys Lys Tyr Pro Lys Leu Glu Ser Glu Phe Val Tyr
1250 1255 1260

Gly Asp Tyr Lys Val Tyr Asp Val Arg Lys Met Ile Ala Lys Ser
1265 1270 1275

Glu Gln Glu Ile Gly Lys Ala Thr Ala Lys Tyr Phe Phe Tyr Ser
1280 1285 1290

Asn Ile Met Asn Phe Phe Lys Thr Glu Ile Thr Leu Ala Asn Gly

1295 1300 1305

Glu Ile Arg Lys Arg Pro Leu Ile Glu Thr Asn Gly Glu Thr Gly
1310 1315 1320

Glu Ile Val Trp Asp Lys Gly Arg Asp Phe Ala Thr Val Arg Lys
1325 1330 1335

Val Leu Ser Met Pro Gln Val Asn Ile Val Lys Lys Thr Glu Val
1340 1345 1350

Gln Thr Gly Gly Phe Ser Lys Glu Ser Ile Leu Pro Lys Arg Asn
1355 1360 1365

Ser Asp Lys Leu Ile Ala Arg Lys Lys Asp Trp Asp Pro Lys Lys
1370 1375 1380

Tyr Gly Gly Phe Asp Ser Pro Thr Val Ala Tyr Ser Val Leu Val
1385 1390 1395

Val Ala Lys Val Glu Lys Gly Lys Ser Lys Lys Leu Lys Ser Val
1400 1405 1410

Lys Glu Leu Leu Gly Ile Thr Ile Met Glu Arg Ser Ser Phe Glu
1415 1420 1425

Lys Asn Pro Ile Asp Phe Leu Glu Ala Lys Gly Tyr Lys Glu Val
1430 1435 1440

Lys Lys Asp Leu Ile Ile Lys Leu Pro Lys Tyr Ser Leu Phe Glu
1445 1450 1455

Leu Glu Asn Gly Arg Lys Arg Met Leu Ala Ser Ala Gly Glu Leu
1460 1465 1470

Gln Lys Gly Asn Glu Leu Ala Leu Pro Ser Lys Tyr Val Asn Phe
1475 1480 1485

Leu Tyr Leu Ala Ser His Tyr Glu Lys Leu Lys Gly Ser Pro Glu

1490 1495 1500

Asp Asn Glu Gln Lys Gln Leu Phe Val Glu Gln His Lys His Tyr
1505 1510 1515

Leu Asp Glu Ile Ile Glu Gln Ile Ser Glu Phe Ser Lys Arg Val
1520 1525 1530

Ile Leu Ala Asp Ala Asn Leu Asp Lys Val Leu Ser Ala Tyr Asn
1535 1540 1545

Lys His Arg Asp Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile Ile
1550 1555 1560

His Leu Phe Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala Phe Lys
1565 1570 1575

Tyr Phe Asp Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser Thr Lys
1580 1585 1590

Glu Val Leu Asp Ala Thr Leu Ile His Gln Ser Ile Thr Gly Leu
1595 1600 1605

Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp Ser Gly
1610 1615 1620

Gly Ser Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys
1625 1630 1635

Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val
1640 1645 1650

Glu Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His
1655 1660 1665

Thr Ala Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr
1670 1675 1680

Ser Asp Ala Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp

1685 1690 1695

Ser Asn Gly Glu Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Pro
1700 1705 1710

Lys Lys Lys Arg Lys Val
1715

<210> 186
<211> 1719
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Polypeptide

<400> 186

Met Gly Ser Ser His His His His His His Ser Ser Glu Thr Gly Pro
1 5 10 15

Val Ala Val Asp Pro Thr Leu Arg Arg Arg Ile Glu Pro His Glu Phe
20 25 30

Glu Val Phe Phe Asp Pro Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu
35 40 45

Tyr Glu Ile Asn Trp Gly Gly Arg His Ser Ile Trp Arg His Thr Ser
50 55 60

Gln Asn Thr Asn Lys His Val Glu Val Asn Phe Ile Glu Lys Phe Thr
65 70 75 80

Thr Glu Arg Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe
85 90 95

Leu Ser Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe
100 105 110

Leu Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu
115 120 125

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Tyr His His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu Ile
    130                 135                 140

Ser Ser Gly Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser Gly Tyr
145                 150                 155                 160

Cys Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu Ala His Trp
                165                 170                 175

Pro Arg Tyr Pro His Leu Trp Val Arg Leu Tyr Val Leu Glu Leu Tyr
            180                 185                 190

Cys Ile Ile Leu Gly Leu Pro Pro Cys Leu Asn Ile Leu Arg Arg Lys
        195                 200                 205

Gln Pro Gln Leu Thr Phe Phe Thr Ile Ala Leu Gln Ser Cys His Tyr
    210                 215                 220

Gln Arg Leu Pro Pro His Ile Leu Trp Ala Thr Gly Leu Lys Ser Gly
225                 230                 235                 240

Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Asp Lys
                245                 250                 255

Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly Trp Ala
            260                 265                 270

Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys Val Leu
        275                 280                 285

Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly Ala Leu
    290                 295                 300

Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys Arg Thr
305                 310                 315                 320

Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr Leu Gln
                325                 330                 335
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Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe Phe His
            340                 345                 350

Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His Glu Arg
        355                 360                 365

His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His Glu Lys
    370                 375                 380

Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser Thr Asp
385                 390                 395                 400

Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met Ile Lys
                405                 410                 415

Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp Asn Ser
            420                 425                 430

Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn Gln Leu
        435                 440                 445

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

Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu Ile Ala
465                 470                 475                 480

Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu Ile Ala
                485                 490                 495

Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp Leu Ala
            500                 505                 510

Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp Asp Leu
        515                 520                 525

Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu Phe Leu
    530                 535                 540
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Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile Leu Arg
545                 550                 555                 560

Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met Ile Lys
                565                 570                 575

Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala Leu Val
            580                 585                 590

Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp Gln Ser
        595                 600                 605

Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln Glu Glu
    610                 615                 620

Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly Thr Glu
625                 630                 635                 640

Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys Gln Arg
                645                 650                 655

Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly Glu Leu
            660                 665                 670

His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu Lys Asp
        675                 680                 685

Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro Tyr Tyr
    690                 695                 700

Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met Thr Arg
705                 710                 715                 720

Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val Val Asp
                725                 730                 735

Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Ala Phe Asp
            740                 745                 750
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Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu Leu Tyr
        755                 760                 765

Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr Val Thr
    770                 775                 780

Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys Lys Ala
785                 790                 795                 800

Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val Lys Gln
                805                 810                 815

Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser Val Glu
            820                 825                 830

Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr Tyr His
        835                 840                 845

Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn Glu Glu
    850                 855                 860

Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu Phe Glu
865                 870                 875                 880

Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His Leu Phe
                885                 890                 895

Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr Gly Trp
            900                 905                 910

Gly Ala Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys Gln Ser
        915                 920                 925

Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala Asn Arg
    930                 935                 940

Asn Phe Met Ala Leu Ile His Asp Asp Ser Leu Thr Phe Lys Glu Asp
945                 950                 955                 960
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Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His Glu His
               965                 970                 975

Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile Leu Gln
           980                 985                 990

Thr Val Lys Val Val Asp Glu Leu  Val Lys Val Met Gly  Arg His Lys
        995                1000                1005

Pro Glu  Asn Ile Val Ile Glu  Met Ala Arg Glu Asn  Gln Thr Thr
    1010                1015                1020

Gln Lys  Gly Gln Lys Asn Ser  Arg Glu Arg Met Lys  Arg Ile Glu
    1025                1030                1035

Glu Gly  Ile Lys Glu Leu Gly  Ser Gln Ile Leu Lys  Glu His Pro
    1040                1045                1050

Val Glu  Asn Thr Gln Leu Gln  Asn Glu Lys Leu Tyr  Leu Tyr Tyr
    1055                1060                1065

Leu Gln  Asn Gly Arg Asp Met  Tyr Val Asp Gln Glu  Leu Asp Ile
    1070                1075                1080

Asn Arg  Leu Ser Asp Tyr Asp  Val Asp His Ile Val  Pro Gln Ser
    1085                1090                1095

Phe Leu  Lys Asp Asp Ser Ile  Asp Asn Lys Val Leu  Thr Arg Ser
    1100                1105                1110

Asp Lys  Asn Arg Gly Lys Ser  Asp Asn Val Pro Ser  Glu Glu Val
    1115                1120                1125

Val Lys  Lys Met Lys Asn Tyr  Trp Arg Gln Leu Leu  Asn Ala Lys
    1130                1135                1140

Leu Ile  Thr Gln Arg Lys Phe  Asp Asn Leu Thr Lys  Ala Glu Arg
    1145                1150                1155
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Gly Gly  Leu Ser Glu Leu Asp  Lys Ala Gly Phe Ile  Lys Arg Gln
    1160                1165                1170

Leu Val  Glu Thr Arg Ala Ile  Thr Lys His Val Ala  Gln Ile Leu
    1175                1180                1185

Asp Ser  Arg Met Asn Thr Lys  Tyr Asp Glu Asn Asp  Lys Leu Ile
    1190                1195                1200

Arg Glu  Val Lys Val Ile Thr  Leu Lys Ser Lys Leu  Val Ser Asp
    1205                1210                1215

Phe Arg  Lys Asp Phe Gln Phe  Tyr Lys Val Arg Glu  Ile Asn Asn
    1220                1225                1230

Tyr His  His Ala His Asp Ala  Tyr Leu Asn Ala Val  Val Gly Thr
    1235                1240                1245

Ala Leu  Ile Lys Lys Tyr Pro  Lys Leu Glu Ser Glu  Phe Val Tyr
    1250                1255                1260

Gly Asp  Tyr Lys Val Tyr Asp  Val Arg Lys Met Ile  Ala Lys Ser
    1265                1270                1275

Glu Gln  Glu Ile Gly Lys Ala  Thr Ala Lys Tyr Phe  Phe Tyr Ser
    1280                1285                1290

Asn Ile  Met Asn Phe Phe Lys  Thr Glu Ile Thr Leu  Ala Asn Gly
    1295                1300                1305

Glu Ile  Arg Lys Arg Pro Leu  Ile Glu Thr Asn Gly  Glu Thr Gly
    1310                1315                1320

Glu Ile  Val Trp Asp Lys Gly  Arg Asp Phe Ala Thr  Val Arg Lys
    1325                1330                1335

Val Leu  Ser Met Pro Gln Val  Asn Ile Val Lys Lys  Thr Glu Val
    1340                1345                1350
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Gln Thr  Gly Gly Phe Ser Lys  Glu Ser Ile Leu Pro  Lys Arg Asn
    1355                1360                1365

Ser Asp  Lys Leu Ile Ala Arg  Lys Lys Asp Trp Asp  Pro Lys Lys
    1370                1375                1380

Tyr Gly  Gly Phe Asp Ser Pro  Thr Val Ala Tyr Ser  Val Leu Val
    1385                1390                1395

Val Ala  Lys Val Glu Lys Gly  Lys Ser Lys Lys Leu  Lys Ser Val
    1400                1405                1410

Lys Glu  Leu Leu Gly Ile Thr  Ile Met Glu Arg Ser  Ser Phe Glu
    1415                1420                1425

Lys Asn  Pro Ile Asp Phe Leu  Glu Ala Lys Gly Tyr  Lys Glu Val
    1430                1435                1440

Lys Lys  Asp Leu Ile Ile Lys  Leu Pro Lys Tyr Ser  Leu Phe Glu
    1445                1450                1455

Leu Glu  Asn Gly Arg Lys Arg  Met Leu Ala Ser Ala  Gly Glu Leu
    1460                1465                1470

Gln Lys  Gly Asn Glu Leu Ala  Leu Pro Ser Lys Tyr  Val Asn Phe
    1475                1480                1485

Leu Tyr  Leu Ala Ser His Tyr  Glu Lys Leu Lys Gly  Ser Pro Glu
    1490                1495                1500

Asp Asn  Glu Gln Lys Gln Leu  Phe Val Glu Gln His  Lys His Tyr
    1505                1510                1515

Leu Asp  Glu Ile Ile Glu Gln  Ile Ser Glu Phe Ser  Lys Arg Val
    1520                1525                1530

Ile Leu  Ala Asp Ala Asn Leu  Asp Lys Val Leu Ser  Ala Tyr Asn
    1535                1540                1545
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Lys His  Arg Asp Lys Pro Ile  Arg Glu Gln Ala Glu  Asn Ile Ile
    1550                1555                1560

His Leu  Phe Thr Leu Thr Asn  Leu Gly Ala Pro Ala  Ala Phe Lys
    1565                1570                1575

Tyr Phe  Asp Thr Thr Ile Asp  Arg Lys Arg Tyr Thr  Ser Thr Lys
    1580                1585                1590

Glu Val  Leu Asp Ala Thr Leu  Ile His Gln Ser Ile  Thr Gly Leu
    1595                1600                1605

Tyr Glu  Thr Arg Ile Asp Leu  Ser Gln Leu Gly Gly  Asp Ser Gly
    1610                1615                1620

Gly Ser  Thr Asn Leu Ser Asp  Ile Ile Glu Lys Glu  Thr Gly Lys
    1625                1630                1635

Gln Leu  Val Ile Gln Glu Ser  Ile Leu Met Leu Pro  Glu Glu Val
    1640                1645                1650

Glu Glu  Val Ile Gly Asn Lys  Pro Glu Ser Asp Ile  Leu Val His
    1655                1660                1665

Thr Ala  Tyr Asp Glu Ser Thr  Asp Glu Asn Val Met  Leu Leu Thr
    1670                1675                1680

Ser Asp  Ala Pro Glu Tyr Lys  Pro Trp Ala Leu Val  Ile Gln Asp
    1685                1690                1695

Ser Asn  Gly Glu Asn Lys Ile  Lys Met Leu Ser Gly  Gly Ser Pro
    1700                1705                1710

Lys Lys  Lys Arg Lys Val
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<210> 188
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<220>
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tgtcacacat gtagttgtag gttttagagc tagaaatagc aagttaaaat aaggc 55

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<211> 55
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gaagcgcctg gcagtgtacc gttttagagc tagaaatagc aagttaaaat aaggc 55

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<210> 192
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<212> DNA
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<210> 193
<211> 55
<212> DNA
<213> Artificial Sequence

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<211> 55
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<220>
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<211> 42
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<210> 218
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<210> 219
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<210> 220
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<212> DNA
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<220>
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<220>
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<220>
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cattcatcct aactacctac 80

<210> 226
<211> 80
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cattcatcct aactacctac 80

<210> 227
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<212> DNA
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cattcatcct aaactaccta c 81

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<210> 232
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cattcatcct aactacctac 80

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cattcatcct aactacctac 80

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cattcatcct aactacctac 80

<210> 235
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cattcatcct aactacctac 80

<210> 236
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cattcatcct aactacctac 80

<210> 237

<211> 80
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cattcatcct aactacctac 80

<210> 238
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cattcatcct aactacctac 80

<210> 239
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cattcatcct aactacctac 80

<210> 240
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<220>
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tcccatcaca tcaaccggtg 80

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tcgcttttcc gagcttctgg 80

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cgggccagcc tgaatagctg 80

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gttcgttgta actcatataa 80

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<211> 47
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<210> 375
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<210> 377
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<210> 399
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<210> 419
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<211> 51
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<220>
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<210> 427
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<220>
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<210> 428

<211> 57
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<210> 429
<211> 53
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<210> 441
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<220>
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<210> 444
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<210> 445
<211> 49
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<213> Artificial Sequence

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<210> 446
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<210> 447
<211> 49
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<220>
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<210> 449
<211> 49
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<213> Artificial Sequence

<220>
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<210> 450
<211> 57
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<223> n is a, c, g, or t

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<210> 451
<211> 49
<212> DNA
<213> Artificial Sequence

<220>
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<400> 451
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<210> 452
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<223> n is a, c, g, or t

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<210> 453
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<210> 455
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<400> 455

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<210> 457
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<210> 459

<211> 48
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<210> 460
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<223> n is a, c, g, or t

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<210> 461
<211> 49
<212> DNA
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<400> 461
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<210> 462
<211> 57
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<223> n is a, c, g, or t

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<210> 463
<211> 49
<212> DNA
<213> Artificial Sequence

<220>
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<400> 463
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<210> 464
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<210> 465
<211> 49
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 465
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<210> 466
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<223> n is a, c, g, or t

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<210> 467
<211> 49
<212> DNA
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<220>
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<400> 467
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<210> 468
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<223> n is a, c, g, or t

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<210> 469
<211> 49
<212> DNA
<213> Artificial Sequence

<220>
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<210> 470
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<220>
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agtacaaacg gcagaagctg gaggaggaag ggcctgagtt tgagcagaag aagaagggct 120

cccatcacat caaccggtgg cgcattgcca cgaagcaggc caatggggag gacatcgatg 180

tcacctccaa tgactagggt 200

<210> 471
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ccaccggttg atgtgatggg agcccttctt cttctgctca aactcaggcc cttcctcctc 120

cagcttctgc cgtttgtact ttgtcctccg gttctggaac cacaccttca cctgggccag 180

ggagggaggg gcacagatga 200

<210> 472
<211> 201
<212> DNA
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<220>
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<400> 472
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tctgcttctc cagccctggc ctgggtcaat ccttggggct tagactgagc acgtgatggc 120

agaggaaagg aagccctgct tcctccagag ggcgtcgcag gacagctttt cctagacagg 180

gggctagtat gtgcagctcc t 201

<210> 473
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<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

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agcagggctt cctttcctct gccatcacgt gctcagtcta agccccaagg attgacccag 120

gccagggctg gagaagcaga aaaaaagcat caagcctaca aatgcatgct tacttgcagc 180

agaaatagac taattgcatc 200

<210> 474
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<212> DNA
<213> Artificial Sequence

<220>
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gcaggatgac aggcaggggc accgcggcgc cccggtggca ttgcggctgg aggtgggggt 120

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gcctccaggc ctgtgtgtgt 200

<210> 475
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<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Polynucleotide

<400> 475

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gcaccagagt ctccgcttta acccccacct ccagccgcaa tgccaccggg gcgccgcggt 120

gcccctgcct gtcatcctgc tttggaccct ctgcctcgcc cttcctccct tccttccacc 180

cagcccggcc tttgtcagcc 200

<210> 476
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<212> DNA
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<220>
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ctccgcgatg ccgatgacct gcagaagtgc ctggcagtgt accaggccgg ggcccgcgag 120

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cgcgtgcggg ccgccactgt 200

<210> 477
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<220>
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ctgaggccgc gctcggcgcc ctcgcgggcc ccggcctggt acactgccag gcacttctgc 120

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acccgcagct cctcggtgct 200

<210> 478
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cacagcacat gacggaggtt gtgaggcgct gcccccacca tgagcgctgc tcagatagcg 180

atggtgagca gctggggctg 200

<210> 479
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aacctccgtc atgtgctgtg actgcttgta gatggccatg gcgcggacgc gggtgccggg 120

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cttgttgagg gcaggggagt 200

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<210> 481
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<210> 482
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gaggccgagc agaagaaaga cgg 23

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gagtcctagc aggagaagaa gag 23

<210> 484
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ggcccagact gagcacgtga tgg 23

<210> 485
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cacccagact gagcacgtgc tgg 23

<210> 486
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<210> 488
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<210> 489
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<210> 493
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<210> 494
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<210> 496
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<210> 499
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gcccctccca accccacctc tgg 23

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<220>
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<400> 503
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<210> 508
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<211> 51
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<210> 533
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<210> 535
<211> 48
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cttccaggat gagaacacag agg 23

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<210> 567
<211> 1368
<212> PRT
<213> Streptococcus pyogenes

<400> 567

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Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe
            20                  25                  30

Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile
        35                  40                  45

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

Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys
65                  70                  75                  80

Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser
                85                  90                  95

Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys
            100                 105                 110

His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr
        115                 120                 125

His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp
    130                 135                 140

Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His
145                 150                 155                 160

Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro
                165                 170                 175

Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr
            180                 185                 190

Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala
        195                 200                 205
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Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn
    210                 215                 220

Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn
225                 230                 235                 240

Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe
                245                 250                 255

Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp
            260                 265                 270

Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp
        275                 280                 285

Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp
    290                 295                 300

Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser
305                 310                 315                 320

Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys
                325                 330                 335

Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe
            340                 345                 350

Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser
        355                 360                 365

Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp
    370                 375                 380

Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg
385                 390                 395                 400

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
                405                 410                 415
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Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe
            420                 425                 430

Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
        435                 440                 445

Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp
    450                 455                 460

Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu
465                 470                 475                 480

Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr
                485                 490                 495

Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser
            500                 505                 510

Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys
        515                 520                 525

Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln
    530                 535                 540

Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr
545                 550                 555                 560

Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp
                565                 570                 575

Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly
            580                 585                 590

Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
        595                 600                 605

Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr
    610                 615                 620
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Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala
625                 630                 635                 640

His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr
                645                 650                 655

Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp
            660                 665                 670

Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe
        675                 680                 685

Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe
    690                 695                 700

Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu
705                 710                 715                 720

His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
                725                 730                 735

Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
            740                 745                 750

Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln
        755                 760                 765

Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780

Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
785                 790                 795                 800

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu
                805                 810                 815

Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg
            820                 825                 830
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Leu Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys
        835                 840                 845

Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg
    850                 855                 860

Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
865                 870                 875                 880

Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys
                885                 890                 895

Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
            900                 905                 910

Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
        915                 920                 925

Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
    930                 935                 940

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
945                 950                 955                 960

Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
                965                 970                 975

Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val
            980                 985                 990

Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
        995                 1000                1005

Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
    1010                1015                1020

Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
    1025                1030                1035
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Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
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Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
    1055                1060                1065

Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1070                1075                1080

Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1085                1090                1095

Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
    1100                1105                1110

Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
    1115                1120                1125

Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
    1130                1135                1140

Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
    1145                1150                1155

Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser
    1160                1165                1170

Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys
    1175                1180                1185

Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu
    1190                1195                1200

Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                1210                1215

Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
    1220                1225                1230
```

```
Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu Lys Leu  Lys Gly Ser
    1235                 1240                 1245


Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe Val Glu  Gln His Lys
    1250                 1255                 1260


His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile Ser Glu  Phe Ser Lys
    1265                 1270                 1275


Arg Val  Ile Leu Ala Asp Ala  Asn Leu Asp Lys Val  Leu Ser Ala
    1280                 1285                 1290


Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg Glu Gln  Ala Glu Asn
    1295                 1300                 1305


Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu Gly Ala  Pro Ala Ala
    1310                 1315                 1320


Phe Lys  Tyr Phe Asp Thr Thr  Ile Asp Arg Lys Arg  Tyr Thr Ser
    1325                 1330                 1335


Thr Lys  Glu Val Leu Asp Ala  Thr Leu Ile His Gln  Ser Ile Thr
    1340                 1345                 1350


Gly Leu  Tyr Glu Thr Arg Ile  Asp Leu Ser Gln Leu  Gly Gly Asp
    1355                 1360                 1365


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<213>  Streptococcus gallolyticus

<400>  568

Met Thr Lys Lys Asn Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser
1               5                   10                  15


Val Gly Trp Ala Val Ile Thr Asp Asp Tyr Lys Val Pro Ala Lys Lys
            20                  25                  30


Met Lys Val Leu Gly Asn Thr Asp Lys Lys Tyr Ile Lys Lys Asn Leu
```

```
        35                  40                  45

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

Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Leu
65                  70                  75                  80

Arg Tyr Leu Gln Glu Ile Phe Ala Asn Glu Ile Ala Lys Val Asp Glu
                85                  90                  95

Ser Phe Phe Gln Arg Leu Asp Glu Ser Phe Leu Thr Asp Asp Asp Lys
            100                 105                 110

Thr Phe Asp Ser His Pro Ile Phe Gly Asn Lys Ala Glu Glu Asp Ala
        115                 120                 125

Tyr His Gln Lys Phe Pro Thr Ile Tyr His Leu Arg Lys His Leu Ala
    130                 135                 140

Asp Ser Ser Glu Lys Ala Asp Leu Arg Leu Val Tyr Leu Ala Leu Ala
145                 150                 155                 160

His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Glu Leu Asn
                165                 170                 175

Ala Glu Asn Thr Asp Val Gln Lys Ile Phe Ala Asp Phe Val Gly Val
            180                 185                 190

Tyr Asn Arg Thr Phe Asp Asp Ser His Leu Ser Glu Ile Thr Val Asp
        195                 200                 205

Val Ala Ser Ile Leu Thr Glu Lys Ile Ser Lys Ser Arg Arg Leu Glu
    210                 215                 220

Asn Leu Ile Lys Tyr Tyr Pro Thr Glu Lys Lys Asn Thr Leu Phe Gly
225                 230                 235                 240

Asn Leu Ile Ala Leu Ala Leu Gly Leu Gln Pro Asn Phe Lys Thr Asn
```

245 250 255

Phe Lys Leu Ser Glu Asp Ala Lys Leu Gln Phe Ser Lys Asp Thr Tyr
260 265 270

Glu Glu Asp Leu Glu Glu Leu Leu Gly Lys Ile Gly Asp Asp Tyr Ala
275 280 285

Asp Leu Phe Thr Ser Ala Lys Asn Leu Tyr Asp Ala Ile Leu Leu Ser
290 295 300

Gly Ile Leu Thr Val Asp Asp Asn Ser Thr Lys Ala Pro Leu Ser Ala
305 310 315 320

Ser Met Ile Lys Arg Tyr Val Glu His His Glu Asp Leu Glu Lys Leu
325 330 335

Lys Glu Phe Ile Lys Ala Asn Lys Ser Glu Leu Tyr His Asp Ile Phe
340 345 350

Lys Asp Lys Asn Lys Asn Gly Tyr Ala Gly Tyr Ile Glu Asn Gly Val
355 360 365

Lys Gln Asp Glu Phe Tyr Lys Tyr Leu Lys Asn Ile Leu Ser Lys Ile
370 375 380

Lys Ile Asp Gly Ser Asp Tyr Phe Leu Asp Lys Ile Glu Arg Glu Asp
385 390 395 400

Phe Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln
405 410 415

Ile His Leu Gln Glu Met His Ala Ile Leu Arg Arg Gln Gly Asp Tyr
420 425 430

Tyr Pro Phe Leu Lys Glu Lys Gln Asp Arg Ile Glu Lys Ile Leu Thr
435 440 445

Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Val Arg Lys Asp Ser Arg

```
    450                 455                 460

Phe Ala Trp Ala Glu Tyr Arg Ser Asp Glu Lys Ile Thr Pro Trp Asn
465                 470                 475                 480

Phe Asp Lys Val Ile Asp Lys Glu Lys Ser Ala Glu Lys Phe Ile Thr
                485                 490                 495

Arg Met Thr Leu Asn Asp Leu Tyr Leu Pro Glu Glu Lys Val Leu Pro
            500                 505                 510

Lys His Ser His Val Tyr Glu Thr Tyr Ala Val Tyr Asn Glu Leu Thr
        515                 520                 525

Lys Ile Lys Tyr Val Asn Glu Gln Gly Lys Glu Ser Phe Phe Asp Ser
    530                 535                 540

Asn Met Lys Gln Glu Ile Phe Asp His Val Phe Lys Glu Asn Arg Lys
545                 550                 555                 560

Val Thr Lys Glu Lys Leu Leu Asn Tyr Leu Asn Lys Glu Phe Pro Glu
                565                 570                 575

Tyr Arg Ile Lys Asp Leu Ile Gly Leu Asp Lys Glu Asn Lys Ser Phe
            580                 585                 590

Asn Ala Ser Leu Gly Thr Tyr His Asp Leu Lys Lys Ile Leu Asp Lys
        595                 600                 605

Ala Phe Leu Asp Asp Lys Val Asn Glu Glu Val Ile Glu Asp Ile Ile
    610                 615                 620

Lys Thr Leu Thr Leu Phe Glu Asp Lys Asp Met Ile His Glu Arg Leu
625                 630                 635                 640

Gln Lys Tyr Ser Asp Ile Phe Thr Ala Asn Gln Leu Lys Lys Leu Glu
                645                 650                 655

Arg Arg His Tyr Thr Gly Trp Gly Arg Leu Ser Tyr Lys Leu Ile Asn
```

660 665 670

Gly Ile Arg Asn Lys Glu Asn Asn Lys Thr Ile Leu Asp Tyr Leu Ile
675 680 685

Asp Asp Gly Ser Ala Asn Arg Asn Phe Met Gln Leu Ile Asn Asp Asp
690 695 700

Thr Leu Pro Phe Lys Gln Ile Ile Gln Lys Ser Gln Val Val Gly Asp
705 710 715 720

Val Asp Asp Ile Glu Ala Val Val His Asp Leu Pro Gly Ser Pro Ala
725 730 735

Ile Lys Lys Gly Ile Leu Gln Ser Val Lys Ile Val Asp Glu Leu Val
740 745 750

Lys Val Met Gly Gly Asn Pro Asp Asn Ile Val Ile Glu Met Ala Arg
755 760 765

Glu Asn Gln Thr Thr Asn Arg Gly Arg Ser Gln Ser Gln Gln Arg Leu
770 775 780

Lys Lys Leu Gln Asn Ser Leu Lys Glu Leu Gly Ser Asn Ile Leu Asn
785 790 795 800

Glu Glu Lys Pro Ser Tyr Ile Glu Asp Lys Val Glu Asn Ser His Leu
805 810 815

Gln Asn Asp Gln Leu Phe Leu Tyr Tyr Ile Gln Asn Gly Lys Asp Met
820 825 830

Tyr Thr Gly Asp Glu Leu Asp Ile Asp His Leu Ser Asp Tyr Asp Ile
835 840 845

Asp His Ile Ile Pro Gln Ala Phe Ile Lys Asp Asp Ser Ile Asp Asn
850 855 860

Arg Val Leu Thr Ser Ser Ala Lys Asn Arg Gly Lys Ser Asp Asp Val

865 870 875 880

Pro Ser Leu Asp Ile Val Arg Ala Arg Lys Ala Glu Trp Val Arg Leu
885 890 895

Tyr Lys Ser Gly Leu Ile Ser Lys Arg Lys Phe Asp Asn Leu Thr Lys
900 905 910

Ala Glu Arg Gly Gly Leu Thr Glu Ala Asp Lys Ala Gly Phe Ile Lys
915 920 925

Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys His Val Ala Gln Ile
930 935 940

Leu Asp Ala Arg Phe Asn Thr Glu His Asp Glu Asn Asp Lys Val Ile
945 950 955 960

Arg Asp Val Lys Val Ile Thr Leu Lys Ser Asn Leu Val Ser Gln Phe
965 970 975

Arg Lys Asp Phe Glu Phe Tyr Lys Val Arg Glu Ile Asn Asp Tyr His
980 985 990

His Ala His Asp Ala Tyr Leu Asn Ala Val Val Gly Thr Ala Leu Leu
995 1000 1005

Lys Lys Tyr Pro Lys Leu Ala Ser Glu Phe Val Tyr Gly Glu Tyr
1010 1015 1020

Lys Lys Tyr Asp Ile Arg Lys Phe Ile Thr Asn Ser Ser Asp Lys
1025 1030 1035

Ala Thr Ala Lys Tyr Phe Phe Tyr Ser Asn Leu Met Asn Phe Phe
1040 1045 1050

Lys Thr Lys Val Lys Tyr Ala Asp Gly Thr Val Phe Glu Arg Pro
1055 1060 1065

Ile Ile Glu Thr Asn Ala Asp Gly Glu Ile Ala Trp Asn Lys Gln

1070 1075 1080

Ile Asp Phe Glu Lys Val Arg Lys Val Leu Ser Tyr Pro Gln Val
1085 1090 1095

Asn Ile Val Lys Lys Val Glu Thr Gln Thr Gly Gly Phe Ser Lys
1100 1105 1110

Glu Ser Ile Leu Pro Lys Gly Asp Ser Asp Lys Leu Ile Pro Arg
1115 1120 1125

Lys Thr Lys Lys Val Tyr Trp Asp Thr Lys Lys Tyr Gly Gly Phe
1130 1135 1140

Asp Ser Pro Thr Val Ala Tyr Ser Val Phe Val Val Ala Asp Val
1145 1150 1155

Glu Lys Gly Lys Ala Lys Lys Leu Lys Thr Val Lys Glu Leu Val
1160 1165 1170

Gly Ile Ser Ile Met Glu Arg Ser Phe Phe Glu Glu Asn Pro Val
1175 1180 1185

Glu Phe Leu Glu Asn Lys Gly Tyr His Asn Ile Arg Glu Asp Lys
1190 1195 1200

Leu Ile Lys Leu Pro Lys Tyr Ser Leu Phe Glu Phe Glu Gly Gly
1205 1210 1215

Arg Arg Arg Leu Leu Ala Ser Ala Ser Glu Leu Gln Lys Gly Asn
1220 1225 1230

Glu Met Val Leu Pro Gly Tyr Leu Val Glu Leu Leu Tyr His Ala
1235 1240 1245

His Arg Ala Asp Asn Phe Asn Ser Thr Glu Tyr Leu Asn Tyr Val
1250 1255 1260

Ser Glu His Lys Lys Glu Phe Glu Lys Val Leu Ser Cys Val Glu

1265 1270 1275

Asp Phe Ala Asn Leu Tyr Val Asp Val Glu Lys Asn Leu Ser Lys
1280 1285 1290

Ile Arg Ala Val Ala Asp Ser Met Asp Asn Phe Ser Ile Glu Glu
1295 1300 1305

Ile Ser Asn Ser Phe Ile Asn Leu Leu Thr Leu Thr Ala Leu Gly
1310 1315 1320

Ala Pro Ala Asp Phe Asn Phe Leu Gly Glu Lys Ile Pro Arg Lys
1325 1330 1335

Arg Tyr Thr Ser Thr Lys Glu Cys Leu Asn Ala Thr Leu Ile His
1340 1345 1350

Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Lys
1355 1360 1365

Leu Gly Glu Glu
1370

<210> 569
<211> 1370
<212> PRT
<213> Streptococcus gordonii

<400> 569

Met Lys Lys Gly Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val
1 5 10 15

Gly Phe Ala Val Ile Thr Asp Asp Tyr Lys Val Pro Ser Lys Lys Met
20 25 30

Lys Val Leu Gly Asn Thr Asp Lys Arg Phe Ile Lys Lys Asn Leu Ile
35 40 45

Gly Ala Leu Leu Phe Asp Glu Gly Thr Thr Ala Glu Ala Arg Arg Leu
50 55 60

```
Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Leu Arg
65                  70                  75                  80

Tyr Leu Gln Glu Ile Phe Ser Glu Glu Met Ser Lys Val Asp Ser Ser
                85                  90                  95

Phe Phe His Arg Leu Asp Asp Ser Phe Leu Ile Pro Glu Asp Lys Arg
            100                 105                 110

Glu Ser Lys Tyr Pro Ile Phe Ala Thr Leu Thr Glu Glu Lys Glu Tyr
        115                 120                 125

His Lys Gln Phe Pro Thr Ile Tyr His Leu Arg Lys Gln Leu Ala Asp
    130                 135                 140

Ser Lys Glu Lys Thr Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His
145                 150                 155                 160

Met Ile Lys Tyr Arg Gly His Phe Leu Tyr Glu Glu Ala Phe Asp Ile
                165                 170                 175

Lys Asn Asn Asp Ile Gln Lys Ile Phe Asn Glu Phe Ile Ser Ile Tyr
            180                 185                 190

Asp Asn Thr Phe Glu Gly Ser Ser Leu Ser Gly Gln Asn Ala Gln Val
        195                 200                 205

Glu Ala Ile Phe Thr Asp Lys Ile Ser Lys Ser Ala Lys Arg Glu Arg
    210                 215                 220

Val Leu Lys Leu Phe Pro Asp Glu Lys Ser Thr Gly Leu Phe Ser Glu
225                 230                 235                 240

Phe Leu Lys Leu Ile Val Gly Asn Gln Ala Asp Phe Lys Lys His Phe
                245                 250                 255

Asp Leu Glu Asp Lys Ala Pro Leu Gln Phe Ser Lys Asp Thr Tyr Asp
            260                 265                 270
```

```
Glu Asp Leu Glu Asn Leu Leu Gly Gln Ile Gly Asp Asp Phe Thr Asp
        275                 280                 285

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

Ile Leu Thr Val Thr Asp Pro Ser Thr Lys Ala Pro Leu Ser Ala Ser
305                 310                 315                 320

Met Ile Glu Arg Tyr Glu Asn His Gln Asn Asp Leu Ala Ala Leu Lys
                325                 330                 335

Gln Phe Ile Lys Asn Asn Leu Pro Glu Lys Tyr Asp Glu Val Phe Ser
            340                 345                 350

Asp Gln Ser Lys Asp Gly Tyr Ala Gly Tyr Ile Asp Gly Lys Thr Thr
        355                 360                 365

Gln Glu Thr Phe Tyr Lys Tyr Ile Lys Asn Leu Leu Ser Lys Phe Glu
    370                 375                 380

Gly Thr Asp Tyr Phe Leu Asp Lys Ile Glu Arg Glu Asp Phe Leu Arg
385                 390                 395                 400

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
                405                 410                 415

Gln Glu Met Asn Ala Ile Leu Arg Arg Gln Gly Glu Tyr Tyr Pro Phe
            420                 425                 430

Leu Lys Asp Asn Lys Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
        435                 440                 445

Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Arg Asp Phe Ala Trp
    450                 455                 460

Leu Thr Arg Asn Ser Asp Glu Ala Ile Arg Pro Trp Asn Phe Glu Glu
465                 470                 475                 480
```

```
Ile Val Asp Lys Ala Ser Ser Ala Glu Asp Phe Ile Asn Lys Met Thr
                485                 490                 495

Asn Tyr Asp Leu Tyr Leu Pro Glu Glu Lys Val Leu Pro Lys His Ser
            500                 505                 510

Leu Leu Tyr Glu Thr Phe Ala Val Tyr Asn Glu Leu Thr Lys Val Lys
        515                 520                 525

Phe Ile Ala Glu Gly Leu Arg Asp Tyr Gln Phe Leu Asp Ser Gly Gln
    530                 535                 540

Lys Lys Gln Ile Val Asn Gln Leu Phe Lys Glu Asn Arg Lys Val Thr
545                 550                 555                 560

Glu Lys Asp Ile Ile His Tyr Leu His Asn Val Asp Gly Tyr Asp Gly
                565                 570                 575

Ile Glu Leu Lys Gly Ile Glu Lys Gln Phe Asn Ala Ser Leu Ser Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Glu Phe Met Asp Asp
        595                 600                 605

Ala Lys Asn Glu Ala Ile Leu Glu Asn Ile Val His Thr Leu Thr Ile
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Lys Gln Arg Leu Ala Gln Tyr Asp Ser
625                 630                 635                 640

Leu Phe Asp Glu Lys Val Ile Lys Ala Leu Thr Arg Arg His Tyr Thr
                645                 650                 655

Gly Trp Gly Lys Leu Ser Ala Lys Leu Ile Asn Gly Ile Cys Asp Lys
            660                 665                 670

Gln Thr Gly Asn Thr Ile Leu Asp Tyr Leu Ile Asp Asp Gly Lys Ile
        675                 680                 685
```

```
Asn Arg Asn Phe Met Gln Leu Ile Asn Asp Asp Gly Leu Ser Phe Lys
    690                 695                 700

Glu Ile Ile Gln Lys Ala Gln Val Ile Gly Lys Thr Asp Asp Val Lys
705                 710                 715                 720

Gln Val Val Gln Glu Leu Ser Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735

Leu Gln Ser Ile Lys Ile Val Asp Glu Leu Val Lys Val Met Gly His
            740                 745                 750

Ala Pro Glu Ser Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr Thr
        755                 760                 765

Ala Arg Gly Lys Lys Asn Ser Gln Gln Arg Tyr Lys Arg Ile Glu Asp
    770                 775                 780

Ser Leu Lys Ile Leu Ala Ser Gly Leu Asp Ser Asn Ile Leu Lys Glu
785                 790                 795                 800

Asn Pro Thr Asp Asn Asn Gln Leu Gln Asn Asp Arg Leu Phe Leu Tyr
                805                 810                 815

Tyr Leu Gln Asn Gly Lys Asp Met Tyr Thr Gly Glu Ala Leu Asp Ile
            820                 825                 830

Asn Gln Leu Ser Ser Tyr Asp Ile Asp His Ile Ile Pro Gln Ala Phe
        835                 840                 845

Ile Lys Asp Asp Ser Leu Asp Asn Arg Val Leu Thr Ser Ser Lys Asp
    850                 855                 860

Asn Arg Gly Lys Ser Asp Asn Val Pro Ser Ile Glu Val Val Gln Lys
865                 870                 875                 880

Arg Lys Ala Phe Trp Gln Gln Leu Leu Asp Ser Lys Leu Ile Ser Glu
                885                 890                 895
```

```
Arg Lys Phe Asn Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Asp Glu
            900                 905                 910

Arg Asp Lys Val Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln
        915                 920                 925

Ile Thr Lys His Val Ala Gln Ile Leu Asp Ala Arg Tyr Asn Thr Glu
    930                 935                 940

Val Asn Glu Lys Asp Lys Lys Asn Arg Thr Val Lys Ile Ile Thr Leu
945                 950                 955                 960

Lys Ser Asn Leu Val Ser Asn Phe Arg Lys Glu Phe Arg Leu Tyr Lys
                965                 970                 975

Val Arg Glu Ile Asn Asp Tyr His His Ala His Asp Ala Tyr Leu Asn
            980                 985                 990

Ala Val Val Ala Lys Ala Ile Leu  Lys Lys Tyr Pro Lys  Leu Glu Pro
        995                 1000                1005

Glu Phe  Val Tyr Gly Glu Tyr  Gln Lys Tyr Asp Leu  Lys Arg Tyr
    1010                1015                1020

Ile Ser  Arg Ser Lys Asp Pro  Lys Glu Val Glu Lys  Ala Thr Glu
    1025                1030                1035

Lys Tyr  Phe Phe Tyr Ser Asn  Leu Leu Asn Phe Phe  Lys Glu Glu
    1040                1045                1050

Val His  Tyr Ala Asp Gly Thr  Ile Val Lys Arg Glu  Asn Ile Glu
    1055                1060                1065

Tyr Ser  Lys Asp Thr Gly Glu  Ile Ala Trp Asn Lys  Glu Lys Asp
    1070                1075                1080

Phe Ala  Ile Ile Lys Lys Val  Leu Ser Leu Pro Gln  Val Asn Ile
    1085                1090                1095
```

```
Val Lys  Lys Arg Glu Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser
    1100                1105                1110

Ile Leu  Pro Lys Gly Asn Ser  Asp Lys Leu Ile Pro  Arg Lys Thr
    1115                1120                1125

Lys Asp  Ile Leu Leu Asp Thr  Thr Lys Tyr Gly Gly  Phe Asp Ser
    1130                1135                1140

Pro Val  Ile Ala Tyr Ser Ile  Leu Leu Ile Ala Asp  Ile Glu Lys
    1145                1150                1155

Gly Lys  Ala Lys Lys Leu Lys  Thr Val Lys Thr Leu  Val Gly Ile
    1160                1165                1170

Thr Ile  Met Glu Lys Ala Ala  Phe Glu Glu Asn Pro  Ile Thr Phe
    1175                1180                1185

Leu Glu  Asn Lys Gly Tyr His  Asn Val Arg Lys Glu  Asn Ile Leu
    1190                1195                1200

Cys Leu  Pro Lys Tyr Ser Leu  Phe Glu Leu Glu Asn  Gly Arg Arg
    1205                1210                1215

Arg Leu  Leu Ala Ser Ala Lys  Glu Leu Gln Lys Gly  Asn Glu Ile
    1220                1225                1230

Val Leu  Pro Val Tyr Leu Thr  Thr Leu Leu Tyr His  Ser Lys Asn
    1235                1240                1245

Val His  Lys Leu Asp Glu Pro  Gly His Leu Glu Tyr  Ile Gln Lys
    1250                1255                1260

His Arg  Asn Glu Phe Lys Asp  Leu Leu Asn Leu Val  Ser Glu Phe
    1265                1270                1275

Ser Gln  Lys Tyr Val Leu Ala  Asp Ala Asn Leu Glu  Lys Ile Lys
    1280                1285                1290
```

```
Ser Leu  Tyr Ala Asp Asn Glu  Gln Ala Asp Ile Glu  Ile Leu Ala
    1295                1300                1305

Asn Ser  Phe Ile Asn Leu Leu  Thr Phe Thr Ala Leu  Gly Ala Pro
    1310                1315                1320

Ala Ala  Phe Lys Phe Phe Gly  Lys Asp Ile Asp Arg  Lys Arg Tyr
    1325                1330                1335

Thr Thr  Val Ser Glu Ile Leu  Asn Ala Thr Leu Ile  His Gln Ser
    1340                1345                1350

Ile Thr  Gly Leu Tyr Glu Thr  Trp Ile Asp Leu Ser  Lys Leu Gly
    1355                1360                1365

Glu Asp
    1370
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<210> 570
<211> 1056
<212> PRT
<213> Staphylococcus aureus

<400> 570

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Gly Ser His Met Lys Arg Asn Tyr Ile Leu Gly Leu Asp Ile Gly Ile
1               5                   10                  15

Thr Ser Val Gly Tyr Gly Ile Ile Asp Tyr Glu Thr Arg Asp Val Ile
            20                  25                  30

Asp Ala Gly Val Arg Leu Phe Lys Glu Ala Asn Val Glu Asn Asn Glu
        35                  40                  45

Gly Arg Arg Ser Lys Arg Gly Ala Arg Arg Leu Lys Arg Arg Arg Arg
    50                  55                  60

His Arg Ile Gln Arg Val Lys Lys Leu Leu Phe Asp Tyr Asn Leu Leu
65                  70                  75                  80
```

```
Thr Asp His Ser Glu Leu Ser Gly Ile Asn Pro Tyr Glu Ala Arg Val
                85                  90                  95

Lys Gly Leu Ser Gln Lys Leu Ser Glu Glu Glu Phe Ser Ala Ala Leu
            100                 105                 110

Leu His Leu Ala Lys Arg Arg Gly Val His Asn Val Asn Glu Val Glu
        115                 120                 125

Glu Asp Thr Gly Asn Glu Leu Ser Thr Lys Glu Gln Ile Ser Arg Asn
    130                 135                 140

Ser Lys Ala Leu Glu Glu Lys Tyr Val Ala Glu Leu Gln Leu Glu Arg
145                 150                 155                 160

Leu Lys Lys Asp Gly Glu Val Arg Gly Ser Ile Asn Arg Phe Lys Thr
                165                 170                 175

Ser Asp Tyr Val Lys Glu Ala Lys Gln Leu Leu Lys Val Gln Lys Ala
            180                 185                 190

Tyr His Gln Leu Asp Gln Ser Phe Ile Asp Thr Tyr Ile Asp Leu Leu
        195                 200                 205

Glu Thr Arg Arg Thr Tyr Tyr Glu Gly Pro Gly Glu Gly Ser Pro Phe
    210                 215                 220

Gly Trp Lys Asp Ile Lys Glu Trp Tyr Glu Met Leu Met Gly His Cys
225                 230                 235                 240

Thr Tyr Phe Pro Glu Glu Leu Arg Ser Val Lys Tyr Ala Tyr Asn Ala
                245                 250                 255

Asp Leu Tyr Asn Ala Leu Asn Asp Leu Asn Asn Leu Val Ile Thr Arg
            260                 265                 270

Asp Glu Asn Glu Lys Leu Glu Tyr Tyr Glu Lys Phe Gln Ile Ile Glu
        275                 280                 285
```

```
Asn Val Phe Lys Gln Lys Lys Lys Pro Thr Leu Lys Gln Ile Ala Lys
    290                 295                 300

Glu Ile Leu Val Asn Glu Glu Asp Ile Lys Gly Tyr Arg Val Thr Ser
305                 310                 315                 320

Thr Gly Lys Pro Glu Phe Thr Asn Leu Lys Val Tyr His Asp Ile Lys
                325                 330                 335

Asp Ile Thr Ala Arg Lys Glu Ile Ile Glu Asn Ala Glu Leu Leu Asp
            340                 345                 350

Gln Ile Ala Lys Ile Leu Thr Ile Tyr Gln Ser Ser Glu Asp Ile Gln
        355                 360                 365

Glu Glu Leu Thr Asn Leu Asn Ser Glu Leu Thr Gln Glu Glu Ile Glu
    370                 375                 380

Gln Ile Ser Asn Leu Lys Gly Tyr Thr Gly Thr His Asn Leu Ser Leu
385                 390                 395                 400

Lys Ala Ile Asn Leu Ile Leu Asp Glu Leu Trp His Thr Asn Asp Asn
                405                 410                 415

Gln Ile Ala Ile Phe Asn Arg Leu Lys Leu Val Pro Lys Lys Val Asp
            420                 425                 430

Leu Ser Gln Gln Lys Glu Ile Pro Thr Thr Leu Val Asp Asp Phe Ile
        435                 440                 445

Leu Ser Pro Val Val Lys Arg Ser Phe Ile Gln Ser Ile Lys Val Ile
    450                 455                 460

Asn Ala Ile Ile Lys Lys Tyr Gly Leu Pro Asn Asp Ile Ile Ile Glu
465                 470                 475                 480

Leu Ala Arg Glu Lys Asn Ser Lys Asp Ala Gln Lys Met Ile Asn Glu
                485                 490                 495
```

```
Met Gln Lys Arg Asn Arg Gln Thr Asn Glu Arg Ile Glu Glu Ile Ile
            500                 505                 510

Arg Thr Thr Gly Lys Glu Asn Ala Lys Tyr Leu Ile Glu Lys Ile Lys
        515                 520                 525

Leu His Asp Met Gln Glu Gly Lys Cys Leu Tyr Ser Leu Glu Ala Ile
    530                 535                 540

Pro Leu Glu Asp Leu Leu Asn Asn Pro Phe Asn Tyr Glu Val Asp His
545                 550                 555                 560

Ile Ile Pro Arg Ser Val Ser Phe Asp Asn Ser Phe Asn Asn Lys Val
                565                 570                 575

Leu Val Lys Gln Glu Glu Ala Ser Lys Lys Gly Asn Arg Thr Pro Phe
            580                 585                 590

Gln Tyr Leu Ser Ser Ser Asp Ser Lys Ile Ser Tyr Glu Thr Phe Lys
        595                 600                 605

Lys His Ile Leu Asn Leu Ala Lys Gly Lys Gly Arg Ile Ser Lys Thr
    610                 615                 620

Lys Lys Glu Tyr Leu Leu Glu Glu Arg Asp Ile Asn Arg Phe Ser Val
625                 630                 635                 640

Gln Lys Asp Phe Ile Asn Arg Asn Leu Val Asp Thr Arg Tyr Ala Thr
                645                 650                 655

Arg Gly Leu Met Asn Leu Leu Arg Ser Tyr Phe Arg Val Asn Asn Leu
            660                 665                 670

Asp Val Lys Val Lys Ser Ile Asn Gly Gly Phe Thr Ser Phe Leu Arg
        675                 680                 685

Arg Lys Trp Lys Phe Lys Lys Glu Arg Asn Lys Gly Tyr Lys His His
    690                 695                 700
```

```
Ala Glu Asp Ala Leu Ile Ile Ala Asn Ala Asp Phe Ile Phe Lys Glu
705                 710                 715                 720

Trp Lys Lys Leu Asp Lys Ala Lys Lys Val Met Glu Asn Gln Met Phe
                725                 730                 735

Glu Glu Lys Gln Ala Glu Ser Met Pro Glu Ile Glu Thr Glu Gln Glu
            740                 745                 750

Tyr Lys Glu Ile Phe Ile Thr Pro His Gln Ile Lys His Ile Lys Asp
        755                 760                 765

Phe Lys Asp Tyr Lys Tyr Ser His Arg Val Asp Lys Lys Pro Asn Arg
    770                 775                 780

Glu Leu Ile Asn Asp Thr Leu Tyr Ser Thr Arg Lys Asp Asp Lys Gly
785                 790                 795                 800

Asn Thr Leu Ile Val Asn Asn Leu Asn Gly Leu Tyr Asp Lys Asp Asn
                805                 810                 815

Asp Lys Leu Lys Lys Leu Ile Asn Lys Ser Pro Glu Lys Leu Leu Met
            820                 825                 830

Tyr His His Asp Pro Gln Thr Tyr Gln Lys Leu Lys Leu Ile Met Glu
        835                 840                 845

Gln Tyr Gly Asp Glu Lys Asn Pro Leu Tyr Lys Tyr Tyr Glu Glu Thr
    850                 855                 860

Gly Asn Tyr Leu Thr Lys Tyr Ser Lys Lys Asp Asn Gly Pro Val Ile
865                 870                 875                 880

Lys Lys Ile Lys Tyr Tyr Gly Asn Lys Leu Asn Ala His Leu Asp Ile
                885                 890                 895

Thr Asp Asp Tyr Pro Asn Ser Arg Asn Lys Val Val Lys Leu Ser Leu
            900                 905                 910
```

Lys Pro Tyr Arg Phe Asp Val Tyr Leu Asp Asn Gly Val Tyr Lys Phe
915 920 925

Val Thr Val Lys Asn Leu Asp Val Ile Lys Lys Glu Asn Tyr Tyr Glu
930 935 940

Val Asn Ser Lys Ala Tyr Glu Glu Ala Lys Lys Leu Lys Lys Ile Ser
945 950 955 960

Asn Gln Ala Glu Phe Ile Ala Ser Phe Tyr Asn Asn Asp Leu Ile Lys
965 970 975

Ile Asn Gly Glu Leu Tyr Arg Val Ile Gly Val Asn Asn Asp Leu Leu
980 985 990

Asn Arg Ile Glu Val Asn Met Ile Asp Ile Thr Tyr Arg Glu Tyr Leu
995 1000 1005

Glu Asn Met Asn Asp Lys Arg Pro Pro Arg Ile Ile Lys Thr Ile
1010 1015 1020

Ala Ser Lys Thr Gln Ser Ile Lys Lys Tyr Ser Thr Asp Ile Leu
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20 25 30

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35 40 45

Lys Glu Gln Thr Glu Trp His Arg Val Val Leu Phe Gly Lys Leu Ala
50 55 60

Glu Val Ala Ser Glu Tyr Leu Arg Lys Gly Ser Gln Val Tyr Ile Glu
65 70 75 80

Gly Gln Leu Arg Thr Arg Lys Trp Thr Asp Gln Ser Gly Gln Asp Arg
85 90 95

Tyr Thr Thr Glu Val Val Val Asn Val Gly Gly Thr Met Gln Met Leu
100 105 110

Gly Gly Arg Gln Gly Gly Gly Ala Pro Ala Gly Gly Asn Ile Gly Gly
115 120 125

Gly Gln Pro Gln Gly Gly Trp Gly Gln Pro Gln Gln Pro Gln Gly Gly

130 135 140

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Phe Lys Phe

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Ala Tyr Val Val Leu Gly Gln Phe
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20 25 30

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35 40 45

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser
50 55 60

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser
65 70 75 80

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser
85 90 95

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100 105 110

Ser Gly Gly Ser Ser Gly Gly Ser
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20 25 30

Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly
35 40 45

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
50 55 60

Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
65 70 75 80

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
85 90 95

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly
100 105 110

Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly
115 120 125

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Ser Gly Gly Gly Gly Ser
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Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala
        35                  40                  45


Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala
    50                  55                  60


Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys
65                  70                  75                  80


Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu
                85                  90                  95


Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala
            100                 105                 110


Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala
        115                 120                 125


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Lys Glu Ala Ala Ala Lys
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20 25 30

Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser
35 40 45

Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly
50 55 60

Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly
65 70 75 80

Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser
85 90

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Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro
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Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro
35 40 45

Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro
50 55 60

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20 25 30

Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly
35 40 45

Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser
50 55 60

Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly
65 70 75 80

Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser
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20 25 30

Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly Ser
35 40 45

Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly Ser
50 55 60

Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly Ser
65 70 75 80

Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly Ser
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100 105 110

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

Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr
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Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile
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Lys Met Leu

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Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His Ser
35 40 45

Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val Asn
50 55 60

Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr Arg
65 70 75 80

Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys Ser
85 90 95

Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu Phe
100 105 110

Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg Gln
115 120 125

Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met Thr
130 135 140

Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser Pro
145 150 155 160

Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg Leu
165 170 175

Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys Leu
180 185 190

Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile Ala
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