SEQUENCE LISTING

<110> MAMMOTH BIOSCIENCES, INC.

<120> ASSAYS AND METHODS FOR DETECTION OF NUCLEIC ACIDS

<130> 53694-730.601

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<150> 62/985,850
<151> 2020-03-05

<150> 62/944,926
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<150> 62/881,809
<151> 2019-08-01

<150> 62/879,325
<151> 2019-07-26

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<400> 15
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<210> 19
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<210> 20
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<210> 21
<211> 50
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<213> Artificial Sequence

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<400> 21
gccaccccaa aaaugaaggg gacuaaaaca agaaacauuu gauaacaaug
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<210> 22
<211> 50
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<213> Artificial Sequence

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oligonucleotide"

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50

<210> 23
<211> 50
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<210> 24
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<210> 25
<211> 50
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<220>
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50

<210> 26
<211> 50
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<400> 26
gccaccccaa aaaugaaggg gacuaaaaca gccuauaaca aaugaucaga
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<210> 27
<211> 1228
<212> PRT
<213> Lachnospiraceae bacterium

<400> 27
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
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```
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
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```
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
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Leu Glu Tyr Ala Gln Thr Ser Val Lys His
    1220   1225

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<212> PRT
<213> Acidaminococcus sp.

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

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

Glu Gln Gly Phe Ile Glu Glu Asp Lys Ala Arg Asn Asp His Tyr Lys
        35   40   45

Glu Leu Lys Pro Ile Ile Asp Arg Ile Tyr Lys Thr Tyr Ala Asp Gln
    50   55   60

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

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

Glu Glu Gln Ala Thr Tyr Arg Asn Ala Ile His Asp Tyr Phe Ile Gly
            100   105   110

Arg Thr Asp Asn Leu Thr Asp Ala Ile Asn Lys Arg His Ala Glu Ile
        115   120   125

Tyr Lys Gly Leu Phe Lys Ala Glu Leu Phe Asn Gly Lys Val Leu Lys
    130   135   140

Gln Leu Gly Thr Val Thr Thr Thr Glu His Glu Asn Ala Leu Leu Arg
145   150   155   160

Ser Phe Asp Lys Phe Thr Thr Tyr Phe Ser Gly Phe Tyr Glu Asn Arg
                165   170   175

Lys Asn Val Phe Ser Ala Glu Asp Ile Ser Thr Ala Ile Pro His Arg
            180   185   190

```
Ile Val Gln Asp Asn Phe Pro Lys Phe Lys Glu Asn Cys His Ile Phe
        195                 200                 205

Thr Arg Leu Ile Thr Ala Val Pro Ser Leu Arg Glu His Phe Glu Asn
    210                 215                 220

Val Lys Lys Ala Ile Gly Ile Phe Val Ser Thr Ser Ile Glu Glu Val
225                 230                 235                 240

Phe Ser Phe Pro Phe Tyr Asn Gln Leu Leu Thr Gln Thr Gln Ile Asp
                245                 250                 255

Leu Tyr Asn Gln Leu Leu Gly Gly Ile Ser Arg Glu Ala Gly Thr Glu
            260                 265                 270

Lys Ile Lys Gly Leu Asn Glu Val Leu Asn Leu Ala Ile Gln Lys Asn
        275                 280                 285

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

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

Glu Glu Phe Lys Ser Asp Glu Glu Val Ile Gln Ser Phe Cys Lys Tyr
                325                 330                 335

Lys Thr Leu Leu Arg Asn Glu Asn Val Leu Glu Thr Ala Glu Ala Leu
            340                 345                 350

Phe Asn Glu Leu Asn Ser Ile Asp Leu Thr His Ile Phe Ile Ser His
        355                 360                 365

Lys Lys Leu Glu Thr Ile Ser Ser Ala Leu Cys Asp His Trp Asp Thr
    370                 375                 380

Leu Arg Asn Ala Leu Tyr Glu Arg Arg Ile Ser Glu Leu Thr Gly Lys
385                 390                 395                 400

Ile Thr Lys Ser Ala Lys Glu Lys Val Gln Arg Ser Leu Lys His Glu
                405                 410                 415

Asp Ile Asn Leu Gln Glu Ile Ile Ser Ala Ala Gly Lys Glu Leu Ser
            420                 425                 430
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```
Glu Ala Phe Lys Gln Lys Thr Ser Glu Ile Leu Ser His Ala His Ala
        435                 440                 445

Ala Leu Asp Gln Pro Leu Pro Thr Thr 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
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<210> 29
<211> 1300
<212> PRT
<213> Francisella novicida

<400> 29

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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 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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<213> Porphyromonas macacae

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Met Lys Thr Gln His Phe Phe Glu Asp Phe Thr Ser Leu Tyr Ser Leu
1               5                  10                  15


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


Asn Ile Lys Lys Asn Gly Leu Ile Arg Arg Asp Glu Gln Arg Leu Asp
        35                  40                  45
```

```
Asp Tyr Glu Lys Leu Lys Lys Val Ile Asp Glu Tyr His Glu Asp Phe
    50                  55                  60

Ile Ala Asn Ile Leu Ser Ser Phe Ser Phe Ser Glu Glu Ile Leu Gln
65                  70                  75                  80

Ser Tyr Ile Gln Asn Leu Ser Glu Ser Glu Ala Arg Ala Lys Ile Glu
                85                  90                  95

Lys Thr Met Arg Asp Thr Leu Ala Lys Ala Phe Ser Glu Asp Glu Arg
            100                 105                 110

Tyr Lys Ser Ile Phe Lys Lys Glu Leu Val Lys Lys Asp Ile Pro Val
        115                 120                 125

Trp Cys Pro Ala Tyr Lys Ser Leu Cys Lys Lys Phe Asp Asn Phe Thr
    130                 135                 140

Thr Ser Leu Val Pro Phe His Glu Asn Arg Lys Asn Leu Tyr Thr Ser
145                 150                 155                 160

Asn Glu Ile Thr Ala Ser Ile Pro Tyr Arg Ile Val His Val Asn Leu
                165                 170                 175

Pro Lys Phe Ile Gln Asn Ile Glu Ala Leu Cys Glu Leu Gln Lys Lys
            180                 185                 190

Met Gly Ala Asp Leu Tyr Leu Glu Met Met Glu Asn Leu Arg Asn Val
        195                 200                 205

Trp Pro Ser Phe Val Lys Thr Pro Asp Asp Leu Cys Asn Leu Lys Thr
    210                 215                 220

Tyr Asn His Leu Met Val Gln Ser Ser Ile Ser Glu Tyr Asn Arg Phe
225                 230                 235                 240

Val Gly Gly Tyr Ser Thr Glu Asp Gly Thr Lys His Gln Gly Ile Asn
                245                 250                 255

Glu Trp Ile Asn Ile Tyr Arg Gln Arg Asn Lys Glu Met Arg Leu Pro
            260                 265                 270
```

```
Gly Leu Val Phe Leu His Lys Gln Ile Leu Ala Lys Val Asp Ser Ser
        275                 280                 285

Ser Phe Ile Ser Asp Thr Leu Glu Asn Asp Asp Gln Val Phe Cys Val
    290                 295                 300

Leu Arg Gln Phe Arg Lys Leu Phe Trp Asn Thr Val Ser Ser Lys Glu
305                 310                 315                 320

Asp Asp Ala Ala Ser Leu Lys Asp Leu Phe Cys Gly Leu Ser Gly Tyr
                325                 330                 335

Asp Pro Glu Ala Ile Tyr Val Ser Asp Ala His Leu Ala Thr Ile Ser
            340                 345                 350

Lys Asn Ile Phe Asp Arg Trp Asn Tyr Ile Ser Asp Ala Ile Arg Arg
        355                 360                 365

Lys Thr Glu Val Leu Met Pro Arg Lys Lys Glu Ser Val Glu Arg Tyr
    370                 375                 380

Ala Glu Lys Ile Ser Lys Gln Ile Lys Lys Arg Gln Ser Tyr Ser Leu
385                 390                 395                 400

Ala Glu Leu Asp Asp Leu Leu Ala His Tyr Ser Glu Glu Ser Leu Pro
                405                 410                 415

Ala Gly Phe Ser Leu Leu Ser Tyr Phe Thr Ser Leu Gly Gly Gln Lys
            420                 425                 430

Tyr Leu Val Ser Asp Gly Glu Val Ile Leu Tyr Glu Glu Gly Ser Asn
        435                 440                 445

Ile Trp Asp Glu Val Leu Ile Ala Phe Arg Asp Leu Gln Val Ile Leu
    450                 455                 460

Asp Lys Asp Phe Thr Glu Lys Lys Leu Gly Lys Asp Glu Glu Ala Val
465                 470                 475                 480

Ser Val Ile Lys Lys Ala Leu Asp Ser Ala Leu Arg Leu Arg Lys Phe
                485                 490                 495

Phe Asp Leu Leu Ser Gly Thr Gly Ala Glu Ile Arg Arg Asp Ser Ser
            500                 505                 510
```

```
Phe Tyr Ala Leu Tyr Thr Asp Arg Met Asp Lys Leu Lys Gly Leu Leu
        515                 520                 525

Lys Met Tyr Asp Lys Val Arg Asn Tyr Leu Thr Lys Lys Pro Tyr Ser
    530                 535                 540

Ile Glu Lys Phe Lys Leu His Phe Asp Asn Pro Ser Leu Leu Ser Gly
545                 550                 555                 560

Trp Asp Lys Asn Lys Glu Leu Asn Asn Leu Ser Val Ile Phe Arg Gln
                565                 570                 575

Asn Gly Tyr Tyr Tyr Leu Gly Ile Met Thr Pro Lys Gly Lys Asn Leu
            580                 585                 590

Phe Lys Thr Leu Pro Lys Leu Gly Ala Glu Glu Met Phe Tyr Glu Lys
        595                 600                 605

Met Glu Tyr Lys Gln Ile Ala Glu Pro Met Leu Met Leu Pro Lys Val
    610                 615                 620

Phe Phe Pro Lys Lys Thr Lys Pro Ala Phe Ala Pro Asp Gln Ser Val
625                 630                 635                 640

Val Asp Ile Tyr Asn Lys Lys Thr Phe Lys Thr Gly Gln Lys Gly Phe
                645                 650                 655

Asn Lys Lys Asp Leu Tyr Arg Leu Ile Asp Phe Tyr Lys Glu Ala Leu
            660                 665                 670

Thr Val His Glu Trp Lys Leu Phe Asn Phe Ser Phe Ser Pro Thr Glu
        675                 680                 685

Gln Tyr Arg Asn Ile Gly Glu Phe Phe Asp Glu Val Arg Glu Gln Ala
    690                 695                 700

Tyr Lys Val Ser Met Val Asn Val Pro Ala Ser Tyr Ile Asp Glu Ala
705                 710                 715                 720

Val Glu Asn Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe
                725                 730                 735
```

```
Ser Pro Tyr Ser Lys Gly Ile Pro Asn Leu His Thr Leu Tyr Trp Lys
            740                 745                 750

Ala Leu Phe Ser Glu Gln Asn Gln Ser Arg Val Tyr Lys Leu Cys Gly
        755                 760                 765

Gly Gly Glu Leu Phe Tyr Arg Lys Ala Ser Leu His Met Gln Asp Thr
    770                 775                 780

Thr Val His Pro Lys Gly Ile Ser Ile His Lys Lys Asn Leu Asn Lys
785                 790                 795                 800

Lys Gly Glu Thr Ser Leu Phe Asn Tyr Asp Leu Val Lys Asp Lys Arg
                805                 810                 815

Phe Thr Glu Asp Lys Phe Phe Phe His Val Pro Ile Ser Ile Asn Tyr
            820                 825                 830

Lys Asn Lys Lys Ile Thr Asn Val Asn Gln Met Val Arg Asp Tyr Ile
        835                 840                 845

Ala Gln Asn Asp Asp Leu Gln Ile Ile Gly Ile Asp Arg Gly Glu Arg
    850                 855                 860

Asn Leu Leu Tyr Ile Ser Arg Ile Asp Thr Arg Gly Asn Leu Leu Glu
865                 870                 875                 880

Gln Phe Ser Leu Asn Val Ile Glu Ser Asp Lys Gly Asp Leu Arg Thr
                885                 890                 895

Asp Tyr Gln Lys Ile Leu Gly Asp Arg Glu Gln Glu Arg Leu Arg Arg
            900                 905                 910

Arg Gln Glu Trp Lys Ser Ile Glu Ser Ile Lys Asp Leu Lys Asp Gly
        915                 920                 925

Tyr Met Ser Gln Val Val His Lys Ile Cys Asn Met Val Val Glu His
    930                 935                 940

Lys Ala Ile Val Val Leu Glu Asn Leu Asn Leu Ser Phe Met Lys Gly
945                 950                 955                 960

Arg Lys Lys Val Glu Lys Ser Val Tyr Glu Lys Phe Glu Arg Met Leu
                965                 970                 975
```

```
Val Asp Lys Leu Asn Tyr Leu Val Val Asp Lys Lys Asn Leu Ser Asn
            980                 985                 990

Glu Pro Gly Gly Leu Tyr Ala Ala  Tyr Gln Leu Thr Asn  Pro Leu Phe
        995                 1000                1005

Ser Phe  Glu Glu Leu His Arg  Tyr Pro Gln Ser Gly  Ile Leu Phe
    1010                1015                1020

Phe Val  Asp Pro Trp Asn Thr  Ser Leu Thr Asp Pro  Ser Thr Gly
    1025                1030                1035

Phe Val  Asn Leu Leu Gly Arg  Ile Asn Tyr Thr Asn  Val Gly Asp
    1040                1045                1050

Ala Arg  Lys Phe Phe Asp Arg  Phe Asn Ala Ile Arg  Tyr Asp Gly
    1055                1060                1065

Lys Gly  Asn Ile Leu Phe Asp  Leu Asp Leu Ser Arg  Phe Asp Val
    1070                1075                1080

Arg Val  Glu Thr Gln Arg Lys  Leu Trp Thr Leu Thr  Thr Phe Gly
    1085                1090                1095

Ser Arg  Ile Ala Lys Ser Lys  Lys Ser Gly Lys Trp  Met Val Glu
    1100                1105                1110

Arg Ile  Glu Asn Leu Ser Leu  Cys Phe Leu Glu Leu  Phe Glu Gln
    1115                1120                1125

Phe Asn  Ile Gly Tyr Arg Val  Glu Lys Asp Leu Lys  Lys Ala Ile
    1130                1135                1140

Leu Ser  Gln Asp Arg Lys Glu  Phe Tyr Val Arg Leu  Ile Tyr Leu
    1145                1150                1155

Phe Asn  Leu Met Met Gln Ile  Arg Asn Ser Asp Gly  Glu Glu Asp
    1160                1165                1170

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

Ser Arg Leu Ile Glu Ala Lys Asp Leu Pro Val Asp Ala Asp Ala
1190 1195 1200

Asn Gly Ala Tyr Asn Val Ala Arg Lys Gly Leu Met Val Val Gln
1205 1210 1215

Arg Ile Lys Arg Gly Asp His Glu Ser Ile His Arg Ile Gly Arg
1220 1225 1230

Ala Gln Trp Leu Arg Tyr Val Gln Glu Gly Ile Val Glu
1235 1240 1245

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<212> PRT
<213> Moraxella bovoculi

<400> 31
Met Leu Phe Gln Asp Phe Thr His Leu Tyr Pro Leu Ser Lys Thr Val
1 5 10 15

Arg Phe Glu Leu Lys Pro Ile Asp Arg Thr Leu Glu His Ile His Ala
20 25 30

Lys Asn Phe Leu Ser Gln Asp Glu Thr Met Ala Asp Met His Gln Lys
35 40 45

Val Lys Val Ile Leu Asp Asp Tyr His Arg Asp Phe Ile Ala Asp Met
50 55 60

Met Gly Glu Val Lys Leu Thr Lys Leu Ala Glu Phe Tyr Asp Val Tyr
65 70 75 80

Leu Lys Phe Arg Lys Asn Pro Lys Asp Asp Glu Leu Gln Lys Gln Leu
85 90 95

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

Asn Gly Gly Lys Tyr Lys Ala Gly Tyr Asp Arg Leu Phe Gly Ala Lys
115 120 125

Leu Phe Lys Asp Gly Lys Glu Leu Gly Asp Leu Ala Lys Phe Val Ile
130 135 140

```
Ala Gln Glu Gly Glu Ser Ser Pro Lys Leu Ala His Leu Ala His Phe
145                 150                 155                 160

Glu Lys Phe Ser Thr Tyr Phe Thr Gly Phe His Asp Asn Arg Lys Asn
                165                 170                 175

Met Tyr Ser Asp Glu Asp Lys His Thr Ala Ile Ala Tyr Arg Leu Ile
            180                 185                 190

His Glu Asn Leu Pro Arg Phe Ile Asp Asn Leu Gln Ile Leu Thr Thr
        195                 200                 205

Ile Lys Gln Lys His Ser Ala Leu Tyr Asp Gln Ile Ile Asn Glu Leu
    210                 215                 220

Thr Ala Ser Gly Leu Asp Val Ser Leu Ala Ser His Leu Asp Gly Tyr
225                 230                 235                 240

His Lys Leu Leu Thr Gln Glu Gly Ile Thr Ala Tyr Asn Thr Leu Leu
                245                 250                 255

Gly Gly Ile Ser Gly Glu Ala Gly Ser Pro Lys Ile Gln Gly Ile Asn
            260                 265                 270

Glu Leu Ile Asn Ser His His Asn Gln His Cys His Lys Ser Glu Arg
        275                 280                 285

Ile Ala Lys Leu Arg Pro Leu His Lys Gln Ile Leu Ser Asp Gly Met
    290                 295                 300

Ser Val Ser Phe Leu Pro Ser Lys Phe Ala Asp Asp Ser Glu Met Cys
305                 310                 315                 320

Gln Ala Val Asn Glu Phe Tyr Arg His Tyr Ala Asp Val Phe Ala Lys
                325                 330                 335

Val Gln Ser Leu Phe Asp Gly Phe Asp Asp His Gln Lys Asp Gly Ile
            340                 345                 350

Tyr Val Glu His Lys Asn Leu Asn Glu Leu Ser Lys Gln Ala Phe Gly
        355                 360                 365

Asp Phe Ala Leu Leu Gly Arg Val Leu Asp Gly Tyr Tyr Val Asp Val
    370                 375                 380
```

```
Val Asn Pro Glu Phe Asn Glu Arg Phe Ala Lys Ala Lys Thr Asp Asn
385                 390                 395                 400

Ala Lys Ala Lys Leu Thr Lys Glu Lys Asp Lys Phe Ile Lys Gly Val
                405                 410                 415

His Ser Leu Ala Ser Leu Glu Gln Ala Ile Glu His Tyr Thr Ala Arg
            420                 425                 430

His Asp Asp Glu Ser Val Gln Ala Gly Lys Leu Gly Gln Tyr Phe Lys
        435                 440                 445

His Gly Leu Ala Gly Val Asp Asn Pro Ile Gln Lys Ile His Asn Asn
    450                 455                 460

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

Arg Ala Leu Pro Lys Ile Lys Ser Gly Lys Asn Pro Glu Met Thr Gln
                485                 490                 495

Leu Arg Gln Leu Lys Glu Leu Leu Asp Asn Ala Leu Asn Val Ala His
            500                 505                 510

Phe Ala Lys Leu Leu Thr Thr Lys Thr Thr Leu Asp Asn Gln Asp Gly
        515                 520                 525

Asn Phe Tyr Gly Glu Phe Gly Val Leu Tyr Asp Glu Leu Ala Lys Ile
    530                 535                 540

Pro Thr Leu Tyr Asn Lys Val Arg Asp Tyr Leu Ser Gln Lys Pro Phe
545                 550                 555                 560

Ser Thr Glu Lys Tyr Lys Leu Asn Phe Gly Asn Pro Thr Leu Leu Asn
                565                 570                 575

Gly Trp Asp Leu Asn Lys Glu Lys Asp Asn Phe Gly Val Ile Leu Gln
            580                 585                 590

Lys Asp Gly Cys Tyr Tyr Leu Ala Leu Leu Asp Lys Ala His Lys Lys
        595                 600                 605
```

```
Val Phe Asp Asn Ala Pro Asn Thr Gly Lys Ser Ile Tyr Gln Lys Met
    610                 615                 620

Ile Tyr Lys Tyr Leu Glu Val Arg Lys Gln Phe Pro Lys Val Phe Phe
625                 630                 635                 640

Ser Lys Glu Ala Ile Ala Ile Asn Tyr His Pro Ser Lys Glu Leu Val
                645                 650                 655

Glu Ile Lys Asp Lys Gly Arg Gln Arg Ser Asp Asp Glu Arg Leu Lys
            660                 665                 670

Leu Tyr Arg Phe Ile Leu Glu Cys Leu Lys Ile His Pro Lys Tyr Asp
        675                 680                 685

Lys Lys Phe Glu Gly Ala Ile Gly Asp Ile Gln Leu Phe Lys Lys Asp
    690                 695                 700

Lys Lys Gly Arg Glu Val Pro Ile Ser Glu Lys Asp Leu Phe Asp Lys
705                 710                 715                 720

Ile Asn Gly Ile Phe Ser Ser Lys Pro Lys Leu Glu Met Glu Asp Phe
                725                 730                 735

Phe Ile Gly Glu Phe Lys Arg Tyr Asn Pro Ser Gln Asp Leu Val Asp
            740                 745                 750

Gln Tyr Asn Ile Tyr Lys Lys Ile Asp Ser Asn Asp Asn Arg Lys Lys
        755                 760                 765

Glu Asn Phe Tyr Asn Asn His Pro Lys Phe Lys Lys Asp Leu Val Arg
    770                 775                 780

Tyr Tyr Tyr Glu Ser Met Cys Lys His Glu Glu Trp Glu Glu Ser Phe
785                 790                 795                 800

Glu Phe Ser Lys Lys Leu Gln Asp Ile Gly Cys Tyr Val Asp Val Asn
                805                 810                 815

Glu Leu Phe Thr Glu Ile Glu Thr Arg Arg Leu Asn Tyr Lys Ile Ser
            820                 825                 830

Phe Cys Asn Ile Asn Ala Asp Tyr Ile Asp Glu Leu Val Glu Gln Gly
        835                 840                 845
```

```
Gln Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ser Pro Lys Ala
    850                 855                 860

His Gly Lys Pro Asn Leu His Thr Leu Tyr Phe Lys Ala Leu Phe Ser
865                 870                 875                 880

Glu Asp Asn Leu Ala Asp Pro Ile Tyr Lys Leu Asn Gly Glu Ala Gln
                885                 890                 895

Ile Phe Tyr Arg Lys Ala Ser Leu Asp Met Asn Glu Thr Thr Ile His
            900                 905                 910

Arg Ala Gly Glu Val Leu Glu Asn Lys Asn Pro Asp Asn Pro Lys Lys
        915                 920                 925

Arg Gln Phe Val Tyr Asp Ile Ile Lys Asp Lys Arg Tyr Thr Gln Asp
    930                 935                 940

Lys Phe Met Leu His Val Pro Ile Thr Met Asn Phe Gly Val Gln Gly
945                 950                 955                 960

Met Thr Ile Lys Glu Phe Asn Lys Lys Val Asn Gln Ser Ile Gln Gln
                965                 970                 975

Tyr Asp Glu Val Asn Val Ile Gly Ile Asp Arg Gly Glu Arg His Leu
            980                 985                 990

Leu Tyr Leu Thr Val Ile Asn Ser  Lys Gly Glu Ile Leu  Glu Gln Cys
        995                 1000                1005

Ser Leu  Asn Asp Ile Thr Thr  Ala Ser Ala Asn Gly  Thr Gln Met
    1010                1015                1020

Thr Thr  Pro Tyr His Lys Ile  Leu Asp Lys Arg Glu  Ile Glu Arg
    1025                1030                1035

Leu Asn  Ala Arg Val Gly Trp  Gly Glu Ile Glu Thr  Ile Lys Glu
    1040                1045                1050

Leu Lys  Ser Gly Tyr Leu Ser  His Val Val His Gln  Ile Ser Gln
    1055                1060                1065
```

```
Leu Met  Leu Lys Tyr Asn Ala  Ile Val Val Leu Glu  Asp Leu Asn
    1070                1075                1080

Phe Gly  Phe Lys Arg Gly Arg  Phe Lys Val Glu Lys  Gln Ile Tyr
    1085                1090                1095

Gln Asn  Phe Glu Asn Ala Leu  Ile Lys Lys Leu Asn  His Leu Val
    1100                1105                1110

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

Leu Gln  Leu Thr Asn Asn Phe  Thr Asp Leu Lys Ser  Ile Gly Lys
    1130                1135                1140

Gln Thr  Gly Phe Leu Phe Tyr  Val Pro Ala Trp Asn  Thr Ser Lys
    1145                1150                1155

Ile Asp  Pro Glu Thr Gly Phe  Val Asp Leu Leu Lys  Pro Arg Tyr
    1160                1165                1170

Glu Asn  Ile Ala Gln Ser Gln  Ala Phe Phe Gly Lys  Phe Asp Lys
    1175                1180                1185

Ile Cys  Tyr Asn Ala Asp Lys  Asp Tyr Phe Glu Phe  His Ile Asp
    1190                1195                1200

Tyr Ala  Lys Phe Thr Asp Lys  Ala Lys Asn Ser Arg  Gln Ile Trp
    1205                1210                1215

Thr Ile  Cys Ser His Gly Asp  Lys Arg Tyr Val Tyr  Asp Lys Thr
    1220                1225                1230

Ala Asn  Gln Asn Lys Gly Ala  Ala Lys Gly Ile Asn  Val Asn Asp
    1235                1240                1245

Glu Leu  Lys Ser Leu Phe Ala  Arg His His Ile Asn  Glu Lys Gln
    1250                1255                1260

Pro Asn  Leu Val Met Asp Ile  Cys Gln Asn Asn Asp  Lys Glu Phe
    1265                1270                1275

His Lys  Ser Leu Met Tyr Leu  Leu Lys Thr Leu Leu  Ala Leu Arg
    1280                1285                1290
```

Tyr Ser Asn Ala Ser Ser Asp Glu Asp Phe Ile Leu Ser Pro Val
    1295   1300   1305

Ala Asn Asp Glu Gly Val Phe Phe Asn Ser Ala Leu Ala Asp Asp
    1310   1315   1320

Thr Gln Pro Gln Asn Ala Asp Ala Asn Gly Ala Tyr His Ile Ala
    1325   1330   1335

Leu Lys Gly Leu Trp Leu Leu Asn Glu Leu Lys Asn Ser Asp Asp
    1340   1345   1350

Leu Asn Lys Val Lys Leu Ala Ile Asp Asn Gln Thr Trp Leu Asn
    1355   1360   1365

Phe Ala Gln Asn Arg
    1370

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<212> PRT
<213> Moraxella bovoculi

<400> 32
Met Gly Ile His Gly Val Pro Ala Ala Leu Phe Gln Asp Phe Thr His
1   5   10   15

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

Arg Thr Leu Glu His Ile His Ala Lys Asn Phe Leu Ser Gln Asp Glu
        35   40   45

Thr Met Ala Asp Met Tyr Gln Lys Val Lys Val Ile Leu Asp Asp Tyr
    50   55   60

His Arg Asp Phe Ile Ala Asp Met Met Gly Glu Val Lys Leu Thr Lys
65   70   75   80

Leu Ala Glu Phe Tyr Asp Val Tyr Leu Lys Phe Arg Lys Asn Pro Lys
                85   90   95

Asp Asp Gly Leu Gln Lys Gln Leu Lys Asp Leu Gln Ala Val Leu Arg
            100   105   110

```
Lys Glu Ser Val Lys Pro Ile Gly Ser Gly Gly Lys Tyr Lys Thr Gly
        115                 120                 125

Tyr Asp Arg Leu Phe Gly Ala Lys Leu Phe Lys Asp Gly Lys Glu Leu
    130                 135                 140

Gly Asp Leu Ala Lys Phe Val Ile Ala Gln Glu Gly Glu Ser Ser Pro
145                 150                 155                 160

Lys Leu Ala His Leu Ala His Phe Glu Lys Phe Ser Thr Tyr Phe Thr
                165                 170                 175

Gly Phe His Asp Asn Arg Lys Asn Met Tyr Ser Asp Glu Asp Lys His
            180                 185                 190

Thr Ala Ile Ala Tyr Arg Leu Ile His Glu Asn Leu Pro Arg Phe Ile
        195                 200                 205

Asp Asn Leu Gln Ile Leu Thr Thr Ile Lys Gln Lys His Ser Ala Leu
    210                 215                 220

Tyr Asp Gln Ile Ile Asn Glu Leu Thr Ala Ser Gly Leu Asp Val Ser
225                 230                 235                 240

Leu Ala Ser His Leu Asp Gly Tyr His Lys Leu Leu Thr Gln Glu Gly
                245                 250                 255

Ile Thr Ala Tyr Asn Arg Ile Ile Gly Glu Val Asn Gly Tyr Thr Asn
            260                 265                 270

Lys His Asn Gln Ile Cys His Lys Ser Glu Arg Ile Ala Lys Leu Arg
        275                 280                 285

Pro Leu His Lys Gln Ile Leu Ser Asp Gly Met Gly Val Ser Phe Leu
    290                 295                 300

Pro Ser Lys Phe Ala Asp Asp Ser Glu Met Cys Gln Ala Val Asn Glu
305                 310                 315                 320

Phe Tyr Arg His Tyr Thr Asp Val Phe Ala Lys Val Gln Ser Leu Phe
                325                 330                 335
```

```
Asp Gly Phe Asp Asp His Gln Lys Asp Gly Ile Tyr Val Glu His Lys
            340                 345                 350

Asn Leu Asn Glu Leu Ser Lys Gln Ala Phe Gly Asp Phe Ala Leu Leu
        355                 360                 365

Gly Arg Val Leu Asp Gly Tyr Tyr Val Asp Val Val Asn Pro Glu Phe
    370                 375                 380

Asn Glu Arg Phe Ala Lys Ala Lys Thr Asp Asn Ala Lys Ala Lys Leu
385                 390                 395                 400

Thr Lys Glu Lys Asp Lys Phe Ile Lys Gly Val His Ser Leu Ala Ser
                405                 410                 415

Leu Glu Gln Ala Ile Glu His His Thr Ala Arg His Asp Asp Glu Ser
            420                 425                 430

Val Gln Ala Gly Lys Leu Gly Gln Tyr Phe Lys His Gly Leu Ala Gly
        435                 440                 445

Val Asp Asn Pro Ile Gln Lys Ile His Asn Asn His Ser Thr Ile Lys
    450                 455                 460

Gly Phe Leu Glu Arg Glu Arg Pro Ala Gly Glu Arg Ala Leu Pro Lys
465                 470                 475                 480

Ile Lys Ser Gly Lys Asn Pro Glu Met Thr Gln Leu Arg Gln Leu Lys
                485                 490                 495

Glu Leu Leu Asp Asn Ala Leu Asn Val Ala His Phe Ala Lys Leu Leu
            500                 505                 510

Thr Thr Lys Thr Thr Leu Asp Asn Gln Asp Gly Asn Phe Tyr Gly Glu
        515                 520                 525

Phe Gly Val Leu Tyr Asp Glu Leu Ala Lys Ile Pro Thr Leu Tyr Asn
    530                 535                 540

Lys Val Arg Asp Tyr Leu Ser Gln Lys Pro Phe Ser Thr Glu Lys Tyr
545                 550                 555                 560

Lys Leu Asn Phe Gly Asn Pro Thr Leu Leu Asn Gly Trp Asp Leu Asn
                565                 570                 575
```

```
Lys Glu Lys Asp Asn Phe Gly Val Ile Leu Gln Lys Asp Gly Cys Tyr
            580                 585                 590

Tyr Leu Ala Leu Leu Asp Lys Ala His Lys Lys Val Phe Asp Asn Ala
        595                 600                 605

Pro Asn Thr Gly Lys Asn Val Tyr Gln Lys Met Val Tyr Lys Leu Leu
    610                 615                 620

Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ala Lys Ser Asn
625                 630                 635                 640

Leu Asp Tyr Tyr Asn Pro Ser Ala Glu Leu Leu Asp Lys Tyr Ala Lys
                645                 650                 655

Gly Thr His Lys Lys Gly Asp Asn Phe Asn Leu Lys Asp Cys His Ala
            660                 665                 670

Leu Ile Asp Phe Phe Lys Ala Gly Ile Asn Lys His Pro Glu Trp Gln
        675                 680                 685

His Phe Gly Phe Lys Phe Ser Pro Thr Ser Ser Tyr Arg Asp Leu Ser
    690                 695                 700

Asp Phe Tyr Arg Glu Val Glu Pro Gln Gly Tyr Gln Val Lys Phe Val
705                 710                 715                 720

Asp Ile Asn Ala Asp Tyr Ile Asp Glu Leu Val Glu Gln Gly Lys Leu
                725                 730                 735

Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ser Pro Lys Ala His Gly
            740                 745                 750

Lys Pro Asn Leu His Thr Leu Tyr Phe Lys Ala Leu Phe Ser Glu Asp
        755                 760                 765

Asn Leu Ala Asp Pro Ile Tyr Lys Leu Asn Gly Glu Ala Gln Ile Phe
    770                 775                 780

Tyr Arg Lys Ala Ser Leu Asp Met Asn Glu Thr Thr Ile His Arg Ala
785                 790                 795                 800
```

```
Gly Glu Val Leu Glu Asn Lys Asn Pro Asp Asn Pro Lys Lys Arg Gln
                805                 810                 815

Phe Val Tyr Asp Ile Ile Lys Asp Lys Arg Tyr Thr Gln Asp Lys Phe
            820                 825                 830

Met Leu His Val Pro Ile Thr Met Asn Phe Gly Val Gln Gly Met Thr
        835                 840                 845

Ile Lys Glu Phe Asn Lys Lys Val Asn Gln Ser Ile Gln Gln Tyr Asp
    850                 855                 860

Glu Val Asn Val Ile Gly Ile Asp Arg Gly Glu Arg His Leu Leu Tyr
865                 870                 875                 880

Leu Thr Val Ile Asn Ser Lys Gly Glu Ile Leu Glu Gln Arg Ser Leu
                885                 890                 895

Asn Asp Ile Thr Thr Ala Ser Ala Asn Gly Thr Gln Val Thr Thr Pro
            900                 905                 910

Tyr His Lys Ile Leu Asp Lys Arg Glu Ile Glu Arg Leu Asn Ala Arg
        915                 920                 925

Val Gly Trp Gly Glu Ile Glu Thr Ile Lys Glu Leu Lys Ser Gly Tyr
    930                 935                 940

Leu Ser His Val Val His Gln Ile Asn Gln Leu Met Leu Lys Tyr Asn
945                 950                 955                 960

Ala Ile Val Val Leu Glu Asp Leu Asn Phe Gly Phe Lys Arg Gly Arg
                965                 970                 975

Phe Lys Val Glu Lys Gln Ile Tyr Gln Asn Phe Glu Asn Ala Leu Ile
            980                 985                 990

Lys Lys Leu Asn His Leu Val Leu  Lys Asp Lys Ala Asp  Asp Glu Ile
        995                 1000                1005

Gly Ser  Tyr Lys Asn Ala Leu  Gln Leu Thr Asn Asn  Phe Thr Asp
    1010                1015                1020

Leu Lys  Ser Ile Gly Lys Gln  Thr Gly Phe Leu Phe  Tyr Val Pro
    1025                1030                1035
```

```
Ala Trp  Asn Thr Ser Lys Ile  Asp Pro Glu Thr Gly  Phe Val Asp
    1040                1045                1050

Leu Leu  Lys Pro Arg Tyr Glu  Asn Ile Ala Gln Ser  Gln Ala Phe
    1055                1060                1065

Phe Gly  Lys Phe Asp Lys Ile  Cys Tyr Asn Thr Asp  Lys Gly Tyr
    1070                1075                1080

Phe Glu  Phe His Ile Asp Tyr  Ala Lys Phe Thr Asp  Lys Ala Lys
    1085                1090                1095

Asn Ser  Arg Gln Lys Trp Ala  Ile Cys Ser His Gly  Asp Lys Arg
    1100                1105                1110

Tyr Val  Tyr Asp Lys Thr Ala  Asn Gln Asn Lys Gly  Ala Ala Lys
    1115                1120                1125

Gly Ile  Asn Val Asn Asp Glu  Leu Lys Ser Leu Phe  Ala Arg Tyr
    1130                1135                1140

His Ile  Asn Asp Lys Gln Pro  Asn Leu Val Met Asp  Ile Cys Gln
    1145                1150                1155

Asn Asn  Asp Lys Glu Phe His  Lys Ser Leu Met Cys  Leu Leu Lys
    1160                1165                1170

Thr Leu  Leu Ala Leu Arg Tyr  Ser Asn Ala Ser Ser  Asp Glu Asp
    1175                1180                1185

Phe Ile  Leu Ser Pro Val Ala  Asn Asp Glu Gly Val  Phe Phe Asn
    1190                1195                1200

Ser Ala  Leu Ala Asp Asp Thr  Gln Pro Gln Asn Ala  Asp Ala Asn
    1205                1210                1215

Gly Ala  Tyr His Ile Ala Leu  Lys Gly Leu Trp Leu  Leu Asn Glu
    1220                1225                1230

Leu Lys  Asn Ser Asp Asp Leu  Asn Lys Val Lys Leu  Ala Ile Asp
    1235                1240                1245
```

Asn Gln Thr Trp Leu Asn Phe Ala Gln Asn Arg
    1250   1255

<210> 33
<211> 1269
<212> PRT
<213> Moraxella bovoculi

<400> 33
Met Gly Ile His Gly Val Pro Ala Ala Leu Phe Gln Asp Phe Thr His
1   5   10   15

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

Lys Thr Leu Glu His Ile His Ala Lys Asn Phe Leu Asn Gln Asp Glu
        35   40   45

Thr Met Ala Asp Met Tyr Gln Lys Val Lys Ala Ile Leu Asp Asp Tyr
    50   55   60

His Arg Asp Phe Ile Ala Asp Met Met Gly Glu Val Lys Leu Thr Lys
65   70   75   80

Leu Ala Glu Phe Tyr Asp Val Tyr Leu Lys Phe Arg Lys Asn Pro Lys
                85   90   95

Asp Asp Gly Leu Gln Lys Gln Leu Lys Asp Leu Gln Ala Val Leu Arg
            100   105   110

Lys Glu Ile Val Lys Pro Ile Gly Asn Gly Gly Lys Tyr Lys Ala Gly
        115   120   125

Tyr Asp Arg Leu Phe Gly Ala Lys Leu Phe Lys Asp Gly Lys Glu Leu
    130   135   140

Gly Asp Leu Ala Lys Phe Val Ile Ala Gln Glu Gly Glu Ser Ser Pro
145   150   155   160

Lys Leu Ala His Leu Ala His Phe Glu Lys Phe Ser Thr Tyr Phe Thr
                165   170   175

Gly Phe His Asp Asn Arg Lys Asn Met Tyr Ser Asp Glu Asp Lys His
            180   185   190

```
Thr Ala Ile Ala Tyr Arg Leu Ile His Glu Asn Leu Pro Arg Phe Ile
        195                 200                 205

Asp Asn Leu Gln Ile Leu Ala Thr Ile Lys Gln Lys His Ser Ala Leu
    210                 215                 220

Tyr Asp Gln Ile Ile Asn Glu Leu Thr Ala Ser Gly Leu Asp Val Ser
225                 230                 235                 240

Leu Ala Ser His Leu Asp Gly Tyr His Lys Leu Leu Thr Gln Glu Gly
                245                 250                 255

Ile Thr Ala Tyr Asn Thr Leu Leu Gly Gly Ile Ser Gly Glu Ala Gly
            260                 265                 270

Ser Arg Lys Ile Gln Gly Ile Asn Glu Leu Ile Asn Ser His His Asn
        275                 280                 285

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

Lys Gln Ile Leu Ser Asp Gly Met Gly Val Ser Phe Leu Pro Ser Lys
305                 310                 315                 320

Phe Ala Asp Asp Ser Glu Val Cys Gln Ala Val Asn Glu Phe Tyr Arg
                325                 330                 335

His Tyr Ala Asp Val Phe Ala Lys Val Gln Ser Leu Phe Asp Gly Phe
            340                 345                 350

Asp Asp Tyr Gln Lys Asp Gly Ile Tyr Val Glu Tyr Lys Asn Leu Asn
        355                 360                 365

Glu Leu Ser Lys Gln Ala Phe Gly Asp Phe Ala Leu Leu Gly Arg Val
    370                 375                 380

Leu Asp Gly Tyr Tyr Val Asp Val Val Asn Pro Glu Phe Asn Glu Arg
385                 390                 395                 400

Phe Ala Lys Ala Lys Thr Asp Asn Ala Lys Ala Lys Leu Thr Lys Glu
                405                 410                 415

Lys Asp Lys Phe Ile Lys Gly Val His Ser Leu Ala Ser Leu Glu Gln
            420                 425                 430
```

```
Ala Ile Glu His Tyr Thr Ala Arg His Asp Asp Glu Ser Val Gln Ala
        435                 440                 445

Gly Lys Leu Gly Gln Tyr Phe Lys His Gly Leu Ala Gly Val Asp Asn
    450                 455                 460

Pro Ile Gln Lys Ile His Asn Asn His Ser Thr Ile Lys Gly Phe Leu
465                 470                 475                 480

Glu Arg Glu Arg Pro Ala Gly Glu Arg Ala Leu Pro Lys Ile Lys Ser
                485                 490                 495

Asp Lys Ser Pro Glu Ile Arg Gln Leu Lys Glu Leu Leu Asp Asn Ala
            500                 505                 510

Leu Asn Val Ala His Phe Ala Lys Leu Leu Thr Thr Lys Thr Thr Leu
        515                 520                 525

His Asn Gln Asp Gly Asn Phe Tyr Gly Glu Phe Gly Ala Leu Tyr Asp
    530                 535                 540

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

Ser Gln Lys Pro Phe Ser Thr Glu Lys Tyr Lys Leu Asn Phe Gly Asn
                565                 570                 575

Pro Thr Leu Leu Asn Gly Trp Asp Leu Asn Lys Glu Lys Asp Asn Phe
            580                 585                 590

Gly Val Ile Leu Gln Lys Asp Gly Cys Tyr Tyr Leu Ala Leu Leu Asp
        595                 600                 605

Lys Ala His Lys Lys Val Phe Asp Asn Ala Pro Asn Thr Gly Lys Ser
    610                 615                 620

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

Leu Pro Lys Val Phe Phe Ala Lys Ser Asn Leu Asp Tyr Tyr Asn Pro
                645                 650                 655
```

```
Ser Ala Glu Leu Leu Asp Lys Tyr Ala Gln Gly Thr His Lys Lys Gly
            660                 665                 670

Asp Asn Phe Asn Leu Lys Asp Cys His Ala Leu Ile Asp Phe Phe Lys
        675                 680                 685

Ala Gly Ile Asn Lys His Pro Glu Trp Gln His Phe Gly Phe Lys Phe
    690                 695                 700

Ser Pro Thr Ser Ser Tyr Gln Asp Leu Ser Asp Phe Tyr Arg Glu Val
705                 710                 715                 720

Glu Pro Gln Gly Tyr Gln Val Lys Phe Val Asp Ile Asn Ala Asp Tyr
                725                 730                 735

Ile Asn Glu Leu Val Glu Gln Gly Gln Leu Tyr Leu Phe Gln Ile Tyr
            740                 745                 750

Asn Lys Asp Phe Ser Pro Lys Ala His Gly Lys Pro Asn Leu His Thr
        755                 760                 765

Leu Tyr Phe Lys Ala Leu Phe Ser Glu Asp Asn Leu Val Asn Pro Ile
    770                 775                 780

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

Asp Met Asn Glu Thr Thr Ile His Arg Ala Gly Glu Val Leu Glu Asn
                805                 810                 815

Lys Asn Pro Asp Asn Pro Lys Lys Arg Gln Phe Val Tyr Asp Ile Ile
            820                 825                 830

Lys Asp Lys Arg Tyr Thr Gln Asp Lys Phe Met Leu His Val Pro Ile
        835                 840                 845

Thr Met Asn Phe Gly Val Gln Gly Met Thr Ile Lys Glu Phe Asn Lys
    850                 855                 860

Lys Val Asn Gln Ser Ile Gln Gln Tyr Asp Glu Val Asn Val Ile Gly
865                 870                 875                 880

Ile Asp Arg Gly Glu Arg His Leu Leu Tyr Leu Thr Val Ile Asn Ser
                885                 890                 895
```

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

Ser Ala Asn Gly Thr Gln Met Thr Thr Pro Tyr His Lys Ile Leu Asp
        915                 920                 925

Lys Arg Glu Ile Glu Arg Leu Asn Ala Arg Val Gly Trp Gly Glu Ile
    930                 935                 940

Glu Thr Ile Lys Glu Leu Lys Ser Gly Tyr Leu Ser His Val Val His
945                 950                 955                 960

Gln Ile Ser Gln Leu Met Leu Lys Tyr Asn Ala Ile Val Val Leu Glu
                965                 970                 975

Asp Leu Asn Phe Gly Phe Lys Arg Gly Arg Phe Lys Val Glu Lys Gln
            980                 985                 990

Ile Tyr Gln Asn Phe Glu Asn Ala  Leu Ile Lys Lys Leu  Asn His Leu
        995                 1000                1005

Val Leu  Lys Asp Lys Ala Asp  Asp Glu Ile Gly Ser  Tyr Lys Asn
    1010                1015                1020

Ala Leu  Gln Leu Thr Asn Asn  Phe Thr Asp Leu Lys  Ser Ile Gly
    1025                1030                1035

Lys Gln  Thr Gly Phe Leu Phe  Tyr Val Pro Ala Trp  Asn Thr Ser
    1040                1045                1050

Lys Ile  Asp Pro Glu Thr Gly  Phe Val Asp Leu Leu  Lys Pro Arg
    1055                1060                1065

Tyr Glu  Asn Ile Ala Gln Ser  Gln Ala Phe Phe Gly  Lys Phe Asp
    1070                1075                1080

Lys Ile  Cys Tyr Asn Ala Asp  Arg Gly Tyr Phe Glu  Phe His Ile
    1085                1090                1095

Asp Tyr  Ala Lys Phe Asn Asp  Lys Ala Lys Asn Ser  Arg Gln Ile
    1100                1105                1110
```

```
Trp Lys  Ile Cys Ser His Gly  Asp Lys Arg Tyr Val  Tyr Asp Lys
    1115                1120                1125

Thr Ala  Asn Gln Asn Lys Gly  Ala Thr Ile Gly Val  Asn Val Asn
    1130                1135                1140

Asp Glu  Leu Lys Ser Leu Phe  Thr Arg Tyr His Ile  Asn Asp Lys
    1145                1150                1155

Gln Pro  Asn Leu Val Met Asp  Ile Cys Gln Asn Asn  Asp Lys Glu
    1160                1165                1170

Phe His  Lys Ser Leu Met Tyr  Leu Leu Lys Thr Leu  Leu Ala Leu
    1175                1180                1185

Arg Tyr  Ser Asn Ala Ser Ser  Asp Glu Asp Phe Ile  Leu Ser Pro
    1190                1195                1200

Val Ala  Asn Asp Glu Gly Val  Phe Phe Asn Ser Ala  Leu Ala Asp
    1205                1210                1215

Asp Thr  Gln Pro Gln Asn Ala  Asp Ala Asn Gly Ala  Tyr His Ile
    1220                1225                1230

Ala Leu  Lys Gly Leu Trp Leu  Leu Asn Glu Leu Lys  Asn Ser Asp
    1235                1240                1245

Asp Leu  Asn Lys Val Lys Leu  Ala Ile Asp Asn Gln  Thr Trp Leu
    1250                1255                1260

Asn Phe  Ala Gln Asn Arg
    1265
```

<210> 34
<211> 1306
<212> PRT
<213> Thiomicrospira sp.

<400> 34

```
Met Gly Ile His Gly Val Pro Ala Ala Thr Lys Thr Phe Asp Ser Glu
1               5                  10                  15

Phe Phe Asn Leu Tyr Ser Leu Gln Lys Thr Val Arg Phe Glu Leu Lys
            20                  25                  30
```

```
Pro Val Gly Glu Thr Ala Ser Phe Val Glu Asp Phe Lys Asn Glu Gly
        35                  40                  45

Leu Lys Arg Val Val Ser Glu Asp Glu Arg Arg Ala Val Asp Tyr Gln
    50                  55                  60

Lys Val Lys Glu Ile Ile Asp Asp Tyr His Arg Asp Phe Ile Glu Glu
65                  70                  75                  80

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

Ala Phe His Leu Tyr Gln Lys Leu Lys Ala Ala Lys Val Glu Glu Arg
            100                 105                 110

Glu Lys Ala Leu Lys Glu Trp Glu Ala Leu Gln Lys Lys Leu Arg Glu
        115                 120                 125

Lys Val Val Lys Cys Phe Ser Asp Ser Asn Lys Ala Arg Phe Ser Arg
    130                 135                 140

Ile Asp Lys Lys Glu Leu Ile Lys Glu Asp Leu Ile Asn Trp Leu Val
145                 150                 155                 160

Ala Gln Asn Arg Glu Asp Asp Ile Pro Thr Val Glu Thr Phe Asn Asn
                165                 170                 175

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

Ser Lys Asp Asp His Ala Thr Ala Ile Ser Phe Arg Leu Ile His Glu
        195                 200                 205

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

Glu Gly Phe Pro Glu Leu Lys Phe Asp Lys Val Lys Glu Asp Leu Glu
225                 230                 235                 240

Val Asp Tyr Asp Leu Lys His Ala Phe Glu Ile Glu Tyr Phe Val Asn
                245                 250                 255

Phe Val Thr Gln Ala Gly Ile Asp Gln Tyr Asn Tyr Leu Leu Gly Gly
            260                 265                 270
```

```
Lys Thr Leu Glu Asp Gly Thr Lys Lys Gln Gly Met Asn Glu Gln Ile
        275                 280                 285

Asn Leu Phe Lys Gln Gln Gln Thr Arg Asp Lys Ala Arg Gln Ile Pro
    290                 295                 300

Lys Leu Ile Pro Leu Phe Lys Gln Ile Leu Ser Glu Arg Thr Glu Ser
305                 310                 315                 320

Gln Ser Phe Ile Pro Lys Gln Phe Glu Ser Asp Gln Glu Leu Phe Asp
                325                 330                 335

Ser Leu Gln Lys Leu His Asn Asn Cys Gln Asp Lys Phe Thr Val Leu
            340                 345                 350

Gln Gln Ala Ile Leu Gly Leu Ala Glu Ala Asp Leu Lys Lys Val Phe
        355                 360                 365

Ile Lys Thr Ser Asp Leu Asn Ala Leu Ser Asn Thr Ile Phe Gly Asn
    370                 375                 380

Tyr Ser Val Phe Ser Asp Ala Leu Asn Leu Tyr Lys Glu Ser Leu Lys
385                 390                 395                 400

Thr Lys Lys Ala Gln Glu Ala Phe Glu Lys Leu Pro Ala His Ser Ile
                405                 410                 415

His Asp Leu Ile Gln Tyr Leu Glu Gln Phe Asn Ser Ser Leu Asp Ala
            420                 425                 430

Glu Lys Gln Gln Ser Thr Asp Thr Val Leu Asn Tyr Phe Ile Lys Thr
        435                 440                 445

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

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

Pro Pro Glu Ser Glu Asp Glu Gly Ala Lys Gly Gln Glu Gly Phe Glu
                485                 490                 495
```

```
Gln Ile Lys Arg Ile Lys Ala Tyr Leu Asp Thr Leu Met Glu Ala Val
            500                 505                 510

His Phe Ala Lys Pro Leu Tyr Leu Val Lys Gly Arg Lys Met Ile Glu
        515                 520                 525

Gly Leu Asp Lys Asp Gln Ser Phe Tyr Glu Ala Phe Glu Met Ala Tyr
    530                 535                 540

Gln Glu Leu Glu Ser Leu Ile Ile Pro Ile Tyr Asn Lys Ala Arg Ser
545                 550                 555                 560

Tyr Leu Ser Arg Lys Pro Phe Lys Ala Asp Lys Phe Lys Ile Asn Phe
                565                 570                 575

Asp Asn Asn Thr Leu Leu Ser Gly Trp Asp Ala Asn Lys Glu Thr Ala
            580                 585                 590

Asn Ala Ser Ile Leu Phe Lys Lys Asp Gly Leu Tyr Tyr Leu Gly Ile
        595                 600                 605

Met Pro Lys Gly Lys Thr Phe Leu Phe Asp Tyr Phe Val Ser Ser Glu
    610                 615                 620

Asp Ser Glu Lys Leu Lys Gln Arg Arg Gln Lys Thr Ala Glu Glu Ala
625                 630                 635                 640

Leu Ala Gln Asp Gly Glu Ser Tyr Phe Glu Lys Ile Arg Tyr Lys Leu
                645                 650                 655

Leu Pro Gly Ala Ser Lys Met Leu Pro Lys Val Phe Phe Ser Asn Lys
            660                 665                 670

Asn Ile Gly Phe Tyr Asn Pro Ser Asp Asp Ile Leu Arg Ile Arg Asn
        675                 680                 685

Thr Ala Ser His Thr Lys Asn Gly Thr Pro Gln Lys Gly His Ser Lys
    690                 695                 700

Val Glu Phe Asn Leu Asn Asp Cys His Lys Met Ile Asp Phe Phe Lys
705                 710                 715                 720

Ser Ser Ile Gln Lys His Pro Glu Trp Gly Ser Phe Gly Phe Thr Phe
                725                 730                 735
```

```
Ser Asp Thr Ser Asp Phe Glu Asp Met Ser Ala Phe Tyr Arg Glu Val
            740                 745                 750

Glu Asn Gln Gly Tyr Val Ile Ser Phe Asp Lys Ile Lys Glu Thr Tyr
        755                 760                 765

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

Asn Lys Asp Phe Ser Pro Tyr Ser Lys Gly Lys Pro Asn Leu His Thr
785                 790                 795                 800

Leu Tyr Trp Lys Ala Leu Phe Glu Glu Ala Asn Leu Asn Asn Val Val
                805                 810                 815

Ala Lys Leu Asn Gly Glu Ala Glu Ile Phe Phe Arg Arg His Ser Ile
            820                 825                 830

Lys Ala Ser Asp Lys Val Val His Pro Ala Asn Gln Ala Ile Asp Asn
        835                 840                 845

Lys Asn Pro His Thr Glu Lys Thr Gln Ser Thr Phe Glu Tyr Asp Leu
    850                 855                 860

Val Lys Asp Lys Arg Tyr Thr Gln Asp Lys Phe Phe Phe His Val Pro
865                 870                 875                 880

Ile Ser Leu Asn Phe Lys Ala Gln Gly Val Ser Lys Phe Asn Asp Lys
                885                 890                 895

Val Asn Gly Phe Leu Lys Gly Asn Pro Asp Val Asn Ile Ile Gly Ile
            900                 905                 910

Asp Arg Gly Glu Arg His Leu Leu Tyr Phe Thr Val Val Asn Gln Lys
        915                 920                 925

Gly Glu Ile Leu Val Gln Glu Ser Leu Asn Thr Leu Met Ser Asp Lys
    930                 935                 940

Gly His Val Asn Asp Tyr Gln Gln Lys Leu Asp Lys Lys Glu Gln Glu
945                 950                 955                 960
```

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

Leu Lys Glu Gly Tyr Leu Ser His Val Val His Lys Leu Ala His Leu
            980                 985                 990

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

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

Phe Glu  Lys Ala Leu Ile Asp  Lys Leu Asn Tyr Leu  Val Phe Lys
    1025                1030                1035

Glu Lys  Glu Leu Gly Glu Val  Gly His Tyr Leu Thr  Ala Tyr Gln
    1040                1045                1050

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

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

Pro Thr  Thr Gly Phe Val Asn  Phe Leu Asp Leu Arg  Tyr Gln Ser
    1085                1090                1095

Val Glu  Lys Ala Lys Gln Leu  Leu Ser Asp Phe Asn  Ala Ile Arg
    1100                1105                1110

Phe Asn  Ser Val Gln Asn Tyr  Phe Glu Phe Glu Ile  Asp Tyr Lys
    1115                1120                1125

Lys Leu  Thr Pro Lys Arg Lys  Val Gly Thr Gln Ser  Lys Trp Val
    1130                1135                1140

Ile Cys  Thr Tyr Gly Asp Val  Arg Tyr Gln Asn Arg  Arg Asn Gln
    1145                1150                1155

Lys Gly  His Trp Glu Thr Glu  Glu Val Asn Val Thr  Glu Lys Leu
    1160                1165                1170

Lys Ala  Leu Phe Ala Ser Asp  Ser Lys Thr Thr Thr  Val Ile Asp
    1175                1180                1185
```

Tyr Ala Asn Asp Asp Asn Leu Ile Asp Val Ile Leu Glu Gln Asp
1190 1195 1200

Lys Ala Ser Phe Phe Lys Glu Leu Leu Trp Leu Leu Lys Leu Thr
1205 1210 1215

Met Thr Leu Arg His Ser Lys Ile Lys Ser Glu Asp Asp Phe Ile
1220 1225 1230

Leu Ser Pro Val Lys Asn Glu Gln Gly Glu Phe Tyr Asp Ser Arg
1235 1240 1245

Lys Ala Gly Glu Val Trp Pro Lys Asp Ala Asp Ala Asn Gly Ala
1250 1255 1260

Tyr His Ile Ala Leu Lys Gly Leu Trp Asn Leu Gln Gln Ile Asn
1265 1270 1275

Gln Trp Glu Lys Gly Lys Thr Leu Asn Leu Ala Ile Lys Asn Gln
1280 1285 1290

Asp Trp Phe Ser Phe Ile Gln Glu Lys Pro Tyr Gln Glu
1295 1300 1305

<210> 35
<211> 1214
<212> PRT
<213> Butyrivibrio sp.

<400> 35
Met Gly Ile His Gly Val Pro Ala Ala Tyr Tyr Gln Asn Leu Thr Lys
1 5 10 15

Lys Tyr Pro Val Ser Lys Thr Ile Arg Asn Glu Leu Ile Pro Ile Gly
20 25 30

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

Lys Arg Lys Gln Asp Tyr Glu His Val Lys Gly Ile Met Asp Glu Tyr
50 55 60

His Lys Gln Leu Ile Asn Glu Ala Leu Asp Asn Tyr Met Leu Pro Ser
65 70 75 80

```
Leu Asn Gln Ala Ala Glu Ile Tyr Leu Lys Lys His Val Asp Val Glu
                85                  90                  95

Asp Arg Glu Glu Phe Lys Lys Thr Gln Asp Leu Leu Arg Arg Glu Val
            100                 105                 110

Thr Gly Arg Leu Lys Glu His Glu Asn Tyr Thr Lys Ile Gly Lys Lys
        115                 120                 125

Asp Ile Leu Asp Leu Leu Glu Lys Leu Pro Ser Ile Ser Glu Glu Asp
    130                 135                 140

Tyr Asn Ala Leu Glu Ser Phe Arg Asn Phe Tyr Thr Tyr Phe Thr Ser
145                 150                 155                 160

Tyr Asn Lys Val Arg Glu Asn Leu Tyr Ser Asp Glu Glu Lys Ser Ser
                165                 170                 175

Thr Val Ala Tyr Arg Leu Ile Asn Glu Asn Leu Pro Lys Phe Leu Asp
            180                 185                 190

Asn Ile Lys Ser Tyr Ala Phe Val Lys Ala Ala Gly Val Leu Ala Asp
        195                 200                 205

Cys Ile Glu Glu Glu Glu Gln Asp Ala Leu Phe Met Val Glu Thr Phe
    210                 215                 220

Asn Met Thr Leu Thr Gln Glu Gly Ile Asp Met Tyr Asn Tyr Gln Ile
225                 230                 235                 240

Gly Lys Val Asn Ser Ala Ile Asn Leu Tyr Asn Gln Lys Asn His Lys
                245                 250                 255

Val Glu Glu Phe Lys Lys Ile Pro Lys Met Lys Val Leu Tyr Lys Gln
            260                 265                 270

Ile Leu Ser Asp Arg Glu Glu Val Phe Ile Gly Glu Phe Lys Asp Asp
        275                 280                 285

Glu Thr Leu Leu Ser Ser Ile Gly Ala Tyr Gly Asn Val Leu Met Thr
    290                 295                 300
```

```
Tyr Leu Lys Ser Glu Lys Ile Asn Ile Phe Phe Asp Ala Leu Arg Glu
305                 310                 315                 320

Ser Glu Gly Lys Asn Val Tyr Val Lys Asn Asp Leu Ser Lys Thr Thr
                325                 330                 335

Met Ser Asn Ile Val Phe Gly Ser Trp Ser Ala Phe Asp Glu Leu Leu
            340                 345                 350

Asn Gln Glu Tyr Asp Leu Ala Asn Glu Asn Lys Lys Lys Asp Asp Lys
        355                 360                 365

Tyr Phe Glu Lys Arg Gln Lys Glu Leu Lys Lys Asn Lys Ser Tyr Thr
    370                 375                 380

Leu Glu Gln Met Ser Asn Leu Ser Lys Glu Asp Ile Ser Pro Ile Glu
385                 390                 395                 400

Asn Tyr Ile Glu Arg Ile Ser Glu Asp Ile Glu Lys Ile Cys Ile Tyr
                405                 410                 415

Asn Gly Glu Phe Glu Lys Ile Val Val Asn Glu His Asp Ser Ser Arg
            420                 425                 430

Lys Leu Ser Lys Asn Ile Lys Ala Val Lys Val Ile Lys Asp Tyr Leu
        435                 440                 445

Asp Ser Ile Lys Glu Leu Glu His Asp Ile Lys Leu Ile Asn Gly Ser
    450                 455                 460

Gly Gln Glu Leu Glu Lys Asn Leu Val Val Tyr Val Gly Gln Glu Glu
465                 470                 475                 480

Ala Leu Glu Gln Leu Arg Pro Val Asp Ser Leu Tyr Asn Leu Thr Arg
                485                 490                 495

Asn Tyr Leu Thr Lys Lys Pro Phe Ser Thr Glu Lys Val Lys Leu Asn
            500                 505                 510

Phe Asn Lys Ser Thr Leu Leu Asn Gly Trp Asp Lys Asn Lys Glu Thr
        515                 520                 525

Asp Asn Leu Gly Ile Leu Phe Phe Lys Asp Gly Lys Tyr Tyr Leu Gly
    530                 535                 540
```

```
Ile Met Asn Thr Thr Ala Asn Lys Ala Phe Val Asn Pro Pro Ala Ala
545                 550                 555                 560

Lys Thr Glu Asn Val Phe Lys Lys Val Asp Tyr Lys Leu Leu Pro Gly
                565                 570                 575

Ser Asn Lys Met Leu Pro Lys Val Phe Phe Ala Lys Ser Asn Ile Gly
            580                 585                 590

Tyr Tyr Asn Pro Ser Thr Glu Leu Tyr Ser Asn Tyr Lys Lys Gly Thr
        595                 600                 605

His Lys Lys Gly Pro Ser Phe Ser Ile Asp Asp Cys His Asn Leu Ile
    610                 615                 620

Asp Phe Phe Lys Glu Ser Ile Lys Lys His Glu Asp Trp Ser Lys Phe
625                 630                 635                 640

Gly Phe Glu Phe Ser Asp Thr Ala Asp Tyr Arg Asp Ile Ser Glu Phe
                645                 650                 655

Tyr Arg Glu Val Glu Lys Gln Gly Tyr Lys Leu Thr Phe Thr Asp Ile
            660                 665                 670

Asp Glu Ser Tyr Ile Asn Asp Leu Ile Glu Lys Asn Glu Leu Tyr Leu
        675                 680                 685

Phe Gln Ile Tyr Asn Lys Asp Phe Ser Glu Tyr Ser Lys Gly Lys Leu
    690                 695                 700

Asn Leu His Thr Leu Tyr Phe Met Met Leu Phe Asp Gln Arg Asn Leu
705                 710                 715                 720

Asp Asn Val Val Tyr Lys Leu Asn Gly Glu Ala Glu Val Phe Tyr Arg
                725                 730                 735

Pro Ala Ser Ile Ala Glu Asn Glu Leu Val Ile His Lys Ala Gly Glu
            740                 745                 750

Gly Ile Lys Asn Lys Asn Pro Asn Arg Ala Lys Val Lys Glu Thr Ser
        755                 760                 765
```

```
Thr Phe Ser Tyr Asp Ile Val Lys Asp Lys Arg Tyr Ser Lys Tyr Lys
    770                 775                 780

Phe Thr Leu His Ile Pro Ile Thr Met Asn Phe Gly Val Asp Glu Val
785                 790                 795                 800

Arg Arg Phe Asn Asp Val Ile Asn Asn Ala Leu Arg Thr Asp Asp Asn
                805                 810                 815

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

Val Val Ile Asn Ser Glu Gly Lys Ile Leu Glu Gln Ile Ser Leu Asn
        835                 840                 845

Ser Ile Ile Asn Lys Glu Tyr Asp Ile Glu Thr Asn Tyr His Ala Leu
    850                 855                 860

Leu Asp Glu Arg Glu Asp Asp Arg Asn Lys Ala Arg Lys Asp Trp Asn
865                 870                 875                 880

Thr Ile Glu Asn Ile Lys Glu Leu Lys Thr Gly Tyr Leu Ser Gln Val
                885                 890                 895

Val Asn Val Val Ala Lys Leu Val Leu Lys Tyr Asn Ala Ile Ile Cys
            900                 905                 910

Leu Glu Asp Leu Asn Phe Gly Phe Lys Arg Gly Arg Gln Lys Val Glu
        915                 920                 925

Lys Gln Val Tyr Gln Lys Phe Glu Lys Met Leu Ile Glu Lys Leu Asn
    930                 935                 940

Tyr Leu Val Ile Asp Lys Ser Arg Glu Gln Val Ser Pro Glu Lys Met
945                 950                 955                 960

Gly Gly Ala Leu Asn Ala Leu Gln Leu Thr Ser Lys Phe Lys Ser Phe
                965                 970                 975

Ala Glu Leu Gly Lys Gln Ser Gly Ile Ile Tyr Tyr Val Pro Ala Tyr
            980                 985                 990

Leu Thr Ser Lys Ile Asp Pro Thr  Thr Gly Phe Val Asn  Leu Phe Tyr
        995                 1000                1005
```

```
Ile Lys  Tyr Glu Asn Ile Glu  Lys Ala Lys Gln Phe  Phe Asp Gly
    1010                 1015                 1020

Phe Asp  Phe Ile Arg Phe Asn  Lys Lys Asp Asp Met  Phe Glu Phe
    1025                 1030                 1035

Ser Phe  Asp Tyr Lys Ser Phe  Thr Gln Lys Ala Cys  Gly Ile Arg
    1040                 1045                 1050

Ser Lys  Trp Ile Val Tyr Thr  Asn Gly Glu Arg Ile  Ile Lys Tyr
    1055                 1060                 1065

Pro Asn  Pro Glu Lys Asn Asn  Leu Phe Asp Glu Lys  Val Ile Asn
    1070                 1075                 1080

Val Thr  Asp Glu Ile Lys Gly  Leu Phe Lys Gln Tyr  Arg Ile Pro
    1085                 1090                 1095

Tyr Glu  Asn Gly Glu Asp Ile  Lys Glu Ile Ile Ile  Ser Lys Ala
    1100                 1105                 1110

Glu Ala  Asp Phe Tyr Lys Arg  Leu Phe Arg Leu Leu  His Gln Thr
    1115                 1120                 1125

Leu Gln  Met Arg Asn Ser Thr  Ser Asp Gly Thr Arg  Asp Tyr Ile
    1130                 1135                 1140

Ile Ser  Pro Val Lys Asn Asp  Arg Gly Glu Phe Phe  Cys Ser Glu
    1145                 1150                 1155

Phe Ser  Glu Gly Thr Met Pro  Lys Asp Ala Asp Ala  Asn Gly Ala
    1160                 1165                 1170

Tyr Asn  Ile Ala Arg Lys Gly  Leu Trp Val Leu Glu  Gln Ile Arg
    1175                 1180                 1185

Gln Lys  Asp Glu Gly Glu Lys  Val Asn Leu Ser Met  Thr Asn Ala
    1190                 1195                 1200

Glu Trp  Leu Lys Tyr Ala Gln  Leu His Leu Leu
    1205                 1210
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<210> 36
<211> 1129
<212> PRT
<213> Alicyclobacillus acidoterrestris

<400> 36
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> 37
<211> 1224
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 37
Met Lys Lys Ile Asp Asn Phe Val Gly Cys Tyr Pro Val Ser Lys Thr
1 5 10 15

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

Lys Lys Arg Leu Val Glu Glu Asp Glu Val Arg Ala Lys Asp Tyr Lys
35 40 45

Ala Val Lys Lys Leu Ile Asp Arg Tyr His Arg Glu Phe Ile Glu Gly
50 55 60

Val Leu Asp Asn Val Lys Leu Asp Gly Leu Glu Glu Tyr Tyr Met Leu
65 70 75 80

Phe Asn Lys Ser Asp Arg Glu Glu Ser Asp Asn Lys Lys Ile Glu Ile
85 90 95

Met Glu Glu Arg Phe Arg Arg Val Ile Ser Lys Ser Phe Lys Asn Asn
100 105 110

Glu Glu Tyr Lys Lys Ile Phe Ser Lys Lys Ile Ile Glu Glu Ile Leu
115 120 125

Pro Asn Tyr Ile Lys Asp Glu Glu Glu Lys Glu Leu Val Lys Gly Phe
130 135 140

Lys Gly Phe Tyr Thr Ala Phe Val Gly Tyr Ala Gln Asn Arg Glu Asn
145 150 155 160

Met Tyr Ser Asp Glu Lys Lys Ser Thr Ala Ile Ser Tyr Arg Ile Val
165 170 175

```
Asn Glu Asn Met Pro Arg Phe Ile Thr Asn Ile Lys Val Phe Glu Lys
            180                 185                 190

Ala Lys Ser Ile Leu Asp Val Asp Lys Ile Asn Glu Ile Asn Glu Tyr
        195                 200                 205

Ile Leu Asn Asn Asp Tyr Tyr Val Asp Asp Phe Phe Asn Ile Asp Phe
    210                 215                 220

Phe Asn Tyr Val Leu Asn Gln Lys Gly Ile Asp Ile Tyr Asn Ala Ile
225                 230                 235                 240

Ile Gly Gly Ile Val Thr Gly Asp Gly Arg Lys Ile Gln Gly Leu Asn
                245                 250                 255

Glu Cys Ile Asn Leu Tyr Asn Gln Glu Asn Lys Lys Ile Arg Leu Pro
            260                 265                 270

Gln Phe Lys Pro Leu Tyr Lys Gln Ile Leu Ser Glu Ser Glu Ser Met
        275                 280                 285

Ser Phe Tyr Ile Asp Glu Ile Glu Ser Asp Asp Met Leu Ile Asp Met
    290                 295                 300

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

Asp Leu Lys Val Leu Phe Asn Asn Ile Phe Asp Tyr Asp Leu Ser Gly
                325                 330                 335

Ile Phe Ile Asn Asn Gly Leu Pro Ile Thr Thr Ile Ser Asn Asp Val
            340                 345                 350

Tyr Gly Gln Trp Ser Thr Ile Ser Asp Gly Trp Asn Glu Arg Tyr Asp
        355                 360                 365

Val Leu Ser Asn Ala Lys Asp Lys Glu Ser Glu Lys Tyr Phe Glu Lys
    370                 375                 380

Arg Arg Lys Glu Tyr Lys Lys Val Lys Ser Phe Ser Ile Ser Asp Leu
385                 390                 395                 400

Gln Glu Leu Gly Gly Lys Asp Leu Ser Ile Cys Lys Lys Ile Asn Glu
```

```
                405                 410                 415

Ile Ile Ser Glu Met Ile Asp Asp Tyr Lys Ser Lys Ile Glu Glu Ile
            420                 425                 430

Gln Tyr Leu Phe Asp Ile Lys Glu Leu Glu Lys Pro Leu Val Thr Asp
        435                 440                 445

Leu Asn Lys Ile Glu Leu Ile Lys Asn Ser Leu Asp Gly Leu Lys Arg
    450                 455                 460

Ile Glu Arg Tyr Val Ile Pro Phe Leu Gly Thr Gly Lys Glu Gln Asn
465                 470                 475                 480

Arg Asp Glu Val Phe Tyr Gly Tyr Phe Ile Lys Cys Ile Asp Ala Ile
                485                 490                 495

Lys Glu Ile Asp Gly Val Tyr Asn Lys Thr Arg Asn Tyr Leu Thr Lys
            500                 505                 510

Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Glu Asn Pro Gln
        515                 520                 525

Leu Met Gly Gly Trp Asp Arg Asn Lys Glu Ser Asp Tyr Arg Ser Thr
    530                 535                 540

Leu Leu Arg Lys Asn Gly Lys Tyr Tyr Val Ala Ile Ile Asp Lys Ser
545                 550                 555                 560

Ser Ser Asn Cys Met Met Asn Ile Glu Glu Asp Glu Asn Asp Asn Tyr
                565                 570                 575

Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu Pro
            580                 585                 590

Lys Val Phe Phe Ser Lys Lys Asn Arg Glu Tyr Phe Ala Pro Ser Lys
        595                 600                 605

Glu Ile Glu Arg Ile Tyr Ser Thr Gly Thr Phe Lys Lys Asp Thr Asn
    610                 615                 620

Phe Val Lys Lys Asp Cys Glu Asn Leu Ile Thr Phe Tyr Lys Asp Ser
625                 630                 635                 640
```

```
Leu Asp Arg His Glu Asp Trp Ser Lys Ser Phe Asp Phe Ser Phe Lys
                645                 650                 655

Glu Ser Ser Ala Tyr Arg Asp Ile Ser Glu Phe Tyr Arg Asp Val Glu
            660                 665                 670

Lys Gln Gly Tyr Arg Val Ser Phe Asp Leu Leu Ser Ser Asn Ala Val
        675                 680                 685

Asn Thr Leu Val Glu Glu Gly Lys Leu Tyr Leu Phe Gln Leu Tyr Asn
    690                 695                 700

Lys Asp Phe Ser Glu Lys Ser His Gly Ile Pro Asn Leu His Thr Met
705                 710                 715                 720

Tyr Phe Arg Ser Leu Phe Asp Asp Asn Asn Lys Gly Asn Ile Arg Leu
                725                 730                 735

Asn Gly Gly Ala Glu Met Phe Met Arg Arg Ala Ser Leu Asn Lys Gln
            740                 745                 750

Asp Val Thr Val His Lys Ala Asn Gln Pro Ile Lys Asn Lys Asn Leu
        755                 760                 765

Leu Asn Pro Lys Lys Thr Thr Thr Leu Pro Tyr Asp Val Tyr Lys Asp
    770                 775                 780

Lys Arg Phe Thr Glu Asp Gln Tyr Glu Val His Ile Pro Ile Thr Met
785                 790                 795                 800

Asn Lys Val Pro Asn Asn Pro Tyr Lys Ile Asn His Met Val Arg Glu
                805                 810                 815

Gln Leu Val Lys Asp Asp Asn Pro Tyr Val Ile Gly Ile Asp Arg Gly
            820                 825                 830

Glu Arg Asn Leu Ile Tyr Val Val Val Val Asp Gly Gln Gly His Ile
        835                 840                 845

Val Glu Gln Leu Ser Leu Asn Glu Ile Ile Asn Glu Asn Asn Gly Ile
    850                 855                 860

Ser Ile Arg Thr Asp Tyr His Thr Leu Leu Asp Ala Lys Glu Arg Glu
```

```
865                 870                 875                 880

Arg Asp Glu Ser Arg Lys Gln Trp Lys Gln Ile Glu Asn Ile Lys Glu
                885                 890                 895

Leu Lys Glu Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys Glu Leu
            900                 905                 910

Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu Asn Ser Gly
        915                 920                 925

Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val Tyr Gln Lys Phe
    930                 935                 940

Glu Lys Met Leu Ile Thr Lys Leu Asn Tyr Met Val Asp Lys Lys Lys
945                 950                 955                 960

Asp Tyr Asn Lys Pro Gly Gly Val Leu Asn Gly Tyr Gln Leu Thr Thr
                965                 970                 975

Gln Phe Glu Ser Phe Ser Lys Met Gly Thr Gln Asn Gly Ile Met Phe
            980                 985                 990

Tyr Ile Pro Ala Trp Leu Thr Ser  Lys Met Asp Pro Thr  Thr Gly Phe
        995                 1000                1005

Val Asp  Leu Leu Lys Pro Lys  Tyr Lys Asn Lys Ala  Asp Ala Gln
    1010                1015                1020

Lys Phe  Phe Ser Gln Phe Asp  Ser Ile Arg Tyr Asp  Asn Gln Glu
    1025                1030                1035

Asp Ala  Phe Val Phe Lys Val  Asn Tyr Thr Lys Phe  Pro Arg Thr
    1040                1045                1050

Asp Ala  Asp Tyr Asn Lys Glu  Trp Glu Ile Tyr Thr  Asn Gly Glu
    1055                1060                1065

Arg Ile  Arg Val Phe Arg Asn  Pro Lys Lys Asn Asn  Glu Tyr Asp
    1070                1075                1080

Tyr Glu  Thr Val Asn Val Ser  Glu Arg Met Lys Glu  Leu Phe Asp
    1085                1090                1095
```

Ser Tyr Asp Leu Leu Tyr Asp Lys Gly Glu Leu Lys Glu Thr Ile
1100 1105 1110

Cys Glu Met Glu Glu Ser Lys Phe Phe Glu Glu Leu Ile Lys Leu
1115 1120 1125

Phe Arg Leu Thr Leu Gln Met Arg Asn Ser Ile Ser Gly Arg Thr
1130 1135 1140

Asp Val Asp Tyr Leu Ile Ser Pro Val Lys Asn Ser Asn Gly Tyr
1145 1150 1155

Phe Tyr Asn Ser Asn Asp Tyr Lys Lys Glu Gly Ala Lys Tyr Pro
1160 1165 1170

Lys Asp Ala Asp Ala Asn Gly Ala Tyr Asn Ile Ala Arg Lys Val
1175 1180 1185

Leu Trp Ala Ile Glu Gln Phe Lys Met Ala Asp Glu Asp Lys Leu
1190 1195 1200

Asp Lys Thr Lys Ile Ser Ile Lys Asn Gln Glu Trp Leu Glu Tyr
1205 1210 1215

Ala Gln Thr His Cys Glu
1220

<210> 38
<211> 500
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 38
Met Glu Val Gln Lys Thr Val Met Lys Thr Leu Ser Leu Arg Ile Leu
1 5 10 15

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

Glu Arg Arg Lys Gln Ala Gly Gly Thr Gly Glu Leu Asp Gly Gly Phe
35 40 45

```
Tyr Lys Lys Leu Glu Lys Lys His Ser Glu Met Phe Ser Phe Asp Arg
    50                  55                  60

Leu Asn Leu Leu Leu Asn Gln Leu Gln Arg Glu Ile Ala Lys Val Tyr
65                  70                  75                  80

Asn His Ala Ile Ser Glu Leu Tyr Ile Ala Thr Ile Ala Gln Gly Asn
                85                  90                  95

Lys Ser Asn Lys His Tyr Ile Ser Ser Ile Val Tyr Asn Arg Ala Tyr
            100                 105                 110

Gly Tyr Phe Tyr Asn Ala Tyr Ile Ala Leu Gly Ile Cys Ser Lys Val
        115                 120                 125

Glu Ala Asn Phe Arg Ser Asn Glu Leu Leu Thr Gln Gln Ser Ala Leu
    130                 135                 140

Pro Thr Ala Lys Ser Asp Asn Phe Pro Ile Val Leu His Lys Gln Lys
145                 150                 155                 160

Gly Ala Glu Gly Glu Asp Gly Gly Phe Arg Ile Ser Thr Glu Gly Ser
                165                 170                 175

Asp Leu Ile Phe Glu Ile Pro Ile Pro Phe Tyr Glu Tyr Asn Gly Glu
            180                 185                 190

Asn Arg Lys Glu Pro Tyr Lys Trp Val Lys Lys Gly Gly Gln Lys Pro
        195                 200                 205

Val Leu Lys Leu Ile Leu Ser Thr Phe Arg Arg Gln Arg Asn Lys Gly
    210                 215                 220

Trp Ala Lys Asp Glu Gly Thr Asp Ala Glu Ile Arg Lys Val Thr Glu
225                 230                 235                 240

Gly Lys Tyr Gln Val Ser Gln Ile Glu Ile Asn Arg Gly Lys Lys Leu
                245                 250                 255

Gly Glu His Gln Lys Trp Phe Ala Asn Phe Ser Ile Glu Gln Pro Ile
            260                 265                 270
```

```
Tyr Glu Arg Lys Pro Asn Arg Ser Ile Val Gly Gly Leu Asp Val Gly
        275                 280                 285

Ile Arg Ser Pro Leu Val Cys Ala Ile Asn Asn Ser Phe Ser Arg Tyr
    290                 295                 300

Ser Val Asp Ser Asn Asp Val Phe Lys Phe Ser Lys Gln Val Phe Ala
305                 310                 315                 320

Phe Arg Arg Arg Leu Leu Ser Lys Asn Ser Leu Lys Arg Lys Gly His
                325                 330                 335

Gly Ala Ala His Lys Leu Glu Pro Ile Thr Glu Met Thr Glu Lys Asn
            340                 345                 350

Asp Lys Phe Arg Lys Lys Ile Ile Glu Arg Trp Ala Lys Glu Val Thr
        355                 360                 365

Asn Phe Phe Val Lys Asn Gln Val Gly Ile Val Gln Ile Glu Asp Leu
    370                 375                 380

Ser Thr Met Lys Asp Arg Glu Asp His Phe Phe Asn Gln Tyr Leu Arg
385                 390                 395                 400

Gly Phe Trp Pro Tyr Tyr Gln Met Gln Thr Leu Ile Glu Asn Lys Leu
                405                 410                 415

Lys Glu Tyr Gly Ile Glu Val Lys Arg Val Gln Ala Lys Tyr Thr Ser
            420                 425                 430

Gln Leu Cys Ser Asn Pro Asn Cys Arg Tyr Trp Asn Asn Tyr Phe Asn
        435                 440                 445

Phe Glu Tyr Arg Lys Val Asn Lys Phe Pro Lys Phe Lys Cys Glu Lys
    450                 455                 460

Cys Asn Leu Glu Ile Ser Ala Asp Tyr Asn Ala Ala Arg Asn Leu Ser
465                 470                 475                 480

Thr Pro Asp Ile Glu Lys Phe Val Ala Lys Ala Thr Lys Gly Ile Asn
                485                 490                 495

Leu Pro Glu Lys
            500
```

<210> 39
<211> 507
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 39
Met Glu Glu Ala Lys Thr Val Ser Lys Thr Leu Ser Leu Arg Ile Leu
1 5 10 15

Arg Pro Leu Tyr Ser Ala Glu Ile Glu Lys Glu Ile Lys Glu Glu Lys
20 25 30

Glu Arg Arg Lys Gln Gly Gly Lys Ser Gly Glu Leu Asp Ser Gly Phe
35 40 45

Tyr Lys Lys Leu Glu Lys Lys His Thr Gln Met Phe Gly Trp Asp Lys
50 55 60

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

Asn Gln Ser Ile Ser Glu Leu Tyr Ile Glu Thr Val Ile Gln Gly Lys
85 90 95

Lys Ser Asn Lys His Tyr Thr Ser Lys Ile Val Tyr Asn Arg Ala Tyr
100 105 110

Ser Val Phe Tyr Asn Ala Tyr Leu Ala Leu Gly Ile Thr Ser Lys Val
115 120 125

Glu Ala Asn Phe Arg Ser Thr Glu Leu Leu Met Gln Lys Ser Ser Leu
130 135 140

Pro Thr Ala Lys Ser Asp Asn Phe Pro Ile Leu Leu His Lys Gln Lys
145 150 155 160

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

Asp Leu Ile Phe Glu Ile Pro Ile Pro Phe Tyr Glu Tyr Asp Ser Ala

```
            180                 185                 190

Asn Lys Lys Glu Pro Phe Lys Trp Ile Lys Lys Gly Gly Gln Lys Pro
        195                 200                 205

Thr Ile Lys Leu Ile Leu Ser Thr Phe Arg Arg Gln Arg Asn Lys Gly
    210                 215                 220

Trp Ala Lys Asp Glu Gly Thr Asp Ala Glu Ile Arg Lys Val Ile Glu
225                 230                 235                 240

Gly Lys Tyr Gln Val Ser His Ile Glu Ile Asn Arg Gly Lys Lys Leu
                245                 250                 255

Gly Asp His Gln Lys Trp Phe Val Asn Phe Thr Ile Glu Gln Pro Ile
            260                 265                 270

Tyr Glu Arg Lys Leu Asp Lys Asn Ile Ile Gly Gly Ile Asp Val Gly
        275                 280                 285

Ile Lys Ser Pro Leu Val Cys Ala Val Asn Asn Ser Phe Ala Arg Tyr
    290                 295                 300

Ser Val Asp Ser Asn Asp Val Leu Lys Phe Ser Lys Gln Ala Phe Ala
305                 310                 315                 320

Phe Arg Arg Arg Leu Leu Ser Lys Asn Ser Leu Lys Arg Ser Gly His
                325                 330                 335

Gly Ser Lys Asn Lys Leu Asp Pro Ile Thr Arg Met Thr Glu Lys Asn
            340                 345                 350

Asp Arg Phe Arg Lys Lys Ile Ile Glu Arg Trp Ala Lys Glu Val Thr
        355                 360                 365

Asn Phe Phe Ile Lys Asn Gln Val Gly Thr Val Gln Ile Glu Asp Leu
    370                 375                 380

Ser Thr Met Lys Asp Arg Gln Asp Asn Phe Phe Asn Gln Tyr Leu Arg
385                 390                 395                 400

Gly Phe Trp Pro Tyr Tyr Gln Met Gln Asn Leu Ile Glu Asn Lys Leu
                405                 410                 415
```

```
Lys Glu Tyr Gly Ile Glu Thr Lys Arg Ile Lys Ala Arg Tyr Thr Ser
            420                 425                 430

Gln Leu Cys Ser Asn Pro Ser Cys Arg His Trp Asn Ser Tyr Phe Ser
        435                 440                 445

Phe Asp His Arg Lys Thr Asn Asn Phe Pro Lys Phe Lys Cys Glu Lys
    450                 455                 460

Cys Ala Leu Glu Ile Ser Ala Asp Tyr Asn Ala Ala Arg Asn Ile Ser
465                 470                 475                 480

Thr Pro Asp Ile Glu Lys Phe Val Ala Lys Ala Thr Lys Gly Ile Asn
                485                 490                 495

Leu Pro Asp Lys Asn Glu Asn Val Ile Leu Glu
            500                 505


<210> 40
<211> 529
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 40
Met Ala Lys Asn Thr Ile Thr Lys Thr Leu Lys Leu Arg Ile Val Arg
1               5                   10                  15

Pro Tyr Asn Ser Ala Glu Val Glu Lys Ile Val Ala Asp Glu Lys Asn
            20                  25                  30

Asn Arg Glu Lys Ile Ala Leu Glu Lys Asn Lys Asp Lys Val Lys Glu
        35                  40                  45

Ala Cys Ser Lys His Leu Lys Val Ala Ala Tyr Cys Thr Thr Gln Val
    50                  55                  60

Glu Arg Asn Ala Cys Leu Phe Cys Lys Ala Arg Lys Leu Asp Asp Lys
65                  70                  75                  80

Phe Tyr Gln Lys Leu Arg Gly Gln Phe Pro Asp Ala Val Phe Trp Gln
                85                  90                  95
```

```
Glu Ile Ser Glu Ile Phe Arg Gln Leu Gln Lys Gln Ala Ala Glu Ile
            100                 105                 110

Tyr Asn Gln Ser Leu Ile Glu Leu Tyr Tyr Glu Ile Phe Ile Lys Gly
        115                 120                 125

Lys Gly Ile Ala Asn Ala Ser Ser Val Glu His Tyr Leu Ser Asp Val
    130                 135                 140

Cys Tyr Thr Arg Ala Ala Glu Leu Phe Lys Asn Ala Ala Ile Ala Ser
145                 150                 155                 160

Gly Leu Arg Ser Lys Ile Lys Ser Asn Phe Arg Leu Lys Glu Leu Lys
                165                 170                 175

Asn Met Lys Ser Gly Leu Pro Thr Thr Lys Ser Asp Asn Phe Pro Ile
            180                 185                 190

Pro Leu Val Lys Gln Lys Gly Gly Gln Tyr Thr Gly Phe Glu Ile Ser
        195                 200                 205

Asn His Asn Ser Asp Phe Ile Ile Lys Ile Pro Phe Gly Arg Trp Gln
    210                 215                 220

Val Lys Lys Glu Ile Asp Lys Tyr Arg Pro Trp Glu Lys Phe Asp Phe
225                 230                 235                 240

Glu Gln Val Gln Lys Ser Pro Lys Pro Ile Ser Leu Leu Leu Ser Thr
                245                 250                 255

Gln Arg Arg Lys Arg Asn Lys Gly Trp Ser Lys Asp Glu Gly Thr Glu
            260                 265                 270

Ala Glu Ile Lys Lys Val Met Asn Gly Asp Tyr Gln Thr Ser Tyr Ile
        275                 280                 285

Glu Val Lys Arg Gly Ser Lys Ile Gly Glu Lys Ser Ala Trp Met Leu
    290                 295                 300

Asn Leu Ser Ile Asp Val Pro Lys Ile Asp Lys Gly Val Asp Pro Ser
305                 310                 315                 320
```

```
Ile Ile Gly Gly Ile Asp Val Gly Val Lys Ser Pro Leu Val Cys Ala
                325                 330                 335

Ile Asn Asn Ala Phe Ser Arg Tyr Ser Ile Ser Asp Asn Asp Leu Phe
            340                 345                 350

His Phe Asn Lys Lys Met Phe Ala Arg Arg Arg Ile Leu Leu Lys Lys
        355                 360                 365

Asn Arg His Lys Arg Ala Gly His Gly Ala Lys Asn Lys Leu Lys Pro
    370                 375                 380

Ile Thr Ile Leu Thr Glu Lys Ser Glu Arg Phe Arg Lys Lys Leu Ile
385                 390                 395                 400

Glu Arg Trp Ala Cys Glu Ile Ala Asp Phe Phe Ile Lys Asn Lys Val
                405                 410                 415

Gly Thr Val Gln Met Glu Asn Leu Glu Ser Met Lys Arg Lys Glu Asp
            420                 425                 430

Ser Tyr Phe Asn Ile Arg Leu Arg Gly Phe Trp Pro Tyr Ala Glu Met
        435                 440                 445

Gln Asn Lys Ile Glu Phe Lys Leu Lys Gln Tyr Gly Ile Glu Ile Arg
    450                 455                 460

Lys Val Ala Pro Asn Asn Thr Ser Lys Thr Cys Ser Lys Cys Gly His
465                 470                 475                 480

Leu Asn Asn Tyr Phe Asn Phe Glu Tyr Arg Lys Lys Asn Lys Phe Pro
                485                 490                 495

His Phe Lys Cys Glu Lys Cys Asn Phe Lys Glu Asn Ala Asp Tyr Asn
            500                 505                 510

Ala Ala Leu Asn Ile Ser Asn Pro Lys Leu Lys Ser Thr Lys Glu Glu
        515                 520                 525

Pro
```

<210> 41
<211> 726

<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 41
Met Glu Arg Gln Lys Val Pro Gln Ile Arg Lys Ile Val Arg Val Val
1 5 10 15

Pro Leu Arg Ile Leu Arg Pro Lys Tyr Ser Asp Val Ile Glu Asn Ala
20 25 30

Leu Lys Lys Phe Lys Glu Lys Gly Asp Asp Thr Asn Thr Asn Asp Phe
35 40 45

Trp Arg Ala Ile Arg Asp Arg Asp Thr Glu Phe Phe Arg Lys Glu Leu
50 55 60

Asn Phe Ser Glu Asp Glu Ile Asn Gln Leu Glu Arg Asp Thr Leu Phe
65 70 75 80

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

Gln Glu Lys Leu Met Lys Asp Tyr Asn Lys Ile Ile Ser Lys Leu Phe
100 105 110

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

Glu Val Glu Glu Leu Ile Glu Lys Asp Val Thr Pro Phe Tyr Gly Ala
130 135 140

Tyr Ile Gly Lys Gly Ile Lys Ser Val Ile Lys Ser Asn Leu Gly Gly
145 150 155 160

Lys Phe Ile Lys Ser Val Lys Ile Asp Arg Glu Thr Lys Lys Val Thr
165 170 175

Lys Leu Thr Ala Ile Asn Ile Gly Leu Met Gly Leu Pro Val Ala Lys
180 185 190

Ser Asp Thr Phe Pro Ile Lys Ile Ile Lys Thr Asn Pro Asp Tyr Ile

```
        195                 200                 205

Thr Phe Gln Lys Ser Thr Lys Glu Asn Leu Gln Lys Ile Glu Asp Tyr
    210                 215                 220

Glu Thr Gly Ile Glu Tyr Gly Asp Leu Leu Val Gln Ile Thr Ile Pro
225                 230                 235                 240

Trp Phe Lys Asn Glu Asn Lys Asp Phe Ser Leu Ile Lys Thr Lys Glu
                245                 250                 255

Ala Ile Glu Tyr Tyr Lys Leu Asn Gly Val Gly Lys Lys Asp Leu Leu
            260                 265                 270

Asn Ile Asn Leu Val Leu Thr Thr Tyr His Ile Arg Lys Lys Lys Ser
        275                 280                 285

Trp Gln Ile Asp Gly Ser Ser Gln Ser Leu Val Arg Glu Met Ala Asn
    290                 295                 300

Gly Glu Leu Glu Glu Lys Trp Lys Ser Phe Phe Asp Thr Phe Ile Lys
305                 310                 315                 320

Lys Tyr Gly Asp Glu Gly Lys Ser Ala Leu Val Lys Arg Arg Val Asn
                325                 330                 335

Lys Lys Ser Arg Ala Lys Gly Glu Lys Gly Arg Glu Leu Asn Leu Asp
            340                 345                 350

Glu Arg Ile Lys Arg Leu Tyr Asp Ser Ile Lys Ala Lys Ser Phe Pro
        355                 360                 365

Ser Glu Ile Asn Leu Ile Pro Glu Asn Tyr Lys Trp Lys Leu His Phe
    370                 375                 380

Ser Ile Glu Ile Pro Pro Met Val Asn Asp Ile Asp Ser Asn Leu Tyr
385                 390                 395                 400

Gly Gly Ile Asp Phe Gly Glu Gln Asn Ile Ala Thr Leu Cys Val Lys
                405                 410                 415

Asn Ile Glu Lys Asp Asp Tyr Asp Phe Leu Thr Ile Tyr Gly Asn Asp
            420                 425                 430
```

```
Leu Leu Lys His Ala Gln Ala Ser Tyr Ala Arg Arg Arg Ile Met Arg
        435                 440                 445

Val Gln Asp Glu Tyr Lys Ala Arg Gly His Gly Lys Ser Arg Lys Thr
    450                 455                 460

Lys Ala Gln Glu Asp Tyr Ser Glu Arg Met Gln Lys Leu Arg Gln Lys
465                 470                 475                 480

Ile Thr Glu Arg Leu Val Lys Gln Ile Ser Asp Phe Phe Leu Trp Arg
                485                 490                 495

Asn Lys Phe His Met Ala Val Cys Ser Leu Arg Tyr Glu Asp Leu Asn
            500                 505                 510

Thr Leu Tyr Lys Gly Glu Ser Val Lys Ala Lys Arg Met Arg Gln Phe
        515                 520                 525

Ile Asn Lys Gln Gln Leu Phe Asn Gly Ile Glu Arg Lys Leu Lys Asp
    530                 535                 540

Tyr Asn Ser Glu Ile Tyr Val Asn Ser Arg Tyr Pro His Tyr Thr Ser
545                 550                 555                 560

Arg Leu Cys Ser Lys Cys Gly Lys Leu Asn Leu Tyr Phe Asp Phe Leu
                565                 570                 575

Lys Phe Arg Thr Lys Asn Ile Ile Ile Arg Lys Asn Pro Asp Gly Ser
            580                 585                 590

Glu Ile Lys Tyr Met Pro Phe Phe Ile Cys Glu Phe Cys Gly Trp Lys
        595                 600                 605

Gln Ala Gly Asp Lys Asn Ala Ser Ala Asn Ile Ala Asp Lys Asp Tyr
    610                 615                 620

Gln Asp Lys Leu Asn Lys Glu Lys Glu Phe Cys Asn Ile Arg Lys Pro
625                 630                 635                 640

Lys Ser Lys Lys Glu Asp Ile Gly Glu Glu Asn Glu Glu Glu Arg Asp
                645                 650                 655

Tyr Ser Arg Arg Phe Asn Arg Asn Ser Phe Ile Tyr Asn Ser Leu Lys
```

660 665 670

Lys Asp Asn Lys Leu Asn Gln Glu Lys Leu Phe Asp Glu Trp Lys Asn
675 680 685

Gln Leu Lys Arg Lys Ile Asp Gly Arg Asn Lys Phe Glu Pro Lys Glu
690 695 700

Tyr Lys Asp Arg Phe Ser Tyr Leu Phe Ala Tyr Tyr Gln Glu Ile Ile
705 710 715 720

Lys Asn Glu Ser Glu Ser
725

<210> 42
<211> 517
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 42
Met Val Pro Thr Glu Leu Ile Thr Lys Thr Leu Gln Leu Arg Val Ile
1 5 10 15

Arg Pro Leu Tyr Phe Glu Glu Ile Glu Lys Glu Leu Ala Glu Leu Lys
20 25 30

Glu Gln Lys Glu Lys Glu Phe Glu Glu Thr Asn Ser Leu Leu Leu Glu
35 40 45

Ser Lys Lys Ile Asp Ala Lys Ser Leu Lys Lys Leu Lys Arg Lys Ala
50 55 60

Arg Ser Ser Ala Ala Val Glu Phe Trp Lys Ile Ala Lys Glu Lys Tyr
65 70 75 80

Pro Asp Ile Leu Thr Lys Pro Glu Met Glu Phe Ile Phe Ser Glu Met
85 90 95

Gln Lys Met Met Ala Arg Phe Tyr Asn Lys Ser Met Thr Asn Ile Phe
100 105 110

```
Ile Glu Met Asn Asn Asp Glu Lys Val Asn Pro Leu Ser Leu Ile Ser
        115                 120                 125

Lys Ala Ser Thr Glu Ala Asn Gln Val Ile Lys Cys Ser Ser Ile Ser
    130                 135                 140

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

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

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

Pro Ile Ser Lys Ile Asn Leu Pro Ser Glu Glu Glu Ala Asp Leu Thr
        195                 200                 205

Ile Thr Leu Pro Phe Pro Phe Phe Glu Ile Lys Lys Glu Lys Lys Gly
    210                 215                 220

Gln Lys Ala Tyr Ser Tyr Phe Asn Ile Ile Glu Lys Ser Gly Arg Ser
225                 230                 235                 240

Asn Asn Lys Ile Asp Leu Leu Leu Ser Thr His Arg Arg Gln Arg Arg
                245                 250                 255

Lys Gly Trp Lys Glu Glu Gly Gly Thr Ser Ala Glu Ile Arg Arg Leu
            260                 265                 270

Met Glu Gly Glu Phe Asp Lys Glu Trp Glu Ile Tyr Leu Gly Glu Ala
        275                 280                 285

Glu Lys Ser Glu Lys Ala Lys Asn Asp Leu Ile Lys Asn Met Thr Arg
    290                 295                 300

Gly Lys Leu Ser Lys Asp Ile Lys Glu Gln Leu Glu Asp Ile Gln Val
305                 310                 315                 320

Lys Tyr Phe Ser Asp Asn Asn Val Glu Ser Trp Asn Asp Leu Ser Lys
                325                 330                 335

Glu Gln Lys Gln Glu Leu Ser Lys Leu Arg Lys Lys Lys Val Glu Glu
            340                 345                 350
```

```
Leu Lys Asp Trp Lys His Val Lys Glu Ile Leu Lys Thr Arg Ala Lys
        355                 360                 365

Ile Gly Trp Val Glu Leu Lys Arg Gly Lys Arg Gln Arg Asp Arg Asn
    370                 375                 380

Lys Trp Phe Val Asn Ile Thr Ile Thr Arg Pro Pro Phe Ile Asn Lys
385                 390                 395                 400

Glu Leu Asp Asp Thr Lys Phe Gly Gly Ile Asp Leu Gly Val Lys Val
                405                 410                 415

Pro Phe Val Cys Ala Val His Gly Ser Pro Ala Arg Leu Ile Ile Lys
            420                 425                 430

Glu Asn Glu Ile Leu Gln Phe Asn Lys Met Val Ser Ala Arg Asn Arg
        435                 440                 445

Gln Ile Thr Lys Asp Ser Glu Gln Arg Lys Gly Arg Gly Lys Lys Asn
    450                 455                 460

Lys Phe Ile Lys Lys Glu Ile Phe Asn Glu Arg Asn Glu Leu Phe Arg
465                 470                 475                 480

Lys Lys Ile Ile Glu Arg Trp Ala Asn Gln Ile Val Lys Phe Phe Glu
                485                 490                 495

Asp Gln Lys Cys Ala Thr Val Gln Ile Glu Asn Leu Glu Ser Phe Asp
            500                 505                 510

Arg Thr Ser Tyr Lys
        515


<210> 43
<211> 481
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 43
Met Lys Ser Asp Thr Lys Asp Lys Lys Ile Ile Ile His Gln Thr Lys
```

```
1               5                   10                  15

Thr Leu Ser Leu Arg Ile Val Lys Pro Gln Ser Ile Pro Met Glu Glu
            20                  25                  30

Phe Thr Asp Leu Val Arg Tyr His Gln Met Ile Ile Phe Pro Val Tyr
        35                  40                  45

Asn Asn Gly Ala Ile Asp Leu Tyr Lys Lys Leu Phe Lys Ala Lys Ile
    50                  55                  60

Gln Lys Gly Asn Glu Ala Arg Ala Ile Lys Tyr Phe Met Asn Lys Ile
65                  70                  75                  80

Val Tyr Ala Pro Ile Ala Asn Thr Val Lys Asn Ser Tyr Ile Ala Leu
                85                  90                  95

Gly Tyr Ser Thr Lys Met Gln Ser Ser Phe Ser Gly Lys Arg Leu Trp
            100                 105                 110

Asp Leu Arg Phe Gly Glu Ala Thr Pro Pro Thr Ile Lys Ala Asp Phe
        115                 120                 125

Pro Leu Pro Phe Tyr Asn Gln Ser Gly Phe Lys Val Ser Ser Glu Asn
    130                 135                 140

Gly Glu Phe Ile Ile Gly Ile Pro Phe Gly Gln Tyr Thr Lys Lys Thr
145                 150                 155                 160

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

Leu Glu Asp Thr Thr Lys Lys Thr Leu Ile Glu Leu Leu Leu Ser Thr
            180                 185                 190

Lys Thr Arg Lys Met Asn Glu Gly Trp Lys Asn Asn Glu Gly Thr Glu
        195                 200                 205

Ala Glu Ile Lys Arg Val Met Asp Gly Thr Tyr Gln Val Thr Ser Leu
    210                 215                 220

Glu Ile Leu Gln Arg Asp Asp Ser Trp Phe Val Asn Phe Asn Ile Ala
225                 230                 235                 240
```

```
Tyr Asp Ser Leu Lys Lys Gln Pro Asp Arg Asp Lys Ile Ala Gly Ile
                245                 250                 255

His Met Gly Ile Thr Arg Pro Leu Thr Ala Val Ile Tyr Asn Asn Lys
            260                 265                 270

Tyr Arg Ala Leu Ser Ile Tyr Pro Asn Thr Val Met His Leu Thr Gln
        275                 280                 285

Lys Gln Leu Ala Arg Ile Lys Glu Gln Arg Thr Asn Ser Lys Tyr Ala
    290                 295                 300

Thr Gly Gly His Gly Arg Asn Ala Lys Val Thr Gly Thr Asp Thr Leu
305                 310                 315                 320

Ser Glu Ala Tyr Arg Gln Arg Arg Lys Lys Ile Ile Glu Asp Trp Ile
                325                 330                 335

Ala Ser Ile Val Lys Phe Ala Ile Asn Asn Glu Ile Gly Thr Ile Tyr
            340                 345                 350

Leu Glu Asp Ile Ser Asn Thr Asn Ser Phe Phe Ala Ala Arg Glu Gln
        355                 360                 365

Lys Leu Ile Tyr Leu Glu Asp Ile Ser Asn Thr Asn Ser Phe Leu Ser
    370                 375                 380

Thr Tyr Lys Tyr Pro Ile Ser Ala Ile Ser Asp Thr Leu Gln His Lys
385                 390                 395                 400

Leu Glu Glu Lys Ala Ile Gln Val Ile Arg Lys Lys Ala Tyr Tyr Val
                405                 410                 415

Asn Gln Ile Cys Ser Leu Cys Gly His Tyr Asn Lys Gly Phe Thr Tyr
            420                 425                 430

Gln Phe Arg Arg Lys Asn Lys Phe Pro Lys Met Lys Cys Gln Gly Cys
        435                 440                 445

Leu Glu Ala Thr Ser Thr Glu Phe Asn Ala Ala Ala Asn Val Ala Asn
    450                 455                 460

Pro Asp Tyr Glu Lys Leu Leu Ile Lys His Gly Leu Leu Gln Leu Lys
```

465 470 475 480

Lys

<210> 44
<211> 358
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 44
Met Ser Thr Ile Thr Arg Gln Val Arg Leu Ser Pro Thr Pro Glu Gln
1 5 10 15

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

Val Leu Val Ala Ala Phe Asp Ser Glu Val Leu Thr Gly Lys Val Ser
35 40 45

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

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

Leu Pro Val Leu Lys Lys Pro His Cys Gln Trp Asn Asn Gln Asn Trp
85 90 95

Arg Val Glu Gly Asp Gln Leu Ile Leu Pro Ile Cys Lys Asp Gly Lys
100 105 110

Thr Gln Gln Glu Arg Phe Arg Cys Ala Ala Val Ala Leu Glu Gly Lys
115 120 125

Ala Gly Ile Leu Arg Ile Lys Lys Lys Arg Gly Lys Trp Ile Ala Asp
130 135 140

Leu Thr Val Thr Gln Glu Asp Ala Pro Glu Ser Ser Gly Ser Ala Ile
145 150 155 160

```
Met Gly Val Asp Leu Gly Ile Lys Val Pro Ala Val Ala His Ile Gly
                165                 170                 175

Gly Lys Gly Thr Arg Phe Phe Gly Asn Gly Arg Ser Gln Arg Ser Met
            180                 185                 190

Arg Arg Arg Phe Tyr Ala Arg Arg Lys Thr Leu Gln Lys Ala Lys Lys
        195                 200                 205

Leu Arg Ala Val Arg Lys Ser Lys Gly Lys Glu Ala Arg Trp Met Lys
    210                 215                 220

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

Leu Gly Val Gly Thr Ile Lys Ile Glu Ala Leu Gln Gly Ile Arg Lys
                245                 250                 255

Gly Thr Thr Arg Lys Ser Arg Gly Ala Ala Ala Arg Lys Asn Asn Arg
            260                 265                 270

Met Thr Asn Thr Trp Ser Phe Ser Gln Leu Thr Leu Phe Ile Thr Tyr
        275                 280                 285

Lys Ala Gln Arg Gln Gly Ile Thr Val Glu Gln Val Asp Pro Ala Tyr
    290                 295                 300

Thr Ser Gln Asp Cys Pro Ala Cys Arg Ala Arg Asn Gly Ala Gln Asp
305                 310                 315                 320

Arg Thr Tyr Val Cys Ser Glu Cys Gly Trp Arg Gly His Arg Asp Thr
                325                 330                 335

Val Gly Ala Ile Asn Ile Ser Arg Arg Ala Gly Leu Ser Gly His Arg
            340                 345                 350

Arg Gly Ala Thr Gly Ala
        355
```

<210> 45
<211> 507
<212> PRT
<213> Artificial Sequence

<220>

<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 45

```
Met Ile Ala Gln Lys Thr Ile Lys Ile Lys Leu Asn Pro Thr Lys Glu
1               5                  10                  15

Gln Ile Ile Lys Leu Asn Ser Ile Ile Glu Glu Tyr Ile Lys Val Ser
            20                  25                  30

Asn Phe Thr Ala Lys Lys Ile Ala Glu Ile Gln Glu Ser Phe Thr Asp
        35                  40                  45

Ser Gly Leu Thr Gln Gly Thr Cys Ser Glu Cys Gly Lys Glu Lys Thr
    50                  55                  60

Tyr Arg Lys Tyr His Leu Leu Lys Lys Asp Asn Lys Leu Phe Cys Ile
65                  70                  75                  80

Thr Cys Tyr Lys Arg Lys Tyr Ser Gln Phe Thr Leu Gln Lys Val Glu
                85                  90                  95

Phe Gln Asn Lys Thr Gly Leu Arg Asn Val Ala Lys Leu Pro Lys Thr
            100                 105                 110

Tyr Tyr Thr Asn Ala Ile Arg Phe Ala Ser Asp Thr Phe Ser Gly Phe
        115                 120                 125

Asp Glu Ile Ile Lys Lys Lys Gln Asn Arg Leu Asn Ser Ile Gln Asn
    130                 135                 140

Arg Leu Asn Phe Trp Lys Glu Leu Leu Tyr Asn Pro Ser Asn Arg Asn
145                 150                 155                 160

Glu Ile Lys Ile Lys Val Val Lys Tyr Ala Pro Lys Thr Asp Thr Arg
                165                 170                 175

Glu His Pro His Tyr Tyr Ser Glu Ala Glu Ile Lys Gly Arg Ile Lys
            180                 185                 190

Arg Leu Glu Lys Gln Leu Lys Lys Phe Lys Met Pro Lys Tyr Pro Glu
        195                 200                 205

Phe Thr Ser Glu Thr Ile Ser Leu Gln Arg Glu Leu Tyr Ser Trp Lys
```

```
    210                 215                 220

Asn Pro Asp Glu Leu Lys Ile Ser Ser Ile Thr Asp Lys Asn Glu Ser
225                 230                 235                 240

Met Asn Tyr Tyr Gly Lys Glu Tyr Leu Lys Arg Tyr Ile Asp Leu Ile
                245                 250                 255

Asn Ser Gln Thr Pro Gln Ile Leu Leu Glu Lys Glu Asn Asn Ser Phe
            260                 265                 270

Tyr Leu Cys Phe Pro Ile Thr Lys Asn Ile Glu Met Pro Lys Ile Asp
        275                 280                 285

Asp Thr Phe Glu Pro Val Gly Ile Asp Trp Gly Ile Thr Arg Asn Ile
    290                 295                 300

Ala Val Val Ser Ile Leu Asp Ser Lys Thr Lys Lys Pro Lys Phe Val
305                 310                 315                 320

Lys Phe Tyr Ser Ala Gly Tyr Ile Leu Gly Lys Arg Lys His Tyr Lys
                325                 330                 335

Ser Leu Arg Lys His Phe Gly Gln Lys Lys Arg Gln Asp Lys Ile Asn
            340                 345                 350

Lys Leu Gly Thr Lys Glu Asp Arg Phe Ile Asp Ser Asn Ile His Lys
        355                 360                 365

Leu Ala Phe Leu Ile Val Lys Glu Ile Arg Asn His Ser Asn Lys Pro
    370                 375                 380

Ile Ile Leu Met Glu Asn Ile Thr Asp Asn Arg Glu Glu Ala Glu Lys
385                 390                 395                 400

Ser Met Arg Gln Asn Ile Leu Leu His Ser Val Lys Ser Arg Leu Gln
                405                 410                 415

Asn Tyr Ile Ala Tyr Lys Ala Leu Trp Asn Asn Ile Pro Thr Asn Leu
            420                 425                 430

Val Lys Pro Glu His Thr Ser Gln Ile Cys Asn Arg Cys Gly His Gln
        435                 440                 445
```

```
Asp Arg Glu Asn Arg Pro Lys Gly Ser Lys Leu Phe Lys Cys Val Lys
    450                 455                 460

Cys Asn Tyr Met Ser Asn Ala Asp Phe Asn Ala Ser Ile Asn Ile Ala
465                 470                 475                 480

Arg Lys Phe Tyr Ile Gly Glu Tyr Glu Pro Phe Tyr Lys Asp Asn Glu
                485                 490                 495

Lys Met Lys Ser Gly Val Asn Ser Ile Ser Met
            500                 505
```

<210> 46
<211> 534
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 46

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

Leu Lys Leu Asp Lys Glu Thr Ser Glu Gly Leu Asn Asp Tyr Phe Asp
            20                  25                  30

Glu Tyr Gly Lys Ala Ile Asn Phe Ala Ile Lys Val Ile Gln Lys Glu
        35                  40                  45

Leu Ala Glu Asp Arg Phe Ala Gly Lys Val Arg Leu Asp Glu Asn Lys
    50                  55                  60

Lys Pro Leu Leu Asn Glu Asp Gly Lys Lys Ile Trp Asp Phe Pro Asn
65                  70                  75                  80

Glu Phe Cys Ser Cys Gly Lys Gln Val Asn Arg Tyr Val Asn Gly Lys
                85                  90                  95

Ser Leu Cys Gln Glu Cys Tyr Lys Asn Lys Phe Thr Glu Tyr Gly Ile
            100                 105                 110

Arg Lys Arg Met Tyr Ser Ala Lys Gly Arg Lys Ala Glu Gln Asp Ile
        115                 120                 125
```

```
Asn Ile Lys Asn Ser Thr Asn Lys Ile Ser Lys Thr His Phe Asn Tyr
    130                 135                 140

Ala Ile Arg Glu Ala Phe Ile Leu Asp Lys Ser Ile Lys Lys Gln Arg
145                 150                 155                 160

Lys Glu Arg Phe Arg Arg Leu Arg Glu Met Lys Lys Lys Leu Gln Glu
                165                 170                 175

Phe Ile Glu Ile Arg Asp Gly Asn Lys Ile Leu Cys Pro Lys Ile Glu
            180                 185                 190

Lys Gln Arg Val Glu Arg Tyr Ile His Pro Ser Trp Ile Asn Lys Glu
        195                 200                 205

Lys Lys Leu Glu Asp Phe Arg Gly Tyr Ser Met Ser Asn Val Leu Gly
    210                 215                 220

Lys Ile Lys Ile Leu Asp Arg Asn Ile Lys Arg Glu Glu Lys Ser Leu
225                 230                 235                 240

Lys Glu Lys Gly Gln Ile Asn Phe Lys Ala Arg Arg Leu Met Leu Asp
                245                 250                 255

Lys Ser Val Lys Phe Leu Asn Asp Asn Lys Ile Ser Phe Thr Ile Ser
            260                 265                 270

Lys Asn Leu Pro Lys Glu Tyr Glu Leu Asp Leu Pro Glu Lys Glu Lys
        275                 280                 285

Arg Leu Asn Trp Leu Lys Glu Lys Ile Lys Ile Ile Lys Asn Gln Lys
    290                 295                 300

Pro Lys Tyr Ala Tyr Leu Leu Arg Lys Asp Asp Asn Phe Tyr Leu Gln
305                 310                 315                 320

Tyr Thr Leu Glu Thr Glu Phe Asn Leu Lys Glu Asp Tyr Ser Gly Ile
                325                 330                 335

Val Gly Ile Asp Arg Gly Val Ser His Ile Ala Val Tyr Thr Phe Val
            340                 345                 350
```

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

Ile Leu Arg Leu Lys Asn Leu Gln Lys Glu Arg Asp Arg Phe Leu Arg
    370                 375                 380

Arg Lys His Asn Lys Lys Arg Lys Lys Ser Asn Met Arg Asn Ile Glu
385                 390                 395                 400

Lys Lys Ile Gln Leu Ile Leu His Asn Tyr Ser Lys Gln Ile Val Asp
                405                 410                 415

Phe Ala Lys Asn Lys Asn Ala Phe Ile Val Phe Glu Lys Leu Glu Lys
            420                 425                 430

Pro Lys Lys Asn Arg Ser Lys Met Ser Lys Lys Ser Gln Tyr Lys Leu
        435                 440                 445

Ser Gln Phe Thr Phe Lys Lys Leu Ser Asp Leu Val Asp Tyr Lys Ala
    450                 455                 460

Lys Arg Glu Gly Ile Lys Val Leu Tyr Ile Ser Pro Glu Tyr Thr Ser
465                 470                 475                 480

Lys Glu Cys Ser His Cys Gly Glu Lys Val Asn Thr Gln Arg Pro Phe
                485                 490                 495

Asn Gly Asn Ser Ser Leu Phe Lys Cys Asn Lys Cys Gly Val Glu Leu
            500                 505                 510

Asn Ala Asp Tyr Asn Ala Ser Ile Asn Ile Ala Lys Lys Gly Leu Asn
        515                 520                 525

Ile Leu Asn Ser Thr Asn
    530


<210> 47
<211> 537
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"
```

<400> 47
Met Glu Glu Ser Ile Ile Thr Gly Val Lys Phe Lys Leu Arg Ile Asp
1 5 10 15

Lys Glu Thr Thr Lys Lys Leu Asn Glu Tyr Phe Asp Glu Tyr Gly Lys
20 25 30

Ala Ile Asn Phe Ala Val Lys Ile Ile Gln Lys Glu Leu Ala Asp Asp
35 40 45

Arg Phe Ala Gly Lys Ala Lys Leu Asp Gln Asn Lys Asn Pro Ile Leu
50 55 60

Asp Glu Asn Gly Lys Lys Ile Tyr Glu Phe Pro Asp Glu Phe Cys Ser
65 70 75 80

Cys Gly Lys Gln Val Asn Lys Tyr Val Asn Asn Lys Pro Phe Cys Gln
85 90 95

Glu Cys Tyr Lys Ile Arg Phe Thr Glu Asn Gly Ile Arg Lys Arg Met
100 105 110

Tyr Ser Ala Lys Gly Arg Lys Ala Glu His Lys Ile Asn Ile Leu Asn
115 120 125

Ser Thr Asn Lys Ile Ser Lys Thr His Phe Asn Tyr Ala Ile Arg Glu
130 135 140

Ala Phe Ile Leu Asp Lys Ser Ile Lys Lys Gln Arg Lys Lys Arg Asn
145 150 155 160

Glu Arg Leu Arg Glu Ser Lys Lys Arg Leu Gln Gln Phe Ile Asp Met
165 170 175

Arg Asp Gly Lys Arg Glu Ile Cys Pro Thr Ile Lys Gly Gln Lys Val
180 185 190

Asp Arg Phe Ile His Pro Ser Trp Ile Thr Lys Asp Lys Lys Leu Glu
195 200 205

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

Leu Asp Arg Asn Ile Lys Arg Glu Glu Lys Ser Leu Lys Glu Lys Gly

225 230 235 240

Gln Ile Ile Phe Lys Ala Lys Arg Leu Met Leu Asp Lys Ser Ile Arg
245 250 255

Phe Val Gly Asp Arg Lys Val Leu Phe Thr Ile Ser Lys Thr Leu Pro
260 265 270

Lys Glu Tyr Glu Leu Asp Leu Pro Ser Lys Glu Lys Arg Leu Asn Trp
275 280 285

Leu Lys Glu Lys Ile Glu Ile Ile Lys Asn Gln Lys Pro Lys Tyr Ala
290 295 300

Tyr Leu Leu Arg Lys Asn Ile Glu Ser Glu Lys Lys Pro Asn Tyr Glu
305 310 315 320

Tyr Tyr Leu Gln Tyr Thr Leu Glu Ile Lys Pro Glu Leu Lys Asp Phe
325 330 335

Tyr Asp Gly Ala Ile Gly Ile Asp Arg Gly Ile Asn His Ile Ala Val
340 345 350

Cys Thr Phe Ile Ser Asn Asp Gly Lys Val Thr Pro Pro Lys Phe Phe
355 360 365

Ser Ser Gly Glu Ile Leu Arg Leu Lys Asn Leu Gln Lys Glu Arg Asp
370 375 380

Arg Phe Leu Leu Arg Lys His Asn Lys Asn Arg Lys Lys Gly Asn Met
385 390 395 400

Arg Val Ile Glu Asn Lys Ile Asn Leu Ile Leu His Arg Tyr Ser Lys
405 410 415

Gln Ile Val Asp Met Ala Lys Lys Leu Asn Ala Ser Ile Val Phe Glu
420 425 430

Glu Leu Gly Arg Ile Gly Lys Ser Arg Thr Lys Met Lys Lys Ser Gln
435 440 445

Arg Tyr Lys Leu Ser Leu Phe Ile Phe Lys Lys Leu Ser Asp Leu Val
450 455 460

```
Asp Tyr Lys Ser Arg Arg Glu Gly Ile Arg Val Thr Tyr Val Pro Pro
465                 470                 475                 480


Glu Tyr Thr Ser Lys Glu Cys Ser His Cys Gly Glu Lys Val Asn Thr
                485                 490                 495


Gln Arg Pro Phe Asn Gly Asn Tyr Ser Leu Phe Lys Cys Asn Lys Cys
            500                 505                 510


Gly Ile Gln Leu Asn Ser Asp Tyr Asn Ala Ser Ile Asn Ile Ala Lys
        515                 520                 525


Lys Gly Leu Lys Ile Pro Asn Ser Thr
    530                 535


<210> 48
<211> 540
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 48
Leu Trp Thr Ile Val Ile Gly Asp Phe Ile Glu Met Pro Lys Gln Asp
1               5                   10                  15


Leu Val Thr Thr Gly Ile Lys Phe Lys Leu Asp Val Asp Lys Glu Thr
            20                  25                  30


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


Phe Ala Val Lys Ile Ile Gln Lys Asn Leu Lys Glu Asp Arg Phe Ala
    50                  55                  60


Gly Lys Ile Ala Leu Gly Glu Asp Lys Lys Pro Leu Leu Asp Lys Asp
65                  70                  75                  80


Gly Lys Lys Ile Tyr Asn Tyr Pro Asn Glu Ser Cys Ser Cys Gly Asn
                85                  90                  95


Gln Val Arg Arg Tyr Val Asn Ala Lys Pro Phe Cys Val Asp Cys Tyr
            100                 105                 110
```

```
Lys Leu Lys Phe Thr Glu Asn Gly Ile Arg Lys Arg Met Tyr Ser Ala
        115                 120                 125

Arg Gly Arg Lys Ala Asp Ser Asp Ile Asn Ile Lys Asn Ser Thr Asn
    130                 135                 140

Lys Ile Ser Lys Thr His Phe Asn Tyr Ala Ile Arg Glu Gly Phe Ile
145                 150                 155                 160

Leu Asp Lys Ser Leu Lys Lys Gln Arg Ser Lys Arg Ile Lys Lys Leu
                165                 170                 175

Leu Glu Leu Lys Arg Lys Leu Gln Glu Phe Ile Asp Ile Arg Gln Gly
            180                 185                 190

Gln Met Val Leu Cys Pro Lys Ile Lys Asn Gln Arg Val Asp Lys Phe
        195                 200                 205

Ile His Pro Ser Trp Leu Lys Arg Asp Lys Lys Leu Glu Glu Phe Arg
    210                 215                 220

Gly Tyr Ser Leu Ser Val Val Glu Gly Lys Ile Lys Ile Phe Asn Arg
225                 230                 235                 240

Asn Ile Leu Arg Glu Glu Asp Ser Leu Arg Gln Arg Gly His Val Asn
                245                 250                 255

Phe Lys Ala Asn Arg Ile Met Leu Asp Lys Ser Val Arg Phe Leu Asp
            260                 265                 270

Gly Gly Lys Val Asn Phe Asn Leu Asn Lys Gly Leu Pro Lys Glu Tyr
        275                 280                 285

Leu Leu Asp Leu Pro Lys Lys Glu Asn Lys Leu Ser Trp Leu Asn Glu
    290                 295                 300

Lys Ile Ser Leu Ile Lys Leu Gln Lys Pro Lys Tyr Ala Tyr Leu Leu
305                 310                 315                 320

Arg Arg Glu Gly Ser Phe Phe Ile Gln Tyr Thr Ile Glu Asn Val Pro
                325                 330                 335
```

```
Lys Thr Phe Ser Asp Tyr Leu Gly Ala Ile Gly Ile Asp Arg Gly Ile
            340                 345                 350

Ser His Ile Ala Val Cys Thr Phe Val Ser Lys Asn Gly Val Asn Lys
        355                 360                 365

Ala Pro Val Phe Phe Ser Ser Gly Glu Ile Leu Lys Leu Lys Ser Leu
    370                 375                 380

Gln Lys Gln Arg Asp Leu Phe Leu Arg Gly Lys His Asn Lys Ile Arg
385                 390                 395                 400

Lys Lys Ser Asn Met Arg Asn Ile Asp Asn Lys Ile Asn Leu Ile Leu
                405                 410                 415

His Lys Tyr Ser Arg Asn Ile Val Asn Leu Ala Lys Ser Glu Lys Ala
            420                 425                 430

Phe Ile Val Phe Glu Lys Leu Glu Lys Ile Lys Lys Ser Arg Phe Lys
        435                 440                 445

Met Ser Lys Ser Leu Gln Tyr Lys Leu Ser Gln Phe Thr Phe Lys Lys
    450                 455                 460

Leu Ser Asp Leu Val Glu Tyr Lys Ala Lys Ile Glu Gly Ile Lys Val
465                 470                 475                 480

Asp Tyr Val Pro Pro Glu Tyr Thr Ser Lys Glu Cys Ser His Cys Gly
                485                 490                 495

Glu Lys Val Asp Thr Gln Arg Pro Phe Asn Gly Asn Ser Ser Leu Phe
            500                 505                 510

Lys Cys Asn Lys Cys Arg Val Gln Leu Asn Ala Asp Tyr Asn Ala Ser
        515                 520                 525

Ile Asn Ile Ala Lys Lys Ser Leu Asn Ile Ser Asn
    530                 535                 540
```

<210> 49
<211> 542
<212> PRT
<213> Artificial Sequence

<220>

<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 49
Met Ser Lys Thr Thr Ile Ser Val Lys Leu Lys Ile Ile Asp Leu Ser
1 5 10 15

Ser Glu Lys Lys Glu Phe Leu Asp Asn Tyr Phe Asn Glu Tyr Ala Lys
20 25 30

Ala Thr Thr Phe Cys Gln Leu Arg Ile Arg Arg Leu Leu Arg Asn Thr
35 40 45

His Trp Leu Gly Lys Lys Glu Lys Ser Ser Lys Lys Trp Ile Phe Glu
50 55 60

Ser Gly Ile Cys Asp Leu Cys Gly Glu Asn Lys Glu Leu Val Asn Glu
65 70 75 80

Asp Arg Asn Ser Gly Glu Pro Ala Lys Ile Cys Lys Arg Cys Tyr Asn
85 90 95

Gly Arg Tyr Gly Asn Gln Met Ile Arg Lys Leu Phe Val Ser Thr Lys
100 105 110

Lys Arg Glu Val Gln Glu Asn Met Asp Ile Arg Arg Val Ala Lys Leu
115 120 125

Asn Asn Thr His Tyr His Arg Ile Pro Glu Glu Ala Phe Asp Met Ile
130 135 140

Lys Ala Ala Asp Thr Ala Glu Lys Arg Arg Lys Lys Asn Val Glu Tyr
145 150 155 160

Asp Lys Lys Arg Gln Met Glu Phe Ile Glu Met Phe Asn Asp Glu Lys
165 170 175

Lys Arg Ala Ala Arg Pro Lys Lys Pro Asn Glu Arg Glu Thr Arg Tyr
180 185 190

Val His Ile Ser Lys Leu Glu Ser Pro Ser Lys Gly Tyr Thr Leu Asn
195 200 205

Gly Ile Lys Arg Lys Ile Asp Gly Met Gly Lys Lys Ile Glu Arg Ala

```
    210                 215                 220

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

Ile Lys Leu Asp Ser Asn Trp Val Arg Phe Asp Leu Ala Glu Ser Glu
                245                 250                 255

Ile Thr Ile Pro Ser Leu Phe Lys Glu Met Lys Leu Arg Ile Thr Gly
            260                 265                 270

Pro Thr Asn Val His Ser Lys Ser Gly Gln Ile Tyr Phe Ala Glu Trp
        275                 280                 285

Phe Glu Arg Ile Asn Lys Gln Pro Asn Asn Tyr Cys Tyr Leu Ile Arg
    290                 295                 300

Lys Thr Ser Ser Asn Gly Lys Tyr Glu Tyr Tyr Leu Gln Tyr Thr Tyr
305                 310                 315                 320

Glu Ala Glu Val Glu Ala Asn Lys Glu Tyr Ala Gly Cys Leu Gly Val
                325                 330                 335

Asp Ile Gly Cys Ser Lys Leu Ala Ala Ala Val Tyr Tyr Asp Ser Lys
            340                 345                 350

Asn Lys Lys Ala Gln Lys Pro Ile Glu Ile Phe Thr Asn Pro Ile Lys
        355                 360                 365

Lys Ile Lys Met Arg Arg Glu Lys Leu Ile Lys Leu Leu Ser Arg Val
    370                 375                 380

Lys Val Arg His Arg Arg Arg Lys Leu Met Gln Leu Ser Lys Thr Glu
385                 390                 395                 400

Pro Ile Ile Asp Tyr Thr Cys His Lys Thr Ala Arg Lys Ile Val Glu
                405                 410                 415

Met Ala Asn Thr Ala Lys Ala Phe Ile Ser Met Glu Asn Leu Glu Thr
            420                 425                 430

Gly Ile Lys Gln Lys Gln Gln Ala Arg Glu Thr Lys Lys Gln Lys Phe
        435                 440                 445
```

```
Tyr Arg Asn Met Phe Leu Phe Arg Lys Leu Ser Lys Leu Ile Glu Tyr
    450                 455                 460

Lys Ala Leu Leu Lys Gly Ile Lys Ile Val Tyr Val Lys Pro Asp Tyr
465                 470                 475                 480

Thr Ser Gln Thr Cys Ser Ser Cys Gly Ala Asp Lys Glu Lys Thr Glu
                485                 490                 495

Arg Pro Ser Gln Ala Ile Phe Arg Cys Leu Asn Pro Thr Cys Arg Tyr
            500                 505                 510

Tyr Gln Arg Asp Ile Asn Ala Asp Phe Asn Ala Ala Val Asn Ile Ala
        515                 520                 525

Lys Lys Ala Leu Asn Asn Thr Glu Val Val Thr Thr Leu Leu
    530                 535                 540
```

<210> 50
<211> 564
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 50

```
Met Ala Arg Ala Lys Asn Gln Pro Tyr Gln Lys Leu Thr Thr Thr Thr
1               5                   10                  15

Gly Ile Lys Phe Lys Leu Asp Leu Ser Glu Glu Glu Gly Lys Arg Phe
            20                  25                  30

Asp Glu Tyr Phe Ser Glu Tyr Ala Lys Ala Val Asn Phe Cys Ala Lys
        35                  40                  45

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

Leu Ala Ala Lys Glu Trp Lys Phe Glu Ile Ser Asn Cys Asp Phe Cys
65                  70                  75                  80

Asn Lys Gln Lys Glu Ile Tyr Tyr Lys Asn Ile Ala Asn Gly Gln Lys
                85                  90                  95
```

```
Val Cys Lys Gly Cys His Arg Thr Asn Phe Ser Asp Asn Ala Ile Arg
            100                 105                 110

Lys Lys Met Ile Pro Val Lys Gly Arg Lys Val Glu Ser Lys Phe Asn
        115                 120                 125

Ile His Asn Thr Thr Lys Lys Ile Ser Gly Thr His Arg His Trp Ala
    130                 135                 140

Phe Glu Asp Ala Ala Asp Ile Ile Glu Ser Met Asp Lys Gln Arg Lys
145                 150                 155                 160

Glu Lys Gln Lys Arg Leu Arg Arg Glu Lys Arg Lys Leu Ser Tyr Phe
                165                 170                 175

Phe Glu Leu Phe Gly Asp Pro Ala Lys Arg Tyr Glu Leu Pro Lys Val
            180                 185                 190

Gly Lys Gln Arg Val Pro Arg Tyr Leu His Lys Ile Ile Asp Lys Asp
        195                 200                 205

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

Ile Lys Ile Ser Glu Arg Asn Ile Glu Arg Asp Glu Lys Ser Leu Arg
225                 230                 235                 240

Lys Ala Ser Pro Ile Ala Phe Gly Ala Arg Lys Ile Lys Met Ser Lys
                245                 250                 255

Leu Asp Pro Lys Arg Ala Phe Asp Leu Glu Asn Asn Val Phe Lys Ile
            260                 265                 270

Pro Gly Lys Val Ile Lys Gly Gln Tyr Lys Phe Phe Gly Thr Asn Val
        275                 280                 285

Ala Asn Glu His Gly Lys Lys Phe Tyr Lys Asp Arg Ile Ser Lys Ile
    290                 295                 300

Leu Ala Gly Lys Pro Lys Tyr Phe Tyr Leu Leu Arg Lys Lys Val Ala
305                 310                 315                 320
```

```
Glu Ser Asp Gly Asn Pro Ile Phe Glu Tyr Tyr Val Gln Trp Ser Ile
                325                 330                 335

Asp Thr Glu Thr Pro Ala Ile Thr Ser Tyr Asp Asn Ile Leu Gly Ile
            340                 345                 350

Asp Ala Gly Ile Thr Asn Leu Ala Thr Thr Val Leu Ile Pro Lys Asn
        355                 360                 365

Leu Ser Ala Glu His Cys Ser His Cys Gly Asn Asn His Val Lys Pro
    370                 375                 380

Ile Phe Thr Lys Phe Phe Ser Gly Lys Glu Leu Lys Ala Ile Lys Ile
385                 390                 395                 400

Lys Ser Arg Lys Gln Lys Tyr Phe Leu Arg Gly Lys His Asn Lys Leu
                405                 410                 415

Val Lys Ile Lys Arg Ile Arg Pro Ile Glu Gln Lys Val Asp Gly Tyr
            420                 425                 430

Cys His Val Val Ser Lys Gln Ile Val Glu Met Ala Lys Glu Arg Asn
        435                 440                 445

Ser Cys Ile Ala Leu Glu Lys Leu Glu Lys Pro Lys Lys Ser Lys Phe
    450                 455                 460

Arg Gln Arg Arg Arg Glu Lys Tyr Ala Val Ser Met Phe Val Phe Lys
465                 470                 475                 480

Lys Leu Ala Thr Phe Ile Lys Tyr Lys Ala Ala Arg Glu Gly Ile Glu
                485                 490                 495

Ile Ile Pro Val Glu Pro Glu Gly Thr Ser Tyr Thr Cys Ser His Cys
            500                 505                 510

Lys Asn Ala Gln Asn Asn Gln Arg Pro Tyr Phe Lys Pro Asn Ser Lys
        515                 520                 525

Lys Ser Trp Thr Ser Met Phe Lys Cys Gly Lys Cys Gly Ile Glu Leu
    530                 535                 540

Asn Ser Asp Tyr Asn Ala Ala Phe Asn Ile Ala Gln Lys Ala Leu Asn
545                 550                 555                 560
```

Met Thr Ser Ala

<210> 51
<211> 610
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 51
Met Asp Glu Lys His Phe Phe Cys Ser Tyr Cys Asn Lys Glu Leu Lys
1 5 10 15

Ile Ser Lys Asn Leu Ile Asn Lys Ile Ser Lys Gly Ser Ile Arg Glu
20 25 30

Asp Glu Ala Val Ser Lys Ala Ile Ser Ile His Asn Lys Lys Glu His
35 40 45

Ser Leu Ile Leu Gly Ile Lys Phe Lys Leu Phe Ile Glu Asn Lys Leu
50 55 60

Asp Lys Lys Lys Leu Asn Glu Tyr Phe Asp Asn Tyr Ser Lys Ala Val
65 70 75 80

Thr Phe Ala Ala Arg Ile Phe Asp Lys Ile Arg Ser Pro Tyr Lys Phe
85 90 95

Ile Gly Leu Lys Asp Lys Asn Thr Lys Lys Trp Thr Phe Pro Lys Ala
100 105 110

Lys Cys Val Phe Cys Leu Glu Glu Lys Glu Val Ala Tyr Ala Asn Glu
115 120 125

Lys Asp Asn Ser Lys Ile Cys Thr Glu Cys Tyr Leu Lys Glu Phe Gly
130 135 140

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

Glu Pro Lys Tyr Asn Ile Phe Asn Ser Thr Lys Glu Leu Ser Ser Thr

```
                165                 170                 175

His Tyr Asn Tyr Ala Ile Arg Asp Ala Phe Gln Leu Leu Asp Ala Leu
            180                 185                 190

Lys Lys Gln Arg Gln Lys Lys Leu Lys Ser Ile Phe Asn Gln Lys Leu
        195                 200                 205

Arg Leu Lys Glu Phe Glu Asp Ile Phe Ser Asp Pro Gln Lys Arg Ile
    210                 215                 220

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

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

Val Arg Gly Lys Ile Lys Ser Leu Thr Arg Asn Ile Glu Arg Glu Glu
            260                 265                 270

Lys Ser Leu Arg Lys Lys Thr Pro Ile His Phe Lys Gly Asn Arg Leu
        275                 280                 285

Met Ile Phe Pro Ala Gly Ile Lys Phe Asp Phe Ala Ser Asn Lys Val
    290                 295                 300

Lys Ile Ser Ile Ser Lys Asn Leu Pro Asn Glu Phe Asn Phe Ser Gly
305                 310                 315                 320

Thr Asn Val Lys Asn Glu His Gly Lys Ser Phe Phe Lys Ser Arg Ile
                325                 330                 335

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

Ile Lys Arg Glu Tyr Ser Lys Leu Arg Asn Tyr Glu Ile Glu Lys Ile
        355                 360                 365

Arg Leu Glu Asn Pro Asn Ala Asp Leu Cys Asp Phe Tyr Leu Gln Tyr
    370                 375                 380

Thr Ile Glu Thr Glu Ser Arg Asn Asn Glu Glu Ile Asn Gly Ile Ile
385                 390                 395                 400
```

```
Gly Ile Asp Arg Gly Ile Thr Asn Leu Ala Cys Leu Val Leu Leu Lys
                405                 410                 415

Lys Gly Asp Lys Lys Pro Ser Gly Val Lys Phe Tyr Lys Gly Asn Lys
            420                 425                 430

Ile Leu Gly Met Lys Ile Ala Tyr Arg Lys His Leu Tyr Leu Leu Lys
        435                 440                 445

Gly Lys Arg Asn Lys Leu Arg Lys Gln Arg Gln Ile Arg Ala Ile Glu
    450                 455                 460

Pro Lys Ile Asn Leu Ile Leu His Gln Ile Ser Lys Asp Ile Val Lys
465                 470                 475                 480

Ile Ala Lys Glu Lys Asn Phe Ala Ile Ala Leu Glu Gln Leu Glu Lys
                485                 490                 495

Pro Lys Lys Ala Arg Phe Ala Gln Arg Lys Lys Glu Lys Tyr Lys Leu
            500                 505                 510

Ala Leu Phe Thr Phe Lys Asn Leu Ser Thr Leu Ile Glu Tyr Lys Ser
        515                 520                 525

Lys Arg Glu Gly Ile Pro Val Ile Tyr Val Pro Pro Glu Lys Thr Ser
    530                 535                 540

Gln Met Cys Ser His Cys Ala Ile Asn Gly Asp Glu His Val Asp Thr
545                 550                 555                 560

Gln Arg Pro Tyr Lys Lys Pro Asn Ala Gln Lys Pro Ser Tyr Ser Leu
                565                 570                 575

Phe Lys Cys Asn Lys Cys Gly Ile Glu Leu Asn Ala Asp Tyr Asn Ala
            580                 585                 590

Ala Phe Asn Ile Ala Gln Lys Gly Leu Lys Thr Leu Met Leu Asn His
        595                 600                 605

Ser His
    610
```

<210> 52

<211> 369
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 52
Met Leu Gln Thr Leu Leu Val Lys Leu Asp Pro Ser Lys Glu Gln Tyr
1 5 10 15

Lys Met Leu Tyr Glu Thr Met Glu Arg Phe Asn Glu Ala Cys Asn Gln
20 25 30

Ile Ala Glu Thr Val Phe Ala Ile His Ser Ala Asn Lys Ile Glu Val
35 40 45

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

Gln Leu Thr Ile Leu Ala Ile Arg Lys Val Cys Glu Ala Tyr Lys Arg
65 70 75 80

Asp Lys Ser Ile Lys Pro Glu Phe Arg Leu Asp Gly Ala Leu Val Tyr
85 90 95

Asp Gln Arg Val Leu Ser Trp Lys Gly Leu Asp Lys Val Ser Leu Val
100 105 110

Thr Leu Gln Gly Arg Gln Ile Ile Pro Ile Lys Phe Gly Asp Tyr Gln
115 120 125

Lys Ala Arg Met Asp Arg Ile Arg Gly Gln Ala Asp Leu Ile Leu Val
130 135 140

Lys Gly Val Phe Tyr Leu Cys Val Val Val Glu Val Ser Glu Glu Ser
145 150 155 160

Pro Tyr Asp Pro Lys Gly Val Leu Gly Val Asp Leu Gly Ile Lys Asn
165 170 175

Leu Ala Val Asp Ser Asp Gly Glu Val His Ser Gly Glu Gln Thr Thr
180 185 190

```
Asn Thr Arg Glu Arg Leu Asp Ser Leu Lys Ala Arg Leu Gln Ser Lys
        195                 200                 205

Gly Thr Lys Ser Ala Lys Arg His Leu Lys Lys Leu Ser Gly Arg Met
    210                 215                 220

Ala Lys Phe Ser Lys Asp Val Asn His Cys Ile Ser Lys Lys Leu Val
225                 230                 235                 240

Ala Lys Ala Lys Gly Thr Leu Met Ser Ile Ala Leu Glu Asp Leu Gln
                245                 250                 255

Gly Ile Arg Asp Arg Val Thr Val Arg Lys Ala Gln Arg Arg Asn Leu
            260                 265                 270

His Thr Trp Asn Phe Gly Leu Leu Arg Met Phe Val Asp Tyr Lys Ala
        275                 280                 285

Lys Ile Ala Gly Val Pro Leu Val Phe Val Asp Pro Arg Asn Thr Ser
    290                 295                 300

Arg Thr Cys Pro Ser Cys Gly His Val Ala Lys Ala Asn Arg Pro Thr
305                 310                 315                 320

Arg Asp Glu Phe Arg Cys Val Ser Cys Gly Phe Ala Gly Ala Ala Asp
                325                 330                 335

His Ile Ala Ala Met Asn Ile Ala Phe Arg Ala Glu Val Ser Gln Pro
            340                 345                 350

Ile Val Thr Arg Phe Phe Val Gln Ser Gln Ala Pro Ser Phe Arg Val
        355                 360                 365

Gly
```

<210> 53
<211> 552
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 53
Met Asp Glu Glu Pro Asp Ser Ala Glu Pro Asn Leu Ala Pro Ile Ser
1 5 10 15

Val Lys Leu Lys Leu Val Lys Leu Asp Gly Glu Lys Leu Ala Ala Leu
20 25 30

Asn Asp Tyr Phe Asn Glu Tyr Ala Lys Ala Val Asn Phe Cys Glu Leu
35 40 45

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

Leu Lys Glu Lys Lys Ala Trp Ile Asn Gln Thr Gly Glu Cys Cys Ile
65 70 75 80

Cys Lys Lys Ile Asp Glu Leu Arg Cys Glu Asp Lys Asn Pro Asp Ile
85 90 95

Asn Gly Lys Ile Cys Lys Lys Cys Tyr Asn Gly Arg Tyr Gly Asn Gln
100 105 110

Met Ile Arg Lys Leu Phe Val Ser Thr Asn Lys Arg Ala Val Pro Lys
115 120 125

Ser Leu Asp Ile Arg Lys Val Ala Arg Leu His Asn Thr His Tyr His
130 135 140

Arg Ile Pro Pro Glu Ala Ala Asp Ile Ile Lys Ala Ile Glu Thr Ala
145 150 155 160

Glu Arg Lys Arg Arg Asn Arg Ile Leu Phe Asp Glu Arg Arg Tyr Asn
165 170 175

Glu Leu Lys Asp Ala Leu Glu Asn Glu Glu Lys Arg Val Ala Arg Pro
180 185 190

Lys Lys Pro Lys Glu Arg Glu Val Arg Tyr Val Pro Ile Ser Lys Lys
195 200 205

Asp Thr Pro Ser Lys Gly Tyr Thr Met Asn Ala Leu Val Arg Lys Val
210 215 220

Ser Gly Met Ala Lys Lys Ile Glu Arg Ala Lys Arg Asn Leu Asn Lys

```
225                 230                 235                 240

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

Trp Val Arg Phe Asp Phe Asp Lys Ser Glu Ile Ser Ile Pro Thr Met
            260                 265                 270

Lys Glu Phe Phe Gly Glu Met Arg Phe Glu Ile Thr Gly Pro Ser Asn
        275                 280                 285

Val Met Ser Pro Asn Gly Arg Glu Tyr Phe Thr Lys Trp Phe Asp Arg
    290                 295                 300

Ile Lys Ala Gln Pro Asp Asn Tyr Cys Tyr Leu Leu Arg Lys Glu Ser
305                 310                 315                 320

Glu Asp Glu Thr Asp Phe Tyr Leu Gln Tyr Thr Trp Arg Pro Asp Ala
                325                 330                 335

His Pro Lys Lys Asp Tyr Thr Gly Cys Leu Gly Ile Asp Ile Gly Gly
            340                 345                 350

Ser Lys Leu Ala Ser Ala Val Tyr Phe Asp Ala Asp Lys Asn Arg Ala
        355                 360                 365

Lys Gln Pro Ile Gln Ile Phe Ser Asn Pro Ile Gly Lys Trp Lys Thr
    370                 375                 380

Lys Arg Gln Lys Val Ile Lys Val Leu Ser Lys Ala Ala Val Arg His
385                 390                 395                 400

Lys Thr Lys Lys Leu Glu Ser Leu Arg Asn Ile Glu Pro Arg Ile Asp
                405                 410                 415

Val His Cys His Arg Ile Ala Arg Lys Ile Val Gly Met Ala Leu Ala
            420                 425                 430

Ala Asn Ala Phe Ile Ser Met Glu Asn Leu Glu Gly Gly Ile Arg Glu
        435                 440                 445

Lys Gln Lys Ala Lys Glu Thr Lys Lys Gln Lys Phe Ser Arg Asn Met
    450                 455                 460
```

```
Phe Val Phe Arg Lys Leu Ser Lys Leu Ile Glu Tyr Lys Ala Leu Met
465                 470                 475                 480


Glu Gly Val Lys Val Val Tyr Ile Val Pro Asp Tyr Thr Ser Gln Leu
                485                 490                 495


Cys Ser Ser Cys Gly Thr Asn Asn Thr Lys Arg Pro Lys Gln Ala Ile
            500                 505                 510


Phe Met Cys Gln Asn Thr Glu Cys Arg Tyr Phe Gly Lys Asn Ile Asn
        515                 520                 525


Ala Asp Phe Asn Ala Ala Ile Asn Ile Ala Lys Lys Ala Leu Asn Arg
    530                 535                 540


Lys Asp Ile Val Arg Glu Leu Ser
545                 550


<210> 54
<211> 534
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 54
Met Glu Lys Asn Asn Ser Glu Gln Thr Ser Ile Thr Thr Gly Ile Lys
1               5                   10                  15


Phe Lys Leu Lys Leu Asp Lys Glu Thr Lys Glu Lys Leu Asn Asn Tyr
            20                  25                  30


Phe Asp Glu Tyr Gly Lys Ala Ile Asn Phe Ala Val Arg Ile Ile Gln
        35                  40                  45


Met Gln Leu Asn Asp Asp Arg Leu Ala Gly Lys Tyr Lys Arg Asp Glu
    50                  55                  60


Lys Gly Lys Pro Ile Leu Gly Glu Asp Gly Lys Lys Ile Leu Glu Ile
65                  70                  75                  80


Pro Asn Asp Phe Cys Ser Cys Gly Asn Gln Val Asn His Tyr Val Asn
                85                  90                  95
```

```
Gly Val Ser Phe Cys Gln Glu Cys Tyr Lys Lys Arg Phe Ser Glu Asn
            100                 105                 110

Gly Ile Arg Lys Arg Met Tyr Ser Ala Lys Gly Arg Lys Ala Glu Gln
        115                 120                 125

Asp Ile Asn Ile Lys Asn Ser Thr Asn Lys Ile Ser Lys Thr His Phe
    130                 135                 140

Asn Tyr Ala Ile Arg Glu Ala Phe Asn Leu Asp Lys Ser Ile Lys Lys
145                 150                 155                 160

Gln Arg Glu Lys Arg Phe Lys Lys Leu Lys Asp Met Lys Arg Lys Leu
                165                 170                 175

Gln Glu Phe Leu Glu Ile Arg Asp Gly Lys Arg Val Ile Cys Pro Lys
            180                 185                 190

Ile Glu Lys Gln Lys Val Glu Arg Tyr Ile His Pro Ser Trp Ile Asn
        195                 200                 205

Lys Glu Lys Lys Leu Glu Glu Phe Arg Gly Tyr Ser Leu Ser Ile Val
    210                 215                 220

Asn Ser Lys Ile Lys Ser Phe Asp Arg Asn Ile Gln Arg Glu Glu Lys
225                 230                 235                 240

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

Leu Asp Lys Ser Val Lys Phe Leu Lys Asp Asn Lys Val Ser Phe Thr
            260                 265                 270

Ile Ser Lys Glu Leu Pro Lys Thr Phe Glu Leu Asp Leu Pro Lys Lys
        275                 280                 285

Glu Lys Lys Leu Asn Trp Leu Asn Glu Lys Leu Glu Ile Ile Lys Asn
    290                 295                 300

Gln Lys Pro Lys Tyr Ala Tyr Leu Leu Arg Lys Glu Asn Asn Ile Phe
305                 310                 315                 320
```

```
Leu Gln Tyr Thr Leu Asp Ser Ile Pro Glu Ile His Ser Glu Tyr Ser
                325                 330                 335

Gly Ala Val Gly Ile Asp Arg Gly Val Ser His Ile Ala Val Tyr Thr
            340                 345                 350

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

Ser Gly Ile Leu Arg Leu Lys Asn Leu Gln Lys Glu Arg Asp Lys Phe
    370                 375                 380

Leu Arg Lys Lys His Asn Lys Ile Arg Lys Lys Gly Asn Met Arg Asn
385                 390                 395                 400

Ile Glu Gln Lys Ile Asn Leu Ile Leu His Glu Tyr Ser Lys Gln Ile
                405                 410                 415

Val Asn Phe Ala Lys Asp Lys Asn Ala Phe Ile Val Phe Glu Leu Leu
            420                 425                 430

Glu Lys Pro Lys Lys Ser Arg Glu Arg Met Ser Lys Lys Ile Gln Tyr
        435                 440                 445

Lys Leu Ser Gln Phe Thr Phe Lys Lys Leu Ser Asp Leu Val Asp Tyr
    450                 455                 460

Lys Ala Lys Arg Glu Gly Ile Lys Val Ile Tyr Val Glu Pro Ala Tyr
465                 470                 475                 480

Thr Ser Lys Asp Cys Ser His Cys Gly Glu Arg Val Asn Thr Gln Arg
                485                 490                 495

Pro Phe Asn Gly Asn Phe Ser Leu Phe Lys Cys Asn Lys Cys Gly Ile
            500                 505                 510

Val Leu Asn Ser Asp Tyr Asn Ala Ser Leu Asn Ile Ala Arg Lys Gly
        515                 520                 525

Leu Asn Ile Ser Ala Asn
    530
```

<210> 55
<211> 577

<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 55
Met Ala Glu Glu Lys Phe Phe Phe Cys Glu Lys Cys Asn Lys Asp Ile
1 5 10 15

Lys Ile Pro Lys Asn Tyr Ile Asn Lys Gln Gly Ala Glu Glu Lys Ala
20 25 30

Arg Ala Lys His Glu His Arg Val His Ala Leu Ile Leu Gly Ile Lys
35 40 45

Phe Lys Ile Tyr Pro Lys Lys Glu Asp Ile Ser Lys Leu Asn Asp Tyr
50 55 60

Phe Asp Glu Tyr Ala Lys Ala Val Thr Phe Thr Ala Lys Ile Val Asp
65 70 75 80

Lys Leu Lys Ala Pro Phe Leu Phe Ala Gly Lys Arg Asp Lys Asp Thr
85 90 95

Ser Lys Lys Lys Trp Val Phe Pro Val Asp Lys Cys Ser Phe Cys Lys
100 105 110

Glu Lys Thr Glu Ile Asn Tyr Arg Thr Lys Gln Gly Lys Asn Ile Cys
115 120 125

Asn Ser Cys Tyr Leu Thr Glu Phe Gly Glu Gln Gly Leu Leu Glu Lys
130 135 140

Ile Tyr Ala Thr Lys Gly Arg Lys Val Ser Ser Ser Phe Asn Leu Phe
145 150 155 160

Asn Ser Thr Lys Lys Leu Thr Gly Thr His Asn Asn Tyr Val Val Lys
165 170 175

Glu Ser Leu Gln Leu Leu Asp Ala Leu Lys Lys Gln Arg Ser Lys Arg
180 185 190

Leu Lys Lys Leu Ser Asn Thr Arg Arg Lys Leu Lys Gln Phe Glu Glu

```
        195                 200                 205

Met Phe Glu Lys Glu Asp Lys Arg Phe Gln Leu Pro Leu Lys Glu Lys
    210                 215                 220

Gln Arg Glu Leu Arg Phe Ile His Val Ser Gln Lys Asp Arg Ala Thr
225                 230                 235                 240

Glu Phe Lys Gly Tyr Thr Met Asn Lys Ile Lys Ser Lys Ile Lys Val
                245                 250                 255

Leu Arg Arg Asn Ile Glu Arg Glu Gln Arg Ser Leu Asn Arg Lys Ser
            260                 265                 270

Pro Val Phe Phe Arg Gly Thr Arg Ile Arg Leu Ser Pro Ser Val Gln
        275                 280                 285

Phe Asp Asp Lys Asp Asn Lys Ile Lys Leu Thr Leu Ser Lys Glu Leu
    290                 295                 300

Pro Lys Glu Tyr Ser Phe Ser Gly Leu Asn Val Ala Asn Glu His Gly
305                 310                 315                 320

Arg Lys Phe Phe Ala Glu Lys Leu Lys Leu Ile Lys Glu Asn Lys Ser
                325                 330                 335

Lys Tyr Ala Tyr Leu Leu Arg Arg Gln Val Asn Lys Asn Asn Lys Lys
            340                 345                 350

Pro Ile Tyr Asp Tyr Tyr Leu Gln Tyr Thr Val Glu Phe Leu Pro Asn
        355                 360                 365

Ile Ile Thr Asn Tyr Asn Gly Ile Leu Gly Ile Asp Arg Gly Ile Asn
    370                 375                 380

Thr Leu Ala Cys Ile Val Leu Leu Glu Asn Lys Lys Glu Lys Pro Ser
385                 390                 395                 400

Phe Val Lys Phe Phe Ser Gly Lys Gly Ile Leu Asn Leu Lys Asn Lys
                405                 410                 415

Arg Arg Lys Gln Leu Tyr Phe Leu Lys Gly Val His Asn Lys Tyr Arg
            420                 425                 430
```

Lys Gln Gln Lys Ile Arg Pro Ile Glu Pro Arg Ile Asp Gln Ile Leu
435 440 445

His Asp Ile Ser Lys Gln Ile Ile Asp Leu Ala Lys Glu Lys Arg Val
450 455 460

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

Gln Ser Arg Lys Ala Lys Tyr Lys Leu Ser Gln Phe Asn Phe Lys Thr
485 490 495

Leu Ser Asn Tyr Ile Asp Tyr Lys Ala Lys Lys Glu Gly Ile Arg Val
500 505 510

Ile Tyr Ile Ala Pro Glu Met Thr Ser Gln Asn Cys Ser Arg Cys Ala
515 520 525

Met Lys Asn Asp Leu His Val Asn Thr Gln Arg Pro Tyr Lys Asn Thr
530 535 540

Ser Ser Leu Phe Lys Cys Asn Lys Cys Gly Val Glu Leu Asn Ala Asp
545 550 555 560

Tyr Asn Ala Ala Phe Asn Ile Ala Gln Lys Gly Leu Lys Ile Leu Asn
565 570 575

Ser

<210> 56
<211> 613
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 56
Met Ile Ser Leu Lys Leu Lys Leu Leu Pro Asp Glu Glu Gln Lys Lys
1 5 10 15

Leu Leu Asp Glu Met Phe Trp Lys Trp Ala Ser Ile Cys Thr Arg Val
20 25 30

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

Glu Gly Val Trp Phe Ser Leu Thr Gln Leu Asn Gln Ala Asn Thr Asp
    50                  55                  60

Ile Asn Asp Leu Arg Glu Ala Met Lys His Gln Lys His Arg Leu Glu
65                  70                  75                  80

Tyr Glu Lys Asn Arg Leu Glu Ala Gln Arg Asp Asp Thr Gln Asp Ala
                85                  90                  95

Leu Lys Asn Pro Asp Arg Arg Glu Ile Ser Thr Lys Arg Lys Asp Leu
            100                 105                 110

Phe Arg Pro Lys Ala Ser Val Glu Lys Gly Phe Leu Lys Leu Lys Tyr
        115                 120                 125

His Gln Glu Arg Tyr Trp Val Arg Arg Leu Lys Glu Ile Asn Lys Leu
    130                 135                 140

Ile Glu Arg Lys Thr Lys Thr Leu Ile Lys Ile Glu Lys Gly Arg Ile
145                 150                 155                 160

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

Arg Phe Gly Asp Lys Pro Ala Phe Leu Ile Lys Ala Leu Ser Gly Lys
            180                 185                 190

Asn Gln Ile Asp Ala Pro Phe Val Val Val Pro Glu Gln Pro Ile Cys
        195                 200                 205

Gly Ser Val Val Asn Ser Lys Lys Tyr Leu Asp Glu Ile Thr Thr Asn
    210                 215                 220

Phe Leu Ala Tyr Ser Val Asn Ala Met Leu Phe Gly Leu Ser Arg Ser
225                 230                 235                 240

Glu Glu Met Leu Leu Lys Ala Lys Arg Pro Glu Lys Ile Lys Lys Lys
                245                 250                 255
```

```
Glu Glu Lys Leu Ala Lys Lys Gln Ser Ala Phe Glu Asn Lys Lys Lys
            260                 265                 270

Glu Leu Gln Lys Leu Leu Gly Arg Glu Leu Thr Gln Gln Glu Glu Ala
        275                 280                 285

Ile Ile Glu Glu Thr Arg Asn Gln Phe Phe Gln Asp Phe Glu Val Lys
    290                 295                 300

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

Lys Gln Lys Asn Asp Phe Leu Lys Val Asn Lys Tyr Pro Ile Leu Leu
                325                 330                 335

Arg Lys Pro Leu Lys Lys Ala Lys Ser Lys Lys Ile Asn Asn Leu Ser
            340                 345                 350

Pro Ser Glu Trp Lys Tyr Tyr Leu Gln Phe Gly Val Lys Pro Leu Leu
        355                 360                 365

Lys Gln Lys Ser Arg Arg Lys Ser Arg Asn Val Leu Gly Ile Asp Arg
    370                 375                 380

Gly Leu Lys His Leu Leu Ala Val Thr Val Leu Glu Pro Asp Lys Lys
385                 390                 395                 400

Thr Phe Val Trp Asn Lys Leu Tyr Pro Asn Pro Ile Thr Gly Trp Lys
                405                 410                 415

Trp Arg Arg Arg Lys Leu Leu Arg Ser Leu Lys Arg Leu Lys Arg Arg
            420                 425                 430

Ile Lys Ser Gln Lys His Glu Thr Ile His Glu Asn Gln Thr Arg Lys
        435                 440                 445

Lys Leu Lys Ser Leu Gln Gly Arg Ile Asp Asp Leu Leu His Asn Ile
    450                 455                 460

Ser Arg Lys Ile Val Glu Thr Ala Lys Glu Tyr Asp Ala Val Ile Val
465                 470                 475                 480

Val Glu Asp Leu Gln Ser Met Arg Gln His Gly Arg Ser Lys Gly Asn
                485                 490                 495
```

```
Arg Leu Lys Thr Leu Asn Tyr Ala Leu Ser Leu Phe Asp Tyr Ala Asn
            500                 505                 510

Val Met Gln Leu Ile Lys Tyr Lys Ala Gly Ile Glu Gly Ile Gln Ile
        515                 520                 525

Tyr Asp Val Lys Pro Ala Gly Thr Ser Gln Asn Cys Ala Tyr Cys Leu
    530                 535                 540

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

Lys Ile Gly Val Cys Leu Asn Pro Asn Cys Gln Asn His Lys Lys Gln
                565                 570                 575

Ile Asp Ala Asp Leu Asn Ala Ala Arg Val Ile Ala Ser Cys Tyr Ala
            580                 585                 590

Leu Lys Ile Asn Asp Ser Gln Pro Phe Gly Thr Arg Lys Arg Phe Lys
        595                 600                 605

Lys Arg Thr Thr Asn
    610
```

<210> 57
<211> 615
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 57

```
Met Glu Thr Leu Ser Leu Lys Leu Lys Leu Asn Pro Ser Lys Glu Gln
1               5                   10                  15

Leu Leu Val Leu Asp Lys Met Phe Trp Lys Trp Ala Ser Ile Cys Thr
            20                  25                  30

Arg Leu Gly Leu Lys Lys Ala Glu Met Ser Asp Leu Glu Pro Pro Lys
        35                  40                  45

Asp Ala Glu Gly Val Trp Phe Ser Lys Thr Gln Leu Asn Gln Ala Asn
```

```
    50                  55                  60

Thr Asp Val Asn Asp Leu Arg Lys Ala Met Gln His Gln Gly Lys Arg
65                  70                  75                  80

Ile Glu Tyr Glu Leu Asp Lys Val Glu Asn Arg Arg Asn Glu Ile Gln
                85                  90                  95

Glu Met Leu Glu Lys Pro Asp Arg Arg Asp Ile Ser Pro Asn Arg Lys
            100                 105                 110

Asp Leu Phe Arg Pro Lys Ala Ala Val Glu Lys Gly Tyr Leu Lys Leu
        115                 120                 125

Lys Tyr His Lys Leu Gly Tyr Trp Ser Lys Glu Leu Lys Thr Ala Asn
    130                 135                 140

Lys Leu Ile Glu Arg Lys Arg Lys Thr Leu Ala Lys Ile Asp Ala Gly
145                 150                 155                 160

Lys Met Lys Phe Lys Pro Thr Arg Ile Ser Leu His Thr Asn Ser Phe
                165                 170                 175

Arg Ile Lys Phe Gly Glu Glu Pro Lys Ile Ala Leu Ser Thr Thr Ser
            180                 185                 190

Lys His Glu Lys Ile Glu Leu Pro Leu Ile Thr Ser Leu Gln Arg Pro
        195                 200                 205

Leu Lys Thr Ser Cys Ala Lys Lys Ser Lys Thr Tyr Leu Asp Ala Ala
    210                 215                 220

Ile Leu Asn Phe Leu Ala Tyr Ser Thr Asn Ala Ala Leu Phe Gly Leu
225                 230                 235                 240

Ser Arg Ser Glu Glu Met Leu Leu Lys Ala Lys Lys Pro Glu Lys Ile
                245                 250                 255

Glu Lys Arg Asp Arg Lys Leu Ala Thr Lys Arg Glu Ser Phe Asp Lys
            260                 265                 270

Lys Leu Lys Thr Leu Glu Lys Leu Leu Glu Arg Lys Leu Ser Glu Lys
        275                 280                 285
```

```
Glu Lys Ser Val Phe Lys Arg Lys Gln Thr Glu Phe Phe Asp Lys Phe
    290                 295                 300

Cys Ile Thr Leu Asp Glu Thr Tyr Val Glu Ala Leu His Arg Ile Ala
305                 310                 315                 320

Glu Glu Leu Val Ser Lys Asn Lys Tyr Leu Glu Ile Lys Lys Tyr Pro
                325                 330                 335

Val Leu Leu Arg Lys Pro Glu Ser Arg Leu Arg Ser Lys Lys Leu Lys
            340                 345                 350

Asn Leu Lys Pro Glu Asp Trp Thr Tyr Tyr Ile Gln Phe Gly Phe Gln
        355                 360                 365

Pro Leu Leu Asp Thr Pro Lys Pro Ile Lys Thr Lys Thr Val Leu Gly
    370                 375                 380

Ile Asp Arg Gly Val Arg His Leu Leu Ala Val Ser Ile Phe Asp Pro
385                 390                 395                 400

Arg Thr Lys Thr Phe Thr Phe Asn Arg Leu Tyr Ser Asn Pro Ile Val
                405                 410                 415

Asp Trp Lys Trp Arg Arg Arg Lys Leu Leu Arg Ser Ile Lys Arg Leu
            420                 425                 430

Lys Arg Arg Leu Lys Ser Glu Lys His Val His Leu His Glu Asn Gln
        435                 440                 445

Phe Lys Ala Lys Leu Arg Ser Leu Glu Gly Arg Ile Glu Asp His Phe
    450                 455                 460

His Asn Leu Ser Lys Glu Ile Val Asp Leu Ala Lys Glu Asn Asn Ser
465                 470                 475                 480

Val Ile Val Val Glu Asn Leu Gly Gly Met Arg Gln His Gly Arg Gly
                485                 490                 495

Arg Gly Lys Trp Leu Lys Ala Leu Asn Tyr Ala Leu Ser His Phe Asp
            500                 505                 510

Tyr Ala Lys Val Met Gln Leu Ile Lys Tyr Lys Ala Glu Leu Ala Gly
```

```
        515                 520                 525

Val Phe Val Tyr Asp Val Ala Pro Ala Gly Thr Ser Ile Asn Cys Ala
    530                 535                 540

Tyr Cys Leu Leu Asn Asp Lys Asp Ala Ser Asn Tyr Thr Arg Gly Lys
545                 550                 555                 560

Val Ile Asn Gly Lys Lys Asn Thr Lys Ile Gly Glu Cys Lys Thr Cys
                565                 570                 575

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

Cys Tyr Glu Lys Arg Leu Asn Asp Pro Gln Pro Phe Gly Thr Arg Lys
        595                 600                 605

Gln Phe Lys Pro Lys Lys Pro
    610                 615


<210> 58
<211> 775
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 58
Met Lys Ala Leu Lys Leu Gln Leu Ile Pro Thr Arg Lys Gln Tyr Lys
1               5                   10                  15

Ile Leu Asp Glu Met Phe Trp Lys Trp Ala Ser Leu Ala Asn Arg Val
            20                  25                  30

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

Gln Lys Ile Gln Phe Asn Ala Thr Gln Leu Asn Gln Ile Glu Lys Asp
    50                  55                  60

Ile Lys Asp Leu Arg Gly Ala Met Lys Glu Gln Gln Lys Gln Lys Glu
65                  70                  75                  80
```

```
Arg Leu Leu Leu Gln Ile Gln Glu Arg Arg Ser Thr Ile Ser Glu Met
                85                  90                  95

Leu Asn Asp Asp Asn Asn Lys Glu Arg Asp Pro His Arg Pro Leu Asn
            100                 105                 110

Phe Arg Pro Lys Gly Trp Arg Lys Phe His Thr Ser Lys His Trp Val
        115                 120                 125

Gly Glu Leu Ser Lys Ile Leu Arg Gln Glu Asp Arg Val Lys Lys Thr
    130                 135                 140

Ile Glu Arg Ile Val Ala Gly Lys Ile Ser Phe Lys Pro Lys Arg Ile
145                 150                 155                 160

Gly Ile Trp Ser Ser Asn Tyr Lys Ile Asn Phe Phe Lys Arg Lys Ile
                165                 170                 175

Ser Ile Asn Pro Leu Asn Ser Lys Gly Phe Glu Leu Thr Leu Met Thr
            180                 185                 190

Glu Pro Thr Gln Asp Leu Ile Gly Lys Asn Gly Gly Lys Ser Val Leu
        195                 200                 205

Asn Asn Lys Arg Tyr Leu Asp Asp Ser Ile Lys Ser Leu Leu Met Phe
    210                 215                 220

Ala Leu His Ser Arg Phe Phe Gly Leu Asn Asn Thr Asp Thr Tyr Leu
225                 230                 235                 240

Leu Gly Gly Lys Ile Asn Pro Ser Leu Val Lys Tyr Tyr Lys Lys Asn
                245                 250                 255

Gln Asp Met Gly Glu Phe Gly Arg Glu Ile Val Glu Lys Phe Glu Arg
            260                 265                 270

Lys Leu Lys Gln Glu Ile Asn Glu Gln Gln Lys Lys Ile Ile Met Ser
        275                 280                 285

Gln Ile Lys Glu Gln Tyr Ser Asn Arg Asp Ser Ala Phe Asn Lys Asp
    290                 295                 300

Tyr Leu Gly Leu Ile Asn Glu Phe Ser Glu Val Phe Asn Gln Arg Lys
305                 310                 315                 320
```

```
Ser Glu Arg Ala Glu Tyr Leu Leu Asp Ser Phe Glu Asp Lys Ile Lys
                325                 330                 335

Gln Ile Lys Gln Glu Ile Gly Glu Ser Leu Asn Ile Ser Asp Trp Asp
            340                 345                 350

Phe Leu Ile Asp Glu Ala Lys Lys Ala Tyr Gly Tyr Glu Glu Gly Phe
        355                 360                 365

Thr Glu Tyr Val Tyr Ser Lys Arg Tyr Leu Glu Ile Leu Asn Lys Ile
    370                 375                 380

Val Lys Ala Val Leu Ile Thr Asp Ile Tyr Phe Asp Leu Arg Lys Tyr
385                 390                 395                 400

Pro Ile Leu Leu Arg Lys Pro Leu Asp Lys Ile Lys Lys Ile Ser Asn
                405                 410                 415

Leu Lys Pro Asp Glu Trp Ser Tyr Tyr Ile Gln Phe Gly Tyr Asp Ser
            420                 425                 430

Ile Asn Pro Val Gln Leu Met Ser Thr Asp Lys Phe Leu Gly Ile Asp
        435                 440                 445

Arg Gly Leu Thr His Leu Leu Ala Tyr Ser Val Phe Asp Lys Glu Lys
    450                 455                 460

Lys Glu Phe Ile Ile Asn Gln Leu Glu Pro Asn Pro Ile Met Gly Trp
465                 470                 475                 480

Lys Trp Lys Leu Arg Lys Val Lys Arg Ser Leu Gln His Leu Glu Arg
                485                 490                 495

Arg Ile Arg Ala Gln Lys Met Val Lys Leu Pro Glu Asn Gln Met Lys
            500                 505                 510

Lys Lys Leu Lys Ser Ile Glu Pro Lys Ile Glu Val His Tyr His Asn
        515                 520                 525

Ile Ser Arg Lys Ile Val Asn Leu Ala Lys Asp Tyr Asn Ala Ser Ile
    530                 535                 540
```

```
Val Val Glu Ser Leu Glu Gly Gly Gly Leu Lys Gln His Gly Arg Lys
545                 550                 555                 560

Lys Asn Ala Arg Asn Arg Ser Leu Asn Tyr Ala Leu Ser Leu Phe Asp
                565                 570                 575

Tyr Gly Lys Ile Ala Ser Leu Ile Lys Tyr Lys Ala Asp Leu Glu Gly
            580                 585                 590

Val Pro Met Tyr Glu Val Leu Pro Ala Tyr Thr Ser Gln Gln Cys Ala
        595                 600                 605

Lys Cys Val Leu Glu Lys Gly Ser Phe Val Asp Pro Glu Ile Ile Gly
    610                 615                 620

Tyr Val Glu Asp Ile Gly Ile Lys Gly Ser Leu Leu Asp Ser Leu Phe
625                 630                 635                 640

Glu Gly Thr Glu Leu Ser Ser Ile Gln Val Leu Lys Lys Ile Lys Asn
                645                 650                 655

Lys Ile Glu Leu Ser Ala Arg Asp Asn His Asn Lys Glu Ile Asn Leu
            660                 665                 670

Ile Leu Lys Tyr Asn Phe Lys Gly Leu Val Ile Val Arg Gly Gln Asp
        675                 680                 685

Lys Glu Glu Ile Ala Glu His Pro Ile Lys Glu Ile Asn Gly Lys Phe
    690                 695                 700

Ala Ile Leu Asp Phe Val Tyr Lys Arg Gly Lys Glu Lys Val Gly Lys
705                 710                 715                 720

Lys Gly Asn Gln Lys Val Arg Tyr Thr Gly Asn Lys Lys Val Gly Tyr
                725                 730                 735

Cys Ser Lys His Gly Gln Val Asp Ala Asp Leu Asn Ala Ser Arg Val
            740                 745                 750

Ile Ala Leu Cys Lys Tyr Leu Asp Ile Asn Asp Pro Ile Leu Phe Gly
        755                 760                 765

Glu Gln Arg Lys Ser Phe Lys
    770                 775
```

<210> 59
<211> 777
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 59
Met Val Thr Arg Ala Ile Lys Leu Lys Leu Asp Pro Thr Lys Asn Gln
1 5 10 15

Tyr Lys Leu Leu Asn Glu Met Phe Trp Lys Trp Ala Ser Leu Ala Asn
20 25 30

Arg Phe Ser Gln Lys Gly Ala Ser Lys Glu Thr Leu Ala Pro Lys Asp
35 40 45

Gly Thr Gln Lys Ile Gln Phe Asn Ala Thr Gln Leu Asn Gln Ile Lys
50 55 60

Lys Asp Val Asp Asp Leu Arg Gly Ala Met Glu Lys Gln Gly Lys Gln
65 70 75 80

Lys Glu Arg Leu Leu Ile Gln Ile Gln Glu Arg Leu Leu Thr Ile Ser
85 90 95

Glu Ile Leu Arg Asp Asp Ser Lys Lys Glu Lys Asp Pro His Arg Pro
100 105 110

Gln Asn Phe Arg Pro Phe Gly Trp Arg Arg Phe His Thr Ser Ala Tyr
115 120 125

Trp Ser Ser Glu Ala Ser Lys Leu Thr Arg Gln Val Asp Arg Val Arg
130 135 140

Arg Thr Ile Glu Arg Ile Lys Ala Gly Lys Ile Asn Phe Lys Pro Lys
145 150 155 160

Arg Ile Gly Leu Trp Ser Ser Thr Tyr Lys Ile Asn Phe Leu Lys Lys
165 170 175

Lys Ile Asn Ile Ser Pro Leu Lys Ser Lys Ser Phe Glu Leu Asp Leu

```
            180                 185                 190

Ile Thr Glu Pro Gln Gln Lys Ile Ile Gly Lys Glu Gly Gly Lys Ser
        195                 200                 205

Val Ala Asn Ser Lys Lys Tyr Leu Asp Asp Ser Ile Lys Ser Leu Leu
    210                 215                 220

Ile Phe Ala Ile Lys Ser Arg Leu Phe Gly Leu Asn Asn Lys Asp Lys
225                 230                 235                 240

Pro Leu Phe Glu Asn Ile Ile Thr Pro Asn Leu Val Arg Tyr His Lys
                245                 250                 255

Lys Gly Gln Glu Gln Glu Asn Phe Lys Lys Glu Val Ile Lys Lys Phe
            260                 265                 270

Glu Asn Lys Leu Lys Lys Glu Ile Ser Gln Lys Gln Lys Glu Ile Ile
        275                 280                 285

Phe Ser Gln Ile Glu Arg Gln Tyr Glu Asn Arg Asp Ala Thr Phe Ser
    290                 295                 300

Glu Asp Tyr Leu Arg Ala Ile Ser Glu Phe Ser Glu Ile Phe Asn Gln
305                 310                 315                 320

Arg Lys Lys Glu Arg Ala Lys Glu Leu Leu Asn Ser Phe Asn Glu Lys
                325                 330                 335

Ile Arg Gln Leu Lys Lys Glu Val Asn Gly Asn Ile Ser Glu Glu Asp
            340                 345                 350

Leu Lys Ile Leu Glu Val Glu Ala Glu Lys Ala Tyr Asn Tyr Glu Asn
        355                 360                 365

Gly Phe Ile Glu Trp Glu Tyr Ser Glu Gln Phe Leu Gly Val Leu Glu
    370                 375                 380

Lys Ile Ala Arg Ala Val Leu Ile Ser Asp Asn Tyr Phe Asp Leu Lys
385                 390                 395                 400

Lys Tyr Pro Ile Leu Ile Arg Lys Pro Thr Asn Lys Ser Lys Lys Ile
                405                 410                 415
```

```
Thr Asn Leu Lys Pro Glu Glu Trp Asp Tyr Tyr Ile Gln Phe Gly Tyr
            420                 425                 430

Gly Leu Ile Asn Ser Pro Met Lys Ile Glu Thr Lys Asn Phe Met Gly
        435                 440                 445

Ile Asp Arg Gly Leu Thr His Leu Leu Ala Tyr Ser Ile Phe Asp Arg
    450                 455                 460

Asp Ser Glu Lys Phe Thr Ile Asn Gln Leu Glu Leu Asn Pro Ile Lys
465                 470                 475                 480

Gly Trp Lys Trp Lys Leu Arg Lys Val Lys Arg Ser Leu Gln His Leu
                485                 490                 495

Glu Arg Arg Met Arg Ala Gln Lys Gly Val Lys Leu Pro Glu Asn Gln
            500                 505                 510

Met Lys Lys Arg Leu Lys Ser Ile Glu Pro Lys Ile Glu Ser Tyr Tyr
        515                 520                 525

His Asn Leu Ser Arg Lys Ile Val Asn Leu Ala Lys Ala Asn Asn Ala
    530                 535                 540

Ser Ile Val Val Glu Ser Leu Glu Gly Gly Gly Leu Lys Gln His Gly
545                 550                 555                 560

Arg Lys Lys Asn Ser Arg His Arg Ala Leu Asn Tyr Ala Leu Ser Leu
                565                 570                 575

Phe Asp Tyr Gly Lys Ile Ala Ser Leu Ile Lys Tyr Lys Ser Asp Leu
            580                 585                 590

Glu Gly Val Pro Met Tyr Glu Val Leu Pro Ala Tyr Thr Ser Gln Gln
        595                 600                 605

Cys Ala Lys Cys Val Leu Lys Lys Gly Ser Phe Val Glu Pro Glu Ile
    610                 615                 620

Ile Gly Tyr Ile Glu Glu Ile Gly Phe Lys Glu Asn Leu Leu Thr Leu
625                 630                 635                 640

Leu Phe Glu Asp Thr Gly Leu Ser Ser Val Gln Val Leu Lys Lys Ser
```

645 650 655

Lys Asn Lys Met Thr Leu Ser Ala Arg Asp Lys Glu Gly Lys Met Val
660 665 670

Asp Leu Val Leu Lys Tyr Asn Phe Lys Gly Leu Val Ile Ser Gln Glu
675 680 685

Lys Lys Lys Glu Glu Ile Val Glu Phe Pro Ile Lys Glu Ile Asp Gly
690 695 700

Lys Phe Ala Val Leu Asp Ser Ala Tyr Lys Arg Gly Lys Glu Arg Ile
705 710 715 720

Ser Lys Lys Gly Asn Gln Lys Leu Val Tyr Thr Gly Asn Lys Lys Val
725 730 735

Gly Tyr Cys Ser Val His Gly Gln Val Asp Ala Asp Leu Asn Ala Ser
740 745 750

Arg Val Ile Ala Leu Cys Lys Tyr Leu Gly Ile Asn Glu Pro Ile Val
755 760 765

Phe Gly Glu Gln Arg Lys Ser Phe Lys
770 775

<210> 60
<211> 610
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 60
Leu Asp Leu Ile Thr Glu Pro Ile Gln Pro His Lys Ser Ser Ser Leu
1 5 10 15

Arg Ser Lys Glu Phe Leu Glu Tyr Gln Ile Ser Asp Phe Leu Asn Phe
20 25 30

Ser Leu His Ser Leu Phe Phe Gly Leu Ala Ser Asn Glu Gly Pro Leu
35 40 45

```
Val Asp Phe Lys Ile Tyr Asp Lys Ile Val Ile Pro Lys Pro Glu Glu
    50                  55                  60

Arg Phe Pro Lys Lys Glu Ser Glu Glu Gly Lys Lys Leu Asp Ser Phe
65                  70                  75                  80

Asp Lys Arg Val Glu Glu Tyr Tyr Ser Asp Lys Leu Glu Lys Lys Ile
                85                  90                  95

Glu Arg Lys Leu Asn Thr Glu Glu Lys Asn Val Ile Asp Arg Glu Lys
            100                 105                 110

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

Ile Asp Glu Ile Asn Glu Ile Lys Lys Gln Lys His Ile Ser Glu Lys
    130                 135                 140

Ser Lys Leu Leu Gly Glu Lys Trp Lys Lys Val Asn Asn Ile Gln Glu
145                 150                 155                 160

Thr Leu Leu Ser Gln Glu Tyr Val Ser Leu Ile Ser Asn Leu Ser Asp
                165                 170                 175

Glu Leu Thr Asn Lys Lys Lys Glu Leu Leu Ala Lys Lys Tyr Ser Lys
            180                 185                 190

Phe Asp Asp Lys Ile Lys Lys Ile Lys Glu Asp Tyr Gly Leu Glu Phe
        195                 200                 205

Asp Glu Asn Thr Ile Lys Lys Glu Gly Glu Lys Ala Phe Leu Asn Pro
    210                 215                 220

Asp Lys Phe Ser Lys Tyr Gln Phe Ser Ser Ser Tyr Leu Lys Leu Ile
225                 230                 235                 240

Gly Glu Ile Ala Arg Ser Leu Ile Thr Tyr Lys Gly Phe Leu Asp Leu
                245                 250                 255

Asn Lys Tyr Pro Ile Ile Phe Arg Lys Pro Ile Asn Lys Val Lys Lys
            260                 265                 270

Ile His Asn Leu Glu Pro Asp Glu Trp Lys Tyr Tyr Ile Gln Phe Gly
        275                 280                 285
```

```
Tyr Glu Gln Ile Asn Asn Pro Lys Leu Glu Thr Glu Asn Ile Leu Gly
    290                 295                 300

Ile Asp Arg Gly Leu Thr His Ile Leu Ala Tyr Ser Val Phe Glu Pro
305                 310                 315                 320

Arg Ser Ser Lys Phe Ile Leu Asn Lys Leu Glu Pro Asn Pro Ile Glu
                325                 330                 335

Gly Trp Lys Trp Lys Leu Arg Lys Leu Arg Arg Ser Ile Gln Asn Leu
            340                 345                 350

Glu Arg Arg Trp Arg Ala Gln Asp Asn Val Lys Leu Pro Glu Asn Gln
        355                 360                 365

Met Lys Lys Asn Leu Arg Ser Ile Glu Asp Lys Val Glu Asn Leu Tyr
    370                 375                 380

His Asn Leu Ser Arg Lys Ile Val Asp Leu Ala Lys Glu Lys Asn Ala
385                 390                 395                 400

Cys Ile Val Phe Glu Lys Leu Glu Gly Gln Gly Met Lys Gln His Gly
                405                 410                 415

Arg Lys Lys Ser Asp Arg Leu Arg Gly Leu Asn Tyr Lys Leu Ser Leu
            420                 425                 430

Phe Asp Tyr Gly Lys Ile Ala Lys Leu Ile Lys Tyr Lys Ala Glu Ile
        435                 440                 445

Glu Gly Ile Pro Ile Tyr Arg Ile Asp Ser Ala Tyr Thr Ser Gln Asn
    450                 455                 460

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

Ile Ser Cys Leu Asp Asp Phe Lys Glu Gly Asp Asn Leu Asp Lys Arg
                485                 490                 495

Ile Leu Glu Gly Thr Gly Leu Val Glu Ala Lys Ile Tyr Lys Lys Leu
            500                 505                 510
```

Leu Lys Glu Lys Lys Glu Asp Phe Glu Ile Glu Glu Asp Ile Ala Met
515 520 525

Phe Asp Thr Lys Lys Val Ile Lys Glu Asn Lys Glu Lys Thr Val Ile
530 535 540

Leu Asp Tyr Val Tyr Thr Arg Arg Lys Glu Ile Ile Gly Thr Asn His
545 550 555 560

Lys Lys Asn Ile Lys Gly Ile Ala Lys Tyr Thr Gly Asn Thr Lys Ile
565 570 575

Gly Tyr Cys Met Lys His Gly Gln Val Asp Ala Asp Leu Asn Ala Ser
580 585 590

Arg Thr Ile Ala Leu Cys Lys Asn Phe Asp Ile Asn Asn Pro Glu Ile
595 600 605

Trp Lys
610

<210> 61
<211> 632
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 61
Met Ser Asp Glu Ser Leu Val Ser Ser Glu Asp Lys Leu Ala Ile Lys
1 5 10 15

Ile Lys Ile Val Pro Asn Ala Glu Gln Ala Lys Met Leu Asp Glu Met
20 25 30

Phe Lys Lys Trp Ser Ser Ile Cys Asn Arg Ile Ser Arg Gly Lys Glu
35 40 45

Asp Ile Glu Thr Leu Arg Pro Asp Glu Gly Lys Glu Leu Gln Phe Asn
50 55 60

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

```
Ala Met Ala Arg Gln Gly Glu Arg Leu Glu Ala Glu Val Ser Lys Leu
                85                  90                  95

Arg Gly Arg Tyr Glu Thr Ile Asp Ala Ser Leu Arg Asp Pro Ser Arg
            100                 105                 110

Arg His Thr Asn Pro Gln Lys Pro Ser Ser Phe Tyr Pro Ser Asp Trp
        115                 120                 125

Asp Ile Ser Gly Arg Leu Thr Pro Arg Phe His Thr Ala Arg His Tyr
    130                 135                 140

Ser Thr Glu Leu Arg Lys Leu Lys Ala Lys Glu Asp Lys Met Leu Lys
145                 150                 155                 160

Thr Ile Asn Lys Ile Lys Asn Gly Lys Ile Val Phe Lys Pro Lys Arg
                165                 170                 175

Ile Thr Leu Trp Pro Ser Ser Val Asn Met Ala Phe Lys Gly Ser Arg
            180                 185                 190

Leu Leu Leu Lys Pro Phe Ala Asn Gly Phe Glu Met Glu Leu Pro Ile
        195                 200                 205

Val Ile Ser Pro Gln Lys Thr Ala Asp Gly Lys Ser Gln Lys Ala Ser
    210                 215                 220

Ala Glu Tyr Met Arg Asn Ala Leu Leu Gly Leu Ala Gly Tyr Ser Ile
225                 230                 235                 240

Asn Gln Leu Leu Phe Gly Met Asn Arg Ser Gln Lys Met Leu Ala Asn
                245                 250                 255

Ala Lys Lys Pro Glu Lys Val Glu Lys Phe Leu Glu Gln Met Lys Asn
            260                 265                 270

Lys Asp Ala Asn Phe Asp Lys Lys Ile Lys Ala Leu Glu Gly Lys Trp
        275                 280                 285

Leu Leu Asp Arg Lys Leu Lys Glu Ser Glu Lys Ser Ser Ile Ala Val
    290                 295                 300

Val Arg Thr Lys Phe Phe Lys Ser Gly Lys Val Glu Leu Asn Glu Asp
```

```
305                 310                 315                 320

Tyr Leu Lys Leu Leu Lys His Met Ala Asn Glu Ile Leu Glu Arg Asp
                325                 330                 335

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

Lys Arg Tyr Lys Gln Lys Asn Ile Asp Asn Leu Lys Pro Asn Met Trp
        355                 360                 365

Lys Tyr Tyr Ile Gln Phe Gly Tyr Glu Pro Ile Phe Glu Arg Lys Ala
    370                 375                 380

Ser Gly Lys Pro Lys Asn Ile Met Gly Ile Asp Arg Gly Leu Thr His
385                 390                 395                 400

Leu Leu Ala Val Ala Val Phe Ser Pro Asp Gln Gln Lys Phe Leu Phe
                405                 410                 415

Asn His Leu Glu Ser Asn Pro Ile Met His Trp Lys Trp Lys Leu Arg
            420                 425                 430

Lys Ile Arg Arg Ser Ile Gln His Met Glu Arg Arg Ile Arg Ala Glu
        435                 440                 445

Lys Asn Lys His Ile His Glu Ala Gln Leu Lys Lys Arg Leu Gly Ser
    450                 455                 460

Ile Glu Glu Lys Thr Glu Gln His Tyr His Ile Val Ser Ser Lys Ile
465                 470                 475                 480

Ile Asn Trp Ala Ile Glu Tyr Glu Ala Ala Ile Val Leu Glu Ser Leu
                485                 490                 495

Ser His Met Lys Gln Arg Gly Gly Lys Lys Ser Val Arg Thr Arg Ala
            500                 505                 510

Leu Asn Tyr Ala Leu Ser Leu Phe Asp Tyr Glu Lys Val Ala Arg Leu
        515                 520                 525

Ile Thr Tyr Lys Ala Arg Ile Arg Gly Ile Pro Val Tyr Asp Val Leu
    530                 535                 540
```

```
Pro Gly Met Thr Ser Lys Thr Cys Ala Thr Cys Leu Leu Asn Gly Ser
545                 550                 555                 560


Gln Gly Ala Tyr Val Arg Gly Leu Glu Thr Thr Lys Ala Ala Gly Lys
                565                 570                 575


Ala Thr Lys Arg Lys Asn Met Lys Ile Gly Lys Cys Met Val Cys Asn
            580                 585                 590


Ser Ser Glu Asn Ser Met Ile Asp Ala Asp Leu Asn Ala Ala Arg Val
        595                 600                 605


Ile Ala Ile Cys Lys Tyr Lys Asn Leu Asn Asp Pro Gln Pro Ala Gly
    610                 615                 620


Ser Arg Lys Val Phe Lys Arg Phe
625                 630


<210> 62
<211> 625
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 62
Met Leu Ala Leu Lys Leu Lys Ile Met Pro Thr Glu Lys Gln Ala Glu
1               5                   10                  15


Ile Leu Asp Ala Met Phe Trp Lys Trp Ala Ser Ile Cys Ser Arg Ile
            20                  25                  30


Ala Lys Met Lys Lys Lys Val Ser Val Lys Glu Asn Lys Lys Glu Leu
        35                  40                  45


Ser Lys Lys Ile Pro Ser Asn Ser Asp Ile Trp Phe Ser Lys Thr Gln
    50                  55                  60


Leu Cys Gln Ala Glu Val Asp Val Gly Asp His Lys Lys Ala Leu Lys
65                  70                  75                  80


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

```
Val Lys Ala Ile Asn Glu Val Ile Asn Asp Glu Ser Lys Arg Glu Ile
            100                 105                 110

Asp Pro Asn Asn Pro Ser Lys Phe Arg Ile Lys Asp Ser Thr Lys Lys
        115                 120                 125

Gly Asn Leu Asn Ser Pro Lys Phe Phe Thr Leu Lys Lys Trp Gln Lys
    130                 135                 140

Ile Leu Gln Glu Asn Glu Lys Arg Ile Lys Lys Lys Glu Ser Thr Ile
145                 150                 155                 160

Glu Lys Leu Lys Arg Gly Asn Ile Phe Phe Asn Pro Thr Lys Ile Ser
                165                 170                 175

Leu His Glu Glu Glu Tyr Ser Ile Asn Phe Gly Ser Ser Lys Leu Leu
            180                 185                 190

Leu Asn Cys Phe Tyr Lys Tyr Asn Lys Lys Ser Gly Ile Asn Ser Asp
        195                 200                 205

Gln Leu Glu Asn Lys Phe Asn Glu Phe Gln Asn Gly Leu Asn Ile Ile
    210                 215                 220

Cys Ser Pro Leu Gln Pro Ile Arg Gly Ser Ser Lys Arg Ser Phe Glu
225                 230                 235                 240

Phe Ile Arg Asn Ser Ile Ile Asn Phe Leu Met Tyr Ser Leu Tyr Ala
                245                 250                 255

Lys Leu Phe Gly Ile Pro Arg Ser Val Lys Ala Leu Met Lys Ser Asn
            260                 265                 270

Lys Asp Glu Asn Lys Leu Lys Leu Glu Glu Lys Leu Lys Lys Lys Lys
        275                 280                 285

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

Lys Leu Ser Asp Asn Glu Ser Lys Ile Leu Asn Asp Glu Ser Lys Lys
305                 310                 315                 320
```

```
Phe Phe Glu Ile Ile Lys Ser Asn Asn Lys Tyr Ile Pro Ser Glu Glu
                325                 330                 335

Tyr Leu Lys Leu Leu Lys Asp Ile Ser Glu Glu Ile Tyr Asn Ser Asn
            340                 345                 350

Ile Asp Phe Lys Pro Tyr Lys Tyr Ser Ile Leu Ile Arg Lys Pro Leu
        355                 360                 365

Ser Lys Phe Lys Ser Lys Lys Leu Tyr Asn Leu Lys Pro Thr Asp Tyr
    370                 375                 380

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

Ala Thr Lys Thr Ile Leu Gly Ile Asp Arg Gly Leu Lys His Leu Leu
                405                 410                 415

Ala Val Ser Val Phe Asp Pro Ser Gln Asn Lys Phe Val Tyr Asn Lys
            420                 425                 430

Leu Ile Lys Asn Pro Val Phe Lys Trp Lys Lys Arg Tyr His Asp Leu
        435                 440                 445

Lys Arg Ser Ile Arg Asn Arg Glu Arg Arg Ile Arg Ala Leu Thr Gly
    450                 455                 460

Val His Ile His Glu Asn Gln Leu Ile Lys Lys Leu Lys Ser Met Lys
465                 470                 475                 480

Asn Lys Ile Asn Val Leu Tyr His Asn Val Ser Lys Asn Ile Val Asp
                485                 490                 495

Leu Ala Lys Lys Tyr Glu Ser Thr Ile Val Leu Glu Arg Leu Glu Asn
            500                 505                 510

Leu Lys Gln His Gly Arg Ser Lys Gly Lys Arg Tyr Lys Lys Leu Asn
        515                 520                 525

Tyr Val Leu Ser Asn Phe Asp Tyr Lys Lys Ile Glu Ser Leu Ile Ser
    530                 535                 540

Tyr Lys Ala Lys Lys Glu Gly Val Pro Val Ser Asn Ile Asn Pro Lys
545                 550                 555                 560
```

Tyr Thr Ser Lys Thr Cys Ala Lys Cys Leu Leu Glu Val Asn Gln Leu
565 570 575

Ser Glu Leu Lys Asn Glu Tyr Asn Arg Asp Ser Lys Asn Ser Lys Ile
580 585 590

Gly Ile Cys Asn Ile His Gly Gln Ile Asp Ala Asp Leu Asn Ala Ala
595 600 605

Arg Val Ile Ala Leu Cys Tyr Ser Lys Asn Leu Asn Glu Pro His Phe
610 615 620

Lys
625

<210> 63
<211> 517
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 63
Val Ile Asn Leu Phe Gly Tyr Lys Phe Ala Leu Tyr Pro Asn Lys Thr
1 5 10 15

Gln Glu Glu Leu Leu Asn Lys His Leu Gly Glu Cys Gly Trp Leu Tyr
20 25 30

Asn Lys Ala Ile Glu Gln Asn Glu Tyr Tyr Lys Ala Asp Ser Asn Ile
35 40 45

Glu Glu Ala Gln Lys Lys Phe Glu Leu Leu Pro Asp Lys Asn Ser Asp
50 55 60

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

Arg Thr Leu Val Lys Lys Lys Lys Ser Glu Ile Asn Val Gln Ile Arg
85 90 95

Lys Ala Val Val Leu Arg Pro Ala Glu Thr Ile Arg Asn Leu Ala Lys

```
            100                 105                 110

Val Lys Lys Lys Gly Leu Ser Val Gly Arg Leu Lys Phe Ile Pro Ile
        115                 120                 125

Arg Glu Trp Asp Val Leu Pro Phe Lys Gln Ser Asp Gln Ile Arg Leu
    130                 135                 140

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

Met His Arg Pro Leu Leu Gly Lys Pro Lys Thr Phe Cys Ile Lys Arg
                165                 170                 175

Thr Ala Thr Asp Arg Trp Thr Ile Ser Phe Ser Thr Glu Tyr Asp Asp
            180                 185                 190

Ser Asn Met Arg Lys Asn Asp Gly Gly Gln Val Gly Ile Asp Val Gly
        195                 200                 205

Leu Lys Thr His Leu Arg Leu Ser Asn Glu Asn Pro Asp Glu Asp Pro
    210                 215                 220

Arg Tyr Pro Asn Pro Lys Ile Trp Lys Arg Tyr Asp Arg Arg Leu Thr
225                 230                 235                 240

Ile Leu Gln Arg Arg Ile Ser Lys Ser Lys Lys Leu Gly Lys Asn Arg
                245                 250                 255

Thr Arg Leu Arg Leu Arg Leu Ser Arg Leu Trp Glu Lys Ile Arg Asn
            260                 265                 270

Ser Arg Ala Asp Leu Ile Gln Asn Glu Thr Tyr Glu Ile Leu Ser Glu
        275                 280                 285

Asn Lys Leu Ile Ala Ile Glu Asp Leu Asn Val Lys Gly Met Gln Glu
    290                 295                 300

Lys Lys Asp Lys Lys Gly Arg Lys Gly Arg Thr Arg Ala Gln Glu Lys
305                 310                 315                 320

Gly Leu His Arg Ser Ile Ser Asp Ala Ala Phe Ser Glu Phe Arg Arg
                325                 330                 335
```

```
Val Leu Glu Tyr Lys Ala Lys Arg Phe Gly Ser Glu Val Lys Pro Val
            340                 345                 350

Ser Ala Ile Asp Ser Ser Lys Glu Cys His Asn Cys Gly Asn Lys Lys
        355                 360                 365

Gly Met Pro Leu Glu Ser Arg Ile Tyr Glu Cys Pro Lys Cys Gly Leu
    370                 375                 380

Lys Ile Asp Arg Asp Leu Asn Ser Ala Lys Val Ile Leu Ala Arg Ala
385                 390                 395                 400

Thr Gly Val Arg Pro Gly Ser Asn Ala Arg Ala Asp Thr Lys Ile Ser
                405                 410                 415

Ala Thr Ala Gly Ala Ser Val Gln Thr Glu Gly Thr Val Ser Glu Asp
            420                 425                 430

Phe Arg Gln Gln Met Glu Thr Ser Asp Gln Lys Pro Met Gln Gly Glu
        435                 440                 445

Gly Ser Lys Glu Pro Pro Met Asn Pro Glu His Lys Ser Ser Gly Arg
    450                 455                 460

Gly Ser Lys His Val Asn Ile Gly Cys Lys Asn Lys Val Gly Leu Tyr
465                 470                 475                 480

Asn Glu Asp Glu Asn Ser Arg Ser Thr Glu Lys Gln Ile Met Asp Glu
                485                 490                 495

Asn Arg Ser Thr Thr Glu Asp Met Val Glu Ile Gly Ala Leu His Ser
            500                 505                 510

Pro Val Leu Thr Thr
        515
```

<210> 64
<211> 410
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 64
Met Ile Ala Ser Ile Asp Tyr Glu Ala Val Ser Gln Ala Leu Ile Val
1 5 10 15

Phe Glu Phe Lys Ala Lys Gly Lys Asp Ser Gln Tyr Gln Ala Ile Asp
20 25 30

Glu Ala Ile Arg Ser Tyr Arg Phe Ile Arg Asn Ser Cys Leu Arg Tyr
35 40 45

Trp Met Asp Asn Lys Lys Val Gly Lys Tyr Asp Leu Asn Lys Tyr Cys
50 55 60

Lys Val Leu Ala Lys Gln Tyr Pro Phe Ala Asn Lys Leu Asn Ser Gln
65 70 75 80

Ala Arg Gln Ser Ala Ala Glu Cys Ser Trp Ser Ala Ile Ser Arg Phe
85 90 95

Tyr Asp Asn Cys Lys Arg Lys Val Ser Gly Lys Lys Gly Phe Pro Lys
100 105 110

Phe Lys Lys His Ala Arg Ser Val Glu Tyr Lys Thr Ser Gly Trp Lys
115 120 125

Leu Ser Glu Asn Arg Lys Ala Ile Thr Phe Thr Asp Lys Asn Gly Ile
130 135 140

Gly Lys Leu Lys Leu Lys Gly Thr Tyr Asp Leu His Phe Ser Gln Leu
145 150 155 160

Glu Asp Met Lys Arg Val Arg Leu Val Arg Arg Ala Asp Gly Tyr Tyr
165 170 175

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

Gly Lys Ala Ile Gly Leu Asp Val Gly Ile Lys Tyr Phe Leu Ala Asp
195 200 205

Ser Ser Gly Asn Thr Ile Glu Asn Pro Gln Phe Tyr Arg Lys Ala Glu
210 215 220

```
Lys Lys Leu Asn Arg Ala Asn Arg Arg Lys Ser Lys Lys Tyr Ile Arg
225                 230                 235                 240

Gly Val Lys Pro Gln Ser Lys Asn Tyr His Lys Ala Arg Cys Arg Tyr
                245                 250                 255

Ala Arg Lys His Leu Arg Val Ser Arg Gln Arg Lys Glu Tyr Cys Lys
            260                 265                 270

Arg Val Ala Tyr Cys Val Ile His Ser Asn Asp Val Val Ala Tyr Glu
        275                 280                 285

Asp Leu Asn Val Lys Gly Met Val Lys Asn Arg His Leu Ala Lys Ser
    290                 295                 300

Ile Ser Asp Val Ala Trp Ser Thr Phe Arg His Trp Leu Glu Tyr Phe
305                 310                 315                 320

Ala Ile Lys Tyr Gly Lys Leu Thr Ile Pro Val Ala Pro His Asn Thr
                325                 330                 335

Ser Gln Asn Cys Ser Asn Cys Asp Lys Lys Val Pro Lys Ser Leu Ser
            340                 345                 350

Thr Arg Thr His Ile Cys His His Cys Gly Tyr Ser Glu Asp Arg Asp
        355                 360                 365

Val Asn Ala Ala Lys Asn Ile Leu Lys Lys Ala Leu Ser Thr Val Gly
    370                 375                 380

Gln Thr Gly Ser Leu Lys Leu Gly Glu Ile Glu Pro Leu Leu Val Leu
385                 390                 395                 400

Glu Gln Ser Cys Thr Arg Lys Phe Asp Leu
                405                 410


<210> 65
<211> 486
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"
```

<400> 65
Leu Ala Glu Glu Asn Thr Leu His Leu Thr Leu Ala Met Ser Leu Pro
1 5 10 15

Leu Asn Asp Leu Pro Glu Asn Arg Thr Arg Ser Glu Leu Trp Arg Arg
20 25 30

Gln Trp Leu Pro Gln Lys Lys Leu Ser Leu Leu Leu Gly Val Asn Gln
35 40 45

Ser Val Arg Lys Ala Ala Ala Asp Cys Leu Arg Trp Phe Glu Pro Tyr
50 55 60

Gln Glu Leu Leu Trp Trp Glu Pro Thr Asp Pro Asp Gly Lys Lys Leu
65 70 75 80

Leu Asp Lys Glu Gly Arg Pro Ile Lys Arg Thr Ala Gly His Met Arg
85 90 95

Val Leu Arg Lys Leu Glu Glu Ile Ala Pro Phe Arg Gly Tyr Gln Leu
100 105 110

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

Leu Ser Tyr Ala Lys Arg Lys Leu Asp Pro Gln Phe Thr Asp Lys Thr
130 135 140

Ser Tyr Pro Ser Ile Gly Asp Gln Phe Pro Ile Val Trp Thr Gly Ala
145 150 155 160

Phe Val Cys Tyr Glu Gln Ser Ile Thr Gly Gln Leu Tyr Leu Tyr Leu
165 170 175

Pro Leu Phe Pro Arg Gly Ser His Gln Glu Asp Ile Thr Asn Asn Tyr
180 185 190

Asp Pro Asp Arg Gly Pro Ala Leu Gln Val Phe Gly Glu Lys Glu Ile
195 200 205

Ala Arg Leu Ser Arg Ser Thr Ser Gly Leu Leu Leu Pro Leu Gln Phe
210 215 220

Asp Lys Trp Gly Glu Ala Thr Phe Ile Arg Gly Glu Asn Asn Pro Pro

```
225                 230                 235                 240

Thr Trp Lys Ala Thr His Arg Arg Ser Asp Lys Lys Trp Leu Ser Glu
                245                 250                 255

Val Leu Leu Arg Glu Lys Asp Phe Gln Pro Lys Arg Val Glu Leu Leu
            260                 265                 270

Val Arg Asn Gly Arg Ile Phe Val Asn Val Ala Cys Glu Ile Pro Thr
        275                 280                 285

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

Glu His Leu Val Thr Val Val Val Ile Asn Arg Asp Gly Asn Val Val
305                 310                 315                 320

His Gln Arg Gln Glu Pro Ala Arg Arg Tyr Glu Lys Thr Tyr Phe Ala
                325                 330                 335

Arg Leu Glu Arg Leu Arg Arg Arg Gly Gly Pro Phe Ser Gln Glu Leu
            340                 345                 350

Glu Thr Phe His Tyr Arg Gln Val Ala Gln Ile Val Glu Glu Ala Leu
        355                 360                 365

Arg Phe Lys Ser Val Pro Ala Val Glu Gln Val Gly Asn Ile Pro Lys
    370                 375                 380

Gly Arg Tyr Asn Pro Arg Leu Asn Leu Arg Leu Ser Tyr Trp Pro Phe
385                 390                 395                 400

Gly Lys Leu Ala Asp Leu Thr Ser Tyr Lys Ala Val Lys Glu Gly Leu
                405                 410                 415

Pro Lys Pro Tyr Ser Val Tyr Ser Ala Thr Ala Lys Met Leu Cys Ser
            420                 425                 430

Thr Cys Gly Ala Ala Asn Lys Glu Gly Asp Gln Pro Ile Ser Leu Lys
        435                 440                 445

Gly Pro Thr Val Tyr Cys Gly Asn Cys Gly Thr Arg His Asn Thr Gly
    450                 455                 460
```

Phe Asn Thr Ala Leu Asn Leu Ala Arg Arg Ala Gln Glu Leu Phe Val
465 470 475 480

Lys Gly Val Val Ala Arg
485

<210> 66
<211> 602
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 66
Met Ser Gln Ser Leu Leu Lys Trp His Asp Met Ala Gly Arg Asp Lys
1 5 10 15

Asp Ala Ser Arg Ser Leu Gln Lys Ser Ala Val Glu Gly Val Leu Leu
20 25 30

His Leu Thr Ala Ser His Arg Val Ala Leu Glu Met Leu Glu Lys Ser
35 40 45

Val Ser Gln Thr Val Ala Val Thr Met Glu Ala Ala Gln Gln Arg Leu
50 55 60

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

Val Ile Ser Ala Asp Leu Gln Phe Thr Arg Glu Glu Phe Gly Ser Leu
85 90 95

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

Lys Tyr Ala Asp Lys His Ile Asn Ser Ile Arg Ile Ala Trp Gly Val
115 120 125

Ala Lys Glu Ser Thr Asn Gly Asp Ala Val Glu Gln Lys Leu Gln Trp
130 135 140

Gln Ile Arg Leu Leu Asp Val Thr Met Phe Leu Gln Gln Leu Val Leu
145 150 155 160

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

Gly Gly Ile Gly Gln Glu Val Ala Gln Gln Val Thr Ser His Ile Gln
            180                 185                 190

Leu Leu Asp Ser Gly Thr Val Leu Lys Ala Glu Leu Pro Thr Ile Ser
        195                 200                 205

Asp Arg Asn Ser Glu Leu Ala Arg Lys Gln Trp Glu Asp Ala Ile Gln
    210                 215                 220

Thr Val Cys Thr Tyr Ala Leu Pro Phe Ser Arg Glu Arg Ala Arg Ile
225                 230                 235                 240

Leu Asp Pro Gly Lys Tyr Ala Ala Glu Asp Pro Arg Gly Asp Arg Leu
                245                 250                 255

Ile Asn Ile Asp Pro Met Trp Ala Arg Val Leu Lys Gly Pro Thr Val
            260                 265                 270

Lys Ser Leu Pro Leu Leu Phe Val Ser Gly Ser Ser Ile Arg Ile Val
        275                 280                 285

Lys Leu Thr Leu Pro Arg Lys His Ala Ala Gly His Lys His Thr Phe
    290                 295                 300

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

Leu Pro Gly Thr Val Gln Glu Lys Val Gln Trp Trp Lys Lys Pro Asp
                325                 330                 335

Val Leu Ala Thr Gln Glu Leu Leu Val Gly Lys Gly Ala Leu Lys Lys
            340                 345                 350

Ser Ala Asn Thr Leu Val Ile Pro Ile Ser Ala Gly Lys Lys Arg Phe
        355                 360                 365

Phe Asn His Ile Leu Pro Ala Leu Gln Arg Gly Phe Pro Leu Gln Trp
    370                 375                 380
```

```
Gln Arg Ile Val Gly Arg Ser Tyr Arg Arg Pro Ala Thr His Arg Lys
385                 390                 395                 400

Trp Phe Ala Gln Leu Thr Ile Gly Tyr Thr Asn Pro Ser Ser Leu Pro
                405                 410                 415

Glu Met Ala Leu Gly Ile His Phe Gly Met Lys Asp Ile Leu Trp Trp
            420                 425                 430

Ala Leu Ala Asp Lys Gln Gly Asn Ile Leu Lys Asp Gly Ser Ile Pro
        435                 440                 445

Gly Asn Ser Ile Leu Asp Phe Ser Leu Gln Glu Lys Gly Lys Ile Glu
    450                 455                 460

Arg Gln Gln Lys Ala Gly Lys Asn Val Ala Gly Lys Lys Tyr Gly Lys
465                 470                 475                 480

Ser Leu Leu Asn Ala Thr Tyr Arg Val Val Asn Gly Val Leu Glu Phe
                485                 490                 495

Ser Lys Gly Ile Ser Ala Glu His Ala Ser Gln Pro Ile Gly Leu Gly
            500                 505                 510

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

Asn Ala Arg His Ser Asn Trp Asn Tyr Gly Gln Leu Ser Gly Ile Phe
    530                 535                 540

Ala Asn Lys Ala Gly Pro Ala Gly Phe Ser Val Thr Glu Ile Thr Leu
545                 550                 555                 560

Lys Lys Ala Gln Arg Asp Leu Ser Asp Ala Glu Gln Ala Arg Val Leu
                565                 570                 575

Ala Ile Glu Ala Thr Lys Arg Phe Ala Ser Arg Ile Lys Arg Leu Ala
            580                 585                 590

Thr Lys Arg Lys Asp Asp Thr Leu Phe Val
        595                 600
```

<210> 67
<211> 494

<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 67
Val Glu Pro Val Glu Lys Glu Arg Phe Tyr Tyr Arg Thr Tyr Thr Phe
1 5 10 15

Arg Leu Asp Gly Gln Pro Arg Thr Gln Asn Leu Thr Thr Gln Ser Gly
20 25 30

Trp Gly Leu Leu Thr Lys Ala Val Leu Asp Asn Thr Lys His Tyr Trp
35 40 45

Glu Ile Val His His Ala Arg Ile Ala Asn Gln Pro Ile Val Phe Glu
50 55 60

Asn Pro Val Ile Asp Glu Gln Gly Asn Pro Lys Leu Asn Lys Leu Gly
65 70 75 80

Gln Pro Arg Phe Trp Lys Arg Pro Ile Ser Asp Ile Val Asn Gln Leu
85 90 95

Arg Ala Leu Phe Glu Asn Gln Asn Pro Tyr Gln Leu Gly Ser Ser Leu
100 105 110

Ile Gln Gly Thr Tyr Trp Asp Val Ala Glu Asn Leu Ala Ser Trp Tyr
115 120 125

Ala Leu Asn Lys Glu Tyr Leu Ala Gly Thr Ala Thr Trp Gly Glu Pro
130 135 140

Ser Phe Pro Glu Pro His Pro Leu Thr Glu Ile Asn Gln Trp Met Pro
145 150 155 160

Leu Thr Phe Ser Ser Gly Lys Val Val Arg Leu Leu Lys Asn Ala Ser
165 170 175

Gly Arg Tyr Phe Ile Gly Leu Pro Ile Leu Gly Glu Asn Asn Pro Cys
180 185 190

Tyr Arg Met Arg Thr Ile Glu Lys Leu Ile Pro Cys Asp Gly Lys Gly

```
        195                 200                 205

Arg Val Thr Ser Gly Ser Leu Ile Leu Phe Pro Leu Val Gly Ile Tyr
    210                 215                 220

Ala Gln Gln His Arg Arg Met Thr Asp Ile Cys Glu Ser Ile Arg Thr
225                 230                 235                 240

Glu Lys Gly Lys Leu Ala Trp Ala Gln Val Ser Ile Asp Tyr Val Arg
                245                 250                 255

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

Trp Ile Gln Gly Pro Trp Gln Glu Val Phe Ile Leu Arg Leu Val Leu
        275                 280                 285

Ala His Lys Ala Pro Lys Leu Tyr Lys Pro Arg Cys Phe Ala Gly Ile
    290                 295                 300

Ser Leu Gly Pro Lys Thr Leu Ala Ser Cys Val Ile Leu Asp Gln Asp
305                 310                 315                 320

Glu Arg Val Val Glu Lys Gln Gln Trp Ser Gly Ser Glu Leu Leu Ser
                325                 330                 335

Leu Ile His Gln Gly Glu Glu Arg Leu Arg Ser Leu Arg Glu Gln Ser
            340                 345                 350

Lys Pro Thr Trp Asn Ala Ala Tyr Arg Lys Gln Leu Lys Ser Leu Ile
        355                 360                 365

Asn Thr Gln Val Phe Thr Ile Val Thr Phe Leu Arg Glu Arg Gly Ala
    370                 375                 380

Ala Val Arg Leu Glu Ser Ile Ala Arg Val Arg Lys Ser Thr Pro Ala
385                 390                 395                 400

Pro Pro Val Asn Phe Leu Leu Ser His Trp Ala Tyr Arg Gln Ile Thr
                405                 410                 415

Glu Arg Leu Lys Asp Leu Ala Ile Arg Asn Gly Met Pro Leu Thr His
            420                 425                 430
```

Ser Asn Gly Ser Tyr Gly Val Arg Phe Thr Cys Ser Gln Cys Gly Ala
435 440 445

Thr Asn Gln Gly Ile Lys Asp Pro Thr Lys Tyr Lys Val Asp Ile Glu
450 455 460

Ser Glu Thr Phe Leu Cys Ser Ile Cys Ser His Arg Glu Ile Ala Ala
465 470 475 480

Val Asn Thr Ala Thr Asn Leu Ala Lys Gln Leu Leu Asp Glu
485 490

<210> 68
<211> 526
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 68
Met Asn Asp Thr Glu Thr Ser Glu Thr Leu Thr Ser His Arg Thr Val
1 5 10 15

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

Val Glu Ala Ala Leu Ala Glu Leu Ile Thr Leu Asn Gly Arg Ala Thr
35 40 45

Gln Ala Leu Leu Ser Leu Ala Lys Asn Gly Leu Val Leu Arg Arg Asp
50 55 60

Lys Glu Glu Asn Leu Ile Ala Ala Glu Leu Thr Leu Pro Cys Arg Lys
65 70 75 80

Asn Lys Tyr Ala Asp Val Ala Ala Lys Ala Gly Glu Pro Ile Leu Ala
85 90 95

Thr Arg Ile Asn Asn Lys Gly Lys Leu Val Thr Lys Lys Trp Tyr Gly
100 105 110

Glu Gly Asn Ser Tyr His Ile Val Arg Phe Thr Pro Glu Thr Gly Met
115 120 125

```
Phe Thr Val Arg Val Phe Asp Arg Tyr Ala Phe Asp Glu Glu Leu Leu
    130                 135                 140

His Leu His Ser Glu Val Val Phe Gly Ser Asp Leu Pro Lys Gly Ile
145                 150                 155                 160

Lys Ala Lys Thr Asp Ser Leu Pro Ala Asn Phe Leu Gln Ala Val Phe
                165                 170                 175

Thr Ser Phe Leu Glu Leu Pro Phe Gln Gly Phe Pro Asp Ile Val Val
            180                 185                 190

Lys Pro Ala Met Lys Gln Ala Ala Glu Gln Leu Leu Ser Tyr Val Gln
        195                 200                 205

Leu Glu Ala Gly Glu Asn Gln Gln Ala Glu Tyr Pro Asp Thr Asn Glu
    210                 215                 220

Arg Asp Pro Glu Leu Arg Leu Val Glu Trp Gln Lys Ser Leu His Glu
225                 230                 235                 240

Leu Ser Val Arg Thr Glu Pro Phe Glu Phe Val Arg Ala Arg Asp Ile
                245                 250                 255

Asp Tyr Tyr Ala Glu Thr Asp Arg Arg Gly Asn Arg Phe Val Asn Ile
            260                 265                 270

Thr Pro Glu Trp Thr Lys Phe Ala Glu Ser Pro Phe Ala Arg Arg Leu
        275                 280                 285

Pro Leu Lys Ile Pro Pro Glu Phe Cys Ile Leu Leu Arg Arg Lys Thr
    290                 295                 300

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

Phe Asp Gly Val Thr Pro Asp Ser Thr Leu Gly Val Leu Ala Thr Ala
                325                 330                 335

Glu Asp Gly Lys Leu Phe Trp Trp His Asp His Leu Asp Glu Phe Ser
            340                 345                 350
```

```
Asn Leu Glu Gly Lys Pro Glu Pro Lys Leu Lys Asn Lys Pro Gln Leu
        355                 360                 365

Leu Met Val Ser Leu Glu Tyr Asp Arg Glu Gln Arg Phe Glu Glu Ser
    370                 375                 380

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

Asn Phe Arg Arg Gly Trp Asn Gly Arg Ile Leu Gly Ile His Phe Gln
                405                 410                 415

His Asn Pro Val Ile Thr Trp Ala Leu Met Asp His Asp Ala Glu Val
            420                 425                 430

Leu Glu Lys Gly Phe Ile Glu Gly Asn Ala Phe Leu Gly Lys Ala Leu
        435                 440                 445

Asp Lys Gln Ala Leu Asn Glu Tyr Leu Gln Lys Gly Gly Lys Trp Val
    450                 455                 460

Gly Asp Arg Ser Phe Gly Asn Lys Leu Lys Gly Ile Thr His Thr Leu
465                 470                 475                 480

Ala Ser Leu Ile Val Arg Leu Ala Arg Glu Lys Asp Ala Trp Ile Ala
                485                 490                 495

Leu Glu Glu Ile Ser Trp Val Gln Lys Gln Ser Ala Asp Ser Val Ala
            500                 505                 510

Asn His Glu Ile Val Glu Gln Pro His His Ser Leu Thr Arg
        515                 520                 525


<210> 69
<211> 649
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 69
Met Asn Asp Thr Glu Thr Ser Glu Thr Leu Thr Ser His Arg Thr Val
1               5                   10                  15
```

```
Cys Ala His Leu His Val Val Gly Glu Thr Gly Ser Leu Pro Arg Leu
            20                  25                  30

Val Glu Ala Ala Leu Ala Glu Leu Ile Thr Leu Asn Gly Arg Ala Thr
        35                  40                  45

Gln Ala Leu Leu Ser Leu Ala Lys Asn Gly Leu Val Leu Arg Arg Asp
    50                  55                  60

Lys Glu Glu Asn Leu Ile Ala Ala Glu Leu Thr Leu Pro Cys Arg Lys
65                  70                  75                  80

Asn Lys Tyr Ala Asp Val Ala Ala Lys Ala Gly Glu Pro Ile Leu Ala
                85                  90                  95

Thr Arg Ile Asn Asn Lys Gly Lys Leu Val Thr Lys Lys Trp Tyr Gly
            100                 105                 110

Glu Gly Asn Ser Tyr His Ile Val Arg Phe Thr Pro Glu Thr Gly Met
        115                 120                 125

Phe Thr Val Arg Val Phe Asp Arg Tyr Ala Phe Asp Glu Glu Leu Leu
    130                 135                 140

His Leu His Ser Glu Val Val Phe Gly Ser Asp Leu Pro Lys Gly Ile
145                 150                 155                 160

Lys Ala Lys Thr Asp Ser Leu Pro Ala Asn Phe Leu Gln Ala Val Phe
                165                 170                 175

Thr Ser Phe Leu Glu Leu Pro Phe Gln Gly Phe Pro Asp Ile Val Val
            180                 185                 190

Lys Pro Ala Met Lys Gln Ala Ala Glu Gln Leu Leu Ser Tyr Val Gln
        195                 200                 205

Leu Glu Ala Gly Glu Asn Gln Gln Ala Glu Tyr Pro Asp Thr Asn Glu
    210                 215                 220

Arg Asp Pro Glu Leu Arg Leu Val Glu Trp Gln Lys Ser Leu His Glu
225                 230                 235                 240

Leu Ser Val Arg Thr Glu Pro Phe Glu Phe Val Arg Ala Arg Asp Ile
```

```
                245                 250                 255

Asp Tyr Tyr Ala Glu Thr Asp Arg Arg Gly Asn Arg Phe Val Asn Ile
            260                 265                 270

Thr Pro Glu Trp Thr Lys Phe Ala Glu Ser Pro Phe Ala Arg Arg Leu
        275                 280                 285

Pro Leu Lys Ile Pro Pro Glu Phe Cys Ile Leu Leu Arg Arg Lys Thr
    290                 295                 300

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

Phe Asp Gly Val Thr Pro Asp Ser Thr Leu Gly Val Leu Ala Thr Ala
                325                 330                 335

Glu Asp Gly Lys Leu Phe Trp Trp His Asp His Leu Asp Glu Phe Ser
            340                 345                 350

Asn Leu Glu Gly Lys Pro Glu Pro Lys Leu Lys Asn Lys Pro Gln Leu
        355                 360                 365

Leu Met Val Ser Leu Glu Tyr Asp Arg Glu Gln Arg Phe Glu Glu Ser
    370                 375                 380

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

Asn Phe Arg Arg Gly Arg His Gly His Thr Arg Thr Asp Arg Leu Pro
                405                 410                 415

Ala Gly Asn Thr Leu Trp Arg Ala Asp Phe Ala Thr Ser Ala Glu Val
            420                 425                 430

Ala Ala Pro Lys Trp Asn Gly Arg Ile Leu Gly Ile His Phe Gln His
        435                 440                 445

Asn Pro Val Ile Thr Trp Ala Leu Met Asp His Asp Ala Glu Val Leu
    450                 455                 460

Glu Lys Gly Phe Ile Glu Gly Asn Ala Phe Leu Gly Lys Ala Leu Asp
465                 470                 475                 480
```

```
Lys Gln Ala Leu Asn Glu Tyr Leu Gln Lys Gly Gly Lys Trp Val Gly
                485                 490                 495

Asp Arg Ser Phe Gly Asn Lys Leu Lys Gly Ile Thr His Thr Leu Ala
            500                 505                 510

Ser Leu Ile Val Arg Leu Ala Arg Glu Lys Asp Ala Trp Ile Ala Leu
        515                 520                 525

Glu Glu Ile Ser Trp Val Gln Lys Gln Ser Ala Asp Ser Val Ala Asn
    530                 535                 540

Arg Arg Phe Ser Met Trp Asn Tyr Ser Arg Leu Ala Thr Leu Ile Glu
545                 550                 555                 560

Trp Leu Gly Thr Asp Ile Ala Thr Arg Asp Cys Gly Thr Ala Ala Pro
                565                 570                 575

Leu Ala His Lys Val Ser Asp Tyr Leu Thr His Phe Thr Cys Pro Glu
            580                 585                 590

Cys Gly Ala Cys Arg Lys Ala Gly Gln Lys Lys Glu Ile Ala Asp Thr
        595                 600                 605

Val Arg Ala Gly Asp Ile Leu Thr Cys Arg Lys Cys Gly Phe Ser Gly
    610                 615                 620

Pro Ile Pro Asp Asn Phe Ile Ala Glu Phe Val Ala Lys Lys Ala Leu
625                 630                 635                 640

Glu Arg Met Leu Lys Lys Lys Pro Val
                645
```

<210> 70
<211> 414
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 70

```
Met Ala Lys Arg Asn Phe Gly Glu Lys Ser Glu Ala Leu Tyr Arg Ala
1               5                   10                  15
```

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

Ala Val Ser Glu Val Leu Arg Met Leu Phe Asn Ser Ala Leu Ala Glu
        35                  40                  45

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

Lys Ser Ala Ser Val Pro Glu Glu Ile Ser Glu Ile Arg Lys Lys Leu
65                  70                  75                  80

Arg Glu Ala Tyr Lys Glu His Ser Ile Ser Leu Phe Asp Gln Ile Asn
                85                  90                  95

Ala Leu Thr Ala Arg Arg Val Glu Asp Glu Ala Phe Ala Ser Val Thr
            100                 105                 110

Arg Asn Trp Gln Glu Glu Thr Leu Asp Ala Leu Asp Gly Ala Tyr Lys
        115                 120                 125

Ser Phe Leu Ser Leu Arg Arg Lys Gly Asp Tyr Asp Ala His Ser Pro
    130                 135                 140

Arg Ser Arg Asp Ser Gly Phe Phe Gln Lys Ile Pro Gly Arg Ser Gly
145                 150                 155                 160

Phe Lys Ile Gly Glu Gly Arg Ile Ala Leu Ser Cys Gly Ala Gly Arg
                165                 170                 175

Lys Leu Ser Phe Pro Ile Pro Asp Tyr Gln Gln Gly Arg Leu Ala Glu
            180                 185                 190

Thr Thr Lys Leu Lys Lys Phe Glu Leu Tyr Arg Asp Gln Pro Asn Leu
        195                 200                 205

Ala Lys Ser Gly Arg Phe Trp Ile Ser Val Val Tyr Glu Leu Pro Lys
    210                 215                 220

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

```
Gly Ala Ser Ser Ile Gly Val Val Ser Gln Arg Gly Glu Glu Val Ile
                245                 250                 255

Ala Leu Trp Arg Ser Asp Lys His Trp Val Pro Lys Ile Glu Ala Val
            260                 265                 270

Glu Glu Arg Met Lys Arg Arg Val Lys Gly Ser Arg Gly Trp Leu Arg
        275                 280                 285

Leu Leu Asn Ser Gly Lys Arg Arg Met His Met Ile Ser Ser Arg Gln
    290                 295                 300

His Val Gln Asp Glu Arg Glu Ile Val Asp Tyr Leu Val Arg Asn His
305                 310                 315                 320

Gly Ser His Phe Val Val Thr Glu Leu Val Val Arg Ser Lys Glu Gly
                325                 330                 335

Lys Leu Ala Asp Ser Ser Lys Pro Glu Arg Gly Gly Ser Leu Gly Leu
            340                 345                 350

Asn Trp Ala Ala Gln Asn Thr Gly Ser Leu Ser Arg Leu Val Arg Gln
        355                 360                 365

Leu Glu Glu Lys Val Lys Glu His Gly Gly Ser Val Arg Lys His Lys
    370                 375                 380

Leu Thr Leu Thr Glu Ala Pro Pro Ala Arg Gly Ala Glu Asn Lys Leu
385                 390                 395                 400

Trp Met Ala Arg Lys Leu Arg Glu Ser Phe Leu Lys Glu Val
                405                 410


<210> 71
<211> 413
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 71
Leu Ala Lys Asn Asp Glu Lys Glu Leu Leu Tyr Gln Ser Val Lys Phe
1               5                   10                  15
```

```
Glu Ile Tyr Pro Asp Glu Ser Lys Ile Arg Val Leu Thr Arg Val Ser
            20                  25                  30

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

Arg Phe Glu Leu Tyr Ile Ala Pro Leu Tyr Glu Glu Leu Lys Lys Phe
    50                  55                  60

Pro Arg Lys Ser Ala Glu Ser Asn Ala Leu Arg Gln Lys Ile Arg Glu
65                  70                  75                  80

Gly Tyr Lys Glu His Ile Pro Thr Phe Phe Asp Gln Leu Lys Lys Leu
                85                  90                  95

Leu Thr Pro Met Arg Lys Glu Asp Pro Ala Leu Leu Gly Ser Val Pro
            100                 105                 110

Arg Ala Tyr Gln Glu Glu Thr Leu Asn Thr Leu Asn Gly Ser Phe Val
        115                 120                 125

Ser Phe Met Thr Leu Arg Arg Asn Asn Asp Met Asp Ala Lys Pro Pro
    130                 135                 140

Lys Gly Arg Ala Glu Asp Arg Phe His Glu Ile Ser Gly Arg Ser Gly
145                 150                 155                 160

Phe Lys Ile Asp Gly Ser Glu Phe Val Leu Ser Thr Lys Glu Gln Lys
                165                 170                 175

Leu Arg Phe Pro Ile Pro Asn Tyr Gln Leu Glu Lys Leu Lys Glu Ala
            180                 185                 190

Lys Gln Ile Lys Lys Phe Thr Leu Tyr Gln Ser Arg Asp Arg Arg Phe
        195                 200                 205

Trp Ile Ser Ile Ala Tyr Glu Ile Glu Leu Pro Asp Gln Arg Pro Phe
    210                 215                 220

Asn Pro Glu Glu Val Ile Tyr Ile Ala Phe Gly Ala Ser Ser Ile Gly
225                 230                 235                 240

Val Ile Ser Pro Glu Gly Glu Lys Val Ile Asp Phe Trp Arg Pro Asp
```

245 250 255

Lys His Trp Lys Pro Lys Ile Lys Glu Val Glu Asn Arg Met Arg Ser
260 265 270

Cys Lys Lys Gly Ser Arg Ala Trp Lys Lys Arg Ala Ala Ala Arg Arg
275 280 285

Lys Met Tyr Ala Met Thr Gln Arg Gln Gln Lys Leu Asn His Arg Glu
290 295 300

Ile Val Ala Ser Leu Leu Arg Leu Gly Phe His Phe Val Val Thr Glu
305 310 315 320

Tyr Thr Val Arg Ser Lys Pro Gly Lys Leu Ala Asp Gly Ser Asn Pro
325 330 335

Lys Arg Gly Gly Ala Pro Gln Gly Phe Asn Trp Ser Ala Gln Asn Thr
340 345 350

Gly Ser Phe Gly Glu Phe Ile Leu Trp Leu Lys Gln Lys Val Lys Glu
355 360 365

Gln Gly Gly Thr Val Gln Thr Phe Arg Leu Val Leu Gly Gln Ser Glu
370 375 380

Arg Pro Glu Lys Arg Gly Arg Asp Asn Lys Ile Glu Met Val Arg Leu
385 390 395 400

Leu Arg Glu Lys Tyr Leu Glu Ser Gln Thr Ile Val Val
405 410

<210> 72
<211> 449
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 72
Met Ala Lys Gly Lys Lys Lys Glu Gly Lys Pro Leu Tyr Arg Ala Val
1 5 10 15

```
Arg Phe Glu Ile Phe Pro Thr Ser Asp Gln Ile Thr Leu Phe Leu Arg
            20                  25                  30

Val Ser Lys Asn Leu Gln Gln Val Trp Asn Glu Ala Trp Gln Glu Arg
        35                  40                  45

Gln Ser Cys Tyr Glu Gln Phe Phe Gly Ser Ile Tyr Glu Arg Ile Gly
    50                  55                  60

Gln Ala Lys Lys Arg Ala Gln Glu Ala Gly Phe Ser Glu Val Trp Glu
65                  70                  75                  80

Asn Glu Ala Lys Lys Gly Leu Asn Lys Lys Leu Arg Gln Gln Glu Ile
                85                  90                  95

Ser Met Gln Leu Val Ser Glu Lys Glu Ser Leu Leu Gln Glu Leu Ser
            100                 105                 110

Ile Ala Phe Gln Glu His Gly Val Thr Leu Tyr Asp Gln Ile Asn Gly
        115                 120                 125

Leu Thr Ala Arg Arg Ile Ile Gly Glu Phe Ala Leu Ile Pro Arg Asn
    130                 135                 140

Trp Gln Glu Glu Thr Leu Asp Ser Leu Asp Gly Ser Phe Lys Ser Phe
145                 150                 155                 160

Leu Ala Leu Arg Lys Asn Gly Asp Pro Asp Ala Lys Pro Pro Arg Gln
                165                 170                 175

Arg Val Ser Glu Asn Ser Phe Tyr Lys Ile Pro Gly Arg Ser Gly Phe
            180                 185                 190

Lys Val Ser Asn Gly Gln Ile Tyr Leu Ser Phe Gly Lys Ile Gly Gln
        195                 200                 205

Thr Leu Thr Ser Val Ile Pro Glu Phe Gln Leu Lys Arg Leu Glu Thr
    210                 215                 220

Ala Ile Lys Leu Lys Lys Phe Glu Leu Cys Arg Asp Glu Arg Asp Met
225                 230                 235                 240

Ala Lys Pro Gly Arg Phe Trp Ile Ser Val Ala Tyr Glu Ile Pro Lys
                245                 250                 255
```

```
Pro Glu Lys Val Pro Val Val Ser Lys Gln Ile Thr Tyr Leu Ala Ile
            260                 265                 270

Gly Ala Ser Arg Leu Gly Val Val Ser Pro Lys Gly Glu Phe Cys Leu
        275                 280                 285

Asn Leu Pro Arg Ser Asp Tyr His Trp Lys Pro Gln Ile Asn Ala Leu
    290                 295                 300

Gln Glu Arg Leu Glu Gly Val Val Lys Gly Ser Arg Lys Trp Lys Lys
305                 310                 315                 320

Arg Met Ala Ala Cys Thr Arg Met Phe Ala Lys Leu Gly His Gln Gln
                325                 330                 335

Lys Gln His Gly Gln Tyr Glu Val Val Lys Lys Leu Leu Arg His Gly
            340                 345                 350

Val His Phe Val Val Thr Glu Leu Lys Val Arg Ser Lys Pro Gly Ala
        355                 360                 365

Leu Ala Asp Ala Ser Lys Ser Asp Arg Lys Gly Ser Pro Thr Gly Pro
    370                 375                 380

Asn Trp Ser Ala Gln Asn Thr Gly Asn Ile Ala Arg Leu Ile Gln Lys
385                 390                 395                 400

Leu Thr Asp Lys Ala Ser Glu His Gly Gly Thr Val Ile Lys Arg Asn
                405                 410                 415

Pro Pro Leu Leu Ser Leu Glu Glu Arg Gln Leu Pro Asp Ala Gln Arg
            420                 425                 430

Lys Ile Phe Ile Ala Lys Lys Leu Arg Glu Glu Phe Leu Ala Asp Gln
        435                 440                 445

Lys
```

<210> 73
<211> 711
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 73
Met Ala Lys Arg Glu Lys Lys Asp Asp Val Val Leu Arg Gly Thr Lys
1 5 10 15

Met Arg Ile Tyr Pro Thr Asp Arg Gln Val Thr Leu Met Asp Met Trp
20 25 30

Arg Arg Arg Cys Ile Ser Leu Trp Asn Leu Leu Leu Asn Leu Glu Thr
35 40 45

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

Ile Trp Ala Arg Val Val Glu Glu Asn His Ala Lys Ala Leu Ile Val
65 70 75 80

Tyr Gln His Gly Lys Cys Lys Lys Asp Gly Ser Phe Val Leu Lys Arg
85 90 95

Asp Gly Thr Val Lys His Pro Pro Arg Glu Arg Phe Pro Gly Asp Arg
100 105 110

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

Gly Ala Lys Cys Lys Cys Asn Val Asn Gln Pro Tyr Ala Leu Thr Arg
130 135 140

Ala Trp Leu Asp Glu Thr Gly His Gly Ala Arg Thr Ala Asp Ile Ile
145 150 155 160

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

Thr Ala Ala Lys Tyr Cys Pro Ala Pro Pro Thr Ala Glu Leu Leu Thr
180 185 190

Lys Ile Lys Arg Ala Ala Pro Ala Asp Asp Leu Pro Val Asp Gln Ala
195 200 205

```
Ile Leu Leu Asp Leu Phe Gly Ala Leu Arg Gly Gly Leu Lys Gln Lys
    210                 215                 220

Glu Cys Asp His Thr His Ala Arg Thr Val Ala Tyr Phe Glu Lys His
225                 230                 235                 240

Glu Leu Ala Gly Arg Ala Glu Asp Ile Leu Ala Trp Leu Ile Ala His
                245                 250                 255

Gly Gly Thr Cys Asp Cys Lys Ile Val Glu Glu Ala Ala Asn His Cys
            260                 265                 270

Pro Gly Pro Arg Leu Phe Ile Trp Glu His Glu Leu Ala Met Ile Met
        275                 280                 285

Ala Arg Leu Lys Ala Glu Pro Arg Thr Glu Trp Ile Gly Asp Leu Pro
    290                 295                 300

Ser His Ala Ala Gln Thr Val Val Lys Asp Leu Val Lys Ala Leu Gln
305                 310                 315                 320

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

Arg Lys Thr Gly Phe Pro Lys Phe Lys Lys Gln Ala Tyr Ala Ala Gly
            340                 345                 350

Ser Val Tyr Phe Pro Asn Thr Thr Met Phe Phe Asp Val Ala Ala Gly
        355                 360                 365

Arg Val Gln Leu Pro Asn Gly Cys Gly Ser Met Arg Cys Glu Ile Pro
    370                 375                 380

Arg Gln Leu Val Ala Glu Leu Leu Glu Arg Asn Leu Lys Pro Gly Leu
385                 390                 395                 400

Val Ile Gly Ala Gln Leu Gly Leu Leu Gly Gly Arg Ile Trp Arg Gln
                405                 410                 415

Gly Asp Arg Trp Tyr Leu Ser Cys Gln Trp Glu Arg Pro Gln Pro Thr
            420                 425                 430

Leu Leu Pro Lys Thr Gly Arg Thr Ala Gly Val Lys Ile Ala Ala Ser
```

```
        435                 440                 445

Ile Val Phe Thr Thr Tyr Asp Asn Arg Gly Gln Thr Lys Glu Tyr Pro
    450                 455                 460

Met Pro Pro Ala Asp Lys Lys Leu Thr Ala Val His Leu Val Ala Gly
465                 470                 475                 480

Lys Gln Asn Ser Arg Ala Leu Glu Ala Gln Lys Glu Lys Glu Lys Lys
                485                 490                 495

Leu Lys Ala Arg Lys Glu Arg Leu Arg Leu Gly Lys Leu Glu Lys Gly
            500                 505                 510

His Asp Pro Asn Ala Leu Lys Pro Leu Lys Arg Pro Arg Val Arg Arg
        515                 520                 525

Ser Lys Leu Phe Tyr Lys Ser Ala Ala Arg Leu Ala Ala Cys Glu Ala
    530                 535                 540

Ile Glu Arg Asp Arg Arg Asp Gly Phe Leu His Arg Val Thr Asn Glu
545                 550                 555                 560

Ile Val His Lys Phe Asp Ala Val Ser Val Gln Lys Met Ser Val Ala
                565                 570                 575

Pro Met Met Arg Arg Gln Lys Gln Lys Glu Lys Gln Ile Glu Ser Lys
            580                 585                 590

Lys Asn Glu Ala Lys Lys Glu Asp Asn Gly Ala Ala Lys Lys Pro Arg
        595                 600                 605

Asn Leu Lys Pro Val Arg Lys Leu Leu Arg His Val Ala Met Ala Arg
    610                 615                 620

Gly Arg Gln Phe Leu Glu Tyr Lys Tyr Asn Asp Leu Arg Gly Pro Gly
625                 630                 635                 640

Ser Val Leu Ile Ala Asp Arg Leu Glu Pro Glu Val Gln Glu Cys Ser
                645                 650                 655

Arg Cys Gly Thr Lys Asn Pro Gln Met Lys Asp Gly Arg Arg Leu Leu
            660                 665                 670
```

Arg Cys Ile Gly Val Leu Pro Asp Gly Thr Asp Cys Asp Ala Val Leu
675 680 685

Pro Arg Asn Arg Asn Ala Ala Arg Asn Ala Glu Lys Arg Leu Arg Lys
690 695 700

His Arg Glu Ala His Asn Ala
705 710

<210> 74
<211> 574
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 74
Met Asn Glu Val Leu Pro Ile Pro Ala Val Gly Glu Asp Ala Ala Asp
1 5 10 15

Thr Ile Met Arg Gly Ser Lys Met Arg Ile Tyr Pro Ser Val Arg Gln
20 25 30

Ala Ala Thr Met Asp Leu Trp Arg Arg Arg Cys Ile Gln Leu Trp Asn
35 40 45

Leu Leu Leu Glu Leu Glu Gln Ala Ala Tyr Ser Gly Glu Asn Arg Arg
50 55 60

Thr Gln Ile Gly Trp Arg Ser Ile Trp Ala Thr Val Val Glu Asp Ser
65 70 75 80

His Ala Glu Ala Val Arg Val Ala Arg Glu Gly Lys Lys Arg Lys Asp
85 90 95

Gly Thr Phe Arg Lys Ala Pro Ser Gly Lys Glu Ile Pro Pro Leu Asp
100 105 110

Pro Ala Met Leu Ala Lys Ile Gln Arg Gln Met Asn Gly Ala Val Asp
115 120 125

Val Asp Pro Lys Thr Gly Glu Val Thr Pro Ala Gln Pro Arg Leu Phe
130 135 140

```
Met Trp Glu His Glu Leu Gln Lys Ile Met Ala Arg Leu Lys Gln Ala
145                 150                 155                 160

Pro Arg Thr His Trp Ile Asp Asp Leu Pro Ser His Ala Ala Gln Ser
                165                 170                 175

Val Val Lys Asp Leu Ile Lys Ala Leu Gln Ala Met Leu Arg Glu Arg
            180                 185                 190

Lys Lys Arg Ala Ser Gly Ile Gly Gly Arg Asp Thr Gly Phe Pro Lys
        195                 200                 205

Phe Lys Lys Asn Arg Tyr Ala Ala Gly Ser Val Tyr Phe Ala Asn Thr
    210                 215                 220

Gln Leu Arg Phe Glu Ala Lys Arg Gly Lys Ala Gly Asp Pro Asp Ala
225                 230                 235                 240

Val Arg Gly Glu Phe Ala Arg Val Lys Leu Pro Asn Gly Val Gly Trp
                245                 250                 255

Met Glu Cys Arg Met Pro Arg His Ile Asn Ala Ala His Ala Tyr Ala
            260                 265                 270

Gln Ala Thr Leu Met Gly Gly Arg Ile Trp Arg Gln Gly Glu Asn Trp
        275                 280                 285

Tyr Leu Ser Cys Gln Trp Lys Met Pro Lys Pro Ala Pro Leu Pro Arg
    290                 295                 300

Ala Gly Arg Thr Ala Ala Ile Lys Ile Ala Ala Ala Ile Pro Ile Thr
305                 310                 315                 320

Thr Val Asp Asn Arg Gly Gln Thr Arg Glu Tyr Ala Met Pro Pro Ile
                325                 330                 335

Asp Arg Glu Arg Ile Ala Ala His Ala Ala Ala Gly Arg Ala Gln Ser
            340                 345                 350

Arg Ala Leu Glu Ala Arg Lys Arg Arg Ala Lys Lys Arg Glu Ala Tyr
        355                 360                 365
```

```
Ala Lys Lys Arg His Ala Lys Lys Leu Glu Arg Gly Ile Ala Ala Lys
    370                 375                 380

Pro Pro Gly Arg Ala Arg Ile Lys Leu Ser Pro Gly Phe Tyr Ala Ala
385                 390                 395                 400

Ala Ala Lys Leu Ala Lys Leu Glu Ala Glu Asp Ala Asn Ala Arg Glu
                405                 410                 415

Ala Trp Leu His Glu Ile Thr Thr Gln Ile Val Arg Asn Phe Asp Val
            420                 425                 430

Ile Ala Val Pro Arg Met Glu Val Ala Lys Leu Met Lys Lys Pro Glu
        435                 440                 445

Pro Pro Glu Glu Lys Glu Glu Gln Val Lys Ala Pro Trp Gln Gly Lys
    450                 455                 460

Arg Arg Ser Leu Lys Ala Ala Arg Val Met Met Arg Arg Thr Ala Met
465                 470                 475                 480

Ala Leu Ile Gln Thr Thr Leu Lys Tyr Lys Ala Val Asp Leu Arg Gly
                485                 490                 495

Pro Gln Ala Tyr Glu Glu Ile Ala Pro Leu Asp Val Thr Ala Ala Ala
            500                 505                 510

Cys Ser Gly Cys Gly Val Leu Lys Pro Glu Trp Lys Met Ala Arg Ala
        515                 520                 525

Lys Gly Arg Glu Ile Met Arg Cys Gln Glu Pro Leu Pro Gly Gly Lys
    530                 535                 540

Thr Cys Asn Thr Val Leu Thr Tyr Thr Arg Asn Ser Ala Arg Val Ile
545                 550                 555                 560

Gly Arg Glu Leu Ala Val Arg Leu Ala Glu Arg Gln Lys Ala
                565                 570
```

<210> 75
<211> 400
<212> PRT
<213> Artificial Sequence

<220>

<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 75
Met Thr Thr Gln Lys Thr Tyr Asn Phe Cys Phe Tyr Asp Gln Arg Phe
1 5 10 15

Phe Glu Leu Ser Lys Glu Ala Gly Glu Val Tyr Ser Arg Ser Leu Glu
20 25 30

Glu Phe Trp Lys Ile Tyr Asp Glu Thr Gly Val Trp Leu Ser Lys Phe
35 40 45

Asp Leu Gln Lys His Met Arg Asn Lys Leu Glu Arg Lys Leu Leu His
50 55 60

Ser Asp Ser Phe Leu Gly Ala Met Gln Gln Val His Ala Asn Leu Ala
65 70 75 80

Ser Trp Lys Gln Ala Lys Lys Val Val Pro Asp Ala Cys Pro Pro Arg
85 90 95

Lys Pro Lys Phe Leu Gln Ala Ile Leu Phe Lys Lys Ser Gln Ile Lys
100 105 110

Tyr Lys Asn Gly Phe Leu Arg Leu Thr Leu Gly Thr Glu Lys Glu Phe
115 120 125

Leu Tyr Leu Lys Trp Asp Ile Asn Ile Pro Leu Pro Ile Tyr Gly Ser
130 135 140

Val Thr Tyr Ser Lys Thr Arg Gly Trp Lys Ile Asn Leu Cys Leu Glu
145 150 155 160

Thr Glu Val Glu Gln Lys Asn Leu Ser Glu Asn Lys Tyr Leu Ser Ile
165 170 175

Asp Leu Gly Val Lys Arg Val Ala Thr Ile Phe Asp Gly Glu Asn Thr
180 185 190

Ile Thr Leu Ser Gly Lys Lys Phe Met Gly Leu Met His Tyr Arg Asn
195 200 205

Lys Leu Asn Gly Lys Thr Gln Ser Arg Leu Ser His Lys Lys Lys Gly

```
    210                 215                 220

Ser Asn Asn Tyr Lys Lys Ile Gln Arg Ala Lys Arg Lys Thr Thr Asp
225                 230                 235                 240

Arg Leu Leu Asn Ile Gln Lys Glu Met Leu His Lys Tyr Ser Ser Phe
                245                 250                 255

Ile Val Asn Tyr Ala Ile Arg Asn Asp Ile Gly Asn Ile Ile Ile Gly
            260                 265                 270

Asp Asn Ser Ser Thr His Asp Ser Pro Asn Met Arg Gly Lys Thr Asn
        275                 280                 285

Gln Lys Ile Ser Gln Asn Pro Glu Gln Lys Leu Lys Asn Tyr Ile Lys
    290                 295                 300

Tyr Lys Phe Glu Ser Ile Ser Gly Arg Val Asp Ile Val Pro Glu Pro
305                 310                 315                 320

Tyr Thr Ser Arg Lys Cys Pro His Cys Lys Asn Ile Lys Lys Ser Ser
                325                 330                 335

Pro Lys Gly Arg Thr Tyr Lys Cys Lys Lys Cys Gly Phe Ile Phe Asp
            340                 345                 350

Arg Asp Gly Val Gly Ala Ile Asn Ile Tyr Asn Glu Asn Val Ser Phe
        355                 360                 365

Gly Gln Ile Ile Ser Pro Gly Arg Ile Arg Ser Leu Thr Glu Pro Ile
    370                 375                 380

Gly Met Lys Phe His Asn Glu Ile Tyr Phe Lys Ser Tyr Val Ala Ala
385                 390                 395                 400


<210> 76
<211> 743
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 76
```

```
Met Ser Val Arg Ser Phe Gln Ala Arg Val Glu Cys Asp Lys Gln Thr
1               5                  10                  15

Met Glu His Leu Trp Arg Thr His Lys Val Phe Asn Glu Arg Leu Pro
            20                  25                  30

Glu Ile Ile Lys Ile Leu Phe Lys Met Lys Arg Gly Glu Cys Gly Gln
        35                  40                  45

Asn Asp Lys Gln Lys Ser Leu Tyr Lys Ser Ile Ser Gln Ser Ile Leu
    50                  55                  60

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

Lys Gly Trp Lys Pro Gly Thr Ala Lys Lys Tyr Arg Asn Ala Ser Phe
                85                  90                  95

Thr Trp Ala Asp Asp Ala Ala Lys Leu Ser Ser Gln Gly Ile His Val
            100                 105                 110

Tyr Asp Lys Lys Gln Val Leu Gly Asp Leu Pro Gly Met Met Ser Gln
        115                 120                 125

Met Val Cys Arg Gln Ser Val Glu Ala Ile Ser Gly His Ile Glu Leu
    130                 135                 140

Thr Lys Lys Trp Glu Lys Glu His Asn Glu Trp Leu Lys Glu Lys Glu
145                 150                 155                 160

Lys Trp Glu Ser Glu Asp Glu His Lys Lys Tyr Leu Asp Leu Arg Glu
                165                 170                 175

Lys Phe Glu Gln Phe Glu Gln Ser Ile Gly Gly Lys Ile Thr Lys Arg
            180                 185                 190

Arg Gly Arg Trp His Leu Tyr Leu Lys Trp Leu Ser Asp Asn Pro Asp
        195                 200                 205

Phe Ala Ala Trp Arg Gly Asn Lys Ala Val Ile Asn Pro Leu Ser Glu
    210                 215                 220

Lys Ala Gln Ile Arg Ile Asn Lys Ala Lys Pro Asn Lys Lys Asn Ser
225                 230                 235                 240
```

```
Val Glu Arg Asp Glu Phe Phe Lys Ala Asn Pro Glu Met Lys Ala Leu
                245                 250                 255

Asp Asn Leu His Gly Tyr Tyr Glu Arg Asn Phe Val Arg Arg Arg Lys
            260                 265                 270

Thr Lys Lys Asn Pro Asp Gly Phe Asp His Lys Pro Thr Phe Thr Leu
        275                 280                 285

Pro His Pro Thr Ile His Pro Arg Trp Phe Val Phe Asn Lys Pro Lys
    290                 295                 300

Thr Asn Pro Glu Gly Tyr Arg Lys Leu Ile Leu Pro Lys Lys Ala Gly
305                 310                 315                 320

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

Gly Asn Tyr Pro Asp Asp Trp Ile Ser Val Lys Phe Lys Ala Asp Pro
            340                 345                 350

Arg Leu Ser Leu Ile Arg Pro Val Lys Gly Arg Arg Val Val Arg Lys
        355                 360                 365

Gly Lys Glu Gln Gly Gln Thr Lys Glu Thr Asp Ser Tyr Glu Phe Phe
    370                 375                 380

Asp Lys His Leu Lys Lys Trp Arg Pro Ala Lys Leu Ser Gly Val Lys
385                 390                 395                 400

Leu Ile Phe Pro Asp Lys Thr Pro Lys Ala Ala Tyr Leu Tyr Phe Thr
                405                 410                 415

Cys Asp Ile Pro Asp Glu Pro Leu Thr Glu Thr Ala Lys Lys Ile Gln
            420                 425                 430

Trp Leu Glu Thr Gly Asp Val Thr Lys Lys Gly Lys Lys Arg Lys Lys
        435                 440                 445

Lys Val Leu Pro His Gly Leu Val Ser Cys Ala Val Asp Leu Ser Met
    450                 455                 460
```

```
Arg Arg Gly Thr Thr Gly Phe Ala Thr Leu Cys Arg Tyr Glu Asn Gly
465                 470                 475                 480

Lys Ile His Ile Leu Arg Ser Arg Asn Leu Trp Val Gly Tyr Lys Glu
                485                 490                 495

Gly Lys Gly Cys His Pro Tyr Arg Trp Thr Glu Gly Pro Asp Leu Gly
            500                 505                 510

His Ile Ala Lys His Lys Arg Glu Ile Arg Ile Leu Arg Ser Lys Arg
        515                 520                 525

Gly Lys Pro Val Lys Gly Glu Glu Ser His Ile Asp Leu Gln Lys His
    530                 535                 540

Ile Asp Tyr Met Gly Glu Asp Arg Phe Lys Lys Ala Ala Arg Thr Ile
545                 550                 555                 560

Val Asn Phe Ala Leu Asn Thr Glu Asn Ala Ala Ser Lys Asn Gly Phe
                565                 570                 575

Tyr Pro Arg Ala Asp Val Leu Leu Leu Glu Asn Leu Glu Gly Leu Ile
            580                 585                 590

Pro Asp Ala Glu Lys Glu Arg Gly Ile Asn Arg Ala Leu Ala Gly Trp
        595                 600                 605

Asn Arg Arg His Leu Val Glu Arg Val Ile Glu Met Ala Lys Asp Ala
    610                 615                 620

Gly Phe Lys Arg Arg Val Phe Glu Ile Pro Pro Tyr Gly Thr Ser Gln
625                 630                 635                 640

Val Cys Ser Lys Cys Gly Ala Leu Gly Arg Arg Tyr Ser Ile Ile Arg
                645                 650                 655

Glu Asn Asn Arg Arg Glu Ile Arg Phe Gly Tyr Val Glu Lys Leu Phe
            660                 665                 670

Ala Cys Pro Asn Cys Gly Tyr Cys Ala Asn Ala Asp His Asn Ala Ser
        675                 680                 685

Val Asn Leu Asn Arg Arg Phe Leu Ile Glu Asp Ser Phe Lys Ser Tyr
    690                 695                 700
```

Tyr Asp Trp Lys Arg Leu Ser Glu Lys Lys Gln Lys Glu Glu Ile Glu
705 710 715 720

Thr Ile Glu Ser Lys Leu Met Asp Lys Leu Cys Ala Met His Lys Ile
725 730 735

Ser Arg Gly Ser Ile Ser Lys
740

<210> 77
<211> 769
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 77
Met His Leu Trp Arg Thr His Cys Val Phe Asn Gln Arg Leu Pro Ala
1 5 10 15

Leu Leu Lys Arg Leu Phe Ala Met Arg Arg Gly Glu Val Gly Gly Asn
20 25 30

Glu Ala Gln Arg Gln Val Tyr Gln Arg Val Ala Gln Phe Val Leu Ala
35 40 45

Arg Asp Ala Lys Asp Ser Val Asp Leu Leu Asn Ala Val Ser Leu Arg
50 55 60

Lys Arg Ser Ala Asn Ser Ala Phe Lys Lys Lys Ala Thr Ile Ser Cys
65 70 75 80

Asn Gly Gln Ala Arg Glu Val Thr Gly Glu Glu Val Phe Ala Glu Ala
85 90 95

Val Ala Leu Ala Ser Lys Gly Val Phe Ala Tyr Asp Lys Asp Asp Met
100 105 110

Arg Ala Gly Leu Pro Asp Ser Leu Phe Gln Pro Leu Thr Arg Asp Ala
115 120 125

Val Ala Cys Met Arg Ser His Glu Glu Leu Val Ala Thr Trp Lys Lys

```
    130                 135                 140

Glu Tyr Arg Glu Trp Arg Asp Arg Lys Ser Glu Trp Glu Ala Glu Pro
145                 150                 155                 160

Glu His Ala Leu Tyr Leu Asn Leu Arg Pro Lys Phe Glu Glu Gly Glu
                165                 170                 175

Ala Ala Arg Gly Gly Arg Phe Arg Lys Arg Ala Glu Arg Asp His Ala
            180                 185                 190

Tyr Leu Asp Trp Leu Glu Ala Asn Pro Gln Leu Ala Ala Trp Arg Arg
        195                 200                 205

Lys Ala Pro Pro Ala Val Val Pro Ile Asp Glu Ala Gly Lys Arg Arg
    210                 215                 220

Ile Ala Arg Ala Lys Ala Trp Lys Gln Ala Ser Val Arg Ala Glu Glu
225                 230                 235                 240

Phe Trp Lys Arg Asn Pro Glu Leu His Ala Leu His Lys Ile His Val
                245                 250                 255

Gln Tyr Leu Arg Glu Phe Val Arg Pro Arg Arg Thr Arg Arg Asn Lys
            260                 265                 270

Arg Arg Glu Gly Phe Lys Gln Arg Pro Thr Phe Thr Met Pro Asp Pro
        275                 280                 285

Val Arg His Pro Arg Trp Cys Leu Phe Asn Ala Pro Gln Thr Ser Pro
    290                 295                 300

Gln Gly Tyr Arg Leu Leu Arg Leu Pro Gln Ser Arg Arg Thr Val Gly
305                 310                 315                 320

Ser Val Glu Leu Arg Leu Leu Thr Gly Pro Ser Asp Gly Ala Gly Phe
                325                 330                 335

Pro Asp Ala Trp Val Asn Val Arg Phe Lys Ala Asp Pro Arg Leu Ala
            340                 345                 350

Gln Leu Arg Pro Val Lys Val Pro Arg Thr Val Thr Arg Gly Lys Asn
        355                 360                 365
```

```
Lys Gly Ala Lys Val Glu Ala Asp Gly Phe Arg Tyr Tyr Asp Asp Gln
    370                 375                 380

Leu Leu Ile Glu Arg Asp Ala Gln Val Ser Gly Val Lys Leu Leu Phe
385                 390                 395                 400

Arg Asp Ile Arg Met Ala Pro Phe Ala Asp Lys Pro Ile Glu Asp Arg
                405                 410                 415

Leu Leu Ser Ala Thr Pro Tyr Leu Val Phe Ala Val Glu Ile Lys Asp
            420                 425                 430

Glu Ala Arg Thr Glu Arg Ala Lys Ala Ile Arg Phe Asp Glu Thr Ser
        435                 440                 445

Glu Leu Thr Lys Ser Gly Lys Lys Arg Lys Thr Leu Pro Ala Gly Leu
    450                 455                 460

Val Ser Val Ala Val Asp Leu Asp Thr Arg Gly Val Gly Phe Leu Thr
465                 470                 475                 480

Arg Ala Val Ile Gly Val Pro Glu Ile Gln Gln Thr His His Gly Val
                485                 490                 495

Arg Leu Leu Gln Ser Arg Tyr Val Ala Val Gly Gln Val Glu Ala Arg
            500                 505                 510

Ala Ser Gly Glu Ala Glu Trp Ser Pro Gly Pro Asp Leu Ala His Ile
        515                 520                 525

Ala Arg His Lys Arg Glu Ile Arg Arg Leu Arg Gln Leu Arg Gly Lys
    530                 535                 540

Pro Val Lys Gly Glu Arg Ser His Val Arg Leu Gln Ala His Ile Asp
545                 550                 555                 560

Arg Met Gly Glu Asp Arg Phe Lys Lys Ala Ala Arg Lys Ile Val Asn
                565                 570                 575

Glu Ala Leu Arg Gly Ser Asn Pro Ala Ala Gly Asp Pro Tyr Thr Arg
            580                 585                 590

Ala Asp Val Leu Leu Tyr Glu Ser Leu Glu Thr Leu Leu Pro Asp Ala
```

595 600 605

Glu Arg Glu Arg Gly Ile Asn Arg Ala Leu Leu Arg Trp Asn Arg Ala
610 615 620

Lys Leu Ile Glu His Leu Lys Arg Met Cys Asp Asp Ala Gly Ile Arg
625 630 635 640

His Phe Pro Val Ser Pro Phe Gly Thr Ser Gln Val Cys Ser Lys Cys
645 650 655

Gly Ala Leu Gly Arg Arg Tyr Ser Leu Ala Arg Glu Asn Gly Arg Ala
660 665 670

Val Ile Arg Phe Gly Trp Val Glu Arg Leu Phe Ala Cys Pro Asn Pro
675 680 685

Glu Cys Pro Gly Arg Arg Pro Asp Arg Pro Asp Arg Pro Phe Thr Cys
690 695 700

Asn Ser Asp His Asn Ala Ser Val Asn Leu His Arg Val Phe Ala Leu
705 710 715 720

Gly Asp Gln Ala Val Ala Ala Phe Arg Ala Leu Ala Pro Arg Asp Ser
725 730 735

Pro Ala Arg Thr Leu Ala Val Lys Arg Val Glu Asp Thr Leu Arg Pro
740 745 750

Gln Leu Met Arg Val His Lys Leu Ala Asp Ala Gly Val Asp Ser Pro
755 760 765

Phe

<210> 78
<211> 666
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 78

```
Met Ala Thr Leu Val Tyr Arg Tyr Gly Val Arg Ala His Gly Ser Ala
1               5                  10                  15

Arg Gln Gln Asp Ala Val Val Ser Asp Pro Ala Met Leu Glu Gln Leu
            20                  25                  30

Arg Leu Gly His Glu Leu Arg Asn Ala Leu Val Gly Val Gln His Arg
        35                  40                  45

Tyr Glu Asp Gly Lys Arg Ala Val Trp Ser Gly Phe Ala Ser Val Ala
    50                  55                  60

Ala Ala Asp His Arg Val Thr Thr Gly Glu Thr Ala Val Ala Glu Leu
65                  70                  75                  80

Glu Lys Gln Ala Arg Ala Glu His Ser Ala Asp Arg Thr Ala Ala Thr
                85                  90                  95

Arg Gln Gly Thr Ala Glu Ser Leu Lys Ala Ala Arg Ala Ala Val Lys
            100                 105                 110

Gln Ala Arg Ala Asp Arg Lys Ala Ala Met Ala Ala Val Ala Glu Gln
        115                 120                 125

Ala Lys Pro Lys Ile Gln Ala Leu Gly Asp Asp Arg Asp Ala Glu Ile
    130                 135                 140

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

Cys Gly Arg Cys Ala Gly Asp Leu Arg Ser Asp Gly Asp Cys Thr Asp
                165                 170                 175

Cys Gly Ala Ala His Glu Pro Arg Lys Leu Tyr Trp Ala Thr Tyr Asn
            180                 185                 190

Ala Ile Arg Glu Asp His Gln Thr Ala Val Lys Leu Val Glu Ala Lys
        195                 200                 205

Arg Lys Ala Gly Gln Pro Ala Arg Leu Arg Phe Arg Arg Trp Thr Gly
    210                 215                 220

Asp Gly Thr Leu Thr Val Gln Leu Gln Arg Met His Gly Pro Ala Cys
225                 230                 235                 240
```

```
Arg Cys Val Thr Cys Ala Glu Lys Leu Thr Arg Arg Ala Arg Lys Thr
                245                 250                 255

Asp Pro Gln Ala Pro Ala Val Ala Ala Asp Pro Ala Tyr Pro Pro Thr
            260                 265                 270

Asp Pro Pro Arg Asp Pro Ala Leu Leu Ala Ser Gly Gln Gly Lys Trp
        275                 280                 285

Arg Asn Val Leu Gln Leu Gly Thr Trp Ile Pro Pro Gly Glu Trp Ser
    290                 295                 300

Ala Met Ser Arg Ala Glu Arg Arg Arg Val Gly Arg Ser His Ile Gly
305                 310                 315                 320

Trp Gln Leu Gly Gly Gly Arg Gln Leu Thr Leu Pro Val Gln Leu His
                325                 330                 335

Arg Gln Met Pro Ala Asp Ala Asp Val Ala Met Ala Gln Leu Thr Arg
            340                 345                 350

Val Arg Val Gly Gly Arg His Arg Met Ser Val Ala Leu Thr Ala Lys
        355                 360                 365

Leu Pro Asp Pro Pro Gln Val Gln Gly Leu Pro Pro Val Ala Leu His
    370                 375                 380

Leu Gly Trp Arg Gln Arg Pro Asp Gly Ser Leu Arg Val Ala Thr Trp
385                 390                 395                 400

Ala Cys Pro Gln Pro Leu Asp Leu Pro Pro Ala Val Ala Asp Val Val
                405                 410                 415

Val Ser His Gly Gly Arg Trp Gly Glu Val Ile Met Pro Ala Arg Trp
            420                 425                 430

Leu Ala Asp Ala Glu Val Pro Pro Arg Leu Leu Gly Arg Arg Asp Lys
        435                 440                 445

Ala Met Glu Pro Val Leu Glu Ala Leu Ala Asp Trp Leu Glu Ala His
    450                 455                 460
```

```
Thr Glu Ala Cys Thr Ala Arg Met Thr Pro Ala Leu Val Arg Arg Trp
465                 470                 475                 480

Arg Ser Gln Gly Arg Leu Ala Gly Leu Thr Asn Arg Trp Arg Gly Gln
                485                 490                 495

Pro Pro Thr Gly Ser Ala Glu Ile Leu Thr Tyr Leu Glu Ala Trp Arg
            500                 505                 510

Ile Gln Asp Lys Leu Leu Trp Glu Arg Glu Ser His Leu Arg Arg Arg
        515                 520                 525

Leu Ala Ala Arg Arg Asp Asp Ala Trp Arg Arg Val Ala Ser Trp Leu
    530                 535                 540

Ala Arg His Ala Gly Val Leu Val Val Asp Asp Ala Asp Ile Ala Glu
545                 550                 555                 560

Leu Arg Arg Arg Asp Asp Pro Ala Asp Thr Asp Pro Thr Met Pro Ala
                565                 570                 575

Ser Ala Ala Gln Ala Ala Arg Ala Arg Ala Ala Leu Ala Ala Pro Gly
            580                 585                 590

Arg Leu Arg His Leu Ala Thr Ile Thr Ala Thr Arg Asp Gly Leu Gly
        595                 600                 605

Val His Thr Val Ala Ser Ala Gly Leu Thr Arg Leu His Arg Lys Cys
    610                 615                 620

Gly His Gln Ala Gln Pro Asp Pro Arg Tyr Ala Ala Ser Ala Val Val
625                 630                 635                 640

Thr Cys Pro Gly Cys Gly Asn Gly Tyr Asp Gln Asp Tyr Asn Ala Ala
                645                 650                 655

Met Leu Met Leu Asp Arg Gln Gln Gln Pro
            660                 665
```

<210> 79
<211> 564
<212> PRT
<213> Artificial Sequence

<220>

<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 79
Met Ser Arg Val Glu Leu His Arg Ala Tyr Lys Phe Arg Leu Tyr Pro
1 5 10 15

Thr Pro Ala Gln Val Ala Glu Leu Ala Glu Trp Glu Arg Gln Leu Arg
20 25 30

Arg Leu Tyr Asn Leu Ala His Ser Gln Arg Leu Ala Ala Met Gln Arg
35 40 45

His Val Arg Pro Lys Ser Pro Gly Val Leu Lys Ser Glu Cys Leu Ser
50 55 60

Cys Gly Ala Val Ala Val Ala Glu Ile Gly Thr Asp Gly Lys Ala Lys
65 70 75 80

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

Cys Gly Gly Ser Pro Asp Ala Glu Gly Arg Thr Ala His Thr Ala Ala
100 105 110

Cys Ser Phe Val Asp Tyr Tyr Arg Gln Gly Arg Glu Met Thr Gln Leu
115 120 125

Leu Glu Glu Asp Asp Gln Leu Ala Arg Val Val Cys Ser Ala Arg Gln
130 135 140

Glu Thr Leu Arg Asp Leu Glu Lys Ala Trp Gln Arg Trp His Lys Met
145 150 155 160

Pro Gly Phe Gly Lys Pro His Phe Lys Lys Arg Ile Asp Ser Cys Arg
165 170 175

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

Ser Phe Thr Gly Val Ala Ser Ser Val Gly Arg Ile Lys Ile Arg Gln
195 200 205

Asp Arg Val Trp Pro Gly Asp Ala Lys Phe Ser Ser Cys His Val Val

```
    210                 215                 220

Arg Asp Val Asp Glu Trp Tyr Ala Val Phe Pro Leu Thr Phe Thr Lys
225                 230                 235                 240

Glu Ile Glu Lys Pro Lys Gly Gly Ala Val Gly Ile Asn Arg Gly Ala
                245                 250                 255

Val His Ala Ile Ala Asp Ser Thr Gly Arg Val Val Asp Ser Pro Lys
            260                 265                 270

Phe Tyr Ala Arg Ser Leu Gly Val Ile Arg His Arg Ala Arg Leu Leu
        275                 280                 285

Asp Arg Lys Val Pro Phe Gly Arg Ala Val Lys Pro Ser Pro Thr Lys
    290                 295                 300

Tyr His Gly Leu Pro Lys Ala Asp Ile Asp Ala Ala Ala Ala Arg Val
305                 310                 315                 320

Asn Ala Ser Pro Gly Arg Leu Val Tyr Glu Ala Arg Ala Arg Gly Ser
                325                 330                 335

Ile Ala Ala Ala Glu Ala His Leu Ala Ala Leu Val Leu Pro Ala Pro
            340                 345                 350

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

Arg Arg Phe Leu Ala Leu Ala His Gln Arg Val Arg Arg Gln Arg Glu
    370                 375                 380

Trp Phe Leu His Asn Glu Ser Ala His Tyr Ala Gln Ser Tyr Thr Lys
385                 390                 395                 400

Ile Ala Ile Glu Asp Trp Ser Thr Lys Glu Met Thr Ser Ser Glu Pro
                405                 410                 415

Arg Asp Ala Glu Glu Met Lys Arg Val Thr Arg Ala Arg Asn Arg Ser
            420                 425                 430

Ile Leu Asp Val Gly Trp Tyr Glu Leu Gly Arg Gln Ile Ala Tyr Lys
        435                 440                 445
```

Ser Glu Ala Thr Gly Ala Glu Phe Ala Lys Val Asp Pro Gly Leu Arg
450 455 460

Glu Thr Glu Thr His Val Pro Glu Ala Ile Val Arg Glu Arg Asp Val
465 470 475 480

Asp Val Ser Gly Met Leu Arg Gly Glu Ala Gly Ile Ser Gly Thr Cys
485 490 495

Ser Arg Cys Gly Gly Leu Leu Arg Ala Ser Ala Ser Gly His Ala Asp
500 505 510

Ala Glu Cys Glu Val Cys Leu His Val Glu Val Gly Asp Val Asn Ala
515 520 525

Ala Val Asn Val Leu Lys Arg Ala Met Phe Pro Gly Ala Ala Pro Pro
530 535 540

Ser Lys Glu Lys Ala Lys Val Thr Ile Gly Ile Lys Gly Arg Lys Lys
545 550 555 560

Lys Arg Ala Ala

<210> 80
<211> 565
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 80
Met Ser Arg Val Glu Leu His Arg Ala Tyr Lys Phe Arg Leu Tyr Pro
1 5 10 15

Thr Pro Val Gln Val Ala Glu Leu Ser Glu Trp Glu Arg Gln Leu Arg
20 25 30

Arg Leu Tyr Asn Leu Gly His Glu Gln Arg Leu Leu Thr Leu Thr Arg
35 40 45

His Leu Arg Pro Lys Ser Pro Gly Val Leu Lys Gly Glu Cys Leu Ser
50 55 60

```
Cys Asp Ser Thr Gln Val Gln Glu Val Gly Ala Asp Gly Arg Pro Lys
65                  70                  75                  80

Thr Thr Val Arg His Ala Glu Gln Cys Pro Thr Leu Ala Cys Arg Ser
                85                  90                  95

Cys Gly Ala Leu Arg Asp Ala Glu Gly Arg Thr Ala His Thr Val Ala
            100                 105                 110

Cys Ala Phe Val Asp Tyr Tyr Arg Gln Gly Arg Glu Met Thr Glu Leu
        115                 120                 125

Leu Ala Ala Asp Asp Gln Leu Ala Arg Val Val Cys Ser Ala Arg Gln
    130                 135                 140

Glu Val Leu Arg Asp Leu Asp Lys Ala Trp Gln Arg Trp Arg Lys Met
145                 150                 155                 160

Pro Gly Phe Gly Lys Pro Arg Phe Lys Arg Arg Thr Asp Ser Cys Arg
                165                 170                 175

Ile Tyr Phe Ser Thr Pro Lys Ala Trp Lys Leu Glu Gly Gly His Leu
            180                 185                 190

Ser Phe Thr Gly Ala Ala Thr Thr Val Gly Ala Ile Lys Met Arg Gln
        195                 200                 205

Asp Arg Asn Trp Pro Ala Ser Val Gln Phe Ser Ser Cys His Val Val
    210                 215                 220

Arg Asp Val Asp Glu Trp Tyr Ala Val Phe Pro Leu Thr Phe Val Ala
225                 230                 235                 240

Glu Val Ala Arg Pro Lys Gly Gly Ala Val Gly Ile Asn Arg Gly Ala
                245                 250                 255

Val His Ala Ile Ala Asp Ser Thr Gly Arg Val Val Asp Ser Pro Arg
            260                 265                 270

Tyr Tyr Ala Arg Ala Leu Gly Val Ile Arg His Arg Ala Arg Leu Phe
        275                 280                 285
```

```
Asp Arg Lys Val Pro Ser Gly His Ala Val Lys Pro Ser Pro Thr Lys
    290                 295                 300

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

Gly Phe Thr Pro Gly Arg Val Val Thr Glu Ala Leu Asn Arg Gly Gly
                325                 330                 335

Val Ala Tyr Ala Glu Cys Ala Leu Ala Ala Ile Ala Val Leu Gly His
            340                 345                 350

Gly Pro Glu Arg Pro Leu Thr Ser Asp Gly Arg Asn Arg Glu Lys Ala
        355                 360                 365

Arg Lys Phe Leu Ala Leu Ala His Gln Arg Val Arg Arg Gln Arg Glu
    370                 375                 380

Trp Phe Leu His Asn Glu Ser Ala His Tyr Ala Arg Thr Tyr Ser Lys
385                 390                 395                 400

Ile Ala Ile Glu Asp Trp Ser Thr Lys Glu Met Thr Ala Ser Glu Pro
                405                 410                 415

Gln Gly Glu Glu Thr Arg Arg Val Thr Arg Ser Arg Asn Arg Ser Ile
            420                 425                 430

Leu Asp Val Gly Trp Tyr Glu Leu Gly Arg Gln Leu Ala Tyr Lys Thr
        435                 440                 445

Glu Ala Thr Gly Ala Glu Phe Ala Gln Val Asp Pro Gly Leu Lys Glu
    450                 455                 460

Thr Glu Thr Asn Val Pro Lys Ala Ile Ala Asp Ala Arg Asp Val Asp
465                 470                 475                 480

Val Ser Gly Met Leu Arg Gly Glu Ala Gly Ile Ser Gly Thr Cys Ser
                485                 490                 495

Lys Cys Gly Gly Leu Leu Arg Ala Pro Ala Ser Gly His Ala Asp Ala
            500                 505                 510

Glu Cys Glu Ile Cys Leu Asn Val Glu Val Gly Asp Val Asn Ala Ala
        515                 520                 525
```

Val Asn Val Leu Lys Arg Ala Met Phe Pro Gly Asp Ala Pro Pro Ala
530 535 540

Ser Gly Glu Lys Pro Lys Val Ser Ile Gly Ile Lys Gly Arg Gln Lys
545 550 555 560

Lys Lys Lys Ala Ala
565

<210> 81
<211> 499
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 81
Met Glu Ala Ile Ala Thr Gly Met Ser Pro Glu Arg Arg Val Glu Leu
1 5 10 15

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

Leu Tyr Pro Met Lys Val Gln Gln Ala Glu Leu Ser Glu Trp Glu Arg
35 40 45

Gln Leu Arg Arg Leu Tyr Asn Leu Ala His Glu Gln Arg Leu Ala Ala
50 55 60

Leu Leu Arg Tyr Arg Asp Trp Asp Phe Gln Lys Gly Ala Cys Pro Ser
65 70 75 80

Cys Arg Val Ala Val Pro Gly Val His Thr Ala Ala Cys Asp His Val
85 90 95

Asp Tyr Phe Arg Gln Ala Arg Glu Met Thr Gln Leu Leu Glu Val Asp
100 105 110

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

Asp Leu Asp Lys Ala Trp Gln Arg Trp Arg Lys Lys Leu Gly Gly Arg

```
    130                 135                 140

Pro Arg Phe Lys Arg Arg Thr Asp Ser Cys Arg Ile Tyr Leu Ser Thr
145                 150                 155                 160

Pro Lys His Trp Glu Ile Ala Gly Arg Tyr Leu Arg Leu Ser Gly Leu
                165                 170                 175

Ala Ser Ser Val Gly Glu Ile Arg Ile Glu Gln Asp Arg Ala Phe Pro
            180                 185                 190

Glu Gly Ala Leu Leu Ser Ser Cys Ser Ile Val Arg Asp Val Asp Glu
        195                 200                 205

Trp Tyr Ala Cys Leu Pro Leu Thr Phe Thr Gln Pro Ile Glu Arg Ala
    210                 215                 220

Pro His Arg Ser Val Gly Leu Asn Arg Gly Val Val His Ala Leu Ala
225                 230                 235                 240

Asp Ser Asp Gly Arg Val Val Asp Ser Pro Lys Phe Phe Glu Arg Ala
                245                 250                 255

Leu Ala Thr Val Gln Lys Arg Ser Arg Asp Leu Ala Arg Lys Val Ser
            260                 265                 270

Gly Ser Arg Asn Ala His Lys Ala Arg Ile Lys Leu Ala Lys Ala His
        275                 280                 285

Gln Arg Val Arg Arg Gln Arg Ala Ala Phe Leu His Gln Glu Ser Ala
    290                 295                 300

Tyr Tyr Ser Lys Gly Phe Asp Leu Val Ala Leu Glu Asp Met Ser Val
305                 310                 315                 320

Arg Lys Met Thr Ala Thr Ala Gly Glu Ala Pro Glu Met Gly Arg Gly
                325                 330                 335

Ala Gln Arg Asp Leu Asn Arg Gly Ile Leu Asp Val Gly Trp Tyr Glu
            340                 345                 350

Leu Ala Arg Gln Ile Asp Tyr Lys Arg Leu Ala His Gly Gly Glu Leu
        355                 360                 365
```

```
Leu Arg Val Asp Pro Gly Gln Thr Thr Pro Leu Ala Cys Val Thr Glu
    370                 375                 380

Glu Gln Pro Ala Arg Gly Ile Ser Ser Ala Cys Ala Val Cys Gly Ile
385                 390                 395                 400

Pro Leu Ala Arg Pro Ala Ser Gly Asn Ala Arg Met Arg Cys Thr Ala
                405                 410                 415

Cys Gly Ser Ser Gln Val Gly Asp Val Asn Ala Ala Glu Asn Val Leu
            420                 425                 430

Thr Arg Ala Leu Ser Ser Ala Pro Ser Gly Pro Lys Ser Pro Lys Ala
        435                 440                 445

Ser Ile Lys Ile Lys Gly Arg Gln Lys Arg Leu Gly Thr Pro Ala Asn
    450                 455                 460

Arg Ala Gly Glu Ala Ser Gly Gly Asp Pro Pro Val Arg Gly Pro Val
465                 470                 475                 480

Glu Gly Gly Thr Leu Ala Tyr Val Val Glu Pro Val Ser Glu Ser Gln
                485                 490                 495

Ser Asp Thr
```

<210> 82
<211> 560
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 82

```
Met Thr Val Arg Thr Tyr Lys Tyr Arg Ala Tyr Pro Thr Pro Glu Gln
1               5                   10                  15

Ala Glu Ala Leu Thr Ser Trp Leu Arg Phe Ala Ser Gln Leu Tyr Asn
            20                  25                  30

Ala Ala Leu Glu His Arg Lys Asn Ala Trp Gly Arg His Asp Ala His
        35                  40                  45
```

```
Gly Arg Gly Phe Arg Phe Trp Asp Gly Asp Ala Ala Pro Arg Lys Lys
    50                  55                  60

Ser Asp Pro Pro Gly Arg Trp Val Tyr Arg Gly Gly Gly Gly Ala His
65                  70                  75                  80

Ile Ser Lys Asn Asp Gln Gly Lys Leu Leu Thr Glu Phe Arg Arg Glu
                85                  90                  95

His Ala Glu Leu Leu Pro Pro Gly Met Pro Ala Leu Val Gln His Glu
            100                 105                 110

Val Leu Ala Arg Leu Glu Arg Ser Met Ala Ala Phe Phe Gln Arg Ala
        115                 120                 125

Thr Lys Gly Gln Lys Ala Gly Tyr Pro Arg Trp Arg Ser Glu His Arg
    130                 135                 140

Tyr Asp Ser Leu Thr Phe Gly Leu Thr Ser Pro Ser Lys Glu Arg Phe
145                 150                 155                 160

Asp Pro Glu Thr Gly Glu Ser Leu Gly Arg Gly Lys Thr Val Gly Ala
                165                 170                 175

Gly Thr Tyr His Asn Gly Asp Leu Arg Leu Thr Gly Leu Gly Glu Leu
            180                 185                 190

Arg Ile Leu Glu His Arg Arg Ile Pro Met Gly Ala Ile Pro Lys Ser
        195                 200                 205

Val Ile Val Arg Arg Ser Gly Lys Arg Trp Phe Val Ser Ile Ala Met
    210                 215                 220

Glu Met Pro Ser Val Glu Pro Ala Ala Ser Gly Arg Pro Ala Val Gly
225                 230                 235                 240

Leu Asp Met Gly Val Val Thr Trp Gly Thr Ala Phe Thr Ala Asp Thr
                245                 250                 255

Ser Ala Ala Ala Ala Leu Val Ala Asp Leu Arg Arg Met Ala Thr Asp
            260                 265                 270
```

```
Pro Ser Asp Cys Arg Arg Leu Glu Glu Leu Glu Arg Glu Ala Ala Gln
        275                 280                 285

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

Arg Pro Arg Arg Cys Pro Lys Glu Leu Thr Lys Leu Tyr Arg Arg Ser
305                 310                 315                 320

Leu His Arg Leu Gly Glu Leu Asp Arg Ala Cys Ala Arg Ile Arg Arg
                325                 330                 335

Arg Leu Gln Ala Ala His Asp Ile Ala Glu Pro Val Pro Asp Glu Ala
            340                 345                 350

Gly Ser Ala Val Leu Ile Glu Gly Ser Asn Ala Gly Met Arg His Ala
        355                 360                 365

Arg Arg Val Ala Arg Thr Gln Arg Arg Val Ala Arg Arg Thr Arg Ala
    370                 375                 380

Gly His Ala His Ser Asn Arg Arg Lys Lys Ala Val Gln Ala Tyr Ala
385                 390                 395                 400

Arg Ala Lys Glu Arg Glu Arg Ser Ala Arg Gly Asp His Arg His Lys
                405                 410                 415

Val Ser Arg Ala Leu Val Arg Gln Phe Glu Glu Ile Ser Val Glu Ala
            420                 425                 430

Leu Asp Ile Lys Gln Leu Thr Val Ala Pro Glu His Asn Pro Asp Pro
        435                 440                 445

Gln Pro Asp Leu Pro Ala His Val Gln Arg Arg Arg Asn Arg Gly Glu
    450                 455                 460

Leu Asp Ala Ala Trp Gly Ala Phe Phe Ala Ala Leu Asp Tyr Lys Ala
465                 470                 475                 480

Ala Asp Ala Gly Gly Arg Val Ala Arg Lys Pro Ala Pro His Thr Thr
                485                 490                 495

Gln Glu Cys Ala Arg Cys Gly Thr Leu Val Pro Lys Pro Ile Ser Leu
            500                 505                 510
```

```
Arg Val His Arg Cys Pro Ala Cys Gly Tyr Thr Ala Pro Arg Thr Val
        515                 520                 525


Asn Ser Ala Arg Asn Val Leu Gln Arg Pro Leu Glu Glu Pro Gly Arg
    530                 535                 540


Ala Gly Pro Ser Gly Ala Asn Gly Arg Gly Val Pro His Ala Val Ala
545                 550                 555                 560


<210> 83
<211> 404
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 83
Met Asn Cys Arg Tyr Arg Tyr Arg Ile Tyr Pro Thr Pro Gly Gln Arg
1               5                   10                  15


Gln Ser Leu Ala Arg Leu Phe Gly Cys Val Arg Val Val Trp Asn Asp
            20                  25                  30


Ala Leu Phe Leu Cys Arg Gln Ser Glu Lys Leu Pro Lys Asn Ser Glu
        35                  40                  45


Leu Gln Lys Leu Cys Ile Thr Gln Ala Lys Lys Thr Glu Ala Arg Gly
    50                  55                  60


Trp Leu Gly Gln Val Ser Ala Ile Pro Leu Gln Gln Ser Val Ala Asp
65                  70                  75                  80


Leu Gly Val Ala Phe Lys Asn Phe Phe Gln Ser Arg Ser Gly Lys Arg
                85                  90                  95


Lys Gly Lys Lys Val Asn Pro Pro Arg Val Lys Arg Arg Asn Asn Arg
            100                 105                 110


Gln Gly Ala Arg Phe Thr Arg Gly Gly Phe Lys Val Lys Thr Ser Lys
        115                 120                 125


Val Tyr Leu Ala Arg Ile Gly Asp Ile Lys Ile Lys Trp Ser Arg Pro
```

```
    130                 135                 140

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

Gln Tyr Phe Leu Ser Phe Val Val Glu Val Lys Pro Glu Ile Lys Pro
                165                 170                 175

Pro Lys Asn Pro Ser Ile Gly Ile Asp Leu Gly Leu Lys Thr Phe Ala
            180                 185                 190

Ser Cys Ser Asn Gly Glu Lys Ile Asp Ser Pro Asp Tyr Ser Arg Leu
        195                 200                 205

Tyr Arg Lys Leu Lys Arg Cys Gln Arg Arg Leu Ala Lys Arg Gln Arg
    210                 215                 220

Gly Ser Lys Arg Arg Glu Arg Met Arg Val Lys Val Ala Lys Leu Asn
225                 230                 235                 240

Ala Gln Ile Arg Asp Lys Arg Lys Asp Phe Leu His Lys Leu Ser Thr
                245                 250                 255

Lys Val Val Asn Glu Asn Gln Val Ile Ala Leu Glu Asp Leu Asn Val
            260                 265                 270

Gly Gly Met Leu Lys Asn Arg Lys Leu Ser Arg Ala Ile Ser Gln Ala
        275                 280                 285

Gly Trp Tyr Glu Phe Arg Ser Leu Cys Glu Gly Lys Ala Glu Lys His
    290                 295                 300

Asn Arg Asp Phe Arg Val Ile Ser Arg Trp Glu Pro Thr Ser Gln Val
305                 310                 315                 320

Cys Ser Glu Cys Gly Tyr Arg Trp Gly Lys Ile Asp Leu Ser Val Arg
                325                 330                 335

Ser Ile Val Cys Ile Asn Cys Gly Val Glu His Asp Arg Asp Asp Asn
            340                 345                 350

Ala Ser Val Asn Ile Glu Gln Ala Gly Leu Lys Val Gly Val Gly His
        355                 360                 365
```

```
Thr His Asp Ser Lys Arg Thr Gly Ser Ala Cys Lys Thr Ser Asn Gly
    370                 375                 380

Ala Val Cys Val Glu Pro Ser Thr His Arg Glu Tyr Val Gln Leu Thr
385                 390                 395                 400

Leu Phe Asp Trp
```

<210> 84
<211> 392
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 84

```
Met Lys Ser Arg Trp Thr Phe Arg Cys Tyr Pro Thr Pro Glu Gln Glu
1               5                   10                  15

Gln His Leu Ala Arg Thr Phe Gly Cys Val Arg Phe Val Trp Asn Trp
            20                  25                  30

Ala Leu Arg Ala Arg Thr Asp Ala Phe Arg Ala Gly Glu Arg Ile Gly
        35                  40                  45

Tyr Pro Ala Thr Asp Lys Ala Leu Thr Leu Leu Lys Gln Gln Pro Glu
    50                  55                  60

Thr Val Trp Leu Asn Glu Val Ser Ser Val Cys Leu Gln Gln Ala Leu
65                  70                  75                  80

Arg Asp Leu Gln Val Ala Phe Ser Asn Phe Phe Asp Lys Arg Ala Ala
                85                  90                  95

His Pro Ser Phe Lys Arg Lys Glu Ala Arg Gln Ser Ala Asn Tyr Thr
            100                 105                 110

Glu Arg Gly Phe Ser Phe Asp His Glu Arg Arg Ile Leu Lys Leu Ala
        115                 120                 125

Lys Ile Gly Ala Ile Lys Val Lys Trp Ser Arg Lys Ala Ile Pro His
    130                 135                 140
```

```
Pro Ser Ser Ile Arg Leu Ile Arg Thr Ala Ser Gly Lys Tyr Phe Val
145                 150                 155                 160

Ser Leu Val Val Glu Thr Gln Pro Ala Pro Met Pro Glu Thr Gly Glu
                165                 170                 175

Ser Val Gly Val Asp Phe Gly Val Ala Arg Leu Ala Thr Leu Ser Asn
            180                 185                 190

Gly Glu Arg Ile Ser Asn Pro Lys His Gly Ala Lys Trp Gln Arg Arg
        195                 200                 205

Leu Ala Phe Tyr Gln Lys Arg Leu Ala Arg Ala Thr Lys Gly Ser Lys
    210                 215                 220

Arg Arg Met Arg Ile Lys Arg His Val Ala Arg Ile His Glu Lys Ile
225                 230                 235                 240

Gly Asn Ser Arg Ser Asp Thr Leu His Lys Leu Ser Thr Asp Leu Val
                245                 250                 255

Thr Arg Phe Asp Leu Ile Cys Val Glu Asp Leu Asn Leu Arg Gly Met
            260                 265                 270

Val Lys Asn His Ser Leu Ala Arg Ser Leu His Asp Ala Ser Ile Gly
        275                 280                 285

Ser Ala Ile Arg Met Ile Glu Glu Lys Ala Glu Arg Tyr Gly Lys Asn
    290                 295                 300

Val Val Lys Ile Asp Arg Trp Phe Pro Ser Ser Lys Thr Cys Ser Asp
305                 310                 315                 320

Cys Gly His Ile Val Glu Gln Leu Pro Leu Asn Val Arg Glu Trp Thr
                325                 330                 335

Cys Pro Glu Cys Gly Thr Thr His Asp Arg Asp Ala Asn Ala Ala Ala
            340                 345                 350

Asn Ile Leu Ala Val Gly Gln Thr Val Ser Ala His Gly Gly Thr Val
        355                 360                 365
```

Arg Arg Ser Arg Ala Lys Ala Ser Glu Arg Lys Ser Gln Arg Ser Ala
370 375 380

Asn Arg Gln Gly Val Asn Arg Ala
385 390

<210> 85
<211> 500
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 85
Lys Glu Pro Leu Asn Ile Gly Lys Thr Ala Lys Ala Val Phe Lys Glu
1 5 10 15

Ile Asp Pro Thr Ser Leu Asn Arg Ala Ala Asn Tyr Asp Ala Ser Ile
20 25 30

Glu Leu Asn Cys Lys Glu Cys Lys Phe Lys Pro Phe Lys Asn Val Lys
35 40 45

Arg Tyr Glu Phe Asn Phe Tyr Asn Asn Trp Tyr Arg Cys Asn Pro Asn
50 55 60

Ser Cys Leu Gln Ser Thr Tyr Lys Ala Gln Val Arg Lys Val Glu Ile
65 70 75 80

Gly Tyr Glu Lys Leu Lys Asn Glu Ile Leu Thr Gln Met Gln Tyr Tyr
85 90 95

Pro Trp Phe Gly Arg Leu Tyr Gln Asn Phe Phe His Asp Glu Arg Asp
100 105 110

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

Val Phe Phe Asn Thr Val Glu Lys Ala Trp Arg Glu Ile Ile Lys Lys
130 135 140

Arg Phe Lys Asp Asn Lys Glu Thr Met Glu Thr Ile Pro Glu Leu Lys
145 150 155 160

```
His Ala Ala Gly His Gly Lys Arg Lys Leu Ser Asn Lys Ser Leu Leu
                165                 170                 175

Arg Arg Arg Phe Ala Phe Val Gln Lys Ser Phe Lys Phe Val Asp Asn
            180                 185                 190

Ser Asp Val Ser Tyr Arg Ser Phe Ser Asn Asn Ile Ala Cys Val Leu
        195                 200                 205

Pro Ser Arg Ile Gly Val Asp Leu Gly Gly Val Ile Ser Arg Asn Pro
    210                 215                 220

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

Gln His Glu Gly Leu Lys Lys Gly Arg Asn Ile Glu Ile Gln Ser Val
                245                 250                 255

Gln Tyr Lys Gly Glu Thr Val Lys Arg Ile Glu Ala Asp Thr Gly Glu
            260                 265                 270

Asp Lys Ala Trp Gly Lys Asn Arg Gln Arg Arg Phe Thr Ser Leu Ile
        275                 280                 285

Leu Lys Leu Val Pro Lys Gln Gly Gly Lys Lys Val Trp Lys Tyr Pro
    290                 295                 300

Glu Lys Arg Asn Glu Gly Asn Tyr Glu Tyr Phe Pro Ile Pro Ile Glu
305                 310                 315                 320

Phe Ile Leu Asp Ser Gly Glu Thr Ser Ile Arg Phe Gly Gly Asp Glu
                325                 330                 335

Gly Glu Ala Gly Lys Gln Lys His Leu Val Ile Pro Phe Asn Asp Ser
            340                 345                 350

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

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

Tyr Phe Tyr Gly Tyr Ala Arg Asn Tyr Val Ile Ser Ser Ile Tyr His
```

385 390 395 400

Lys Asn Ser Lys Asn Gly Gln Ala Ile Thr Ala Ile Tyr Leu Glu Ser
405 410 415

Ile Ala His Asn Tyr Val Lys Ala Ile Glu Arg Gln Leu Gln Asn Leu
420 425 430

Leu Leu Asn Leu Arg Asp Phe Ser Phe Met Glu Ser His Lys Lys Glu
435 440 445

Leu Lys Lys Tyr Phe Gly Gly Asp Leu Glu Gly Thr Gly Gly Ala Gln
450 455 460

Lys Arg Arg Glu Lys Glu Glu Lys Ile Glu Lys Glu Ile Glu Gln Ser
465 470 475 480

Tyr Leu Pro Arg Leu Ile Arg Leu Ser Leu Thr Lys Met Val Thr Lys
485 490 495

Gln Val Glu Met
500

<210> 86
<211> 507
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 86
Glu Leu Ile Val Asn Glu Asn Lys Asp Pro Leu Asn Ile Gly Lys Thr
1 5 10 15

Ala Lys Ala Val Phe Lys Glu Ile Asp Pro Thr Ser Ile Asn Arg Ala
20 25 30

Ala Asn Tyr Asp Ala Ser Ile Glu Leu Ala Cys Lys Glu Cys Lys Phe
35 40 45

Lys Pro Phe Asn Asn Thr Lys Arg His Asp Phe Ser Phe Tyr Ser Asn
50 55 60

```
Trp His Arg Cys Ser Pro Asn Ser Cys Leu Gln Ser Thr Tyr Arg Ala
65                  70                  75                  80

Lys Ile Arg Lys Thr Glu Ile Gly Tyr Glu Lys Leu Lys Asn Glu Ile
                85                  90                  95

Leu Asn Gln Met Gln Tyr Tyr Pro Trp Phe Gly Arg Leu Tyr Gln Asn
            100                 105                 110

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

Val Thr Gly Val Gln Asn Lys Ile Phe Phe Asn Thr Val Glu Lys Ala
    130                 135                 140

Trp Arg Glu Ile Ile Lys Lys Arg Phe Arg Asp Asn Lys Glu Thr Met
145                 150                 155                 160

Arg Thr Ile Pro Asp Leu Lys Asn Lys Ser Gly His Gly Ser Arg Lys
                165                 170                 175

Leu Ser Asn Lys Ser Leu Leu Arg Arg Arg Phe Ala Phe Ala Gln Lys
            180                 185                 190

Ser Phe Lys Leu Val Asp Asn Ser Asp Val Ser Tyr Arg Ala Phe Ser
        195                 200                 205

Asn Asn Val Ala Cys Val Leu Pro Ser Lys Ile Gly Val Asp Ile Gly
    210                 215                 220

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

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

Asn Ile Glu Ile His Ser Val Gln Tyr Lys Gly Glu Ile Val Lys Arg
            260                 265                 270

Ile Glu Ala Asp Thr Gly Glu Asp Lys Ala Trp Gly Lys Asn Arg Gln
        275                 280                 285

Arg Arg Phe Thr Ser Leu Ile Leu Lys Ile Thr Pro Lys Gln Gly Gly
    290                 295                 300
```

```
Lys Lys Ile Trp Lys Phe Pro Glu Lys Lys Asn Ala Ser Asp Tyr Glu
305                 310                 315                 320

Tyr Phe Pro Ile Pro Ile Glu Phe Ile Leu Asp Asn Gly Asp Ala Ser
                325                 330                 335

Ile Lys Phe Gly Gly Glu Glu Gly Glu Val Gly Lys Gln Lys His Leu
            340                 345                 350

Leu Ile Pro Phe Asn Asp Ser Lys Ala Thr Pro Leu Ser Ser Lys Gln
        355                 360                 365

Met Leu Leu Glu Thr Ser Arg Phe Asn Ala Glu Val Lys Ser Thr Ile
    370                 375                 380

Gly Leu Ala Leu Tyr Ala Asn Tyr Phe Val Ser Tyr Ala Arg Asn Tyr
385                 390                 395                 400

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

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

Gln Arg Gln Leu Gln Ser Leu Met Leu Asn Leu Lys Asp Trp Gly Phe
        435                 440                 445

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

Glu Gly Ser Lys Gly Gly Gln Lys Arg Arg Glu Lys Glu Glu Lys Ile
465                 470                 475                 480

Glu Lys Glu Ile Glu Ala Ser Tyr Leu Pro Arg Leu Ile Arg Leu Ser
                485                 490                 495

Leu Thr Lys Ser Val Thr Lys Ala Glu Glu Met
            500                 505
```

<210> 87
<211> 529
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 87
Pro Glu Glu Lys Thr Ser Lys Leu Lys Pro Asn Ser Ile Asn Leu Ala
1 5 10 15

Ala Asn Tyr Asp Ala Asn Glu Lys Phe Asn Cys Lys Glu Cys Lys Phe
20 25 30

His Pro Phe Lys Asn Lys Lys Arg Tyr Glu Phe Asn Phe Tyr Asn Asn
35 40 45

Leu His Gly Cys Lys Ser Cys Thr Lys Ser Thr Asn Asn Pro Ala Val
50 55 60

Lys Arg Ile Glu Ile Gly Tyr Gln Lys Leu Lys Phe Glu Ile Lys Asn
65 70 75 80

Gln Met Glu Ala Tyr Pro Trp Phe Gly Arg Leu Arg Ile Asn Phe Tyr
85 90 95

Ser Asp Glu Lys Arg Lys Met Ser Glu Leu Asn Glu Met Gln Val Thr
100 105 110

Gly Val Lys Asn Lys Ile Phe Phe Asp Ala Ile Glu Cys Ala Trp Arg
115 120 125

Glu Ile Leu Lys Lys Arg Phe Arg Glu Ser Lys Glu Thr Leu Ile Thr
130 135 140

Ile Pro Lys Leu Lys Asn Lys Ala Gly His Gly Ala Arg Lys His Arg
145 150 155 160

Asn Lys Lys Leu Leu Ile Arg Arg Arg Ala Phe Met Lys Lys Asn Phe
165 170 175

His Phe Leu Asp Asn Asp Ser Ile Ser Tyr Arg Ser Phe Ala Asn Asn
180 185 190

Ile Ala Cys Val Leu Pro Ser Lys Val Gly Val Asp Ile Gly Gly Ile
195 200 205

```
Ile Ser Pro Asp Val Gly Lys Asp Ile Lys Pro Val Asp Ile Ser Leu
    210                 215                 220

Asn Leu Met Trp Ala Ser Lys Glu Gly Ile Lys Ser Gly Arg Lys Val
225                 230                 235                 240

Glu Ile Tyr Ser Thr Gln Tyr Asp Gly Asn Met Val Lys Lys Ile Glu
                245                 250                 255

Ala Glu Thr Gly Glu Asp Lys Ser Trp Gly Lys Asn Arg Lys Arg Arg
            260                 265                 270

Gln Thr Ser Leu Leu Leu Ser Ile Pro Lys Pro Ser Lys Gln Val Gln
        275                 280                 285

Glu Phe Asp Phe Lys Glu Trp Pro Arg Tyr Lys Asp Ile Glu Lys Lys
    290                 295                 300

Val Gln Trp Arg Gly Phe Pro Ile Lys Ile Ile Phe Asp Ser Asn His
305                 310                 315                 320

Asn Ser Ile Glu Phe Gly Thr Tyr Gln Gly Gly Lys Gln Lys Val Leu
                325                 330                 335

Pro Ile Pro Phe Asn Asp Ser Lys Thr Thr Pro Leu Gly Ser Lys Met
            340                 345                 350

Asn Lys Leu Glu Lys Leu Arg Phe Asn Ser Lys Ile Lys Ser Arg Leu
        355                 360                 365

Gly Ser Ala Ile Ala Ala Asn Lys Phe Leu Glu Ala Ala Arg Thr Tyr
    370                 375                 380

Cys Val Asp Ser Leu Tyr His Glu Val Ser Ser Ala Asn Ala Ile Gly
385                 390                 395                 400

Lys Gly Lys Ile Phe Ile Glu Tyr Tyr Leu Glu Ile Leu Ser Gln Asn
                405                 410                 415

Tyr Ile Glu Ala Ala Gln Lys Gln Leu Gln Arg Phe Ile Glu Ser Ile
            420                 425                 430

Glu Gln Trp Phe Val Ala Asp Pro Phe Gln Gly Arg Leu Lys Gln Tyr
```

```
        435                 440                 445

Phe Lys Asp Asp Leu Lys Arg Ala Lys Cys Phe Leu Cys Ala Asn Arg
    450                 455                 460

Glu Val Gln Thr Thr Cys Tyr Ala Ala Val Lys Leu His Lys Ser Cys
465                 470                 475                 480

Ala Glu Lys Val Lys Asp Lys Asn Lys Glu Leu Ala Ile Lys Glu Arg
                485                 490                 495

Asn Asn Lys Glu Asp Ala Val Ile Lys Glu Val Glu Ala Ser Asn Tyr
            500                 505                 510

Pro Arg Val Ile Arg Leu Lys Leu Thr Lys Thr Ile Thr Asn Lys Ala
        515                 520                 525

Met



<210> 88
<211> 726
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 88
Ser Glu Ser Glu Asn Lys Ile Ile Glu Gln Tyr Tyr Ala Phe Leu Tyr
1               5                   10                  15

Ser Phe Arg Asp Lys Tyr Glu Lys Pro Glu Phe Lys Asn Arg Gly Asp
            20                  25                  30

Ile Lys Arg Lys Leu Gln Asn Lys Trp Glu Asp Phe Leu Lys Glu Gln
        35                  40                  45

Asn Leu Lys Asn Asp Lys Lys Leu Ser Asn Tyr Ile Phe Ser Asn Arg
    50                  55                  60

Asn Phe Arg Arg Ser Tyr Asp Arg Glu Glu Glu Asn Glu Glu Gly Ile
65                  70                  75                  80
```

```
Asp Glu Lys Lys Ser Lys Pro Lys Arg Ile Asn Cys Phe Glu Lys Glu
                85                  90                  95

Lys Asn Leu Lys Asp Gln Tyr Asp Lys Asp Ala Ile Asn Ala Ser Ala
            100                 105                 110

Asn Lys Asp Gly Ala Gln Lys Trp Gly Cys Phe Glu Cys Ile Phe Phe
        115                 120                 125

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

Asn Lys Thr Arg Phe Lys Leu Phe Asp Phe Tyr Leu Asn Leu Lys Gly
145                 150                 155                 160

Cys Lys Ser Cys Leu Arg Ser Thr Tyr His Pro Tyr Arg Ser Asn Val
                165                 170                 175

Tyr Ile Glu Ser Asn Tyr Asp Lys Leu Lys Arg Glu Ile Gly Asn Phe
            180                 185                 190

Leu Gln Gln Lys Asn Ile Phe Gln Arg Met Arg Lys Ala Lys Val Ser
        195                 200                 205

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

Ala Met His Phe Lys Asn Arg Trp Leu Phe Phe Asp Ser Ile Gln Lys
225                 230                 235                 240

Val Leu Arg Glu Thr Ile Lys Gln Arg Leu Lys Gln Met Arg Glu Ser
                245                 250                 255

Tyr Asp Glu Gln Ala Lys Thr Lys Arg Ser Lys Gly His Gly Arg Ala
            260                 265                 270

Lys Tyr Glu Asp Gln Val Arg Met Ile Arg Arg Arg Ala Tyr Ser Ala
        275                 280                 285

Gln Ala His Lys Leu Leu Asp Asn Gly Tyr Ile Thr Leu Phe Asp Tyr
    290                 295                 300

Asp Asp Lys Glu Ile Asn Lys Val Cys Leu Thr Ala Ile Asn Gln Glu
305                 310                 315                 320
```

```
Gly Phe Asp Ile Gly Gly Tyr Leu Asn Ser Asp Ile Asp Asn Val Met
                325                 330                 335

Pro Pro Ile Glu Ile Ser Phe His Leu Lys Trp Lys Tyr Asn Glu Pro
            340                 345                 350

Ile Leu Asn Ile Glu Ser Pro Phe Ser Lys Ala Lys Ile Ser Asp Tyr
        355                 360                 365

Leu Arg Lys Ile Arg Glu Asp Leu Asn Leu Glu Arg Gly Lys Glu Gly
    370                 375                 380

Lys Ala Arg Ser Lys Lys Asn Val Arg Arg Lys Val Leu Ala Ser Lys
385                 390                 395                 400

Gly Glu Asp Gly Tyr Lys Lys Ile Phe Thr Asp Phe Phe Ser Lys Trp
                405                 410                 415

Lys Glu Glu Leu Glu Gly Asn Ala Met Glu Arg Val Leu Ser Gln Ser
            420                 425                 430

Ser Gly Asp Ile Gln Trp Ser Lys Lys Lys Arg Ile His Tyr Thr Thr
        435                 440                 445

Leu Val Leu Asn Ile Asn Leu Leu Asp Lys Lys Gly Val Gly Asn Leu
    450                 455                 460

Lys Tyr Tyr Glu Ile Ala Glu Lys Thr Lys Ile Leu Ser Phe Asp Lys
465                 470                 475                 480

Asn Glu Asn Lys Phe Trp Pro Ile Thr Ile Gln Val Leu Leu Asp Gly
                485                 490                 495

Tyr Glu Ile Gly Thr Glu Tyr Asp Glu Ile Lys Gln Leu Asn Glu Lys
            500                 505                 510

Thr Ser Lys Gln Phe Thr Ile Tyr Asp Pro Asn Thr Lys Ile Ile Lys
        515                 520                 525

Ile Pro Phe Thr Asp Ser Lys Ala Val Pro Leu Gly Met Leu Gly Ile
    530                 535                 540
```

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

Val Ser Lys Ile Phe Lys Gly Gly Leu Asn Ser Lys Ile Val Ser Lys
                565                 570                 575

Ile Gly Lys Gly Ile Tyr Ala Gly Tyr Phe Pro Thr Val Asp Lys Glu
            580                 585                 590

Ile Leu Glu Glu Val Glu Glu Asp Thr Leu Asp Asn Glu Phe Ser Ser
        595                 600                 605

Lys Ser Gln Arg Asn Ile Phe Leu Lys Ser Ile Ile Lys Asn Tyr Asp
    610                 615                 620

Lys Met Leu Lys Glu Gln Leu Phe Asp Phe Tyr Ser Phe Leu Val Arg
625                 630                 635                 640

Asn Asp Leu Gly Val Arg Phe Leu Thr Asp Arg Glu Leu Gln Asn Ile
                645                 650                 655

Glu Asp Glu Ser Phe Asn Leu Glu Lys Arg Phe Phe Glu Thr Asp Arg
            660                 665                 670

Asp Arg Ile Ala Arg Trp Phe Asp Asn Thr Asn Thr Asp Asp Gly Lys
        675                 680                 685

Glu Lys Phe Lys Lys Leu Ala Asn Glu Ile Val Asp Ser Tyr Lys Pro
    690                 695                 700

Arg Leu Ile Arg Leu Pro Val Val Arg Val Ile Lys Arg Ile Gln Pro
705                 710                 715                 720

Val Lys Gln Arg Glu Met
                725
```

<210> 89
<211> 517
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 89

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

Ala Cys Lys Gln Asp Glu Phe Phe Lys Val Ile Gln Asn Ala Trp Arg
            20                  25                  30

Glu Ile Ile Lys Lys Arg Phe Leu Glu Asn Arg Glu Asn Phe Ile Glu
        35                  40                  45

Lys Lys Ile Phe Lys Asn Lys Lys Gly Arg Gly Lys Arg Gln Glu Ser
    50                  55                  60

Asp Lys Thr Ile Gln Arg Asn Arg Ala Ser Val Met Lys Asn Phe Gln
65                  70                  75                  80

Leu Ile Glu Asn Glu Lys Ile Ile Leu Arg Ala Pro Ser Gly His Val
                85                  90                  95

Ala Cys Val Phe Pro Val Lys Val Gly Leu Asp Ile Gly Gly Phe Lys
            100                 105                 110

Thr Asp Asp Leu Glu Lys Asn Ile Phe Pro Pro Arg Thr Ile Thr Ile
        115                 120                 125

Asn Val Phe Trp Lys Asn Arg Asp Arg Gln Arg Lys Gly Arg Lys Leu
    130                 135                 140

Glu Val Trp Gly Ile Lys Ala Arg Thr Lys Leu Ile Glu Lys Val His
145                 150                 155                 160

Lys Trp Asp Lys Leu Glu Glu Val Lys Lys Lys Arg Leu Lys Ser Leu
                165                 170                 175

Glu Gln Lys Gln Glu Lys Ser Leu Asp Asn Trp Ser Glu Val Asn Asn
            180                 185                 190

Asp Ser Phe Tyr Lys Val Gln Ile Asp Glu Leu Gln Glu Lys Ile Asp
        195                 200                 205

Lys Ser Leu Lys Gly Arg Thr Met Asn Lys Ile Leu Asp Asn Lys Ala
    210                 215                 220

Lys Glu Ser Lys Glu Ala Glu Gly Leu Tyr Ile Glu Trp Glu Lys Asp
```

225 230 235 240

Phe Glu Gly Glu Met Leu Arg Arg Ile Glu Ala Ser Thr Gly Gly Glu
245 250 255

Glu Lys Trp Gly Lys Arg Arg Gln Arg Arg His Thr Ser Leu Leu Leu
260 265 270

Asp Ile Lys Asn Asn Ser Arg Gly Ser Lys Glu Ile Ile Asn Phe Tyr
275 280 285

Ser Tyr Ala Lys Gln Gly Lys Lys Glu Lys Lys Ile Glu Phe Phe Pro
290 295 300

Phe Pro Leu Thr Ile Thr Leu Asp Ala Glu Glu Glu Ser Pro Leu Asn
305 310 315 320

Ile Lys Ser Ile Pro Ile Glu Asp Lys Asn Ala Thr Ser Lys Tyr Phe
325 330 335

Ser Ile Pro Phe Thr Glu Thr Arg Ala Thr Pro Leu Ser Ile Leu Gly
340 345 350

Asp Arg Val Gln Lys Phe Lys Thr Lys Asn Ile Ser Gly Ala Ile Lys
355 360 365

Arg Asn Leu Gly Ser Ser Ile Ser Ser Cys Lys Ile Val Gln Asn Ala
370 375 380

Glu Thr Ser Ala Lys Ser Ile Leu Ser Leu Pro Asn Val Lys Glu Asp
385 390 395 400

Asn Asn Met Glu Ile Phe Ile Asn Thr Met Ser Lys Asn Tyr Phe Arg
405 410 415

Ala Met Met Lys Gln Met Glu Ser Phe Ile Phe Glu Met Glu Pro Lys
420 425 430

Thr Leu Ile Asp Pro Tyr Lys Glu Lys Ala Ile Lys Trp Phe Glu Val
435 440 445

Ala Ala Ser Ser Arg Ala Lys Arg Lys Leu Lys Lys Leu Ser Lys Ala
450 455 460

Asp Ile Lys Lys Ser Glu Leu Leu Leu Ser Asn Thr Glu Glu Phe Glu
465 470 475 480

Lys Glu Lys Gln Glu Lys Leu Glu Ala Leu Glu Lys Glu Ile Glu Glu
485 490 495

Phe Tyr Leu Pro Arg Ile Val Arg Leu Gln Leu Thr Lys Thr Ile Leu
500 505 510

Glu Thr Pro Val Met
515

<210> 90
<211> 481
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 90
Lys Lys Leu Gln Leu Leu Gly His Lys Ile Leu Leu Lys Glu Tyr Asp
1 5 10 15

Pro Asn Ala Val Asn Ala Ala Ala Asn Phe Glu Thr Ser Thr Ala Glu
20 25 30

Leu Cys Gly Gln Cys Lys Met Lys Pro Phe Lys Asn Lys Arg Arg Phe
35 40 45

Gln Tyr Thr Phe Gly Lys Asn Tyr His Gly Cys Leu Ser Cys Ile Gln
50 55 60

Asn Val Tyr Tyr Ala Lys Lys Arg Ile Val Gln Ile Ala Lys Glu Glu
65 70 75 80

Leu Lys His Gln Leu Thr Asp Ser Ile Ala Ser Ile Pro Tyr Lys Tyr
85 90 95

Thr Ser Leu Phe Ser Asn Thr Asn Ser Ile Asp Glu Leu Tyr Ile Leu
100 105 110

Lys Gln Glu Arg Ala Ala Phe Phe Ser Asn Thr Asn Ser Ile Asp Glu
115 120 125

```
Leu Tyr Ile Thr Gly Ile Glu Asn Asn Ile Ala Phe Lys Val Ile Ser
    130                 135                 140

Ala Ile Trp Asp Glu Ile Ile Lys Lys Arg Arg Gln Arg Tyr Ala Glu
145                 150                 155                 160

Ser Leu Thr Asp Thr Gly Thr Val Lys Ala Asn Arg Gly His Gly Gly
                165                 170                 175

Thr Ala Tyr Lys Ser Asn Thr Arg Gln Glu Lys Ile Arg Ala Leu Gln
            180                 185                 190

Lys Gln Thr Leu His Met Val Thr Asn Pro Tyr Ile Ser Leu Ala Arg
        195                 200                 205

Tyr Lys Asn Asn Tyr Ile Val Ala Thr Leu Pro Arg Thr Ile Gly Met
    210                 215                 220

His Ile Gly Ala Ile Lys Asp Arg Asp Pro Gln Lys Lys Leu Ser Asp
225                 230                 235                 240

Tyr Ala Ile Asn Phe Asn Val Phe Trp Ser Asp Asp Arg Gln Leu Ile
                245                 250                 255

Glu Leu Ser Thr Val Gln Tyr Thr Gly Asp Met Val Arg Lys Ile Glu
            260                 265                 270

Ala Glu Thr Gly Glu Asn Asn Lys Trp Gly Glu Asn Met Lys Arg Thr
        275                 280                 285

Lys Thr Ser Leu Leu Leu Glu Ile Leu Thr Lys Lys Thr Thr Asp Glu
    290                 295                 300

Leu Thr Phe Lys Asp Trp Ala Phe Ser Thr Lys Lys Glu Ile Asp Ser
305                 310                 315                 320

Val Thr Lys Lys Thr Tyr Gln Gly Phe Pro Ile Gly Ile Ile Phe Glu
                325                 330                 335

Gly Asn Glu Ser Ser Val Lys Phe Gly Ser Gln Asn Tyr Phe Pro Leu
            340                 345                 350
```

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

Asp Trp Leu Arg Lys Gly Ser Phe Ser Ser Gln Met Lys Thr Ser Tyr
    370                 375                 380

Gly Leu Ala Ile Tyr Ser Asn Lys Val Thr Asn Ala Ile Pro Ala Tyr
385                 390                 395                 400

Val Ile Lys Asn Met Phe Tyr Lys Ile Ala Arg Ala Glu Asn Gly Lys
                405                 410                 415

Gln Ile Lys Ala Lys Phe Leu Lys Lys Tyr Leu Asp Ile Ala Gly Asn
            420                 425                 430

Asn Tyr Val Pro Phe Ile Ile Met Gln His Tyr Arg Val Leu Asp Thr
        435                 440                 445

Phe Glu Glu Met Pro Ile Ser Gln Pro Lys Val Ile Arg Leu Ser Leu
    450                 455                 460

Thr Lys Thr Gln His Ile Ile Ile Lys Lys Asp Lys Thr Asp Ser Lys
465                 470                 475                 480

Met
```

<210> 91
<211> 534
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 91

```
Asn Thr Ser Asn Leu Ile Asn Leu Gly Lys Lys Ala Ile Asn Ile Ser
1               5                   10                  15

Ala Asn Tyr Asp Ala Asn Leu Glu Val Gly Cys Lys Asn Cys Lys Phe
            20                  25                  30

Leu Ser Ser Asn Gly Asn Phe Pro Arg Gln Thr Asn Val Lys Glu Gly
        35                  40                  45
```

```
Cys His Ser Cys Glu Lys Ser Thr Tyr Glu Pro Ser Ile Tyr Leu Val
    50                  55                  60

Lys Ile Gly Glu Arg Lys Ala Lys Tyr Asp Val Leu Asp Ser Leu Lys
65                  70                  75                  80

Lys Phe Thr Phe Gln Ser Leu Lys Tyr Gln Ser Lys Lys Ser Met Lys
                85                  90                  95

Ser Arg Asn Lys Lys Pro Lys Glu Leu Lys Glu Phe Val Ile Phe Ala
            100                 105                 110

Asn Lys Asn Lys Ala Phe Asp Val Ile Gln Lys Ser Tyr Asn His Leu
        115                 120                 125

Ile Leu Gln Ile Lys Lys Glu Ile Asn Arg Met Asn Ser Lys Lys Arg
    130                 135                 140

Lys Lys Asn His Lys Arg Arg Leu Phe Arg Asp Arg Glu Lys Gln Leu
145                 150                 155                 160

Asn Lys Leu Arg Leu Ile Glu Ser Ser Asn Leu Phe Leu Pro Arg Glu
                165                 170                 175

Asn Lys Gly Asn Asn His Val Phe Thr Tyr Val Ala Ile His Ser Val
            180                 185                 190

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

Glu Thr Glu Leu Thr Tyr Gln Leu Tyr Phe Asn Asp Asp Lys Arg Leu
    210                 215                 220

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

Lys Leu Trp Asn Leu Arg Lys Glu Lys Glu Pro Leu Asp Leu Glu Tyr
                245                 250                 255

Glu Lys Pro Leu Asn Lys Ser Ile Thr Phe Ser Ile Lys Asn Asp Asn
            260                 265                 270

Leu Phe Lys Val Ser Lys Asp Leu Met Leu Arg Arg Ala Lys Phe Asn
```

```
        275                 280                 285

Ile Gln Gly Lys Glu Lys Leu Ser Lys Glu Glu Arg Lys Ile Asn Arg
    290                 295                 300

Asp Leu Ile Lys Ile Lys Gly Leu Val Asn Ser Met Ser Tyr Gly Arg
305                 310                 315                 320

Phe Asp Glu Leu Lys Lys Glu Lys Asn Ile Trp Ser Pro His Ile Tyr
                325                 330                 335

Arg Glu Val Arg Gln Lys Glu Ile Lys Pro Cys Leu Ile Lys Asn Gly
            340                 345                 350

Asp Arg Ile Glu Ile Phe Glu Gln Leu Lys Lys Lys Met Glu Arg Leu
        355                 360                 365

Arg Arg Phe Arg Glu Lys Arg Gln Lys Lys Ile Ser Lys Asp Leu Ile
    370                 375                 380

Phe Ala Glu Arg Ile Ala Tyr Asn Phe His Thr Lys Ser Ile Lys Asn
385                 390                 395                 400

Thr Ser Asn Lys Ile Asn Ile Asp Gln Glu Ala Lys Arg Gly Lys Ala
                405                 410                 415

Ser Tyr Met Arg Lys Arg Ile Gly Tyr Glu Thr Phe Lys Asn Lys Tyr
            420                 425                 430

Cys Glu Gln Cys Leu Ser Lys Gly Asn Val Tyr Arg Asn Val Gln Lys
        435                 440                 445

Gly Cys Ser Cys Phe Glu Asn Pro Phe Asp Trp Ile Lys Lys Gly Asp
    450                 455                 460

Glu Asn Leu Leu Pro Lys Lys Asn Glu Asp Leu Arg Val Lys Gly Ala
465                 470                 475                 480

Phe Arg Asp Glu Ala Leu Glu Lys Gln Ile Val Lys Ile Ala Phe Asn
                485                 490                 495

Ile Ala Lys Gly Tyr Glu Asp Phe Tyr Asp Asn Leu Gly Glu Ser Thr
            500                 505                 510
```

Glu Lys Asp Leu Lys Leu Lys Phe Lys Val Gly Thr Thr Ile Asn Glu
515 520 525

Gln Glu Ser Leu Lys Leu
530

<210> 92
<211> 537
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 92
Thr Ser Asn Pro Ile Lys Leu Gly Lys Lys Ala Ile Asn Ile Ser Ala
1 5 10 15

Asn Tyr Asp Ser Asn Leu Gln Ile Gly Cys Lys Asn Cys Lys Phe Leu
20 25 30

Ser Tyr Asn Gly Asn Phe Pro Arg Gln Thr Asn Val Lys Glu Gly Cys
35 40 45

His Ser Cys Glu Lys Ser Thr Tyr Glu Pro Pro Val Tyr Thr Val Arg
50 55 60

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

Phe Ile Phe Leu Ser Leu Lys Tyr Arg Gln Ser Lys Lys Met Lys Thr
85 90 95

Arg Ser Lys Gly Ile Arg Gly Leu Glu Glu Phe Val Ile Ser Ala Asn
100 105 110

Leu Lys Lys Ala Met Asp Val Ile Gln Lys Ser Tyr Arg His Leu Ile
115 120 125

Leu Asn Ile Lys Asn Glu Ile Val Arg Met Asn Gly Lys Lys Arg Asn
130 135 140

Lys Asn His Lys Arg Leu Leu Phe Arg Asp Arg Glu Lys Gln Leu Asn
145 150 155 160

```
Lys Leu Arg Leu Ile Glu Gly Ser Ser Phe Phe Lys Pro Pro Thr Val
                165                 170                 175

Lys Gly Asp Asn Ser Ile Phe Thr Cys Val Ala Ile His Asn Ile Gly
            180                 185                 190

Arg Asp Ile Gly Ile Ala Gly Asp Tyr Phe Asp Lys Leu Glu Pro Lys
        195                 200                 205

Ile Glu Leu Thr Tyr Gln Leu Tyr Tyr Glu Tyr Asn Pro Lys Lys Glu
    210                 215                 220

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

Lys Ile Ile Glu Ile Lys Glu Lys Leu Trp Asn Leu Arg Lys Glu Lys
                245                 250                 255

Ser Pro Leu Asp Leu Glu Tyr Glu Lys Pro Leu Thr Lys Ser Ile Thr
            260                 265                 270

Phe Leu Val Lys Arg Asp Gly Val Phe Arg Ile Ser Lys Asp Leu Met
        275                 280                 285

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

Glu Glu Arg Lys Ile Asn Arg Asp Leu Ile Lys Ile Lys Ser Asn Ile
305                 310                 315                 320

Ile Ser Leu Thr Tyr Gly Arg Phe Asp Glu Leu Lys Lys Asp Lys Thr
                325                 330                 335

Ile Trp Ser Pro His Ile Phe Arg Asp Val Lys Gln Gly Lys Ile Thr
            340                 345                 350

Pro Cys Ile Glu Arg Lys Gly Asp Arg Met Asp Ile Phe Gln Gln Leu
        355                 360                 365

Arg Lys Lys Ser Glu Arg Leu Arg Glu Asn Arg Lys Lys Arg Gln Lys
    370                 375                 380
```

```
Lys Ile Ser Lys Asp Leu Ile Phe Ala Glu Arg Ile Ala Tyr Asn Phe
385                 390                 395                 400


His Thr Lys Ser Ile Lys Asn Thr Ser Asn Leu Ile Asn Ile Lys His
                405                 410                 415


Glu Ala Lys Arg Gly Lys Ala Ser Tyr Met Arg Lys Arg Ile Gly Asn
            420                 425                 430


Glu Thr Phe Arg Ile Lys Tyr Cys Glu Gln Cys Phe Pro Lys Asn Asn
        435                 440                 445


Val Tyr Lys Asn Val Gln Lys Gly Cys Ser Cys Phe Glu Asp Pro Phe
    450                 455                 460


Glu Tyr Ile Lys Lys Gly Asn Glu Asp Leu Ile Pro Asn Lys Asn Gln
465                 470                 475                 480


Asp Leu Lys Ala Lys Gly Ala Phe Arg Asp Asp Ala Leu Glu Lys Gln
                485                 490                 495


Ile Ile Lys Val Ala Phe Asn Ile Ala Lys Gly Tyr Glu Asp Phe Tyr
            500                 505                 510


Glu Asn Leu Lys Lys Thr Thr Glu Lys Asp Ile Arg Leu Lys Phe Lys
        515                 520                 525


Val Gly Thr Ile Ile Ser Glu Glu Met
    530                 535


<210> 93
<211> 541
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 93
Asn Asn Ser Ile Asn Leu Ser Lys Lys Ala Ile Asn Ile Ser Ala Asn
1               5                   10                  15


Tyr Asp Ala Asn Leu Gln Val Arg Cys Lys Asn Cys Lys Phe Leu Ser
            20                  25                  30
```

```
Ser Asn Gly Asn Phe Pro Arg Gln Thr Asp Val Lys Glu Gly Cys His
        35                  40                  45

Ser Cys Glu Lys Ser Thr Tyr Glu Pro Pro Val Tyr Asp Val Lys Ile
    50                  55                  60

Gly Glu Ile Lys Ala Lys Tyr Glu Val Leu Asp Ser Leu Lys Lys Phe
65                  70                  75                  80

Thr Phe Gln Ser Leu Lys Tyr Gln Leu Ser Lys Ser Met Lys Phe Arg
                85                  90                  95

Ser Lys Lys Ile Lys Glu Leu Lys Glu Phe Val Ile Phe Ala Lys Glu
            100                 105                 110

Ser Lys Ala Leu Asn Val Ile Asn Arg Ser Tyr Lys His Leu Ile Leu
        115                 120                 125

Asn Ile Lys Asn Asp Ile Asn Arg Met Asn Ser Lys Lys Arg Ile Lys
    130                 135                 140

Asn His Lys Gly Arg Leu Phe Leu Asp Arg Gln Lys Gln Leu Ser Lys
145                 150                 155                 160

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

Gly Asn Lys Ser Val Phe Thr Cys Val Ala Ile His Ser Ile Gly Arg
            180                 185                 190

Asp Ile Gly Ile Ala Gly Leu Tyr Asp Ser Phe Thr Lys Pro Val Asn
        195                 200                 205

Glu Ile Thr Tyr Gln Ile Phe Phe Ser Gly Glu Arg Arg Leu Leu Tyr
    210                 215                 220

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

Trp Ser Leu Lys Asn Glu Lys Lys Pro Leu Asp Leu Leu Tyr Glu Lys
                245                 250                 255

Pro Leu Gly Lys Asn Leu Asn Phe Asn Val Lys Gly Gly Asp Leu Phe
```

```
            260                 265                 270

Arg Val Ser Lys Asp Leu Met Ile Arg Asn Ala Lys Phe Asn Val His
        275                 280                 285

Gly Arg Gln Arg Leu Ser Asp Glu Glu Arg Leu Ile Asn Arg Asn Phe
    290                 295                 300

Ile Lys Ile Lys Gly Glu Val Val Ser Leu Ser Tyr Gly Arg Phe Glu
305                 310                 315                 320

Glu Leu Lys Lys Asp Arg Lys Leu Trp Ser Pro His Ile Phe Lys Asp
                325                 330                 335

Val Arg Gln Asn Lys Ile Lys Pro Cys Leu Val Met Gln Gly Gln Arg
            340                 345                 350

Ile Asp Ile Phe Glu Gln Leu Lys Arg Lys Leu Glu Leu Leu Lys Lys
        355                 360                 365

Ile Arg Lys Ser Arg Gln Lys Lys Leu Ser Lys Asp Leu Ile Phe Gly
    370                 375                 380

Glu Arg Ile Ala Tyr Asn Phe His Thr Lys Ser Ile Lys Asn Thr Ser
385                 390                 395                 400

Asn Lys Ile Asn Ile Asp Ser Asp Ala Lys Arg Gly Arg Ala Ser Tyr
                405                 410                 415

Met Arg Lys Arg Ile Gly Asn Glu Thr Phe Lys Leu Lys Tyr Cys Asp
            420                 425                 430

Val Cys Phe Pro Lys Ala Asn Val Tyr Arg Arg Val Gln Asn Gly Cys
        435                 440                 445

Ser Cys Ser Glu Asn Pro Tyr Asn Tyr Ile Lys Lys Gly Asp Lys Asp
    450                 455                 460

Leu Leu Pro Lys Lys Asp Glu Gly Leu Ala Ile Lys Gly Ala Phe Arg
465                 470                 475                 480

Asp Glu Lys Leu Asn Lys Gln Ile Ile Lys Val Ala Phe Asn Ile Ala
                485                 490                 495
```

Lys Gly Tyr Glu Asp Phe Tyr Asp Asp Leu Lys Lys Arg Thr Glu Lys
500 505 510

Asp Val Asp Leu Lys Phe Lys Ile Gly Thr Thr Val Leu Asp Gln Lys
515 520 525

Pro Met Glu Ile Phe Asp Gly Ile Val Ile Thr Trp Leu
530 535 540

<210> 94
<211> 542
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 94
Leu Leu Thr Thr Val Val Glu Thr Asn Asn Leu Ala Lys Lys Ala Ile
1 5 10 15

Asn Val Ala Ala Asn Phe Asp Ala Asn Ile Asp Arg Gln Tyr Tyr Arg
20 25 30

Cys Thr Pro Asn Leu Cys Arg Phe Ile Ala Gln Ser Pro Arg Glu Thr
35 40 45

Lys Glu Lys Asp Ala Gly Cys Ser Ser Cys Thr Gln Ser Thr Tyr Asp
50 55 60

Pro Lys Val Tyr Val Ile Lys Ile Gly Lys Leu Leu Ala Lys Tyr Glu
65 70 75 80

Ile Leu Lys Ser Leu Lys Arg Phe Leu Phe Met Asn Arg Tyr Phe Lys
85 90 95

Gln Lys Lys Thr Glu Arg Ala Gln Gln Lys Gln Lys Ile Gly Thr Glu
100 105 110

Leu Asn Glu Met Ser Ile Phe Ala Lys Ala Thr Asn Ala Met Glu Val
115 120 125

Ile Lys Arg Ala Thr Lys His Cys Thr Tyr Asp Ile Ile Pro Glu Thr
130 135 140

```
Lys Ser Leu Gln Met Leu Lys Arg Arg Arg His Arg Val Lys Val Arg
145                 150                 155                 160

Ser Leu Leu Lys Ile Leu Lys Glu Arg Arg Met Lys Ile Lys Lys Ile
                165                 170                 175

Pro Asn Thr Phe Ile Glu Ile Pro Lys Gln Ala Lys Lys Asn Lys Ser
            180                 185                 190

Asp Tyr Tyr Val Ala Ala Ala Leu Lys Ser Cys Gly Ile Asp Val Gly
        195                 200                 205

Leu Cys Gly Ala Tyr Glu Lys Asn Ala Glu Val Glu Ala Glu Tyr Thr
    210                 215                 220

Tyr Gln Leu Tyr Tyr Glu Tyr Lys Gly Asn Ser Ser Thr Lys Arg Ile
225                 230                 235                 240

Leu Tyr Cys Tyr Asn Asn Pro Gln Lys Asn Ile Arg Glu Phe Trp Glu
                245                 250                 255

Ala Phe Tyr Ile Gln Gly Ser Lys Ser His Val Asn Thr Pro Gly Thr
            260                 265                 270

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

Glu Ala Leu Asp Phe Arg Val Trp Asn Ser Asp Leu Lys Ile Arg Asn
    290                 295                 300

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

Glu Ile Lys Lys Gly Met Gly Asp Ile Lys Arg Lys Ile Gly Asn Leu
                325                 330                 335

Thr Tyr Gly Lys Ser Pro Ser Glu Leu Lys Ser Ile His Val Tyr Arg
            340                 345                 350

Thr Glu Arg Glu Asn Pro Lys Lys Pro Arg Ala Ala Arg Lys Lys Glu
        355                 360                 365
```

```
Asp Asn Phe Met Glu Ile Phe Glu Met Gln Arg Lys Lys Asp Tyr Glu
    370                 375                 380

Val Asn Lys Lys Arg Arg Lys Glu Ala Thr Asp Ala Ala Lys Ile Met
385                 390                 395                 400

Asp Phe Ala Glu Glu Pro Ile Arg His Tyr His Thr Asn Asn Leu Lys
                405                 410                 415

Ala Val Arg Arg Ile Asp Met Asn Glu Gln Val Glu Arg Lys Lys Thr
            420                 425                 430

Ser Val Phe Leu Lys Arg Ile Met Gln Asn Gly Tyr Arg Gly Asn Tyr
        435                 440                 445

Cys Arg Lys Cys Ile Lys Ala Pro Glu Gly Ser Asn Arg Asp Glu Asn
    450                 455                 460

Val Leu Glu Lys Asn Glu Gly Cys Leu Asp Cys Ile Gly Ser Glu Phe
465                 470                 475                 480

Ile Trp Lys Lys Ser Ser Lys Glu Lys Lys Gly Leu Trp His Thr Asn
                485                 490                 495

Arg Leu Leu Arg Arg Ile Arg Leu Gln Cys Phe Thr Thr Ala Lys Ala
            500                 505                 510

Tyr Glu Asn Phe Tyr Asn Asp Leu Phe Glu Lys Lys Glu Ser Ser Leu
        515                 520                 525

Asp Ile Ile Lys Leu Lys Val Ser Ile Thr Thr Lys Ser Met
    530                 535                 540
```

<210> 95
<211> 564
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 95

```
Ala Ser Thr Met Asn Leu Ala Lys Gln Ala Ile Asn Phe Ala Ala Asn
1               5                   10                  15
```

```
Tyr Asp Ser Asn Leu Glu Ile Gly Cys Lys Gly Cys Lys Phe Met Ser
            20                  25                  30

Thr Trp Ser Lys Lys Ser Asn Pro Lys Phe Tyr Pro Arg Gln Asn Asn
        35                  40                  45

Gln Ala Asn Lys Cys His Ser Cys Thr Tyr Ser Thr Gly Glu Pro Glu
    50                  55                  60

Val Pro Ile Ile Glu Ile Gly Glu Arg Ala Ala Lys Tyr Lys Ile Phe
65                  70                  75                  80

Thr Ala Leu Lys Lys Phe Val Phe Met Ser Val Ala Tyr Lys Glu Arg
                85                  90                  95

Arg Arg Gln Arg Phe Lys Ser Lys Lys Pro Lys Glu Leu Lys Glu Leu
            100                 105                 110

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

Val Val His Cys Tyr Gly Asp Val Lys Gln Glu Ile Pro Arg Ile Arg
    130                 135                 140

Lys Ile Lys Val Leu Lys Asn His Lys Gly Arg Leu Phe Tyr Lys Gln
145                 150                 155                 160

Lys Arg Ser Lys Ile Lys Ile Ala Lys Leu Glu Lys Gly Ser Phe Phe
                165                 170                 175

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

Glu Ala Ser Leu Asn Lys Pro Ile Leu Val Thr Thr Ala Leu Asn Thr
        195                 200                 205

Ile Gly Ala Asp Ile Gly Leu Ile Asn Asp Tyr Ser Thr Ile Ala Pro
    210                 215                 220

Thr Glu Thr Asp Ile Ser Trp Gln Val Tyr Tyr Glu Phe Ile Pro Asn
225                 230                 235                 240

Gly Asp Ser Glu Ala Val Lys Lys Arg Leu Leu Tyr Phe Tyr Lys Pro
```

```
                245                 250                 255

Lys Gly Ala Leu Ile Lys Ser Ile Arg Asp Lys Tyr Phe Lys Lys Gly
            260                 265                 270

His Glu Asn Ala Val Asn Thr Gly Phe Phe Lys Tyr Gln Gly Lys Ile
        275                 280                 285

Val Lys Gly Pro Ile Lys Phe Val Asn Asn Glu Leu Asp Phe Ala Arg
    290                 295                 300

Lys Pro Asp Leu Lys Ser Met Lys Ile Lys Arg Ala Gly Phe Ala Ile
305                 310                 315                 320

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

Ser Ile Lys Ile Lys Asn Lys Ile Tyr Ser Leu Ser Tyr Gly Arg Lys
            340                 345                 350

Lys Thr Leu Ser Asp Lys Asp Ile Ile Lys His Leu Tyr Arg Pro Val
        355                 360                 365

Arg Gln Lys Gly Val Lys Pro Leu Glu Tyr Arg Lys Ala Pro Asp Gly
    370                 375                 380

Phe Leu Glu Phe Phe Tyr Ser Leu Lys Arg Lys Glu Arg Arg Leu Arg
385                 390                 395                 400

Lys Gln Lys Glu Lys Arg Gln Lys Asp Met Ser Glu Ile Ile Asp Ala
                405                 410                 415

Ala Asp Glu Phe Ala Trp His Arg His Thr Gly Ser Ile Lys Lys Thr
            420                 425                 430

Thr Asn His Ile Asn Phe Lys Ser Glu Val Lys Arg Gly Lys Val Pro
        435                 440                 445

Ile Met Lys Lys Arg Ile Ala Asn Asp Ser Phe Asn Thr Arg His Cys
    450                 455                 460

Gly Lys Cys Val Lys Gln Gly Asn Ala Ile Asn Lys Tyr Tyr Ile Glu
465                 470                 475                 480
```

```
Lys Gln Lys Asn Cys Phe Asp Cys Asn Ser Ile Glu Phe Lys Trp Glu
                485                 490                 495

Lys Ala Ala Leu Glu Lys Lys Gly Ala Phe Lys Leu Asn Lys Arg Leu
            500                 505                 510

Gln Tyr Ile Val Lys Ala Cys Phe Asn Val Ala Lys Ala Tyr Glu Ser
        515                 520                 525

Phe Tyr Glu Asp Phe Arg Lys Gly Glu Glu Glu Ser Leu Asp Leu Lys
    530                 535                 540

Phe Lys Ile Gly Thr Thr Thr Thr Leu Lys Gln Tyr Pro Gln Asn Lys
545                 550                 555                 560

Ala Arg Ala Met
```

<210> 96
<211> 610
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 96

```
His Ser His Asn Leu Met Leu Thr Lys Leu Gly Lys Gln Ala Ile Asn
1               5                   10                  15

Phe Ala Ala Asn Tyr Asp Ala Asn Leu Glu Ile Gly Cys Lys Asn Cys
            20                  25                  30

Lys Phe Leu Ser Tyr Ser Pro Lys Gln Ala Asn Pro Lys Lys Tyr Pro
        35                  40                  45

Arg Gln Thr Asp Val His Glu Asp Gly Asn Ile Ala Cys His Ser Cys
    50                  55                  60

Met Gln Ser Thr Lys Glu Pro Pro Val Tyr Ile Val Pro Ile Gly Glu
65                  70                  75                  80

Arg Lys Ser Lys Tyr Glu Ile Leu Thr Ser Leu Asn Lys Phe Thr Phe
                85                  90                  95
```

```
Leu Ala Leu Lys Tyr Lys Glu Lys Lys Arg Gln Ala Phe Arg Ala Lys
            100                 105                 110

Lys Pro Lys Glu Leu Gln Glu Leu Ala Ile Ala Phe Asn Lys Glu Lys
        115                 120                 125

Ala Ile Lys Val Ile Asp Lys Ser Ile Gln His Leu Ile Leu Asn Ile
    130                 135                 140

Lys Pro Glu Ile Ala Arg Ile Gln Arg Gln Lys Arg Leu Lys Asn Arg
145                 150                 155                 160

Lys Gly Lys Leu Leu Tyr Leu His Lys Arg Tyr Ala Ile Lys Met Gly
                165                 170                 175

Leu Ile Lys Asn Gly Lys Tyr Phe Lys Val Gly Ser Pro Lys Lys Asp
            180                 185                 190

Gly Lys Lys Leu Leu Val Leu Cys Ala Leu Asn Thr Ile Gly Arg Asp
        195                 200                 205

Ile Gly Ile Ile Gly Asn Ile Glu Glu Asn Asn Arg Ser Glu Thr Glu
    210                 215                 220

Ile Thr Tyr Gln Leu Tyr Phe Asp Cys Leu Asp Ala Asn Pro Asn Glu
225                 230                 235                 240

Leu Arg Ile Lys Glu Ile Glu Tyr Asn Arg Leu Lys Ser Tyr Glu Arg
                245                 250                 255

Lys Ile Lys Arg Leu Val Tyr Ala Tyr Lys Pro Lys Gln Thr Lys Ile
            260                 265                 270

Leu Glu Ile Arg Ser Lys Phe Phe Ser Lys Gly His Glu Asn Lys Val
        275                 280                 285

Asn Thr Gly Ser Phe Asn Phe Glu Asn Pro Leu Asn Lys Ser Ile Ser
    290                 295                 300

Ile Lys Val Lys Asn Ser Ala Phe Asp Phe Lys Ile Gly Ala Pro Phe
305                 310                 315                 320
```

```
Ile Met Leu Arg Asn Gly Lys Phe His Ile Pro Thr Lys Lys Arg Leu
                325                 330                 335

Ser Lys Glu Glu Arg Glu Ile Asn Arg Thr Leu Ser Lys Ile Lys Gly
            340                 345                 350

Arg Val Phe Arg Leu Thr Tyr Gly Arg Asn Ile Ser Glu Gln Gly Ser
        355                 360                 365

Lys Ser Leu His Ile Tyr Arg Lys Glu Arg Gln His Pro Lys Leu Ser
    370                 375                 380

Leu Glu Ile Arg Lys Gln Pro Asp Ser Phe Ile Asp Glu Phe Glu Lys
385                 390                 395                 400

Leu Arg Leu Lys Gln Asn Phe Ile Ser Lys Leu Lys Lys Gln Arg Gln
                405                 410                 415

Lys Lys Leu Ala Asp Leu Leu Gln Phe Ala Asp Arg Ile Ala Tyr Asn
            420                 425                 430

Tyr His Thr Ser Ser Leu Glu Lys Thr Ser Asn Phe Ile Asn Tyr Lys
        435                 440                 445

Pro Glu Val Lys Arg Gly Arg Thr Ser Tyr Ile Lys Lys Arg Ile Gly
    450                 455                 460

Asn Glu Gly Phe Glu Lys Leu Tyr Cys Glu Thr Cys Ile Lys Ser Asn
465                 470                 475                 480

Asp Lys Glu Asn Ala Tyr Ala Val Glu Lys Glu Glu Leu Cys Phe Val
                485                 490                 495

Cys Lys Ala Lys Pro Phe Thr Trp Lys Lys Thr Asn Lys Asp Lys Leu
            500                 505                 510

Gly Ile Phe Lys Tyr Pro Ser Arg Ile Lys Asp Phe Ile Arg Ala Ala
        515                 520                 525

Phe Thr Val Ala Lys Ser Tyr Asn Asp Phe Tyr Glu Asn Leu Lys Lys
    530                 535                 540

Lys Asp Leu Lys Asn Glu Ile Phe Leu Lys Phe Lys Ile Gly Leu Ile
545                 550                 555                 560
```

Leu Ser His Glu Lys Lys Asn His Ile Ser Ile Ala Lys Ser Val Ala
565 570 575

Glu Asp Glu Arg Ile Ser Gly Lys Ser Ile Lys Asn Ile Leu Asn Lys
580 585 590

Ser Ile Lys Leu Glu Lys Asn Cys Tyr Ser Cys Phe Phe His Lys Glu
595 600 605

Asp Met
610

<210> 97
<211> 552
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 97
Ser Leu Glu Arg Val Ile Asp Lys Arg Asn Leu Ala Lys Lys Ala Ile
1 5 10 15

Asn Ile Ala Ala Asn Phe Asp Ala Asn Ile Asn Lys Gly Phe Tyr Arg
20 25 30

Cys Glu Thr Asn Gln Cys Met Phe Ile Ala Gln Lys Pro Arg Lys Thr
35 40 45

Asn Asn Thr Gly Cys Ser Ser Cys Leu Gln Ser Thr Tyr Asp Pro Val
50 55 60

Ile Tyr Val Val Lys Val Gly Glu Met Leu Ala Lys Tyr Glu Ile Leu
65 70 75 80

Lys Ser Leu Lys Arg Phe Val Phe Met Asn Arg Ser Phe Lys Gln Lys
85 90 95

Lys Thr Glu Lys Ala Lys Gln Lys Glu Arg Ile Gly Gly Glu Leu Asn
100 105 110

Glu Met Ser Ile Phe Ala Asn Ala Ala Leu Ala Met Gly Val Ile Lys

```
        115                 120                 125

Arg Ala Ile Arg His Cys His Val Asp Ile Arg Pro Glu Ile Asn Arg
    130                 135                 140

Leu Ser Glu Leu Lys Lys Thr Lys His Arg Val Ala Ala Lys Ser Leu
145                 150                 155                 160

Val Lys Ile Val Lys Gln Arg Lys Thr Lys Trp Lys Gly Ile Pro Asn
                165                 170                 175

Ser Phe Ile Gln Ile Pro Gln Lys Ala Arg Asn Lys Asp Ala Asp Phe
            180                 185                 190

Tyr Val Ala Ser Ala Leu Lys Ser Gly Gly Ile Asp Ile Gly Leu Cys
        195                 200                 205

Gly Thr Tyr Asp Lys Lys Pro His Ala Asp Pro Arg Trp Thr Tyr Gln
    210                 215                 220

Leu Tyr Phe Asp Thr Glu Asp Glu Ser Glu Lys Arg Leu Leu Tyr Cys
225                 230                 235                 240

Tyr Asn Asp Pro Gln Ala Lys Ile Arg Asp Phe Trp Lys Thr Phe Tyr
                245                 250                 255

Glu Arg Gly Asn Pro Ser Met Val Asn Ser Pro Gly Thr Ile Glu Phe
            260                 265                 270

Arg Met Glu Gly Phe Phe Glu Lys Met Thr Pro Ile Ser Ile Glu Ser
        275                 280                 285

Lys Asp Phe Asp Phe Arg Val Trp Asn Lys Asp Leu Leu Ile Arg Arg
    290                 295                 300

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

Glu Ile Lys Lys Ala Met Gly Ser Val Lys Arg Val Leu Ala Asn Met
                325                 330                 335

Thr Tyr Gly Lys Ser Pro Thr Asp Lys Lys Ser Ile Pro Val Tyr Arg
            340                 345                 350
```

```
Val Glu Arg Glu Lys Pro Lys Lys Pro Arg Ala Val Arg Lys Glu Glu
        355                 360                 365

Asn Glu Leu Ala Asp Lys Leu Glu Asn Tyr Arg Arg Glu Asp Phe Leu
    370                 375                 380

Ile Arg Asn Arg Arg Lys Arg Glu Ala Thr Glu Ile Ala Lys Ile Ile
385                 390                 395                 400

Asp Ala Ala Glu Pro Pro Ile Arg His Tyr His Thr Asn His Leu Arg
                405                 410                 415

Ala Val Lys Arg Ile Asp Leu Ser Lys Pro Val Ala Arg Lys Asn Thr
            420                 425                 430

Ser Val Phe Leu Lys Arg Ile Met Gln Asn Gly Tyr Arg Gly Asn Tyr
        435                 440                 445

Cys Lys Lys Cys Ile Lys Gly Asn Ile Asp Pro Asn Lys Asp Glu Cys
    450                 455                 460

Arg Leu Glu Asp Ile Lys Lys Cys Ile Cys Cys Glu Gly Thr Gln Asn
465                 470                 475                 480

Ile Trp Ala Lys Lys Glu Lys Leu Tyr Thr Gly Arg Ile Asn Val Leu
                485                 490                 495

Asn Lys Arg Ile Lys Gln Met Lys Leu Glu Cys Phe Asn Val Ala Lys
            500                 505                 510

Ala Tyr Glu Asn Phe Tyr Asp Asn Leu Ala Ala Leu Lys Glu Gly Asp
        515                 520                 525

Leu Lys Val Leu Lys Leu Lys Val Ser Ile Pro Ala Leu Asn Pro Glu
    530                 535                 540

Ala Ser Asp Pro Glu Glu Asp Met
545                 550
```

<210> 98
<211> 534
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 98
Asn Ala Ser Ile Asn Leu Gly Lys Arg Ala Ile Asn Leu Ser Ala Asn
1 5 10 15

Tyr Asp Ser Asn Leu Val Ile Gly Cys Lys Asn Cys Lys Phe Leu Ser
20 25 30

Phe Asn Gly Asn Phe Pro Arg Gln Thr Asn Val Arg Glu Gly Cys His
35 40 45

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

Gly Glu Arg Lys Ala Lys Tyr Asp Val Leu Asp Ser Leu Lys Lys Phe
65 70 75 80

Thr Phe Gln Ser Leu Lys Tyr Gln Ile Lys Lys Ser Met Arg Glu Arg
85 90 95

Ser Lys Lys Pro Lys Glu Leu Leu Glu Phe Val Ile Phe Ala Asn Lys
100 105 110

Asp Lys Ala Phe Asn Val Ile Gln Lys Ser Tyr Glu His Leu Ile Leu
115 120 125

Asn Ile Lys Gln Glu Ile Asn Arg Met Asn Gly Lys Lys Arg Ile Lys
130 135 140

Asn His Lys Lys Arg Leu Phe Lys Asp Arg Glu Lys Gln Leu Asn Lys
145 150 155 160

Leu Arg Leu Ile Gly Ser Ser Ser Leu Phe Phe Pro Arg Glu Asn Lys
165 170 175

Gly Asp Lys Asp Leu Phe Thr Tyr Val Ala Ile His Ser Val Gly Arg
180 185 190

Asp Ile Gly Val Ala Gly Ser Tyr Glu Ser His Ile Glu Pro Ile Ser
195 200 205

```
Asp Leu Thr Tyr Gln Leu Phe Ile Asn Asn Glu Lys Arg Leu Leu Tyr
    210                 215                 220

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

Trp Asn Leu Lys Lys Glu Lys Lys Pro Leu Asp Leu Glu Phe Thr Lys
                245                 250                 255

Pro Leu Glu Lys Ser Ile Thr Phe Ser Val Lys Asn Asp Lys Leu Phe
            260                 265                 270

Lys Val Ser Lys Asp Leu Met Leu Arg Gln Ala Lys Phe Asn Ile Gln
        275                 280                 285

Gly Lys Glu Lys Leu Ser Lys Glu Glu Arg Gln Ile Asn Arg Asp Phe
    290                 295                 300

Ser Lys Ile Lys Ser Asn Val Ile Ser Leu Ser Tyr Gly Arg Phe Glu
305                 310                 315                 320

Glu Leu Lys Lys Glu Lys Asn Ile Trp Ser Pro His Ile Tyr Arg Glu
                325                 330                 335

Val Lys Gln Lys Glu Ile Lys Pro Cys Ile Val Arg Lys Gly Asp Arg
            340                 345                 350

Ile Glu Leu Phe Glu Gln Leu Lys Arg Lys Met Asp Lys Leu Lys Lys
        355                 360                 365

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

Glu Arg Ile Ala Tyr Asn Phe His Thr Lys Ser Ile Lys Asn Thr Ser
385                 390                 395                 400

Asn Lys Ile Asn Ile Asp Gln Glu Ala Lys Arg Gly Lys Ala Ser Tyr
                405                 410                 415

Met Arg Lys Arg Ile Gly Asn Glu Ser Phe Arg Lys Lys Tyr Cys Glu
            420                 425                 430

Gln Cys Phe Ser Val Gly Asn Val Tyr His Asn Val Gln Asn Gly Cys
        435                 440                 445
```

Ser Cys Phe Asp Asn Pro Ile Glu Leu Ile Lys Lys Gly Asp Glu Gly
450 455 460

Leu Ile Pro Lys Gly Lys Glu Asp Arg Lys Tyr Lys Gly Ala Leu Arg
465 470 475 480

Asp Asp Asn Leu Gln Met Gln Ile Ile Arg Val Ala Phe Asn Ile Ala
485 490 495

Lys Gly Tyr Glu Asp Phe Tyr Asn Asn Leu Lys Glu Lys Thr Glu Lys
500 505 510

Asp Leu Lys Leu Lys Phe Lys Ile Gly Thr Thr Ile Ser Thr Gln Glu
515 520 525

Ser Asn Asn Lys Glu Met
530

<210> 99
<211> 577
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 99
Ser Asn Leu Ile Lys Leu Gly Lys Gln Ala Ile Asn Phe Ala Ala Asn
1 5 10 15

Tyr Asp Ala Asn Leu Glu Val Gly Cys Lys Asn Cys Lys Phe Leu Ser
20 25 30

Ser Thr Asn Lys Tyr Pro Arg Gln Thr Asn Val His Leu Asp Asn Lys
35 40 45

Met Ala Cys Arg Ser Cys Asn Gln Ser Thr Met Glu Pro Ala Ile Tyr
50 55 60

Ile Val Arg Ile Gly Glu Lys Lys Ala Lys Tyr Asp Ile Tyr Asn Ser
65 70 75 80

Leu Thr Lys Phe Asn Phe Gln Ser Leu Lys Tyr Lys Ala Lys Arg Ser

```
                85                  90                  95

Gln Arg Phe Lys Pro Lys Gln Pro Lys Glu Leu Gln Glu Leu Ser Ile
            100                 105                 110

Ala Val Arg Lys Glu Lys Ala Leu Asp Ile Ile Gln Lys Ser Ile Asp
        115                 120                 125

His Leu Ile Gln Asp Ile Arg Pro Glu Ile Pro Arg Ile Lys Gln Gln
    130                 135                 140

Lys Arg Tyr Lys Asn His Val Gly Lys Leu Phe Tyr Leu Gln Lys Arg
145                 150                 155                 160

Arg Lys Asn Lys Leu Asn Leu Ile Gly Lys Gly Ser Phe Phe Lys Val
                165                 170                 175

Phe Ser Pro Lys Glu Lys Lys Asn Glu Leu Leu Val Ile Cys Ala Leu
            180                 185                 190

Thr Asn Ile Gly Arg Asp Ile Gly Leu Ile Gly Asn Tyr Asn Thr Ile
        195                 200                 205

Ile Asn Pro Leu Phe Glu Val Thr Tyr Gln Leu Tyr Tyr Asp Tyr Ile
    210                 215                 220

Pro Lys Lys Asn Asn Lys Asn Val Gln Arg Arg Leu Leu Tyr Ala Tyr
225                 230                 235                 240

Lys Ser Lys Asn Glu Lys Ile Leu Lys Leu Lys Glu Ala Phe Phe Lys
                245                 250                 255

Arg Gly His Glu Asn Ala Val Asn Leu Gly Ser Phe Ser Tyr Glu Lys
            260                 265                 270

Pro Leu Glu Lys Ser Leu Thr Leu Lys Ile Lys Asn Asp Lys Asp Asp
        275                 280                 285

Phe Gln Val Ser Pro Ser Leu Arg Ile Arg Thr Gly Arg Phe Phe Val
    290                 295                 300

Pro Ser Lys Arg Asn Leu Ser Arg Gln Glu Arg Glu Ile Asn Arg Arg
305                 310                 315                 320
```

```
Leu Val Lys Ile Lys Ser Lys Ile Lys Asn Met Thr Tyr Gly Lys Phe
                325                 330                 335

Glu Thr Ala Arg Asp Lys Gln Ser Val His Ile Phe Arg Leu Glu Arg
            340                 345                 350

Gln Lys Glu Lys Leu Pro Leu Gln Phe Arg Lys Asp Glu Lys Glu Phe
        355                 360                 365

Met Glu Glu Phe Gln Lys Leu Lys Arg Arg Thr Asn Ser Leu Lys Lys
    370                 375                 380

Leu Arg Lys Ser Arg Gln Lys Lys Leu Ala Asp Leu Leu Gln Leu Ser
385                 390                 395                 400

Glu Lys Val Val Tyr Asn Asn His Thr Gly Thr Leu Lys Lys Thr Ser
                405                 410                 415

Asn Phe Leu Asn Phe Ser Ser Ser Val Lys Arg Gly Lys Thr Ala Tyr
            420                 425                 430

Ile Lys Glu Leu Leu Gly Gln Glu Gly Phe Glu Thr Leu Tyr Cys Ser
        435                 440                 445

Asn Cys Ile Asn Lys Gly Gln Lys Thr Arg Tyr Asn Ile Glu Thr Lys
    450                 455                 460

Glu Lys Cys Phe Ser Cys Lys Asp Val Pro Phe Val Trp Lys Lys Lys
465                 470                 475                 480

Ser Thr Asp Lys Asp Arg Lys Gly Ala Phe Leu Phe Pro Ala Lys Leu
                485                 490                 495

Lys Asp Val Ile Lys Ala Thr Phe Thr Val Ala Lys Ala Tyr Glu Asp
            500                 505                 510

Phe Tyr Asp Asn Leu Lys Ser Ile Asp Glu Lys Lys Pro Tyr Ile Lys
        515                 520                 525

Phe Lys Ile Gly Leu Ile Leu Ala His Val Arg His Glu His Lys Ala
    530                 535                 540

Arg Ala Lys Glu Glu Ala Gly Gln Lys Asn Ile Tyr Asn Lys Pro Ile
```

545 550 555 560

Lys Ile Asp Lys Asn Cys Lys Glu Cys Phe Phe Phe Lys Glu Glu Ala
565 570 575

Met

<210> 100
<211> 613
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 100
Asn Thr Thr Arg Lys Lys Phe Arg Lys Arg Thr Gly Phe Pro Gln Ser
1 5 10 15

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

Leu Asp Ala Asp Ile Gln Lys Lys His Asn Gln Cys Asn Pro Asn Leu
35 40 45

Cys Val Gly Ile Lys Ser Asn Glu Gln Ser Arg Lys Tyr Glu His Ser
50 55 60

Asp Arg Gln Ala Leu Leu Cys Tyr Ala Cys Asn Gln Ser Thr Gly Ala
65 70 75 80

Pro Lys Val Asp Tyr Ile Gln Ile Gly Glu Ile Gly Ala Lys Tyr Lys
85 90 95

Ile Leu Gln Met Val Asn Ala Tyr Asp Phe Leu Ser Leu Ala Tyr Asn
100 105 110

Leu Thr Lys Leu Arg Asn Gly Lys Ser Arg Gly His Gln Arg Met Ser
115 120 125

Gln Leu Asp Glu Val Val Ile Val Ala Asp Tyr Glu Lys Ala Thr Glu
130 135 140

```
Val Ile Lys Arg Ser Ile Asn His Leu Leu Asp Asp Ile Arg Gly Gln
145                 150                 155                 160

Leu Ser Lys Leu Lys Lys Arg Thr Gln Asn Glu His Ile Thr Glu His
                165                 170                 175

Lys Gln Ser Lys Ile Arg Arg Lys Leu Arg Lys Leu Ser Arg Leu Leu
            180                 185                 190

Lys Arg Arg Arg Trp Lys Trp Gly Thr Ile Pro Asn Pro Tyr Leu Lys
        195                 200                 205

Asn Trp Val Phe Thr Lys Lys Asp Pro Glu Leu Val Thr Val Ala Leu
    210                 215                 220

Leu His Lys Leu Gly Arg Asp Ile Gly Leu Val Asn Arg Ser Lys Arg
225                 230                 235                 240

Arg Ser Lys Gln Lys Leu Leu Pro Lys Val Gly Phe Gln Leu Tyr Tyr
                245                 250                 255

Lys Trp Glu Ser Pro Ser Leu Asn Asn Ile Lys Lys Ser Lys Ala Lys
            260                 265                 270

Lys Leu Pro Lys Arg Leu Leu Ile Pro Tyr Lys Asn Val Lys Leu Phe
        275                 280                 285

Asp Asn Lys Gln Lys Leu Glu Asn Ala Ile Lys Ser Leu Leu Glu Ser
    290                 295                 300

Tyr Gln Lys Thr Ile Lys Val Glu Phe Asp Gln Phe Phe Gln Asn Arg
305                 310                 315                 320

Thr Glu Glu Ile Ile Ala Glu Glu Gln Gln Thr Leu Glu Arg Gly Leu
                325                 330                 335

Leu Lys Gln Leu Glu Lys Lys Lys Asn Glu Phe Ala Ser Gln Lys Lys
            340                 345                 350

Ala Leu Lys Glu Glu Lys Lys Lys Ile Lys Glu Pro Arg Lys Ala Lys
        355                 360                 365

Leu Leu Met Glu Glu Ser Arg Ser Leu Gly Phe Leu Met Ala Asn Val
    370                 375                 380
```

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

Asn Val Val Ser Gly Cys Ile Pro Gln Glu Pro Val Val Val Phe Pro
                405                 410                 415

Ala Asp Ile Gln Asn Lys Gly Ser Leu Ala Lys Ile Leu Phe Ala Pro
            420                 425                 430

Lys Asp Gly Phe Arg Ile Lys Phe Ser Gly Gln His Leu Thr Ile Arg
        435                 440                 445

Thr Ala Lys Phe Lys Ile Arg Gly Lys Glu Ile Lys Ile Leu Thr Lys
    450                 455                 460

Thr Lys Arg Glu Ile Leu Lys Asn Ile Glu Lys Leu Arg Arg Val Trp
465                 470                 475                 480

Tyr Arg Glu Gln His Tyr Lys Leu Lys Leu Phe Gly Lys Glu Val Ser
                485                 490                 495

Ala Lys Pro Arg Phe Leu Asp Lys Arg Lys Thr Ser Ile Glu Arg Arg
            500                 505                 510

Asp Pro Asn Lys Leu Ala Asp Gln Thr Asp Asp Arg Gln Ala Glu Leu
        515                 520                 525

Arg Asn Lys Glu Tyr Glu Leu Arg His Lys Gln His Lys Met Ala Glu
    530                 535                 540

Arg Leu Asp Asn Ile Asp Thr Asn Ala Gln Asn Leu Gln Thr Leu Ser
545                 550                 555                 560

Phe Trp Val Gly Glu Ala Asp Lys Pro Pro Lys Leu Asp Glu Lys Asp
                565                 570                 575

Ala Arg Gly Phe Gly Val Arg Thr Cys Ile Ser Ala Trp Lys Trp Phe
            580                 585                 590

Met Glu Asp Leu Leu Lys Lys Gln Glu Glu Asp Pro Leu Leu Lys Leu
        595                 600                 605
```

Lys Leu Ser Ile Met
610

<210> 101
<211> 615
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 101
Pro Lys Lys Pro Lys Phe Gln Lys Arg Thr Gly Phe Pro Gln Pro Asp
1 5 10 15

Asn Leu Arg Lys Glu Tyr Cys Leu Ala Ile Val Arg Ala Ala Asn Leu
20 25 30

Asp Ala Asp Phe Glu Lys Lys Cys Thr Lys Cys Glu Gly Ile Lys Thr
35 40 45

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

Lys Asp Asn Leu Leu Cys Tyr Ala Cys Asn Ile Ser Thr Gly Ala Pro
65 70 75 80

Ala Val Asp Tyr Val Phe Val Gly Ala Leu Glu Ala Lys Tyr Lys Ile
85 90 95

Leu Gln Met Val Lys Ala Tyr Asp Phe His Ser Leu Ala Tyr Asn Leu
100 105 110

Ala Lys Leu Trp Lys Gly Arg Gly Arg Gly His Gln Arg Met Gly Gly
115 120 125

Leu Asn Glu Val Val Ile Val Ser Asn Asn Glu Lys Ala Leu Asp Val
130 135 140

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

Ser Arg Leu Lys Ala Lys Phe Gln Asn Glu His Leu His Val His Lys
165 170 175

```
Glu Ser Lys Leu Arg Arg Lys Leu Arg Lys Ile Ser Arg Leu Leu Lys
            180                 185                 190

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

Phe Thr Phe Thr Lys Thr Arg Pro Asp Phe Ile Ser Val Ala Leu Leu
    210                 215                 220

His Arg Val Gly Arg Asp Ile Gly Leu Val Thr Lys Thr Lys Ile Pro
225                 230                 235                 240

Lys Pro Thr Asp Leu Leu Pro Gln Phe Gly Phe Gln Ile Tyr Tyr Thr
                245                 250                 255

Trp Asp Glu Pro Lys Leu Asn Lys Leu Lys Lys Ser Arg Leu Arg Ser
            260                 265                 270

Glu Pro Lys Arg Leu Leu Val Pro Tyr Lys Lys Ile Glu Leu Tyr Lys
        275                 280                 285

Asn Lys Ser Val Leu Glu Glu Ala Ile Arg His Leu Ala Glu Val Tyr
    290                 295                 300

Thr Glu Asp Leu Thr Ile Cys Phe Lys Asp Phe Phe Glu Thr Gln Lys
305                 310                 315                 320

Arg Lys Phe Val Ser Lys Glu Lys Glu Ser Leu Lys Arg Glu Leu Leu
                325                 330                 335

Lys Glu Leu Thr Lys Leu Lys Lys Asp Phe Ser Glu Arg Lys Thr Ala
            340                 345                 350

Leu Lys Arg Asp Arg Lys Glu Ile Lys Glu Pro Lys Lys Ala Lys Leu
        355                 360                 365

Leu Met Glu Glu Ser Arg Ser Leu Gly Phe Leu Ala Ala Asn Thr Ser
    370                 375                 380

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

Lys Ala Cys Ser Thr Lys Leu Pro Arg Gln Leu Ser Thr Ile Leu Pro
```

405 410 415

Leu Glu Ile Lys Glu His Lys Ser Thr Thr Ser Leu Ala Ile Lys Pro
420 425 430

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

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

Arg Lys Arg Glu Ile Leu Lys Asn Ala Thr Lys Leu Glu Lys Ser Trp
465 470 475 480

Tyr Gly Leu Lys His Tyr Lys Leu Lys Leu Tyr Gly Lys Glu Val Ala
485 490 495

Ala Lys Pro Arg Phe Leu Asp Lys Arg Asn Pro Ser Ile Asp Arg Arg
500 505 510

Asp Pro Lys Glu Leu Met Glu Gln Ile Glu Asn Arg Arg Asn Glu Val
515 520 525

Lys Asp Leu Glu Tyr Glu Ile Arg Lys Gly Gln His Gln Met Ala Lys
530 535 540

Arg Leu Asp Asn Val Asp Thr Asn Ala Gln Asn Leu Gln Thr Lys Ser
545 550 555 560

Phe Trp Val Gly Glu Ala Asp Lys Pro Pro Glu Leu Asp Ser Met Glu
565 570 575

Ala Lys Lys Leu Gly Leu Arg Thr Cys Ile Ser Ala Trp Lys Trp Phe
580 585 590

Met Lys Asp Leu Val Leu Leu Gln Glu Lys Ser Pro Asn Leu Lys Leu
595 600 605

Lys Leu Ser Leu Thr Glu Met
610 615

<210> 102
<211> 775
<212> PRT

<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 102
Lys Phe Ser Lys Arg Gln Glu Gly Phe Leu Ile Pro Asp Asn Ile Asp
1 5 10 15

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

Val Gln Gly His Lys Ser Cys Tyr Gly Val Lys Lys Asn Gly Thr Tyr
35 40 45

Arg Val Lys Gln Asn Gly Lys Lys Gly Val Lys Glu Lys Gly Arg Lys
50 55 60

Tyr Val Phe Asp Leu Ile Ala Phe Lys Gly Asn Ile Glu Lys Ile Pro
65 70 75 80

His Glu Ala Ile Glu Glu Lys Asp Gln Gly Arg Val Ile Val Leu Gly
85 90 95

Lys Phe Asn Tyr Lys Leu Ile Leu Asn Ile Glu Lys Asn His Asn Asp
100 105 110

Arg Ala Ser Leu Glu Ile Lys Asn Lys Ile Lys Lys Leu Val Gln Ile
115 120 125

Ser Ser Leu Glu Thr Gly Glu Phe Leu Ser Asp Leu Leu Ser Gly Lys
130 135 140

Ile Gly Ile Asp Glu Val Tyr Gly Ile Ile Glu Pro Asp Val Phe Ser
145 150 155 160

Gly Lys Glu Leu Val Cys Lys Ala Cys Gln Gln Ser Thr Tyr Ala Pro
165 170 175

Leu Val Glu Tyr Met Pro Val Gly Glu Leu Asp Ala Lys Tyr Lys Ile
180 185 190

Leu Ser Ala Ile Lys Gly Tyr Asp Phe Leu Ser Leu Ala Tyr Asn Leu
195 200 205

```
Ser Arg Asn Arg Ala Asn Lys Lys Arg Gly His Gln Lys Leu Gly Gly
    210                 215                 220

Gly Glu Leu Ser Glu Val Val Ile Ser Ala Asn Tyr Asp Lys Ala Leu
225                 230                 235                 240

Asn Val Ile Lys Arg Ser Ile Asn His Tyr His Val Glu Ile Lys Pro
                245                 250                 255

Glu Ile Ser Lys Leu Lys Lys Lys Met Gln Asn Glu Pro Leu Lys Val
            260                 265                 270

Met Lys Gln Ala Arg Ile Arg Arg Glu Leu His Gln Leu Ser Arg Lys
        275                 280                 285

Val Lys Arg Leu Lys Trp Lys Trp Gly Met Ile Pro Asn Pro Glu Leu
    290                 295                 300

Gln Asn Ile Ile Phe Glu Lys Lys Glu Lys Asp Phe Val Ser Tyr Ala
305                 310                 315                 320

Leu Leu His Thr Leu Gly Arg Asp Ile Gly Leu Phe Lys Asp Thr Ser
                325                 330                 335

Met Leu Gln Val Pro Asn Ile Ser Asp Tyr Gly Phe Gln Ile Tyr Tyr
            340                 345                 350

Ser Trp Glu Asp Pro Lys Leu Asn Ser Ile Lys Lys Ile Lys Asp Leu
        355                 360                 365

Pro Lys Arg Leu Leu Ile Pro Tyr Lys Arg Leu Asp Phe Tyr Ile Asp
    370                 375                 380

Thr Ile Leu Val Ala Lys Val Ile Lys Asn Leu Ile Glu Leu Tyr Arg
385                 390                 395                 400

Lys Ser Tyr Val Tyr Glu Thr Phe Gly Glu Glu Tyr Gly Tyr Ala Lys
                405                 410                 415

Lys Ala Glu Asp Ile Leu Phe Asp Trp Asp Ser Ile Asn Leu Ser Glu
            420                 425                 430
```

```
Gly Ile Glu Gln Lys Ile Gln Lys Ile Lys Asp Glu Phe Ser Asp Leu
        435                 440                 445

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

Glu Asn Ile Leu Gly Leu Tyr Asp Lys Asn Phe Ala Ser Asp Arg Asn
465                 470                 475                 480

Ser Tyr Gln Glu Lys Ile Gln Ser Met Ile Ile Lys Lys Gln Gln Glu
                485                 490                 495

Asn Ile Glu Gln Lys Leu Lys Arg Glu Phe Lys Glu Val Ile Glu Arg
            500                 505                 510

Gly Phe Glu Gly Met Asp Gln Asn Lys Lys Tyr Tyr Lys Val Leu Ser
        515                 520                 525

Pro Asn Ile Lys Gly Gly Leu Leu Tyr Thr Asp Thr Asn Asn Leu Gly
    530                 535                 540

Phe Phe Arg Ser His Leu Ala Phe Met Leu Leu Ser Lys Ile Ser Asp
545                 550                 555                 560

Asp Leu Tyr Arg Lys Asn Asn Leu Val Ser Lys Gly Gly Asn Lys Gly
                565                 570                 575

Ile Leu Asp Gln Thr Pro Glu Thr Met Leu Thr Leu Glu Phe Gly Lys
            580                 585                 590

Ser Asn Leu Pro Asn Ile Ser Ile Lys Arg Lys Phe Phe Asn Ile Lys
        595                 600                 605

Tyr Asn Ser Ser Trp Ile Gly Ile Arg Lys Pro Lys Phe Ser Ile Lys
    610                 615                 620

Gly Ala Val Ile Arg Glu Ile Thr Lys Lys Val Arg Asp Glu Gln Arg
625                 630                 635                 640

Leu Ile Lys Ser Leu Glu Gly Val Trp His Lys Ser Thr His Phe Lys
                645                 650                 655

Arg Trp Gly Lys Pro Arg Phe Asn Leu Pro Arg His Pro Asp Arg Glu
            660                 665                 670
```

```
Lys Asn Asn Asp Asp Asn Leu Met Glu Ser Ile Thr Ser Arg Arg Glu
        675                 680                 685

Gln Ile Gln Leu Leu Leu Arg Glu Lys Gln Lys Gln Gln Glu Lys Met
    690                 695                 700

Ala Gly Arg Leu Asp Lys Ile Asp Lys Glu Ile Gln Asn Leu Gln Thr
705                 710                 715                 720

Ala Asn Phe Gln Ile Lys Gln Ile Asp Lys Lys Pro Ala Leu Thr Glu
                725                 730                 735

Lys Ser Glu Gly Lys Gln Ser Val Arg Asn Ala Leu Ser Ala Trp Lys
            740                 745                 750

Trp Phe Met Glu Asp Leu Ile Lys Tyr Gln Lys Arg Thr Pro Ile Leu
        755                 760                 765

Gln Leu Lys Leu Ala Lys Met
    770                 775
```

<210> 103
<211> 777
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 103

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

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

Val Gln Gly His Val Ser Cys Tyr Gly Val Lys Lys Asn Gly Thr Tyr
        35                  40                  45

Val Leu Lys Gln Asn Gly Lys Lys Ser Ile Arg Glu Lys Gly Arg Lys
    50                  55                  60

Tyr Ala Ser Asp Leu Val Ala Phe Lys Gly Asp Ile Glu Lys Ile Pro
```

```
65                  70                  75                  80

Phe Glu Val Ile Glu Glu Lys Lys Lys Glu Gln Ser Ile Val Leu Gly
                85                  90                  95

Lys Phe Asn Tyr Lys Leu Val Leu Asp Val Met Lys Gly Glu Lys Asp
            100                 105                 110

Arg Ala Ser Leu Thr Met Lys Asn Lys Ser Lys Lys Leu Val Gln Val
        115                 120                 125

Ser Ser Leu Gly Thr Asp Glu Phe Leu Leu Thr Leu Leu Asn Glu Lys
    130                 135                 140

Phe Gly Ile Glu Glu Ile Tyr Gly Ile Ile Glu Pro Glu Val Phe Ser
145                 150                 155                 160

Gly Lys Lys Leu Val Cys Lys Ala Cys Gln Gln Ser Thr Tyr Ala Pro
                165                 170                 175

Leu Val Glu Tyr Met Pro Val Gly Glu Leu Asp Ser Lys Tyr Lys Ile
            180                 185                 190

Leu Ser Ala Ile Lys Gly Tyr Asp Phe Leu Ser Leu Ala Tyr Asn Leu
        195                 200                 205

Ala Arg His Arg Ser Asn Lys Lys Arg Gly His Gln Lys Leu Gly Gly
    210                 215                 220

Gly Glu Leu Ser Glu Val Val Ile Ser Ala Asn Asn Ala Lys Ala Leu
225                 230                 235                 240

Asn Val Ile Lys Arg Ser Leu Asn His Tyr Tyr Ser Glu Ile Lys Pro
                245                 250                 255

Glu Ile Ser Lys Leu Arg Lys Lys Met Gln Asn Glu Pro Leu Lys Val
            260                 265                 270

Gly Lys Gln Ala Arg Met Arg Arg Glu Leu His Gln Leu Ser Arg Lys
        275                 280                 285

Val Lys Arg Leu Lys Trp Lys Trp Gly Lys Ile Pro Asn Leu Glu Leu
    290                 295                 300
```

```
Gln Asn Ile Thr Phe Lys Glu Ser Asp Arg Asp Phe Ile Ser Tyr Ala
305                 310                 315                 320

Leu Leu His Thr Leu Gly Arg Asp Ile Gly Met Phe Asn Lys Thr Glu
                325                 330                 335

Ile Lys Met Pro Ser Asn Ile Leu Gly Tyr Gly Phe Gln Ile Tyr Tyr
            340                 345                 350

Asp Trp Glu Glu Pro Lys Leu Asn Thr Ile Lys Lys Ser Lys Asn Thr
        355                 360                 365

Pro Lys Arg Ile Leu Ile Pro Tyr Lys Lys Leu Asp Phe Tyr Asn Asp
    370                 375                 380

Ser Ile Leu Val Ala Arg Ala Ile Lys Glu Leu Val Gly Leu Phe Gln
385                 390                 395                 400

Glu Ser Tyr Glu Trp Glu Ile Phe Gly Asn Glu Tyr Asn Tyr Ala Lys
                405                 410                 415

Glu Ala Glu Val Glu Leu Ile Lys Leu Asp Glu Glu Ser Ile Asn Gly
            420                 425                 430

Asn Val Glu Lys Lys Leu Gln Arg Ile Lys Glu Asn Phe Ser Asn Leu
        435                 440                 445

Leu Glu Lys Ala Arg Glu Lys Lys Arg Gln Asn Phe Ile Glu Ser Phe
    450                 455                 460

Glu Ser Ile Ala Arg Leu Tyr Asp Glu Ser Phe Thr Ala Asp Arg Asn
465                 470                 475                 480

Glu Tyr Gln Arg Glu Ile Gln Ser Phe Ile Ile Glu Lys Gln Lys Gln
                485                 490                 495

Ser Ile Glu Lys Lys Leu Lys Asn Glu Phe Lys Lys Ile Val Glu Lys
            500                 505                 510

Lys Phe Asn Glu Gln Glu Gln Gly Lys Lys His Tyr Arg Val Leu Asn
        515                 520                 525

Pro Thr Ile Ile Asn Glu Phe Leu Pro Lys Asp Lys Asn Asn Leu Gly
```

```
    530                 535                 540

Phe Leu Arg Ser Lys Ile Ala Phe Ile Leu Leu Ser Lys Ile Ser Asp
545                 550                 555                 560

Asp Leu Tyr Lys Lys Ser Asn Ala Val Ser Lys Gly Gly Glu Lys Gly
                565                 570                 575

Ile Ile Lys Gln Gln Pro Glu Thr Ile Leu Asp Leu Glu Phe Ser Lys
            580                 585                 590

Ser Lys Leu Pro Ser Ile Asn Ile Lys Lys Lys Leu Phe Asn Ile Lys
        595                 600                 605

Tyr Thr Ser Ser Trp Leu Gly Ile Arg Lys Pro Lys Phe Asn Ile Lys
    610                 615                 620

Gly Ala Lys Ile Arg Glu Ile Thr Arg Arg Val Arg Asp Val Gln Arg
625                 630                 635                 640

Thr Leu Lys Ser Ala Glu Ser Ser Trp Tyr Ala Ser Thr His Phe Arg
                645                 650                 655

Arg Trp Gly Phe Pro Arg Phe Asn Gln Pro Arg His Pro Asp Lys Glu
            660                 665                 670

Lys Lys Ser Asp Asp Arg Leu Ile Glu Ser Ile Thr Leu Leu Arg Glu
        675                 680                 685

Gln Ile Gln Ile Leu Leu Arg Glu Lys Gln Lys Gly Gln Lys Glu Met
    690                 695                 700

Ala Gly Arg Leu Asp Asp Val Asp Lys Lys Ile Gln Asn Leu Gln Thr
705                 710                 715                 720

Ala Asn Phe Gln Ile Lys Gln Thr Gly Asp Lys Pro Ala Leu Thr Glu
                725                 730                 735

Lys Ser Ala Gly Lys Gln Ser Phe Arg Asn Ala Leu Ser Ala Trp Lys
            740                 745                 750

Trp Phe Met Glu Asn Leu Leu Lys Tyr Gln Asn Lys Thr Pro Asp Leu
        755                 760                 765
```

Lys Leu Lys Ile Ala Arg Thr Val Met
770 775

<210> 104
<211> 610
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 104
Lys Trp Ile Glu Pro Asn Asn Ile Asp Phe Asn Lys Cys Leu Ala Ile
1 5 10 15

Thr Arg Ser Ala Asn Leu Asp Ala Asp Val Gln Gly His Lys Met Cys
20 25 30

Tyr Gly Ile Lys Thr Asn Gly Thr Tyr Lys Ala Ile Gly Lys Ile Asn
35 40 45

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

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

Asp Phe Met Ala Ile Asp Glu Glu Ile Glu Phe Asp Glu Lys Lys Glu
85 90 95

Lys Leu Leu Lys Lys Tyr Ile Lys Ala Glu Val Leu Gly Thr Gly Glu
100 105 110

Leu Ile Arg Lys Asp Leu Asn Asp Gly Glu Lys Phe Asp Asp Leu Cys
115 120 125

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

Ala Cys Asn Gln Ser Thr Tyr Ala Ser Asp Ile Arg Tyr Ile Pro Ile
145 150 155 160

Gly Glu Ile Glu Ala Lys Tyr Lys Ile Leu Lys Ala Ile Lys Gly Tyr
165 170 175

```
Asp Phe Leu Ser Leu Lys Tyr Asn Leu Gly Arg Leu Arg Asp Ser Lys
            180                 185                 190

Lys Arg Gly His Gln Lys Met Gly Gln Gly Glu Leu Lys Glu Phe Val
        195                 200                 205

Ile Cys Ala Asn Lys Glu Lys Ala Leu Asp Val Ile Lys Arg Ser Leu
    210                 215                 220

Asn His Tyr Leu Asn Glu Val Lys Asp Glu Ile Ser Arg Leu Asn Lys
225                 230                 235                 240

Lys Met Gln Asn Glu Pro Leu Lys Val Asn Asp Gln Ala Arg Trp Arg
                245                 250                 255

Arg Glu Leu Asn Gln Ile Ser Arg Arg Leu Lys Arg Leu Lys Trp Lys
            260                 265                 270

Trp Gly Glu Ile Pro Asn Pro Glu Leu Lys Asn Leu Ile Phe Lys Ser
        275                 280                 285

Ser Arg Pro Glu Phe Val Ser Tyr Ala Leu Ile His Thr Leu Gly Arg
    290                 295                 300

Asp Ile Gly Leu Ile Asn Glu Thr Glu Leu Lys Pro Asn Asn Ile Gln
305                 310                 315                 320

Glu Tyr Gly Phe Gln Ile Tyr Tyr Lys Trp Glu Asp Pro Glu Leu Asn
                325                 330                 335

His Ile Lys Lys Val Lys Asn Ile Pro Lys Arg Phe Ile Ile Pro Tyr
            340                 345                 350

Lys Asn Leu Asp Leu Phe Gly Lys Tyr Thr Ile Leu Ser Arg Ala Ile
        355                 360                 365

Glu Gly Ile Leu Lys Leu Tyr Ser Ser Ser Phe Gln Tyr Lys Ser Phe
    370                 375                 380

Lys Asp Pro Asn Leu Phe Ala Lys Glu Gly Glu Lys Lys Ile Thr Asn
385                 390                 395                 400
```

```
Glu Asp Phe Glu Leu Gly Tyr Asp Glu Lys Ile Lys Lys Ile Lys Asp
                405                 410                 415

Asp Phe Lys Ser Tyr Lys Lys Ala Leu Leu Glu Lys Lys Lys Asn Thr
            420                 425                 430

Leu Glu Asp Ser Leu Asn Ser Ile Leu Ser Val Tyr Glu Gln Ser Leu
        435                 440                 445

Leu Thr Glu Gln Ile Asn Asn Val Lys Lys Trp Lys Glu Gly Leu Leu
    450                 455                 460

Lys Ser Lys Glu Ser Ile His Lys Gln Lys Lys Ile Glu Asn Ile Glu
465                 470                 475                 480

Asp Ile Ile Ser Arg Ile Glu Glu Leu Lys Asn Val Glu Gly Trp Ile
                485                 490                 495

Arg Thr Lys Glu Arg Asp Ile Val Asn Lys Glu Glu Thr Asn Leu Lys
            500                 505                 510

Arg Glu Ile Lys Lys Glu Leu Lys Asp Ser Tyr Tyr Glu Glu Val Arg
        515                 520                 525

Lys Asp Phe Ser Asp Leu Lys Lys Gly Glu Glu Ser Glu Lys Lys Pro
    530                 535                 540

Phe Arg Glu Glu Pro Lys Pro Ile Val Ile Lys Asp Tyr Ile Lys Phe
545                 550                 555                 560

Asp Val Leu Pro Gly Glu Asn Ser Ala Leu Gly Phe Phe Leu Ser His
                565                 570                 575

Leu Ser Phe Asn Leu Phe Asp Ser Ile Gln Tyr Glu Leu Phe Glu Lys
            580                 585                 590

Ser Arg Leu Ser Ser Ser Lys His Pro Gln Ile Pro Glu Thr Ile Leu
        595                 600                 605

Asp Leu
    610
```

<210> 105
<211> 632

<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 105
Phe Arg Lys Phe Val Lys Arg Ser Gly Ala Pro Gln Pro Asp Asn Leu
1 5 10 15

Asn Lys Tyr Lys Cys Ile Ala Ile Val Arg Ala Ala Asn Leu Asp Ala
20 25 30

Asp Ile Met Ser Asn Glu Ser Ser Asn Cys Val Met Cys Lys Gly Ile
35 40 45

Lys Met Asn Lys Arg Lys Thr Ala Lys Gly Ala Ala Lys Thr Thr Glu
50 55 60

Leu Gly Arg Val Tyr Ala Gly Gln Ser Gly Asn Leu Leu Cys Thr Ala
65 70 75 80

Cys Thr Lys Ser Thr Met Gly Pro Leu Val Asp Tyr Val Pro Ile Gly
85 90 95

Arg Ile Arg Ala Lys Tyr Thr Ile Leu Arg Ala Val Lys Glu Tyr Asp
100 105 110

Phe Leu Ser Leu Ala Tyr Asn Leu Ala Arg Thr Arg Val Ser Lys Lys
115 120 125

Gly Gly Arg Gln Lys Met His Ser Leu Ser Glu Leu Val Ile Ala Ala
130 135 140

Glu Tyr Glu Ile Ala Trp Asn Ile Ile Lys Ser Ser Val Ile His Tyr
145 150 155 160

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

Ala Glu His Ile His Lys Asn Lys Glu Ala Arg Ile Arg Arg Glu Met
180 185 190

His Gln Ile Ser Arg Arg Ile Lys Arg Leu Lys Trp Lys Trp His Met

```
        195                 200                 205

Ile Pro Asn Ser Glu Leu His Asn Phe Leu Phe Lys Gln Gln Asp Pro
    210                 215                 220

Ser Phe Val Ala Val Ala Leu Leu His Thr Leu Gly Arg Asp Ile Gly
225                 230                 235                 240

Met Ile Asn Lys Pro Lys Gly Ser Ala Lys Arg Glu Phe Ile Pro Glu
                245                 250                 255

Tyr Gly Phe Gln Ile Tyr Tyr Lys Trp Met Asn Pro Lys Leu Asn Asp
            260                 265                 270

Ile Asn Lys Gln Lys Tyr Arg Lys Met Pro Lys Arg Ser Leu Ile Pro
        275                 280                 285

Tyr Lys Asn Leu Asn Val Phe Gly Asp Arg Glu Leu Ile Glu Asn Ala
    290                 295                 300

Met His Lys Leu Leu Lys Leu Tyr Asp Glu Asn Leu Glu Val Lys Gly
305                 310                 315                 320

Ser Lys Phe Phe Lys Thr Arg Val Val Ala Ile Ser Ser Lys Glu Ser
                325                 330                 335

Glu Lys Leu Lys Arg Asp Leu Leu Trp Lys Gly Glu Leu Ala Lys Ile
            340                 345                 350

Lys Lys Asp Phe Asn Ala Asp Lys Asn Lys Met Gln Glu Leu Phe Lys
        355                 360                 365

Glu Val Lys Glu Pro Lys Lys Ala Asn Ala Leu Met Lys Gln Ser Arg
    370                 375                 380

Asn Met Gly Phe Leu Leu Gln Asn Ile Ser Tyr Gly Ala Leu Gly Leu
385                 390                 395                 400

Leu Ala Asn Arg Met Tyr Glu Ala Ser Ala Lys Gln Ser Lys Gly Asp
                405                 410                 415

Ala Thr Lys Gln Pro Ser Ile Val Ile Pro Leu Glu Met Glu Phe Gly
            420                 425                 430
```

```
Asn Ala Phe Pro Lys Leu Leu Leu Arg Ser Gly Lys Phe Ala Met Asn
        435                 440                 445

Val Ser Ser Pro Trp Leu Thr Ile Arg Lys Pro Lys Phe Val Ile Lys
    450                 455                 460

Gly Asn Lys Ile Lys Asn Ile Thr Lys Leu Met Lys Asp Glu Lys Ala
465                 470                 475                 480

Lys Leu Lys Arg Leu Glu Thr Ser Tyr His Arg Ala Thr His Phe Arg
                485                 490                 495

Pro Thr Leu Arg Gly Ser Ile Asp Trp Asp Ser Pro Tyr Phe Ser Ser
            500                 505                 510

Pro Lys Gln Pro Asn Thr His Arg Arg Ser Pro Asp Arg Leu Ser Ala
        515                 520                 525

Asp Ile Thr Glu Tyr Arg Gly Arg Leu Lys Ser Val Glu Ala Glu Leu
    530                 535                 540

Arg Glu Gly Gln Arg Ala Met Ala Lys Lys Leu Asp Ser Val Asp Met
545                 550                 555                 560

Thr Ala Ser Asn Leu Gln Thr Ser Asn Phe Gln Leu Glu Lys Gly Glu
                565                 570                 575

Asp Pro Arg Leu Thr Glu Ile Asp Glu Lys Gly Arg Ser Ile Arg Asn
            580                 585                 590

Cys Ile Ser Ser Trp Lys Lys Phe Met Glu Asp Leu Met Lys Ala Gln
        595                 600                 605

Glu Ala Asn Pro Val Ile Lys Ile Lys Ile Ala Leu Lys Asp Glu Ser
    610                 615                 620

Ser Val Leu Ser Glu Asp Ser Met
625                 630
```

<210> 106
<211> 625
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 106
Lys Phe His Pro Glu Asn Leu Asn Lys Ser Tyr Cys Leu Ala Ile Val
1 5 10 15

Arg Ala Ala Asn Leu Asp Ala Asp Ile Gln Gly His Ile Asn Cys Ile
20 25 30

Gly Ile Lys Ser Asn Lys Ser Asp Arg Asn Tyr Glu Asn Lys Leu Glu
35 40 45

Ser Leu Gln Asn Val Glu Leu Leu Cys Lys Ala Cys Thr Lys Ser Thr
50 55 60

Tyr Lys Pro Asn Ile Asn Ser Val Pro Val Gly Glu Lys Lys Ala Lys
65 70 75 80

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

Tyr Asn Leu Lys Lys Tyr Arg Lys Gly Lys Ser Arg Gly His Gln Lys
100 105 110

Leu Asn Glu Leu Arg Glu Leu Val Ile Thr Ser Glu Tyr Lys Lys Ala
115 120 125

Leu Asp Val Ile Asn Lys Ser Val Asn His Tyr Leu Val Asn Ile Lys
130 135 140

Asn Lys Met Ser Lys Leu Lys Lys Ile Leu Gln Asn Glu His Ile His
145 150 155 160

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

Lys Leu Asp His Tyr Arg Lys Lys Trp Lys Phe Val Pro Asn Lys Ile
180 185 190

Leu Lys Asn Tyr Val Phe Lys Asn Gln Ser Pro Asp Phe Val Ser Val
195 200 205

```
Ala Leu Leu His Lys Leu Gly Arg Asp Ile Gly Leu Ile Thr Lys Thr
    210                 215                 220

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

Lys Tyr Asp Thr Pro Lys Leu Asn Tyr Leu Lys Lys Ser Lys Phe Lys
                245                 250                 255

Ser Leu Pro Lys Arg Ile Leu Ile Ser Tyr Lys Tyr Pro Lys Phe Asp
            260                 265                 270

Ile Asn Ser Asn Tyr Ile Glu Glu Ser Ile Asp Lys Leu Leu Lys Leu
        275                 280                 285

Tyr Glu Glu Ser Pro Ile Tyr Lys Asn Asn Ser Lys Ile Ile Glu Phe
    290                 295                 300

Phe Lys Lys Ser Glu Asp Asn Leu Ile Lys Ser Glu Asn Asp Ser Leu
305                 310                 315                 320

Lys Arg Gly Ile Met Lys Glu Phe Glu Lys Val Thr Lys Asn Phe Ser
                325                 330                 335

Ser Lys Lys Lys Lys Leu Lys Glu Glu Leu Lys Leu Lys Asn Glu Asp
            340                 345                 350

Lys Asn Ser Lys Met Leu Ala Lys Val Ser Arg Pro Ile Gly Phe Leu
        355                 360                 365

Lys Ala Tyr Leu Ser Tyr Met Leu Phe Asn Ile Ile Ser Asn Arg Ile
    370                 375                 380

Phe Glu Phe Ser Arg Lys Ser Ser Gly Arg Ile Pro Gln Leu Pro Ser
385                 390                 395                 400

Cys Ile Ile Asn Leu Gly Asn Gln Phe Glu Asn Phe Lys Asn Glu Leu
                405                 410                 415

Gln Asp Ser Asn Ile Gly Ser Lys Lys Asn Tyr Lys Tyr Phe Cys Asn
            420                 425                 430

Leu Leu Leu Lys Ser Ser Gly Phe Asn Ile Ser Tyr Glu Glu Glu His
        435                 440                 445
```

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

Glu Ile Thr Ser Glu Lys Lys Lys Ile Arg Lys Glu Asn Glu Gln Leu
465                 470                 475                 480

Ile Lys Gln Trp Lys Lys Leu Thr Phe Phe Lys Pro Ser Asn Leu Asn
                485                 490                 495

Gly Lys Lys Thr Ser Asp Lys Ile Arg Phe Lys Ser Pro Asn Asn Pro
            500                 505                 510

Asp Ile Glu Arg Lys Ser Glu Asp Asn Ile Val Glu Asn Ile Ala Lys
        515                 520                 525

Val Lys Tyr Lys Leu Glu Asp Leu Leu Ser Glu Gln Arg Lys Glu Phe
    530                 535                 540

Asn Lys Leu Ala Lys Lys His Asp Gly Val Asp Val Glu Ala Gln Cys
545                 550                 555                 560

Leu Gln Thr Lys Ser Phe Trp Ile Asp Ser Asn Ser Pro Ile Lys Lys
                565                 570                 575

Ser Leu Glu Lys Lys Asn Glu Lys Val Ser Val Lys Lys Lys Met Lys
            580                 585                 590

Ala Ile Arg Ser Cys Ile Ser Ala Trp Lys Trp Phe Met Ala Asp Leu
        595                 600                 605

Ile Glu Ala Gln Lys Glu Thr Pro Met Ile Lys Leu Lys Leu Ala Leu
    610                 615                 620

Met
625
```

<210> 107
<211> 517
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic

polypeptide"

<400> 107

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

Thr Thr Ser Arg Asn Glu Asp Met Ile Gln Lys Glu Thr Ser Arg Ser
            20                  25                  30

Asn Glu Asp Glu Asn Tyr Leu Gly Val Lys Asn Lys Cys Gly Ile Asn
        35                  40                  45

Val His Lys Ser Gly Arg Gly Ser Ser Lys His Glu Pro Asn Met Pro
    50                  55                  60

Pro Glu Lys Ser Gly Glu Gly Gln Met Pro Lys Gln Asp Ser Thr Glu
65                  70                  75                  80

Met Gln Gln Arg Phe Asp Glu Ser Val Thr Gly Glu Thr Gln Val Ser
                85                  90                  95

Ala Gly Ala Thr Ala Ser Ile Lys Thr Asp Ala Arg Ala Asn Ser Gly
            100                 105                 110

Pro Arg Val Gly Thr Ala Arg Ala Leu Ile Val Lys Ala Ser Asn Leu
        115                 120                 125

Asp Arg Asp Ile Lys Leu Gly Cys Lys Pro Cys Glu Tyr Ile Arg Ser
    130                 135                 140

Glu Leu Pro Met Gly Lys Lys Asn Gly Cys Asn His Cys Glu Lys Ser
145                 150                 155                 160

Ser Asp Ile Ala Ser Val Pro Lys Val Glu Ser Gly Phe Arg Lys Ala
                165                 170                 175

Lys Tyr Glu Leu Val Arg Arg Phe Glu Ser Phe Ala Ala Asp Ser Ile
            180                 185                 190

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

Lys Lys Asp Lys Lys Glu Gln Met Gly Lys Val Asn Leu Asp Glu Ile
    210                 215                 220
```

```
Ala Ile Leu Lys Asn Glu Ser Leu Ile Glu Tyr Thr Glu Asn Gln Ile
225                 230                 235                 240

Leu Asp Ala Arg Ser Asn Arg Ile Lys Glu Trp Leu Arg Ser Leu Arg
                245                 250                 255

Leu Arg Leu Arg Thr Arg Asn Lys Gly Leu Lys Lys Ser Lys Ser Ile
            260                 265                 270

Arg Arg Gln Leu Ile Thr Leu Arg Arg Asp Tyr Arg Lys Trp Ile Lys
        275                 280                 285

Pro Asn Pro Tyr Arg Pro Asp Glu Asp Pro Asn Glu Asn Ser Leu Arg
    290                 295                 300

Leu His Thr Lys Leu Gly Val Asp Ile Gly Val Gln Gly Gly Asp Asn
305                 310                 315                 320

Lys Arg Met Asn Ser Asp Asp Tyr Glu Thr Ser Phe Ser Ile Thr Trp
                325                 330                 335

Arg Asp Thr Ala Thr Arg Lys Ile Cys Phe Thr Lys Pro Lys Gly Leu
            340                 345                 350

Leu Pro Arg His Met Lys Phe Lys Leu Arg Gly Tyr Pro Glu Leu Ile
        355                 360                 365

Leu Tyr Asn Glu Glu Leu Arg Ile Gln Asp Ser Gln Lys Phe Pro Leu
    370                 375                 380

Val Asp Trp Glu Arg Ile Pro Ile Phe Lys Leu Arg Gly Val Ser Leu
385                 390                 395                 400

Gly Lys Lys Lys Val Lys Ala Leu Asn Arg Ile Thr Glu Ala Pro Arg
                405                 410                 415

Leu Val Val Ala Lys Arg Ile Gln Val Asn Ile Glu Ser Lys Lys Lys
            420                 425                 430

Lys Val Leu Thr Arg Tyr Val Tyr Asn Asp Lys Ser Ile Asn Gly Arg
        435                 440                 445

Leu Val Lys Ala Glu Asp Ser Asn Lys Asp Pro Leu Leu Glu Phe Lys
```

```
    450                 455                 460

Lys Gln Ala Glu Glu Ile Asn Ser Asp Ala Lys Tyr Tyr Glu Asn Gln
465                 470                 475                 480

Glu Ile Ala Lys Asn Tyr Leu Trp Gly Cys Glu Gly Leu His Lys Asn
                485                 490                 495

Leu Leu Glu Glu Gln Thr Lys Asn Pro Tyr Leu Ala Phe Lys Tyr Gly
            500                 505                 510

Phe Leu Asn Ile Val
        515


<210> 108
<211> 410
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 108
Leu Asp Phe Lys Arg Thr Cys Ser Gln Glu Leu Val Leu Leu Pro Glu
1               5                   10                  15

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

Lys Lys Leu Ile Asn Lys Ala Ala Asn Val Asp Arg Asp Glu Ser Tyr
        35                  40                  45

Gly Cys His His Cys Ile His Thr Arg Thr Ser Leu Ser Lys Pro Val
    50                  55                  60

Lys Lys Asp Cys Asn Ser Cys Asn Gln Ser Thr Asn His Pro Ala Val
65                  70                  75                  80

Pro Ile Thr Leu Lys Gly Tyr Lys Ile Ala Phe Tyr Glu Leu Trp His
                85                  90                  95

Arg Phe Thr Ser Trp Ala Val Asp Ser Ile Ser Lys Ala Leu His Arg
            100                 105                 110
```

```
Asn Lys Val Met Gly Lys Val Asn Leu Asp Glu Tyr Ala Val Val Asp
        115                 120                 125

Asn Ser His Ile Val Cys Tyr Ala Val Arg Lys Cys Tyr Glu Lys Arg
    130                 135                 140

Gln Arg Ser Val Arg Leu His Lys Arg Ala Tyr Arg Cys Arg Ala Lys
145                 150                 155                 160

His Tyr Asn Lys Ser Gln Pro Lys Val Gly Arg Ile Tyr Lys Lys Ser
                165                 170                 175

Lys Arg Arg Asn Ala Arg Asn Leu Lys Lys Glu Ala Lys Arg Tyr Phe
            180                 185                 190

Gln Pro Asn Glu Ile Thr Asn Gly Ser Ser Asp Ala Leu Phe Tyr Lys
        195                 200                 205

Ile Gly Val Asp Leu Gly Ile Ala Lys Gly Thr Pro Glu Thr Glu Val
    210                 215                 220

Lys Val Asp Val Ser Ile Cys Phe Gln Val Tyr Tyr Gly Asp Ala Arg
225                 230                 235                 240

Arg Val Leu Arg Val Arg Lys Met Asp Glu Leu Gln Ser Phe His Leu
                245                 250                 255

Asp Tyr Thr Gly Lys Leu Lys Leu Lys Gly Ile Gly Asn Lys Asp Thr
            260                 265                 270

Phe Thr Ile Ala Lys Arg Asn Glu Ser Leu Lys Trp Gly Ser Thr Lys
        275                 280                 285

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

Gly Ser Val Lys Arg Lys Cys Asn Asp Tyr Phe Arg Ser Ile Ala Ser
305                 310                 315                 320

Trp Ser Cys Glu Ala Ala Ser Gln Arg Ala Gln Ser Asn Leu Lys Asn
                325                 330                 335

Ala Phe Pro Tyr Gln Lys Ala Leu Val Lys Cys Tyr Lys Asn Leu Asp
            340                 345                 350
```

```
Tyr Lys Gly Val Lys Lys Asn Asp Met Trp Tyr Arg Leu Cys Ser Asn
        355                 360                 365

Arg Ile Phe Arg Tyr Ser Arg Ile Ala Glu Asp Ile Ala Gln Tyr Gln
    370                 375                 380

Ser Asp Lys Gly Lys Ala Lys Phe Glu Phe Val Ile Leu Ala Gln Ser
385                 390                 395                 400

Val Ala Glu Tyr Asp Ile Ser Ala Ile Met
                405                 410


<210> 109
<211> 602
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 109
Val Phe Leu Thr Asp Asp Lys Arg Lys Thr Ala Leu Arg Lys Ile Arg
1               5                   10                  15

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

Ala Asp Ser Leu Asp Arg Gln Ala Lys Lys Leu Thr Ile Glu Thr Val
        35                  40                  45

Ser Phe Gly Ala Pro Gly Ala Lys Asn Ala Phe Ile Gly Ser Leu Gln
    50                  55                  60

Gly Tyr Asn Trp Asn Ser His Arg Ala Asn Val Pro Ser Ser Gly Ser
65                  70                  75                  80

Ala Lys Asp Val Phe Arg Ile Thr Glu Leu Gly Leu Gly Ile Pro Gln
                85                  90                  95

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

Val Val Arg Tyr Thr Ala Asn Leu Leu Ser Lys Gly Tyr Lys Lys Gly
```

```
        115                 120                 125

Ala Val Asn Lys Gly Ala Lys Gln Gln Arg Glu Ile Lys Gly Lys Glu
    130                 135                 140

Gln Leu Ser Phe Asp Leu Ile Ser Asn Gly Pro Ile Ser Gly Asp Lys
145                 150                 155                 160

Leu Ile Asn Gly Gln Lys Asp Ala Leu Ala Trp Trp Leu Ile Asp Lys
                165                 170                 175

Met Gly Phe His Ile Gly Leu Ala Met Glu Pro Leu Ser Ser Pro Asn
            180                 185                 190

Thr Tyr Gly Ile Thr Leu Gln Ala Phe Trp Lys Arg His Thr Ala Pro
        195                 200                 205

Arg Arg Tyr Ser Arg Gly Val Ile Arg Gln Trp Gln Leu Pro Phe Gly
    210                 215                 220

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

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

Gly Val Leu Leu Glu Gln Thr Ala Leu Val Asp Pro Lys Lys Trp Trp
            260                 265                 270

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

Ser Val Pro Leu Val Leu Tyr Thr Ala Thr Phe Thr His Lys His Gly
    290                 295                 300

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

Gly Ser Val Phe Leu Leu Pro Leu Ser Lys Val Thr Pro Gly Lys Leu
                325                 330                 335

Val Arg Ala Trp Met Pro Asp Ile Asn Ile Leu Arg Asp Gly Arg Pro
            340                 345                 350
```

```
Asp Glu Ala Ala Tyr Lys Gly Pro Asp Leu Ile Arg Ala Arg Glu Arg
        355                 360                 365

Ser Phe Pro Leu Ala Tyr Thr Cys Val Thr Gln Ile Ala Asp Glu Trp
    370                 375                 380

Gln Lys Arg Ala Leu Glu Ser Asn Arg Asp Ser Ile Thr Pro Leu Glu
385                 390                 395                 400

Ala Lys Leu Val Thr Gly Ser Asp Leu Leu Gln Ile His Ser Thr Val
                405                 410                 415

Gln Gln Ala Val Glu Gln Gly Ile Gly Gly Arg Ile Ser Ser Pro Ile
            420                 425                 430

Gln Glu Leu Leu Ala Lys Asp Ala Leu Gln Leu Val Leu Gln Gln Leu
        435                 440                 445

Phe Met Thr Val Asp Leu Leu Arg Ile Gln Trp Gln Leu Lys Gln Glu
    450                 455                 460

Val Ala Asp Gly Asn Thr Ser Glu Lys Ala Val Gly Trp Ala Ile Arg
465                 470                 475                 480

Ile Ser Asn Ile His Lys Asp Ala Tyr Lys Thr Ala Ile Glu Pro Cys
                485                 490                 495

Thr Ser Ala Leu Lys Gln Ala Trp Asn Pro Leu Ser Gly Phe Glu Glu
            500                 505                 510

Arg Thr Phe Gln Leu Asp Ala Ser Ile Val Arg Lys Arg Ser Thr Ala
        515                 520                 525

Lys Thr Pro Asp Asp Glu Leu Val Ile Val Leu Arg Gln Gln Ala Ala
    530                 535                 540

Glu Met Thr Val Ala Val Thr Gln Ser Val Ser Lys Glu Leu Met Glu
545                 550                 555                 560

Leu Ala Val Arg His Ser Ala Thr Leu His Leu Leu Val Gly Glu Val
                565                 570                 575

Ala Ser Lys Gln Leu Ser Arg Ser Ala Asp Lys Asp Arg Gly Ala Met
```

580 585 590

Asp His Trp Lys Leu Leu Ser Gln Ser Met
595 600

<210> 110
<211> 494
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 110
Glu Asp Leu Leu Gln Lys Ala Leu Asn Thr Ala Thr Asn Val Ala Ala
1 5 10 15

Ile Glu Arg His Ser Cys Ile Ser Cys Leu Phe Thr Glu Ser Glu Ile
20 25 30

Asp Val Lys Tyr Lys Thr Pro Asp Lys Ile Gly Gln Asn Thr Ala Gly
35 40 45

Cys Gln Ser Cys Thr Phe Arg Val Gly Tyr Ser Gly Asn Ser His Thr
50 55 60

Leu Pro Met Gly Asn Arg Ile Ala Leu Asp Lys Leu Arg Glu Thr Ile
65 70 75 80

Gln Arg Tyr Ala Trp His Ser Leu Leu Phe Asn Val Pro Pro Ala Pro
85 90 95

Thr Ser Lys Arg Val Arg Ala Ile Ser Glu Leu Arg Val Ala Ala Gly
100 105 110

Arg Glu Arg Leu Phe Thr Val Ile Thr Phe Val Gln Thr Asn Ile Leu
115 120 125

Ser Lys Leu Gln Lys Arg Tyr Ala Ala Asn Trp Thr Pro Lys Ser Gln
130 135 140

Glu Arg Leu Ser Arg Leu Arg Glu Glu Gly Gln His Ile Leu Ser Leu
145 150 155 160

```
Leu Glu Ser Gly Ser Trp Gln Gln Lys Glu Val Val Arg Glu Asp Gln
                165                 170                 175

Asp Leu Ile Val Cys Ser Ala Leu Thr Lys Pro Gly Leu Ser Ile Gly
            180                 185                 190

Ala Phe Cys Arg Pro Lys Tyr Leu Lys Pro Ala Lys His Ala Leu Val
        195                 200                 205

Leu Arg Leu Ile Phe Val Glu Gln Trp Pro Gly Gln Ile Trp Gly Gln
    210                 215                 220

Ser Lys Arg Thr Arg Arg Met Arg Arg Arg Lys Asp Val Glu Arg Val
225                 230                 235                 240

Tyr Asp Ile Ser Val Gln Ala Trp Ala Leu Lys Gly Lys Glu Thr Arg
                245                 250                 255

Ile Ser Glu Cys Ile Asp Thr Met Arg Arg His Gln Gln Ala Tyr Ile
            260                 265                 270

Gly Val Leu Pro Phe Leu Ile Leu Ser Gly Ser Thr Val Arg Gly Lys
        275                 280                 285

Gly Asp Cys Pro Ile Leu Lys Glu Ile Thr Arg Met Arg Tyr Cys Pro
    290                 295                 300

Asn Asn Glu Gly Leu Ile Pro Leu Gly Ile Phe Tyr Arg Gly Ser Ala
305                 310                 315                 320

Asn Lys Leu Leu Arg Val Val Lys Gly Ser Ser Phe Thr Leu Pro Met
                325                 330                 335

Trp Gln Asn Ile Glu Thr Leu Pro His Pro Glu Pro Phe Ser Pro Glu
            340                 345                 350

Gly Trp Thr Ala Thr Gly Ala Leu Tyr Glu Lys Asn Leu Ala Tyr Trp
        355                 360                 365

Ser Ala Leu Asn Glu Ala Val Asp Trp Tyr Thr Gly Gln Ile Leu Ser
    370                 375                 380

Ser Gly Leu Gln Tyr Pro Asn Gln Asn Glu Phe Leu Ala Arg Leu Gln
385                 390                 395                 400
```

Asn Val Ile Asp Ser Ile Pro Arg Lys Trp Phe Arg Pro Gln Gly Leu
405 410 415

Lys Asn Leu Lys Pro Asn Gly Gln Glu Asp Ile Val Pro Asn Glu Phe
420 425 430

Val Ile Pro Gln Asn Ala Ile Arg Ala His His Val Ile Glu Trp Tyr
435 440 445

His Lys Thr Asn Asp Leu Val Ala Lys Thr Leu Leu Gly Trp Gly Ser
450 455 460

Gln Thr Thr Leu Asn Gln Thr Arg Pro Gln Gly Asp Leu Arg Phe Thr
465 470 475 480

Tyr Thr Arg Tyr Tyr Phe Arg Glu Lys Glu Val Pro Glu Val
485 490

<210> 111
<211> 649
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 111
Val Pro Lys Lys Lys Leu Met Arg Glu Leu Ala Lys Lys Ala Val Phe
1 5 10 15

Glu Ala Ile Phe Asn Asp Pro Ile Pro Gly Ser Phe Gly Cys Lys Arg
20 25 30

Cys Thr Leu Ile Asp Gly Ala Arg Val Thr Asp Ala Ile Glu Lys Lys
35 40 45

Gln Gly Ala Lys Arg Cys Ala Gly Cys Glu Pro Cys Thr Phe His Thr
50 55 60

Leu Tyr Asp Ser Val Lys His Ala Leu Pro Ala Ala Thr Gly Cys Asp
65 70 75 80

Arg Thr Ala Ile Asp Thr Gly Leu Trp Glu Ile Leu Thr Ala Leu Arg

```
                85                  90                  95

Ser Tyr Asn Trp Met Ser Phe Arg Arg Asn Ala Val Ser Asp Ala Ser
            100                 105                 110

Gln Lys Gln Val Trp Ser Ile Glu Glu Leu Ala Ile Trp Ala Asp Lys
        115                 120                 125

Glu Arg Ala Leu Arg Val Ile Leu Ser Ala Leu Thr His Thr Ile Gly
    130                 135                 140

Lys Leu Lys Asn Gly Phe Ser Arg Asp Gly Val Trp Lys Gly Gly Lys
145                 150                 155                 160

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

Ala Asn Gly Glu Ile Phe Gly Lys Glu Leu Val Glu Ala Asp His Asp
            180                 185                 190

Met Leu Ala Trp Thr Ile Val Pro Asn His Gln Phe His Ile Gly Leu
        195                 200                 205

Ile Arg Gly Asn Trp Lys Pro Ala Ala Val Glu Ala Ser Thr Ala Phe
    210                 215                 220

Asp Ala Arg Trp Leu Thr Asn Gly Ala Pro Leu Arg Asp Thr Arg Thr
225                 230                 235                 240

His Gly His Arg Gly Arg Arg Phe Asn Arg Thr Glu Lys Leu Thr Val
                245                 250                 255

Leu Cys Ile Lys Arg Asp Gly Gly Val Ser Glu Glu Phe Arg Gln Glu
            260                 265                 270

Arg Asp Tyr Glu Leu Ser Val Met Leu Leu Gln Pro Lys Asn Lys Leu
        275                 280                 285

Lys Pro Glu Pro Lys Gly Glu Leu Asn Ser Phe Glu Asp Leu His Asp
    290                 295                 300

His Trp Trp Phe Leu Lys Gly Asp Glu Ala Thr Ala Leu Val Gly Leu
305                 310                 315                 320
```

```
Thr Ser Asp Pro Thr Val Gly Asp Phe Ile Gln Leu Gly Leu Tyr Ile
                325                 330                 335

Arg Asn Pro Ile Lys Ala His Gly Glu Thr Lys Arg Arg Leu Leu Ile
            340                 345                 350

Cys Phe Glu Pro Pro Ile Lys Leu Pro Leu Arg Arg Ala Phe Pro Ser
        355                 360                 365

Glu Ala Phe Lys Thr Trp Glu Pro Thr Ile Asn Val Phe Arg Asn Gly
    370                 375                 380

Arg Arg Asp Thr Glu Ala Tyr Tyr Asp Ile Asp Arg Ala Arg Val Phe
385                 390                 395                 400

Glu Phe Pro Glu Thr Arg Val Ser Leu Glu His Leu Ser Lys Gln Trp
                405                 410                 415

Glu Val Leu Arg Leu Glu Pro Asp Arg Glu Asn Thr Asp Pro Tyr Glu
            420                 425                 430

Ala Gln Gln Asn Glu Gly Ala Glu Leu Gln Val Tyr Ser Leu Leu Gln
        435                 440                 445

Glu Ala Ala Gln Lys Met Ala Pro Lys Val Val Ile Asp Pro Phe Gly
    450                 455                 460

Gln Phe Pro Leu Glu Leu Phe Ser Thr Phe Val Ala Gln Leu Phe Asn
465                 470                 475                 480

Ala Pro Leu Ser Asp Thr Lys Ala Lys Ile Gly Lys Pro Leu Asp Ser
                485                 490                 495

Gly Phe Val Val Glu Ser His Leu His Leu Leu Glu Glu Asp Phe Ala
            500                 505                 510

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

Arg Val Ile His Tyr Ser Asn Gly Glu Gly Tyr Trp Lys Lys Thr Val
    530                 535                 540

Leu Lys Gly Lys Asn Asn Ile Arg Thr Ala Leu Ile Pro Glu Gly Ala
```

545 550 555 560

Lys Ala Ala Val Asp Ala Tyr Lys Asn Lys Arg Cys Pro Leu Thr Leu
565 570 575

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

Asn Lys Ala Leu Ser Leu Leu Ala Gln Thr Ala Arg Gly Asn Leu Thr
595 600 605

Ile Leu Glu Ala Leu Ala Ala Glu Val Leu Arg Pro Leu Ser Gly Thr
610 615 620

Glu Gly Val Val His Leu His Ala Cys Val Thr Arg His Ser Thr Leu
625 630 635 640

Thr Glu Ser Thr Glu Thr Asp Asn Met
645

<210> 112
<211> 414
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 112
Val Glu Lys Leu Phe Ser Glu Arg Leu Lys Arg Ala Met Trp Leu Lys
1 5 10 15

Asn Glu Ala Gly Arg Ala Pro Pro Ala Glu Thr Leu Thr Leu Lys His
20 25 30

Lys Arg Val Ser Gly Gly His Glu Lys Val Lys Glu Glu Leu Gln Arg
35 40 45

Val Leu Arg Ser Leu Ser Gly Thr Asn Gln Ala Ala Trp Asn Leu Gly
50 55 60

Leu Ser Gly Gly Arg Glu Pro Lys Ser Ser Asp Ala Leu Lys Gly Glu
65 70 75 80

```
Lys Ser Arg Val Val Leu Glu Thr Val Val Phe His Ser Gly His Asn
                85                  90                  95

Arg Val Leu Tyr Asp Val Ile Glu Arg Glu Asp Gln Val His Gln Arg
            100                 105                 110

Ser Ser Ile Met His Met Arg Arg Lys Gly Ser Asn Leu Leu Arg Leu
        115                 120                 125

Trp Gly Arg Ser Gly Lys Val Arg Arg Lys Met Arg Glu Glu Val Ala
    130                 135                 140

Glu Ile Lys Pro Val Trp His Lys Asp Ser Arg Trp Leu Ala Ile Val
145                 150                 155                 160

Glu Glu Gly Arg Gln Ser Val Val Gly Ile Ser Ser Ala Gly Leu Ala
                165                 170                 175

Val Phe Ala Val Gln Glu Ser Gln Cys Thr Thr Ala Glu Pro Lys Pro
            180                 185                 190

Leu Glu Tyr Val Val Ser Ile Trp Phe Arg Gly Ser Lys Ala Leu Asn
        195                 200                 205

Pro Gln Asp Arg Tyr Leu Glu Phe Lys Lys Leu Lys Thr Thr Glu Ala
    210                 215                 220

Leu Arg Gly Gln Gln Tyr Asp Pro Ile Pro Phe Ser Leu Lys Arg Gly
225                 230                 235                 240

Ala Gly Cys Ser Leu Ala Ile Arg Gly Glu Gly Ile Lys Phe Gly Ser
                245                 250                 255

Arg Gly Pro Ile Lys Gln Phe Phe Gly Ser Asp Arg Ser Arg Pro Ser
            260                 265                 270

His Ala Asp Tyr Asp Gly Lys Arg Arg Leu Ser Leu Phe Ser Lys Tyr
        275                 280                 285

Ala Gly Asp Leu Ala Asp Leu Thr Glu Glu Gln Trp Asn Arg Thr Val
    290                 295                 300

Ser Ala Phe Ala Glu Asp Glu Val Arg Arg Ala Thr Leu Ala Asn Ile
305                 310                 315                 320
```

Gln Asp Phe Leu Ser Ile Ser His Glu Lys Tyr Ala Glu Arg Leu Lys
325 330 335

Lys Arg Ile Glu Ser Ile Glu Glu Pro Val Ser Ala Ser Lys Leu Glu
340 345 350

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

Leu Ala Ser Asn Phe Leu Met Arg Leu Val Glu Ser Val Ala Leu Leu
370 375 380

Ile Ser Leu Glu Glu Lys Ser Pro Arg Val Glu Phe Arg Val Ala Arg
385 390 395 400

Tyr Leu Ala Glu Ser Lys Glu Gly Phe Asn Arg Lys Ala Met
405 410

<210> 113
<211> 413
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 113
Val Val Ile Thr Gln Ser Glu Leu Tyr Lys Glu Arg Leu Leu Arg Val
1 5 10 15

Met Glu Ile Lys Asn Asp Arg Gly Arg Lys Glu Pro Arg Glu Ser Gln
20 25 30

Gly Leu Val Leu Arg Phe Thr Gln Val Thr Gly Gly Gln Glu Lys Val
35 40 45

Lys Gln Lys Leu Trp Leu Ile Phe Glu Gly Phe Ser Gly Thr Asn Gln
50 55 60

Ala Ser Trp Asn Phe Gly Gln Pro Ala Gly Gly Arg Lys Pro Asn Ser
65 70 75 80

Gly Asp Ala Leu Lys Gly Pro Lys Ser Arg Val Thr Tyr Glu Thr Val

```
                85                  90                  95

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

Asn Leu Lys Gln Gln Arg Gln Thr Met Ala Tyr Met Lys Arg Arg Ala
        115                 120                 125

Ala Ala Arg Lys Lys Trp Ala Arg Ser Gly Lys Lys Cys Ser Arg Met
    130                 135                 140

Arg Asn Glu Val Glu Lys Ile Lys Pro Lys Trp His Lys Asp Pro Arg
145                 150                 155                 160

Trp Phe Asp Ile Val Lys Glu Gly Glu Pro Ser Ile Val Gly Ile Ser
                165                 170                 175

Ser Ala Gly Phe Ala Ile Tyr Ile Val Glu Glu Pro Asn Phe Pro Arg
            180                 185                 190

Gln Asp Pro Leu Glu Ile Glu Tyr Ala Ile Ser Ile Trp Phe Arg Arg
        195                 200                 205

Asp Arg Ser Gln Tyr Leu Thr Phe Lys Lys Ile Gln Lys Ala Glu Lys
    210                 215                 220

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

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

Gly Ser Ile Glu His Phe Arg Asp Glu Ala Arg Gly Lys Pro Pro Lys
            260                 265                 270

Ala Asp Met Asp Asn Asn Arg Arg Leu Thr Met Phe Ser Val Phe Ser
        275                 280                 285

Gly Asn Leu Thr Asn Leu Thr Glu Glu Gln Tyr Ala Arg Pro Val Ser
    290                 295                 300

Gly Leu Leu Ala Pro Asp Glu Lys Arg Met Pro Thr Leu Leu Lys Lys
305                 310                 315                 320
```

```
Leu Gln Asp Phe Phe Thr Pro Ile His Glu Lys Tyr Gly Glu Arg Ile
                325                 330                 335

Lys Gln Arg Leu Ala Asn Ser Glu Ala Ser Lys Arg Pro Phe Lys Lys
            340                 345                 350

Leu Glu Glu Tyr Leu Pro Ala Ile Tyr Leu Glu Phe Arg Ala Arg Arg
        355                 360                 365

Glu Gly Leu Ala Ser Asn Trp Val Leu Val Leu Ile Asn Ser Val Arg
    370                 375                 380

Thr Leu Val Arg Ile Lys Ser Glu Asp Pro Tyr Ile Glu Phe Lys Val
385                 390                 395                 400

Ser Gln Tyr Leu Leu Glu Lys Glu Asp Asn Lys Ala Leu
                405                 410
```

<210> 114
<211> 449
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 114

```
Lys Gln Asp Ala Leu Phe Glu Glu Arg Leu Lys Lys Ala Ile Phe Ile
1               5                   10                  15

Lys Arg Gln Ala Asp Pro Leu Gln Arg Glu Glu Leu Ser Leu Leu Pro
            20                  25                  30

Pro Asn Arg Lys Ile Val Thr Gly Gly His Glu Ser Ala Lys Asp Thr
        35                  40                  45

Leu Lys Gln Ile Leu Arg Ala Ile Asn Gly Thr Asn Gln Ala Ser Trp
    50                  55                  60

Asn Pro Gly Thr Pro Ser Gly Lys Arg Asp Ser Lys Ser Ala Asp Ala
65                  70                  75                  80

Leu Ala Gly Pro Lys Ser Arg Val Lys Leu Glu Thr Val Val Phe His
                85                  90                  95
```

```
Val Gly His Arg Leu Leu Lys Lys Val Val Glu Tyr Gln Gly His Gln
            100                 105                 110

Lys Gln Gln His Gly Leu Lys Ala Phe Met Arg Thr Cys Ala Ala Met
        115                 120                 125

Arg Lys Lys Trp Lys Arg Ser Gly Lys Val Val Gly Glu Leu Arg Glu
    130                 135                 140

Gln Leu Ala Asn Ile Gln Pro Lys Trp His Tyr Asp Ser Arg Pro Leu
145                 150                 155                 160

Asn Leu Cys Phe Glu Gly Lys Pro Ser Val Val Gly Leu Arg Ser Ala
                165                 170                 175

Gly Ile Ala Leu Tyr Thr Ile Gln Lys Ser Val Val Pro Val Lys Glu
            180                 185                 190

Pro Lys Pro Ile Glu Tyr Ala Val Ser Ile Trp Phe Arg Gly Pro Lys
        195                 200                 205

Ala Met Asp Arg Glu Asp Arg Cys Leu Glu Phe Lys Lys Leu Lys Ile
    210                 215                 220

Ala Thr Glu Leu Arg Lys Leu Gln Phe Glu Pro Ile Val Ser Thr Leu
225                 230                 235                 240

Thr Gln Gly Ile Lys Gly Phe Ser Leu Tyr Ile Gln Gly Asn Ser Val
                245                 250                 255

Lys Phe Gly Ser Arg Gly Pro Ile Lys Tyr Phe Ser Asn Glu Ser Val
            260                 265                 270

Arg Gln Arg Pro Pro Lys Ala Asp Pro Asp Gly Asn Lys Arg Leu Ala
        275                 280                 285

Leu Phe Ser Lys Phe Ser Gly Asp Leu Ser Asp Leu Thr Glu Glu Gln
    290                 295                 300

Trp Asn Arg Pro Ile Leu Ala Phe Glu Gly Ile Ile Arg Arg Ala Thr
305                 310                 315                 320
```

```
Leu Gly Asn Ile Gln Asp Tyr Leu Thr Val Gly His Glu Gln Phe Ala
                325                 330                 335

Ile Ser Leu Glu Gln Leu Leu Ser Glu Lys Glu Ser Val Leu Gln Met
            340                 345                 350

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

Asn Glu Trp Val Glu Ser Phe Gly Ala Glu Gln Ala Arg Lys Lys Ala
    370                 375                 380

Gln Gly Ile Arg Glu Tyr Ile Ser Gly Phe Phe Gln Glu Tyr Cys Ser
385                 390                 395                 400

Gln Arg Glu Gln Trp Ala Glu Asn Trp Val Gln Gln Leu Asn Lys Ser
                405                 410                 415

Val Arg Leu Phe Leu Thr Ile Gln Asp Ser Thr Pro Phe Ile Glu Phe
            420                 425                 430

Arg Val Ala Arg Tyr Leu Pro Lys Gly Glu Lys Lys Lys Gly Lys Ala
        435                 440                 445

Met
```

<210> 115
<211> 711
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 115

```
Ala Asn His Ala Glu Arg His Lys Arg Leu Arg Lys Glu Ala Asn Arg
1               5                   10                  15

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

Pro Leu Val Gly Ile Cys Arg Leu Leu Arg Arg Gly Asp Lys Met Gln
        35                  40                  45
```

```
Pro Asn Lys Thr Gly Cys Arg Ser Cys Glu Gln Val Glu Pro Glu Leu
    50                  55                  60

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

Tyr Glu Leu Phe Gln Arg Gly Arg Ala Met Ala Val His Arg Leu Leu
                85                  90                  95

Lys Arg Val Pro Lys Leu Asn Arg Pro Lys Lys Ala Ala Gly Asn Asp
            100                 105                 110

Glu Lys Lys Ala Glu Asn Lys Lys Ser Glu Ile Gln Lys Glu Lys Gln
        115                 120                 125

Lys Gln Arg Arg Met Met Pro Ala Val Ser Met Lys Gln Val Ser Val
    130                 135                 140

Ala Asp Phe Lys His Val Ile Glu Asn Thr Val Arg His Leu Phe Gly
145                 150                 155                 160

Asp Arg Arg Asp Arg Glu Ile Ala Glu Cys Ala Ala Leu Arg Ala Ala
                165                 170                 175

Ser Lys Tyr Phe Leu Lys Ser Arg Arg Val Arg Pro Arg Lys Leu Pro
            180                 185                 190

Lys Leu Ala Asn Pro Asp His Gly Lys Glu Leu Lys Gly Leu Arg Leu
        195                 200                 205

Arg Glu Lys Arg Ala Lys Leu Lys Lys Glu Lys Glu Lys Gln Ala Glu
    210                 215                 220

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

Lys Lys Asp Ala Pro Pro Met Pro Tyr Glu Lys Thr Gln Gly Arg Asn
                245                 250                 255

Asp Tyr Thr Thr Phe Val Ile Ser Ala Ala Ile Lys Val Gly Ala Thr
            260                 265                 270

Arg Gly Thr Lys Pro Leu Leu Thr Pro Gln Pro Arg Glu Trp Gln Cys
```

```
        275                 280                 285

Ser Leu Tyr Trp Arg Asp Gly Gln Arg Trp Ile Arg Gly Gly Leu Leu
    290                 295                 300

Gly Leu Gln Ala Gly Ile Val Leu Gly Pro Lys Leu Asn Arg Glu Leu
305                 310                 315                 320

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

Gly Asn Pro Leu Gln Val Arg Gly Ala Ala Val Asp Phe Phe Met Thr
            340                 345                 350

Thr Asn Pro Phe Tyr Val Ser Gly Ala Ala Tyr Ala Gln Lys Lys Phe
        355                 360                 365

Lys Pro Phe Gly Thr Lys Arg Ala Ser Glu Asp Gly Ala Ala Ala Lys
    370                 375                 380

Ala Arg Glu Lys Leu Met Thr Gln Leu Ala Lys Val Leu Asp Lys Val
385                 390                 395                 400

Val Thr Gln Ala Ala His Ser Pro Leu Asp Gly Ile Trp Glu Thr Arg
                405                 410                 415

Pro Glu Ala Lys Leu Arg Ala Met Ile Met Ala Leu Glu His Glu Trp
            420                 425                 430

Ile Phe Leu Arg Pro Gly Pro Cys His Asn Ala Ala Glu Glu Val Ile
        435                 440                 445

Lys Cys Asp Cys Thr Gly Gly His Ala Ile Leu Trp Ala Leu Ile Asp
    450                 455                 460

Glu Ala Arg Gly Ala Leu Glu His Lys Glu Phe Tyr Ala Val Thr Arg
465                 470                 475                 480

Ala His Thr His Asp Cys Glu Lys Gln Lys Leu Gly Gly Arg Leu Ala
                485                 490                 495

Gly Phe Leu Asp Leu Leu Ile Ala Gln Asp Val Pro Leu Asp Asp Ala
            500                 505                 510
```

```
Pro Ala Ala Arg Lys Ile Lys Thr Leu Leu Glu Ala Thr Pro Pro Ala
        515                 520                 525

Pro Cys Tyr Lys Ala Ala Thr Ser Ile Ala Thr Cys Asp Cys Glu Gly
    530                 535                 540

Lys Phe Asp Lys Leu Trp Ala Ile Ile Asp Ala Thr Arg Ala Gly His
545                 550                 555                 560

Gly Thr Glu Asp Leu Trp Ala Arg Thr Leu Ala Tyr Pro Gln Asn Val
                565                 570                 575

Asn Cys Lys Cys Lys Ala Gly Lys Asp Leu Thr His Arg Leu Ala Asp
            580                 585                 590

Phe Leu Gly Leu Leu Ile Lys Arg Asp Gly Pro Phe Arg Glu Arg Pro
        595                 600                 605

Pro His Lys Val Thr Gly Asp Arg Lys Leu Val Phe Ser Gly Asp Lys
    610                 615                 620

Lys Cys Lys Gly His Gln Tyr Val Ile Leu Ala Lys Ala His Asn Glu
625                 630                 635                 640

Glu Val Val Arg Ala Trp Ile Ser Arg Trp Gly Leu Lys Ser Arg Thr
                645                 650                 655

Asn Lys Ala Gly Tyr Ala Ala Thr Glu Leu Asn Leu Leu Leu Asn Trp
            660                 665                 670

Leu Ser Ile Cys Arg Arg Arg Trp Met Asp Met Leu Thr Val Gln Arg
        675                 680                 685

Asp Thr Pro Tyr Ile Arg Met Lys Thr Gly Arg Leu Val Val Asp Asp
    690                 695                 700

Lys Lys Glu Arg Lys Ala Met
705                 710
```

<210> 116
<211> 574
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 116
Ala Lys Gln Arg Glu Ala Leu Arg Val Ala Leu Glu Arg Gly Ile Val
1 5 10 15

Arg Ala Ser Asn Arg Thr Tyr Thr Leu Val Thr Asn Cys Thr Lys Gly
20 25 30

Gly Pro Leu Pro Glu Gln Cys Arg Met Ile Glu Arg Gly Lys Ala Arg
35 40 45

Ala Met Lys Trp Glu Pro Lys Leu Val Gly Cys Gly Ser Cys Ala Ala
50 55 60

Ala Thr Val Asp Leu Pro Ala Ile Glu Glu Tyr Ala Gln Pro Gly Arg
65 70 75 80

Leu Asp Val Ala Lys Tyr Lys Leu Thr Thr Gln Ile Leu Ala Met Ala
85 90 95

Thr Arg Arg Met Met Val Arg Ala Ala Lys Leu Ser Arg Arg Lys Gly
100 105 110

Gln Trp Pro Ala Lys Val Gln Glu Glu Lys Glu Glu Pro Pro Glu Pro
115 120 125

Lys Lys Met Leu Lys Ala Val Glu Met Arg Pro Val Ala Ile Val Asp
130 135 140

Phe Asn Arg Val Ile Gln Thr Thr Ile Glu His Leu Trp Ala Glu Arg
145 150 155 160

Ala Asn Ala Asp Glu Ala Glu Leu Lys Ala Leu Lys Ala Ala Ala Ala
165 170 175

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

Ala Ile Gly Arg Glu Leu Lys Lys Ala His Arg Lys Lys Ala Tyr Ala
195 200 205

```
Glu Arg Lys Lys Ala Arg Arg Lys Arg Ala Glu Leu Ala Arg Ser Gln
    210                 215                 220

Ala Arg Gly Ala Ala Ala His Ala Ala Ile Arg Glu Arg Asp Ile Pro
225                 230                 235                 240

Pro Met Ala Tyr Glu Arg Thr Gln Gly Arg Asn Asp Val Thr Thr Ile
                245                 250                 255

Pro Ile Ala Ala Ala Ile Lys Ile Ala Ala Thr Arg Gly Ala Arg Pro
            260                 265                 270

Leu Pro Ala Pro Lys Pro Met Lys Trp Gln Cys Ser Leu Tyr Trp Asn
        275                 280                 285

Glu Gly Gln Arg Trp Ile Arg Gly Gly Met Leu Thr Ala Gln Ala Tyr
    290                 295                 300

Ala His Ala Ala Asn Ile His Arg Pro Met Arg Cys Glu Met Trp Gly
305                 310                 315                 320

Val Gly Asn Pro Leu Lys Val Arg Ala Phe Glu Gly Arg Val Ala Asp
                325                 330                 335

Pro Asp Gly Ala Lys Gly Arg Lys Ala Glu Phe Arg Leu Gln Thr Asn
            340                 345                 350

Ala Phe Tyr Val Ser Gly Ala Ala Tyr Arg Asn Lys Lys Phe Lys Pro
        355                 360                 365

Phe Gly Thr Asp Arg Gly Gly Ile Gly Ser Ala Arg Lys Lys Arg Glu
    370                 375                 380

Arg Leu Met Ala Gln Leu Ala Lys Ile Leu Asp Lys Val Val Ser Gln
385                 390                 395                 400

Ala Ala His Ser Pro Leu Asp Asp Ile Trp His Thr Arg Pro Ala Gln
                405                 410                 415

Lys Leu Arg Ala Met Ile Lys Gln Leu Glu His Glu Trp Met Phe Leu
            420                 425                 430

Arg Pro Gln Ala Pro Thr Val Glu Gly Thr Lys Pro Asp Val Asp Val
        435                 440                 445
```

```
Ala Gly Asn Met Gln Arg Gln Ile Lys Ala Leu Met Ala Pro Asp Leu
    450                 455                 460

Pro Pro Ile Glu Lys Gly Ser Pro Ala Lys Arg Phe Thr Gly Asp Lys
465                 470                 475                 480

Arg Lys Lys Gly Glu Arg Ala Val Arg Val Ala Glu Ala His Ser Asp
                485                 490                 495

Glu Val Val Thr Ala Trp Ile Ser Arg Trp Gly Ile Gln Thr Arg Arg
            500                 505                 510

Asn Glu Gly Ser Tyr Ala Ala Gln Glu Leu Glu Leu Leu Leu Asn Trp
        515                 520                 525

Leu Gln Ile Cys Arg Arg Arg Trp Leu Asp Met Thr Ala Ala Gln Arg
    530                 535                 540

Val Ser Pro Tyr Ile Arg Met Lys Ser Gly Arg Met Ile Thr Asp Ala
545                 550                 555                 560

Ala Asp Glu Gly Val Ala Pro Ile Pro Leu Val Glu Asn Met
                565                 570
```

<210> 117
<211> 743
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 117

```
Lys Ser Ile Ser Gly Arg Ser Ile Lys His Met Ala Cys Leu Lys Asp
1               5                   10                  15

Met Leu Lys Ser Glu Ile Thr Glu Ile Glu Glu Lys Gln Lys Lys Glu
            20                  25                  30

Ser Leu Arg Lys Trp Asp Tyr Tyr Ser Lys Phe Ser Asp Glu Ile Leu
        35                  40                  45

Phe Arg Arg Asn Leu Asn Val Ser Ala Asn His Asp Ala Asn Ala Cys
```

```
    50                  55                  60

Tyr Gly Cys Asn Pro Cys Ala Phe Leu Lys Glu Val Tyr Gly Phe Arg
65                  70                  75                  80

Ile Glu Arg Arg Asn Asn Glu Arg Ile Ile Ser Tyr Arg Arg Gly Leu
                85                  90                  95

Ala Gly Cys Lys Ser Cys Val Gln Ser Thr Gly Tyr Pro Pro Ile Glu
            100                 105                 110

Phe Val Arg Arg Lys Phe Gly Ala Asp Lys Ala Met Glu Ile Val Arg
        115                 120                 125

Glu Val Leu His Arg Arg Asn Trp Gly Ala Leu Ala Arg Asn Ile Gly
    130                 135                 140

Arg Glu Lys Glu Ala Asp Pro Ile Leu Gly Glu Leu Asn Glu Leu Leu
145                 150                 155                 160

Leu Val Asp Ala Arg Pro Tyr Phe Gly Asn Lys Ser Ala Ala Asn Glu
                165                 170                 175

Thr Asn Leu Ala Phe Asn Val Ile Thr Arg Ala Ala Lys Lys Phe Arg
            180                 185                 190

Asp Glu Gly Met Tyr Asp Ile His Lys Gln Leu Asp Ile His Ser Glu
        195                 200                 205

Glu Gly Lys Val Pro Lys Gly Arg Lys Ser Arg Leu Ile Arg Ile Glu
    210                 215                 220

Arg Lys His Lys Ala Ile His Gly Leu Asp Pro Gly Glu Thr Trp Arg
225                 230                 235                 240

Tyr Pro His Cys Gly Lys Gly Glu Lys Tyr Gly Val Trp Leu Asn Arg
                245                 250                 255

Ser Arg Leu Ile His Ile Lys Gly Asn Glu Tyr Arg Cys Leu Thr Ala
            260                 265                 270

Phe Gly Thr Thr Gly Arg Arg Met Ser Leu Asp Val Ala Cys Ser Val
        275                 280                 285
```

```
Leu Gly His Pro Leu Val Lys Lys Lys Arg Lys Lys Gly Lys Lys Thr
    290                 295                 300

Val Asp Gly Thr Glu Leu Trp Gln Ile Lys Lys Ala Thr Glu Thr Leu
305                 310                 315                 320

Pro Glu Asp Pro Ile Asp Cys Thr Phe Tyr Leu Tyr Ala Ala Lys Pro
                325                 330                 335

Thr Lys Asp Pro Phe Ile Leu Lys Val Gly Ser Leu Lys Ala Pro Arg
            340                 345                 350

Trp Lys Lys Leu His Lys Asp Phe Phe Glu Tyr Ser Asp Thr Glu Lys
        355                 360                 365

Thr Gln Gly Gln Glu Lys Gly Lys Arg Val Val Arg Arg Gly Lys Val
    370                 375                 380

Pro Arg Ile Leu Ser Leu Arg Pro Asp Ala Lys Phe Lys Val Ser Ile
385                 390                 395                 400

Trp Asp Asp Pro Tyr Asn Gly Lys Asn Lys Glu Gly Thr Leu Leu Arg
                405                 410                 415

Met Glu Leu Ser Gly Leu Asp Gly Ala Lys Lys Pro Leu Ile Leu Lys
            420                 425                 430

Arg Tyr Gly Glu Pro Asn Thr Lys Pro Lys Asn Phe Val Phe Trp Arg
        435                 440                 445

Pro His Ile Thr Pro His Pro Leu Thr Phe Thr Pro Lys His Asp Phe
    450                 455                 460

Gly Asp Pro Asn Lys Lys Thr Lys Arg Arg Arg Val Phe Asn Arg Glu
465                 470                 475                 480

Tyr Tyr Gly His Leu Asn Asp Leu Ala Lys Met Glu Pro Asn Ala Lys
                485                 490                 495

Phe Phe Glu Asp Arg Glu Val Ser Asn Lys Lys Asn Pro Lys Ala Lys
            500                 505                 510

Asn Ile Arg Ile Gln Ala Lys Glu Ser Leu Pro Asn Ile Val Ala Lys
```

```
        515                 520                 525

Asn Gly Arg Trp Ala Ala Phe Asp Pro Asn Asp Ser Leu Trp Lys Leu
    530                 535                 540

Tyr Leu His Trp Arg Gly Arg Arg Lys Thr Ile Lys Gly Gly Ile Ser
545                 550                 555                 560

Gln Glu Phe Gln Glu Phe Lys Glu Arg Leu Asp Leu Tyr Lys Lys His
                565                 570                 575

Glu Asp Glu Ser Glu Trp Lys Glu Lys Glu Lys Leu Trp Glu Asn His
            580                 585                 590

Glu Lys Glu Trp Lys Lys Thr Leu Glu Ile His Gly Ser Ile Ala Glu
        595                 600                 605

Val Ser Gln Arg Cys Val Met Gln Ser Met Met Gly Pro Leu Asp Gly
    610                 615                 620

Leu Val Gln Lys Lys Asp Tyr Val His Ile Gly Gln Ser Ser Leu Lys
625                 630                 635                 640

Ala Ala Asp Asp Ala Trp Thr Phe Ser Ala Asn Arg Tyr Lys Lys Ala
                645                 650                 655

Thr Gly Pro Lys Trp Gly Lys Ile Ser Val Ser Asn Leu Leu Tyr Asp
            660                 665                 670

Ala Asn Gln Ala Asn Ala Glu Leu Ile Ser Gln Ser Ile Ser Lys Tyr
        675                 680                 685

Leu Ser Lys Gln Lys Asp Asn Gln Gly Cys Glu Gly Arg Lys Met Lys
    690                 695                 700

Phe Leu Ile Lys Ile Ile Glu Pro Leu Arg Glu Asn Phe Val Lys His
705                 710                 715                 720

Thr Arg Trp Leu His Glu Met Thr Gln Lys Asp Cys Glu Val Arg Ala
                725                 730                 735

Gln Phe Ser Arg Val Ser Met
            740
```

<210> 118
<211> 769
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 118

```
Phe Pro Ser Asp Val Gly Ala Asp Ala Leu Lys His Val Arg Met Leu
1               5                   10                  15

Gln Pro Arg Leu Thr Asp Glu Val Arg Lys Val Ala Leu Thr Arg Ala
            20                  25                  30

Pro Ser Asp Arg Pro Ala Leu Ala Arg Phe Ala Ala Val Ala Gln Asp
        35                  40                  45

Gly Leu Ala Phe Val Arg His Leu Asn Val Ser Ala Asn His Asp Ser
    50                  55                  60

Asn Cys Thr Phe Pro Arg Asp Pro Arg Asp Pro Arg Arg Gly Pro Cys
65                  70                  75                  80

Glu Pro Asn Pro Cys Ala Phe Leu Arg Glu Val Trp Gly Phe Arg Ile
                85                  90                  95

Val Ala Arg Gly Asn Glu Arg Ala Leu Ser Tyr Arg Arg Gly Leu Ala
            100                 105                 110

Gly Cys Lys Ser Cys Val Gln Ser Thr Gly Phe Pro Ser Val Pro Phe
        115                 120                 125

His Arg Ile Gly Ala Asp Asp Cys Met Arg Lys Leu His Glu Ile Leu
    130                 135                 140

Lys Ala Arg Asn Trp Arg Leu Leu Ala Arg Asn Ile Gly Arg Glu Arg
145                 150                 155                 160

Glu Ala Asp Pro Leu Leu Thr Glu Leu Ser Glu Tyr Leu Leu Val Asp
                165                 170                 175

Ala Arg Thr Tyr Pro Asp Gly Ala Ala Pro Asn Ser Gly Arg Leu Ala
            180                 185                 190
```

```
Glu Asn Val Ile Lys Arg Ala Ala Lys Lys Phe Arg Asp Glu Gly Met
        195                 200                 205

Arg Asp Ile His Ala Gln Leu Arg Val His Ser Arg Glu Gly Lys Val
    210                 215                 220

Pro Lys Gly Arg Leu Gln Arg Leu Arg Arg Ile Glu Arg Lys His Arg
225                 230                 235                 240

Ala Ile His Ala Leu Asp Pro Gly Pro Ser Trp Glu Ala Glu Gly Ser
                245                 250                 255

Ala Arg Ala Glu Val Gln Gly Val Ala Val Tyr Arg Ser Gln Leu Leu
            260                 265                 270

Arg Val Gly His His Thr Gln Gln Ile Glu Pro Val Gly Ile Val Ala
        275                 280                 285

Arg Thr Leu Phe Gly Val Gly Arg Thr Asp Leu Asp Val Ala Val Ser
    290                 295                 300

Val Leu Gly Ala Pro Leu Thr Lys Arg Lys Lys Gly Ser Lys Thr Leu
305                 310                 315                 320

Glu Ser Thr Glu Asp Phe Arg Ile Ala Lys Ala Arg Glu Thr Arg Ala
                325                 330                 335

Glu Asp Lys Ile Glu Val Ala Phe Val Leu Tyr Pro Thr Ala Ser Leu
            340                 345                 350

Leu Arg Asp Glu Ile Pro Lys Asp Ala Phe Pro Ala Met Arg Ile Asp
        355                 360                 365

Arg Phe Leu Leu Lys Val Gly Ser Val Gln Ala Asp Arg Glu Ile Leu
    370                 375                 380

Leu Gln Asp Asp Tyr Tyr Arg Phe Gly Asp Ala Glu Val Lys Ala Gly
385                 390                 395                 400

Lys Asn Lys Gly Arg Thr Val Thr Arg Pro Val Lys Val Pro Arg Leu
                405                 410                 415
```

```
Gln Ala Leu Arg Pro Asp Ala Lys Phe Arg Val Asn Val Trp Ala Asp
            420                 425                 430

Pro Phe Gly Ala Gly Asp Ser Pro Gly Thr Leu Leu Arg Leu Glu Val
        435                 440                 445

Ser Gly Val Thr Arg Arg Ser Gln Pro Leu Arg Leu Leu Arg Tyr Gly
    450                 455                 460

Gln Pro Ser Thr Gln Pro Ala Asn Phe Leu Cys Trp Arg Pro His Arg
465                 470                 475                 480

Val Pro Asp Pro Met Thr Phe Thr Pro Arg Gln Lys Phe Gly Glu Arg
                485                 490                 495

Arg Lys Asn Arg Arg Thr Arg Arg Pro Arg Val Phe Glu Arg Leu Tyr
            500                 505                 510

Gln Val His Ile Lys His Leu Ala His Leu Glu Pro Asn Arg Lys Trp
        515                 520                 525

Phe Glu Glu Ala Arg Val Ser Ala Gln Lys Trp Ala Lys Ala Arg Ala
    530                 535                 540

Ile Arg Arg Lys Gly Ala Glu Asp Ile Pro Val Val Ala Pro Pro Ala
545                 550                 555                 560

Lys Arg Arg Trp Ala Ala Leu Gln Pro Asn Ala Glu Leu Trp Asp Leu
                565                 570                 575

Tyr Ala His Asp Arg Glu Ala Arg Lys Arg Phe Arg Gly Gly Arg Ala
            580                 585                 590

Ala Glu Gly Glu Glu Phe Lys Pro Arg Leu Asn Leu Tyr Leu Ala His
        595                 600                 605

Glu Pro Glu Ala Glu Trp Glu Ser Lys Arg Asp Arg Trp Glu Arg Tyr
    610                 615                 620

Glu Lys Lys Trp Thr Ala Val Leu Glu Glu His Ser Arg Met Cys Ala
625                 630                 635                 640

Val Ala Asp Arg Thr Leu Pro Gln Phe Leu Ser Asp Pro Leu Gly Ala
                645                 650                 655
```

```
Arg Met Asp Asp Lys Asp Tyr Ala Phe Val Gly Lys Ser Ala Leu Ala
            660                 665                 670

Val Ala Glu Ala Phe Val Glu Glu Gly Thr Val Glu Arg Ala Gln Gly
        675                 680                 685

Asn Cys Ser Ile Thr Ala Lys Lys Lys Phe Ala Ser Asn Ala Ser Arg
    690                 695                 700

Lys Arg Leu Ser Val Ala Asn Leu Leu Asp Val Ser Asp Lys Ala Asp
705                 710                 715                 720

Arg Ala Leu Val Phe Gln Ala Val Arg Gln Tyr Val Gln Arg Gln Ala
                725                 730                 735

Glu Asn Gly Gly Val Glu Gly Arg Arg Met Ala Phe Leu Arg Lys Leu
            740                 745                 750

Leu Ala Pro Leu Arg Gln Asn Phe Val Cys His Thr Arg Trp Leu His
        755                 760                 765

Met
```

<210> 119
<211> 564
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 119

```
Ala Ala Arg Lys Lys Lys Arg Gly Lys Ile Gly Ile Thr Val Lys Ala
1               5                   10                  15

Lys Glu Lys Ser Pro Pro Ala Ala Gly Pro Phe Met Ala Arg Lys Leu
            20                  25                  30

Val Asn Val Ala Ala Asn Val Asp Gly Val Glu Val His Leu Cys Val
        35                  40                  45

Glu Cys Glu Ala Asp Ala His Gly Ser Ala Ser Ala Arg Leu Leu Gly
```

```
    50                  55                  60

Gly Cys Arg Ser Cys Thr Gly Ser Ile Gly Ala Glu Gly Arg Leu Met
65                  70                  75                  80

Gly Ser Val Asp Val Asp Arg Glu Arg Val Ile Ala Glu Pro Val His
                85                  90                  95

Thr Glu Thr Glu Arg Leu Gly Pro Asp Val Lys Ala Phe Glu Ala Gly
            100                 105                 110

Thr Ala Glu Ser Lys Tyr Ala Ile Gln Arg Gly Leu Glu Tyr Trp Gly
        115                 120                 125

Val Asp Leu Ile Ser Arg Asn Arg Ala Arg Thr Val Arg Lys Met Glu
    130                 135                 140

Glu Ala Asp Arg Pro Glu Ser Ser Thr Met Glu Lys Thr Ser Trp Asp
145                 150                 155                 160

Glu Ile Ala Ile Lys Thr Tyr Ser Gln Ala Tyr His Ala Ser Glu Asn
                165                 170                 175

His Leu Phe Trp Glu Arg Gln Arg Arg Val Arg Gln His Ala Leu Ala
            180                 185                 190

Leu Phe Arg Arg Ala Arg Glu Arg Asn Arg Gly Glu Ser Pro Leu Gln
        195                 200                 205

Ser Thr Gln Arg Pro Ala Pro Leu Val Leu Ala Ala Leu His Ala Glu
    210                 215                 220

Ala Ala Ala Ile Ser Gly Arg Ala Arg Ala Glu Tyr Val Leu Arg Gly
225                 230                 235                 240

Pro Ser Ala Asn Val Arg Ala Ala Ala Ala Asp Ile Asp Ala Lys Pro
                245                 250                 255

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

Val Lys Arg Asp Leu Leu Arg Ala Arg His Arg Ile Val Gly Leu Ser
        275                 280                 285
```

```
Arg Ala Tyr Phe Lys Pro Ser Asp Val Val Arg Gly Thr Ser Asp Ala
    290                 295                 300

Ile Ala His Val Ala Gly Arg Asn Ile Gly Val Ala Gly Gly Lys Pro
305                 310                 315                 320

Lys Glu Ile Glu Lys Thr Phe Thr Leu Pro Phe Val Ala Tyr Trp Glu
                325                 330                 335

Asp Val Asp Arg Val Val His Cys Ser Ser Phe Lys Ala Asp Gly Pro
            340                 345                 350

Trp Val Arg Asp Gln Arg Ile Lys Ile Arg Gly Val Ser Ser Ala Val
        355                 360                 365

Gly Thr Phe Ser Leu Tyr Gly Leu Asp Val Ala Trp Ser Lys Pro Thr
    370                 375                 380

Ser Phe Tyr Ile Arg Cys Ser Asp Ile Arg Lys Lys Phe His Pro Lys
385                 390                 395                 400

Gly Phe Gly Pro Met Lys His Trp Arg Gln Trp Ala Lys Glu Leu Asp
                405                 410                 415

Arg Leu Thr Glu Gln Arg Ala Ser Cys Val Val Arg Ala Leu Gln Asp
            420                 425                 430

Asp Glu Glu Leu Leu Gln Thr Met Glu Arg Gly Gln Arg Tyr Tyr Asp
        435                 440                 445

Val Phe Ser Cys Ala Ala Thr His Ala Thr Arg Gly Glu Ala Asp Pro
    450                 455                 460

Ser Gly Gly Cys Ser Arg Cys Glu Leu Val Ser Cys Gly Val Ala His
465                 470                 475                 480

Lys Val Thr Lys Lys Ala Lys Gly Asp Thr Gly Ile Glu Ala Val Ala
                485                 490                 495

Val Ala Gly Cys Ser Leu Cys Glu Ser Lys Leu Val Gly Pro Ser Lys
            500                 505                 510

Pro Arg Val His Arg Gln Met Ala Ala Leu Arg Gln Ser His Ala Leu
```

515 520 525

Asn Tyr Leu Arg Arg Leu Gln Arg Glu Trp Glu Ala Leu Glu Ala Val
530 535 540

Gln Ala Pro Thr Pro Tyr Leu Arg Phe Lys Tyr Ala Arg His Leu Glu
545 550 555 560

Val Arg Ser Met

<210> 120
<211> 565
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 120
Ala Ala Lys Lys Lys Lys Gln Arg Gly Lys Ile Gly Ile Ser Val Lys
1 5 10 15

Pro Lys Glu Gly Ser Ala Pro Pro Ala Asp Gly Pro Phe Met Ala Arg
20 25 30

Lys Leu Val Asn Val Ala Ala Asn Val Asp Gly Val Glu Val Asn Leu
35 40 45

Cys Ile Glu Cys Glu Ala Asp Ala His Gly Ser Ala Pro Ala Arg Leu
50 55 60

Leu Gly Gly Cys Lys Ser Cys Thr Gly Ser Ile Gly Ala Glu Gly Arg
65 70 75 80

Leu Met Gly Ser Val Asp Val Asp Arg Ala Asp Ala Ile Ala Lys Pro
85 90 95

Val Asn Thr Glu Thr Glu Lys Leu Gly Pro Asp Val Gln Ala Phe Glu
100 105 110

Ala Gly Thr Ala Glu Thr Lys Tyr Ala Leu Gln Arg Gly Leu Glu Tyr
115 120 125

```
Trp Gly Val Asp Leu Ile Ser Arg Asn Arg Ser Arg Thr Val Arg Arg
    130                 135                 140

Thr Glu Glu Gly Gln Pro Glu Ser Ala Thr Met Glu Lys Thr Ser Trp
145                 150                 155                 160

Asp Glu Ile Ala Ile Lys Ser Tyr Thr Arg Ala Tyr His Ala Ser Glu
                165                 170                 175

Asn His Leu Phe Trp Glu Arg Gln Arg Arg Val Arg Gln His Ala Leu
            180                 185                 190

Ala Leu Phe Lys Arg Ala Lys Glu Arg Asn Arg Gly Asp Ser Thr Leu
        195                 200                 205

Pro Arg Glu Pro Gly His Gly Leu Val Ala Ile Ala Ala Leu Ala Cys
    210                 215                 220

Glu Ala Tyr Ala Val Gly Gly Arg Asn Leu Ala Glu Thr Val Val Arg
225                 230                 235                 240

Gly Pro Thr Phe Gly Thr Ala Arg Ala Val Arg Asp Val Glu Ile Ala
                245                 250                 255

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

Pro Val Lys Arg Asp Phe Leu Arg Ala Arg His Arg Ile Val Gly Leu
        275                 280                 285

Ala Arg Ala Tyr Tyr Arg Pro Ser Asp Val Val Arg Gly Thr Ser Asp
    290                 295                 300

Ala Ile Ala His Val Ala Gly Arg Asn Ile Gly Val Ala Gly Gly Lys
305                 310                 315                 320

Pro Arg Ala Val Glu Ala Val Phe Thr Leu Pro Phe Val Ala Tyr Trp
                325                 330                 335

Glu Asp Val Asp Arg Val Val His Cys Ser Ser Phe Gln Val Ser Ala
            340                 345                 350

Pro Trp Asn Arg Asp Gln Arg Met Lys Ile Ala Gly Val Thr Thr Ala
        355                 360                 365
```

```
Ala Gly Thr Phe Ser Leu His Gly Gly Glu Leu Lys Trp Ala Lys Pro
    370                 375                 380

Thr Ser Phe Tyr Ile Arg Cys Ser Asp Thr Arg Arg Lys Phe Arg Pro
385                 390                 395                 400

Lys Gly Phe Gly Pro Met Lys Arg Trp Arg Gln Trp Ala Lys Asp Leu
                405                 410                 415

Asp Arg Leu Val Glu Gln Arg Ala Ser Cys Val Val Arg Ala Leu Gln
            420                 425                 430

Asp Asp Ala Ala Leu Leu Glu Thr Met Glu Arg Gly Gln Arg Tyr Tyr
        435                 440                 445

Asp Val Phe Ala Cys Ala Val Thr His Ala Thr Arg Gly Glu Ala Asp
    450                 455                 460

Arg Leu Ala Gly Cys Ser Arg Cys Ala Leu Thr Pro Cys Gln Glu Ala
465                 470                 475                 480

His Arg Val Thr Thr Lys Pro Arg Gly Asp Ala Gly Val Glu Gln Val
                485                 490                 495

Gln Thr Ser Asp Cys Ser Leu Cys Glu Gly Lys Leu Val Gly Pro Ser
            500                 505                 510

Lys Pro Arg Leu His Arg Thr Leu Thr Leu Leu Arg Gln Glu His Gly
        515                 520                 525

Leu Asn Tyr Leu Arg Arg Leu Gln Arg Glu Trp Glu Ser Leu Glu Ala
    530                 535                 540

Val Gln Val Pro Thr Pro Tyr Leu Arg Phe Lys Tyr Ala Arg His Leu
545                 550                 555                 560

Glu Val Arg Ser Met
                565
```

<210> 121
<211> 499
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 121
Thr Asp Ser Gln Ser Glu Ser Val Pro Glu Val Val Tyr Ala Leu Thr
1 5 10 15

Gly Gly Glu Val Pro Gly Arg Val Pro Pro Asp Gly Gly Ser Ala Glu
20 25 30

Gly Ala Arg Asn Ala Pro Thr Gly Leu Arg Lys Gln Arg Gly Lys Ile
35 40 45

Lys Ile Ser Ala Lys Pro Ser Lys Pro Gly Ser Pro Ala Ser Ser Leu
50 55 60

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

Ser Gly Cys Ala Thr Cys Arg Met Arg Ala Asn Gly Ser Ala Pro Arg
85 90 95

Ala Leu Pro Ile Gly Cys Val Ala Cys Ala Ser Ser Ile Gly Arg Ala
100 105 110

Pro Gln Glu Glu Thr Val Cys Ala Leu Pro Thr Thr Gln Gly Pro Asp
115 120 125

Val Arg Leu Leu Glu Gly Gly His Ala Leu Arg Lys Tyr Asp Ile Gln
130 135 140

Arg Ala Leu Glu Tyr Trp Gly Val Asp Leu Ile Gly Arg Asn Leu Asp
145 150 155 160

Arg Gln Ala Gly Arg Gly Met Glu Pro Ala Glu Gly Ala Thr Ala Thr
165 170 175

Met Lys Arg Val Ser Met Asp Glu Leu Ala Val Leu Asp Phe Gly Lys
180 185 190

Ser Tyr Tyr Ala Ser Glu Gln His Leu Phe Ala Ala Arg Gln Arg Arg
195 200 205

```
Val Arg Gln His Ala Lys Ala Leu Lys Ile Arg Ala Lys His Ala Asn
    210                 215                 220

Arg Ser Gly Ser Val Lys Arg Ala Leu Asp Arg Ser Arg Lys Gln Val
225                 230                 235                 240

Thr Ala Leu Ala Arg Glu Phe Phe Lys Pro Ser Asp Val Val Arg Gly
                245                 250                 255

Asp Ser Asp Ala Leu Ala His Val Val Gly Arg Asn Leu Gly Val Ser
            260                 265                 270

Arg His Pro Ala Arg Glu Ile Pro Gln Thr Phe Thr Leu Pro Leu Cys
        275                 280                 285

Ala Tyr Trp Glu Asp Val Asp Arg Val Ile Ser Cys Ser Ser Leu Leu
    290                 295                 300

Ala Gly Glu Pro Phe Ala Arg Asp Gln Glu Ile Arg Ile Glu Gly Val
305                 310                 315                 320

Ser Ser Ala Leu Gly Ser Leu Arg Leu Tyr Arg Gly Ala Ile Glu Trp
                325                 330                 335

His Lys Pro Thr Ser Leu Tyr Ile Arg Cys Ser Asp Thr Arg Arg Lys
            340                 345                 350

Phe Arg Pro Arg Gly Gly Leu Lys Lys Arg Trp Arg Gln Trp Ala Lys
        355                 360                 365

Asp Leu Asp Arg Leu Val Glu Gln Arg Ala Cys Cys Ile Val Arg Ser
    370                 375                 380

Leu Gln Ala Asp Val Glu Leu Leu Gln Thr Met Glu Arg Ala Gln Arg
385                 390                 395                 400

Phe Tyr Asp Val His Asp Cys Ala Ala Thr His Val Gly Pro Val Ala
                405                 410                 415

Val Arg Cys Ser Pro Cys Ala Gly Lys Gln Phe Asp Trp Asp Arg Tyr
            420                 425                 430

Arg Leu Leu Ala Ala Leu Arg Gln Glu His Ala Leu Asn Tyr Leu Arg
```

435 440 445

Arg Leu Gln Arg Glu Trp Glu Ser Leu Glu Ala Gln Gln Val Lys Met
450 455 460

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

Leu Ile Gly Leu Glu Val Arg Arg Glu Pro Ser Met Gly Thr Ala Ile
485 490 495

Ala Glu Met

<210> 122
<211> 358
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 122
Ala Gly Thr Ala Gly Arg Arg His Gly Ser Leu Gly Ala Arg Arg Ser
1 5 10 15

Ile Asn Ile Ala Gly Val Thr Asp Arg His Gly Arg Trp Gly Cys Glu
20 25 30

Ser Cys Val Tyr Thr Arg Asp Gln Ala Gly Asn Arg Ala Arg Cys Ala
35 40 45

Pro Cys Asp Gln Ser Thr Tyr Ala Pro Asp Val Gln Glu Val Thr Ile
50 55 60

Gly Gln Arg Gln Ala Lys Tyr Thr Ile Phe Leu Thr Leu Gln Ser Phe
65 70 75 80

Ser Trp Thr Asn Thr Met Arg Asn Asn Lys Arg Ala Ala Ala Gly Arg
85 90 95

Ser Lys Arg Thr Thr Gly Lys Arg Ile Gly Gln Leu Ala Glu Ile Lys
100 105 110

```
Ile Thr Gly Val Gly Leu Ala His Ala His Asn Val Ile Gln Arg Ser
        115                 120                 125

Leu Gln His Asn Ile Thr Lys Met Trp Arg Ala Glu Lys Gly Lys Ser
    130                 135                 140

Lys Arg Val Ala Arg Leu Lys Lys Ala Lys Gln Leu Thr Lys Arg Arg
145                 150                 155                 160

Ala Tyr Phe Arg Arg Arg Met Ser Arg Gln Ser Arg Gly Asn Gly Phe
                165                 170                 175

Phe Arg Thr Gly Lys Gly Gly Ile His Ala Val Ala Pro Val Lys Ile
            180                 185                 190

Gly Leu Asp Val Gly Met Ile Ala Ser Gly Ser Ser Glu Pro Ala Asp
        195                 200                 205

Glu Gln Thr Val Thr Leu Asp Ala Ile Trp Lys Gly Arg Lys Lys Lys
    210                 215                 220

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

Phe Arg Glu Gln Gln Thr Lys Gly Asp Lys Cys Ile Pro Leu Ile Leu
                245                 250                 255

Gln Asp Gly Glu Val Arg Trp Asn Gln Asn Asn Trp Gln Cys His Pro
            260                 265                 270

Lys Lys Leu Val Pro Leu Cys Gly Leu Glu Val Ser Arg Lys Phe Val
        275                 280                 285

Ser Gln Ala Asp Arg Leu Ala Gln Asn Lys Val Ala Ser Pro Leu Ala
    290                 295                 300

Ala Arg Phe Asp Lys Thr Ser Val Lys Gly Thr Leu Val Glu Ser Asp
305                 310                 315                 320

Phe Ala Ala Val Leu Val Asn Val Thr Ser Ile Tyr Gln Gln Cys His
                325                 330                 335

Ala Met Leu Leu Arg Ser Gln Glu Pro Thr Pro Ser Leu Arg Val Gln
            340                 345                 350
```

Arg Thr Ile Thr Ser Met
355

<210> 123
<211> 369
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 123
Gly Val Arg Phe Ser Pro Ala Gln Ser Gln Val Phe Phe Arg Thr Val
1 5 10 15

Ile Pro Gln Ser Val Glu Ala Arg Phe Ala Ile Asn Met Ala Ala Ile
20 25 30

His Asp Ala Ala Gly Ala Phe Gly Cys Ser Val Cys Arg Phe Glu Asp
35 40 45

Arg Thr Pro Arg Asn Ala Lys Ala Val His Gly Cys Ser Pro Cys Thr
50 55 60

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

Lys Ala Lys Tyr Asp Val Phe Met Arg Leu Leu Gly Phe Asn Trp Thr
85 90 95

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

Gly Gln Leu Asp Glu Leu Ala Ile Ser Met Leu Thr Gly Lys Ala Lys
115 120 125

Ala Val Leu Lys Lys Ser Ile Cys His Asn Val Asp Lys Ser Phe Lys
130 135 140

Ala Met Arg Gly Ser Leu Lys Lys Leu His Arg Lys Ala Ser Lys Thr
145 150 155 160

Gly Lys Ser Gln Leu Arg Ala Lys Leu Ser Asp Leu Arg Glu Arg Thr

```
                165                 170                 175

Asn Thr Thr Gln Glu Gly Ser His Val Glu Gly Asp Ser Asp Val Ala
            180                 185                 190

Leu Asn Lys Ile Gly Leu Asp Val Gly Leu Val Gly Lys Pro Asp Tyr
        195                 200                 205

Pro Ser Glu Glu Ser Val Glu Val Val Val Cys Leu Tyr Phe Val Gly
    210                 215                 220

Lys Val Leu Ile Leu Asp Ala Gln Gly Arg Ile Arg Asp Met Arg Ala
225                 230                 235                 240

Lys Gln Tyr Asp Gly Phe Lys Ile Pro Ile Ile Gln Arg Gly Gln Leu
                245                 250                 255

Thr Val Leu Ser Val Lys Asp Leu Gly Lys Trp Ser Leu Val Arg Gln
            260                 265                 270

Asp Tyr Val Leu Ala Gly Asp Leu Arg Phe Glu Pro Lys Ile Ser Lys
        275                 280                 285

Asp Arg Lys Tyr Ala Glu Cys Val Lys Arg Ile Ala Leu Ile Thr Leu
    290                 295                 300

Gln Ala Ser Leu Gly Phe Lys Glu Arg Ile Pro Tyr Tyr Val Thr Lys
305                 310                 315                 320

Gln Val Glu Ile Lys Asn Ala Ser His Ile Ala Phe Val Thr Glu Ala
                325                 330                 335

Ile Gln Asn Cys Ala Glu Asn Phe Arg Glu Met Thr Glu Tyr Leu Met
            340                 345                 350

Lys Tyr Gln Glu Lys Ser Pro Asp Leu Lys Val Leu Leu Thr Gln Leu
        355                 360                 365

Met
```

<210> 124
<211> 486
<212> PRT

<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 124
Arg Ala Val Val Gly Lys Val Phe Leu Glu Gln Ala Arg Arg Ala Leu
1 5 10 15

Asn Leu Ala Thr Asn Phe Gly Thr Asn His Arg Thr Gly Cys Asn Gly
20 25 30

Cys Tyr Val Thr Pro Gly Lys Leu Ser Ile Pro Gln Asp Gly Glu Lys
35 40 45

Asn Ala Ala Gly Cys Thr Ser Cys Leu Met Lys Ala Thr Ala Ser Tyr
50 55 60

Val Ser Tyr Pro Lys Pro Leu Gly Glu Lys Val Ala Lys Tyr Ser Thr
65 70 75 80

Leu Asp Ala Leu Lys Gly Phe Pro Trp Tyr Ser Leu Arg Leu Asn Leu
85 90 95

Arg Pro Asn Tyr Arg Gly Lys Pro Ile Asn Gly Val Gln Glu Val Ala
100 105 110

Pro Val Ser Lys Phe Arg Leu Ala Glu Glu Val Ile Gln Ala Val Gln
115 120 125

Arg Tyr His Phe Thr Glu Leu Glu Gln Ser Phe Pro Gly Gly Arg Arg
130 135 140

Arg Leu Arg Glu Leu Arg Ala Phe Tyr Thr Lys Glu Tyr Arg Arg Ala
145 150 155 160

Pro Glu Gln Arg Gln His Val Val Asn Gly Asp Arg Asn Ile Val Val
165 170 175

Val Thr Val Leu His Glu Leu Gly Phe Ser Val Gly Met Phe Asn Glu
180 185 190

Val Glu Leu Leu Pro Lys Thr Pro Ile Glu Cys Ala Val Asn Val Phe
195 200 205

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

Lys Glu Arg Leu Leu Val Glu Ser Leu Trp Lys Lys Asp Ser Arg Arg
225                 230                 235                 240

His Thr Ala Lys Trp Thr Pro Pro Asn Asn Glu Gly Arg Ile Phe Thr
                245                 250                 255

Ala Glu Gly Trp Lys Asp Phe Gln Leu Pro Leu Leu Leu Gly Ser Thr
            260                 265                 270

Ser Arg Ser Leu Arg Ala Ile Glu Lys Glu Gly Phe Val Gln Leu Ala
        275                 280                 285

Pro Gly Arg Asp Pro Asp Tyr Asn Asn Thr Ile Asp Glu Gln His Ser
    290                 295                 300

Gly Arg Pro Phe Leu Pro Leu Tyr Leu Tyr Leu Gln Gly Thr Ile Ser
305                 310                 315                 320

Gln Glu Tyr Cys Val Phe Ala Gly Thr Trp Val Ile Pro Phe Gln Asp
                325                 330                 335

Gly Ile Ser Pro Tyr Ser Thr Lys Asp Thr Phe Gln Pro Asp Leu Lys
            340                 345                 350

Arg Lys Ala Tyr Ser Leu Leu Leu Asp Ala Val Lys His Arg Leu Gly
        355                 360                 365

Asn Lys Val Ala Ser Gly Leu Gln Tyr Gly Arg Phe Pro Ala Ile Glu
    370                 375                 380

Glu Leu Lys Arg Leu Val Arg Met His Gly Ala Thr Arg Lys Ile Pro
385                 390                 395                 400

Arg Gly Glu Lys Asp Leu Leu Lys Lys Gly Asp Pro Asp Thr Pro Glu
                405                 410                 415

Trp Trp Leu Leu Glu Gln Tyr Pro Glu Phe Trp Arg Leu Cys Asp Ala
            420                 425                 430
```

```
Ala Ala Lys Arg Val Ser Gln Asn Val Gly Leu Leu Leu Ser Leu Lys
        435                 440                 445

Lys Gln Pro Leu Trp Gln Arg Arg Trp Leu Glu Ser Arg Thr Arg Asn
    450                 455                 460

Glu Pro Leu Asp Asn Leu Pro Leu Ser Met Ala Leu Thr Leu His Leu
465                 470                 475                 480

Thr Asn Glu Glu Ala Leu
                485
```

<210> 125
<211> 400
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 125

```
Ala Ala Val Tyr Ser Lys Phe Tyr Ile Glu Asn His Phe Lys Met Gly
1               5                   10                  15

Ile Pro Glu Thr Leu Ser Arg Ile Arg Gly Pro Ser Ile Ile Gln Gly
            20                  25                  30

Phe Ser Val Asn Glu Asn Tyr Ile Asn Ile Ala Gly Val Gly Asp Arg
        35                  40                  45

Asp Phe Ile Phe Gly Cys Lys Lys Cys Lys Tyr Thr Arg Gly Lys Pro
    50                  55                  60

Ser Ser Lys Lys Ile Asn Lys Cys His Pro Cys Lys Arg Ser Thr Tyr
65                  70                  75                  80

Pro Glu Pro Val Ile Asp Val Arg Gly Ser Ile Ser Glu Phe Lys Tyr
                85                  90                  95

Lys Ile Tyr Asn Lys Leu Lys Gln Glu Pro Asn Gln Ser Ile Lys Gln
            100                 105                 110

Asn Thr Lys Gly Arg Met Asn Pro Ser Asp His Thr Ser Ser Asn Asp
        115                 120                 125
```

```
Gly Ile Ile Ile Asn Gly Ile Asp Asn Arg Ile Ala Tyr Asn Val Ile
    130                 135                 140

Phe Ser Ser Tyr Lys His Leu Met Glu Lys Gln Ile Asn Leu Leu Arg
145                 150                 155                 160

Asp Thr Thr Lys Arg Lys Ala Arg Gln Ile Lys Lys Tyr Asn Asn Ser
                165                 170                 175

Gly Lys Lys Lys His Ser Leu Arg Ser Gln Thr Lys Gly Asn Leu Lys
            180                 185                 190

Asn Arg Tyr His Met Leu Gly Met Phe Lys Lys Gly Ser Leu Thr Ile
        195                 200                 205

Thr Asn Glu Gly Asp Phe Ile Thr Ala Val Arg Lys Val Gly Leu Asp
    210                 215                 220

Ile Ser Leu Tyr Lys Asn Glu Ser Leu Asn Lys Gln Glu Val Glu Thr
225                 230                 235                 240

Glu Leu Cys Leu Asn Ile Lys Trp Gly Arg Thr Lys Ser Tyr Thr Val
                245                 250                 255

Ser Gly Tyr Ile Pro Leu Pro Ile Asn Ile Asp Trp Lys Leu Tyr Leu
            260                 265                 270

Phe Glu Lys Glu Thr Gly Leu Thr Leu Arg Leu Phe Gly Asn Lys Tyr
        275                 280                 285

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

Arg Pro Pro Cys Ala Asp Pro Val Val Lys Lys Ala Gln Lys Trp Ser
305                 310                 315                 320

Ala Leu Asn Ala His Val Gln Gln Met Ala Gly Leu Phe Ser Asp Ser
                325                 330                 335

His Leu Leu Lys Arg Glu Leu Lys Asn Arg Met His Lys Gln Leu Asp
            340                 345                 350

Phe Lys Ser Leu Trp Val Gly Thr Glu Asp Tyr Ile Lys Trp Phe Glu
```

355 360 365

Glu Leu Ser Arg Ser Tyr Val Glu Gly Ala Glu Lys Ser Leu Glu Phe
370 375 380

Phe Arg Gln Asp Tyr Phe Cys Phe Asn Tyr Thr Lys Gln Thr Thr Met
385 390 395 400

<210> 126
<211> 666
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 126
Pro Gln Gln Gln Arg Asp Leu Met Leu Met Ala Ala Asn Tyr Asp Gln
1 5 10 15

Asp Tyr Gly Asn Gly Cys Gly Pro Cys Thr Val Val Ala Ser Ala Ala
20 25 30

Tyr Arg Pro Asp Pro Gln Ala Gln His Gly Cys Lys Arg His Leu Arg
35 40 45

Thr Leu Gly Ala Ser Ala Val Thr His Val Gly Leu Gly Asp Arg Thr
50 55 60

Ala Thr Ile Thr Ala Leu His Arg Leu Arg Gly Pro Ala Ala Leu Ala
65 70 75 80

Ala Arg Ala Arg Ala Ala Gln Ala Ala Ser Ala Pro Met Thr Pro Asp
85 90 95

Thr Asp Ala Pro Asp Asp Arg Arg Arg Leu Glu Ala Ile Asp Ala Asp
100 105 110

Asp Val Val Leu Val Gly Ala His Arg Ala Leu Trp Ser Ala Val Arg
115 120 125

Arg Trp Ala Asp Asp Arg Arg Ala Ala Leu Arg Arg Arg Leu His Ser
130 135 140

```
Glu Arg Glu Trp Leu Leu Lys Asp Gln Ile Arg Trp Ala Glu Leu Tyr
145                 150                 155                 160

Thr Leu Ile Glu Ala Ser Gly Thr Pro Pro Gln Gly Arg Trp Arg Asn
                165                 170                 175

Thr Leu Gly Ala Leu Arg Gly Gln Ser Arg Trp Arg Arg Val Leu Ala
            180                 185                 190

Pro Thr Met Arg Ala Thr Cys Ala Glu Thr His Ala Glu Leu Trp Asp
        195                 200                 205

Ala Leu Ala Glu Leu Val Pro Glu Met Ala Lys Asp Arg Arg Gly Leu
    210                 215                 220

Leu Arg Pro Pro Val Glu Ala Asp Ala Leu Trp Arg Ala Pro Met Ile
225                 230                 235                 240

Val Glu Gly Trp Arg Gly Gly His Ser Val Val Val Asp Ala Val Ala
                245                 250                 255

Pro Pro Leu Asp Leu Pro Gln Pro Cys Ala Trp Thr Ala Val Arg Leu
            260                 265                 270

Ser Gly Asp Pro Arg Gln Arg Trp Gly Leu His Leu Ala Val Pro Pro
        275                 280                 285

Leu Gly Gln Val Gln Pro Pro Asp Pro Leu Lys Ala Thr Leu Ala Val
    290                 295                 300

Ser Met Arg His Arg Gly Gly Val Arg Val Arg Thr Leu Gln Ala Met
305                 310                 315                 320

Ala Val Asp Ala Asp Ala Pro Met Gln Arg His Leu Gln Val Pro Leu
                325                 330                 335

Thr Leu Gln Arg Gly Gly Gly Leu Gln Trp Gly Ile His Ser Arg Gly
            340                 345                 350

Val Arg Arg Arg Glu Ala Arg Ser Met Ala Ser Trp Glu Gly Pro Pro
        355                 360                 365

Ile Trp Thr Gly Leu Gln Leu Val Asn Arg Trp Lys Gly Gln Gly Ser
    370                 375                 380
```

```
Ala Leu Leu Ala Pro Asp Arg Pro Pro Asp Thr Pro Pro Tyr Ala Pro
385                 390                 395                 400

Asp Ala Ala Val Ala Pro Ala Gln Pro Asp Thr Lys Arg Ala Arg Arg
                405                 410                 415

Thr Leu Lys Glu Ala Cys Thr Val Cys Arg Cys Ala Pro Gly His Met
            420                 425                 430

Arg Gln Leu Gln Val Thr Leu Thr Gly Asp Gly Thr Trp Arg Arg Phe
        435                 440                 445

Arg Leu Arg Ala Pro Gln Gly Ala Lys Arg Lys Ala Glu Val Leu Lys
    450                 455                 460

Val Ala Thr Gln His Asp Glu Arg Ile Ala Asn Tyr Thr Ala Trp Tyr
465                 470                 475                 480

Leu Lys Arg Pro Glu His Ala Ala Gly Cys Asp Thr Cys Asp Gly Asp
                485                 490                 495

Ser Arg Leu Asp Gly Ala Cys Arg Gly Cys Arg Pro Leu Leu Val Gly
            500                 505                 510

Asp Gln Cys Phe Arg Arg Tyr Leu Asp Lys Ile Glu Ala Asp Arg Asp
        515                 520                 525

Asp Gly Leu Ala Gln Ile Lys Pro Lys Ala Gln Glu Ala Val Ala Ala
    530                 535                 540

Met Ala Ala Lys Arg Asp Ala Arg Ala Gln Lys Val Ala Ala Arg Ala
545                 550                 555                 560

Ala Lys Leu Ser Glu Ala Thr Gly Gln Arg Thr Ala Ala Thr Arg Asp
                565                 570                 575

Ala Ser His Glu Ala Arg Ala Gln Lys Glu Leu Glu Ala Val Ala Thr
            580                 585                 590

Glu Gly Thr Thr Val Arg His Asp Ala Ala Ala Val Ser Ala Phe Gly
        595                 600                 605
```

Ser Trp Val Ala Arg Lys Gly Asp Glu Tyr Arg His Gln Val Gly Val
610 615 620

Leu Ala Asn Arg Leu Glu His Gly Leu Arg Leu Gln Glu Leu Met Ala
625 630 635 640

Pro Asp Ser Val Val Ala Asp Gln Gln Arg Ala Ser Gly His Ala Arg
645 650 655

Val Gly Tyr Arg Tyr Val Leu Thr Ala Met
660 665

<210> 127
<211> 560
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 127
Ala Val Ala His Pro Val Gly Arg Gly Asn Ala Gly Ser Pro Gly Ala
1 5 10 15

Arg Gly Pro Glu Glu Leu Pro Arg Gln Leu Val Asn Arg Ala Ser Asn
20 25 30

Val Thr Arg Pro Ala Thr Tyr Gly Cys Ala Pro Cys Arg His Val Arg
35 40 45

Leu Ser Ile Pro Lys Pro Val Leu Thr Gly Cys Arg Ala Cys Glu Gln
50 55 60

Thr Thr His Pro Ala Pro Lys Arg Ala Val Arg Gly Gly Ala Asp Ala
65 70 75 80

Ala Lys Tyr Asp Leu Ala Ala Phe Phe Ala Gly Trp Ala Ala Asp Leu
85 90 95

Glu Gly Arg Asn Arg Arg Arg Gln Val His Ala Pro Leu Asp Pro Gln
100 105 110

Pro Asp Pro Asn His Glu Pro Ala Val Thr Leu Gln Lys Ile Asp Leu
115 120 125

```
Ala Glu Val Ser Ile Glu Glu Phe Gln Arg Val Leu Ala Arg Ser Val
    130                 135                 140

Lys His Arg His Asp Gly Arg Ala Ser Arg Glu Arg Glu Lys Ala Arg
145                 150                 155                 160

Ala Tyr Ala Gln Val Ala Lys Lys Arg Arg Asn Ser His Ala His Gly
                165                 170                 175

Ala Arg Thr Arg Arg Ala Val Arg Arg Gln Thr Arg Ala Val Arg Arg
            180                 185                 190

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

Ala Glu Asp Pro Val Pro Glu Ala Ile Asp His Ala Ala Gln Leu Arg
    210                 215                 220

Arg Arg Ile Arg Ala Cys Ala Arg Asp Leu Glu Gly Leu Arg His Leu
225                 230                 235                 240

Ser Arg Arg Tyr Leu Lys Thr Leu Glu Lys Pro Cys Arg Arg Pro Arg
                245                 250                 255

Ala Pro Asp Leu Gly Arg Ala Arg Cys His Ala Leu Val Glu Ser Leu
            260                 265                 270

Gln Ala Ala Glu Arg Glu Leu Glu Glu Leu Arg Arg Cys Asp Ser Pro
        275                 280                 285

Asp Thr Ala Met Arg Arg Leu Asp Ala Val Leu Ala Ala Ala Ala Ser
    290                 295                 300

Thr Asp Ala Thr Phe Ala Thr Gly Trp Thr Val Val Gly Met Asp Leu
305                 310                 315                 320

Gly Val Ala Pro Arg Gly Ser Ala Ala Pro Glu Val Ser Pro Met Glu
                325                 330                 335

Met Ala Ile Ser Val Phe Trp Arg Lys Gly Ser Arg Arg Val Ile Val
            340                 345                 350

Ser Lys Pro Ile Ala Gly Met Pro Ile Arg Arg His Glu Leu Ile Arg
```

355 360 365

Leu Glu Gly Leu Gly Thr Leu Arg Leu Asp Gly Asn His Tyr Thr Gly
370 375 380

Ala Gly Val Thr Lys Gly Arg Gly Leu Ser Glu Gly Thr Glu Pro Asp
385 390 395 400

Phe Arg Glu Lys Ser Pro Ser Thr Leu Gly Phe Thr Leu Ser Asp Tyr
405 410 415

Arg His Glu Ser Arg Trp Arg Pro Tyr Gly Ala Lys Gln Gly Lys Thr
420 425 430

Ala Arg Gln Phe Phe Ala Ala Met Ser Arg Glu Leu Arg Ala Leu Val
435 440 445

Glu His Gln Val Leu Ala Pro Met Gly Pro Pro Leu Leu Glu Ala His
450 455 460

Glu Arg Arg Phe Glu Thr Leu Leu Lys Gly Gln Asp Asn Lys Ser Ile
465 470 475 480

His Ala Gly Gly Gly Gly Arg Tyr Val Trp Arg Gly Pro Pro Asp Ser
485 490 495

Lys Lys Arg Pro Ala Ala Asp Gly Asp Trp Phe Arg Phe Gly Arg Gly
500 505 510

His Ala Asp His Arg Gly Trp Ala Asn Lys Arg His Glu Leu Ala Ala
515 520 525

Asn Tyr Leu Gln Ser Ala Phe Arg Leu Trp Ser Thr Leu Ala Glu Ala
530 535 540

Gln Glu Pro Thr Pro Tyr Ala Arg Tyr Lys Tyr Thr Arg Val Thr Met
545 550 555 560

<210> 128
<211> 404
<212> PRT
<213> Artificial Sequence

<220>
<221> source

<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 128

```
Trp Asp Phe Leu Thr Leu Gln Val Tyr Glu Arg His Thr Ser Pro Glu
1               5                  10                  15

Val Cys Val Ala Gly Asn Ser Thr Lys Cys Ala Ser Gly Thr Arg Lys
            20                  25                  30

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

Asn Val Ser Ala Asn Asp Asp Arg Asp His Glu Val Gly Cys Asn Ile
    50                  55                  60

Cys Val Ile Ser Arg Val Ser Leu Asp Ile Lys Gly Trp Arg Tyr Gly
65                  70                  75                  80

Cys Glu Ser Cys Val Gln Ser Thr Pro Glu Trp Arg Ser Ile Val Arg
                85                  90                  95

Phe Asp Arg Asn His Lys Glu Ala Lys Gly Glu Cys Leu Ser Arg Phe
            100                 105                 110

Glu Tyr Trp Gly Ala Gln Ser Ile Ala Arg Ser Leu Lys Arg Asn Lys
        115                 120                 125

Leu Met Gly Gly Val Asn Leu Asp Glu Leu Ala Ile Val Gln Asn Glu
    130                 135                 140

Asn Val Val Lys Thr Ser Leu Lys His Leu Phe Asp Lys Arg Lys Asp
145                 150                 155                 160

Arg Ile Gln Ala Asn Leu Lys Ala Val Lys Val Arg Met Arg Glu Arg
                165                 170                 175

Arg Lys Ser Gly Arg Gln Arg Lys Ala Leu Arg Arg Gln Cys Arg Lys
            180                 185                 190

Leu Lys Arg Tyr Leu Arg Ser Tyr Asp Pro Ser Asp Ile Lys Glu Gly
        195                 200                 205

Asn Ser Cys Ser Ala Phe Thr Lys Leu Gly Leu Asp Ile Gly Ile Ser
    210                 215                 220
```

```
Pro Asn Lys Pro Pro Lys Ile Glu Pro Lys Val Glu Val Val Phe Ser
225                 230                 235                 240


Leu Phe Tyr Gln Gly Ala Cys Asp Lys Ile Val Thr Val Ser Ser Pro
                245                 250                 255


Glu Ser Pro Leu Pro Arg Ser Trp Lys Ile Lys Ile Asp Gly Ile Arg
            260                 265                 270


Ala Leu Tyr Val Lys Ser Thr Lys Val Lys Phe Gly Gly Arg Thr Phe
        275                 280                 285


Arg Ala Gly Gln Arg Asn Asn Arg Arg Lys Val Arg Pro Pro Asn Val
    290                 295                 300


Lys Lys Gly Lys Arg Lys Gly Ser Arg Ser Gln Phe Phe Asn Lys Phe
305                 310                 315                 320


Ala Val Gly Leu Asp Ala Val Ser Gln Gln Leu Pro Ile Ala Ser Val
                325                 330                 335


Gln Gly Leu Trp Gly Arg Ala Glu Thr Lys Lys Ala Gln Thr Ile Cys
            340                 345                 350


Leu Lys Gln Leu Glu Ser Asn Lys Pro Leu Lys Glu Ser Gln Arg Cys
        355                 360                 365


Leu Phe Leu Ala Asp Asn Trp Val Val Arg Val Cys Gly Phe Leu Arg
    370                 375                 380


Ala Leu Ser Gln Arg Gln Gly Pro Thr Pro Tyr Ile Arg Tyr Arg Tyr
385                 390                 395                 400


Arg Cys Asn Met
```

<210> 129
<211> 392
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic

polypeptide"

<400> 129

```
Ala Arg Asn Val Gly Gln Arg Asn Ala Ser Arg Gln Ser Lys Arg Glu
1               5                  10                  15

Ser Ala Lys Ala Arg Ser Arg Arg Val Thr Gly Gly His Ala Ser Val
            20                  25                  30

Thr Gln Gly Val Ala Leu Ile Asn Ala Ala Ala Asn Ala Asp Arg Asp
        35                  40                  45

His Thr Thr Gly Cys Glu Pro Cys Thr Trp Glu Arg Val Asn Leu Pro
    50                  55                  60

Leu Gln Glu Val Ile His Gly Cys Asp Ser Cys Thr Lys Ser Ser Pro
65                  70                  75                  80

Phe Trp Arg Asp Ile Lys Val Val Asn Lys Gly Tyr Arg Glu Ala Lys
                85                  90                  95

Glu Glu Ile Met Arg Ile Ala Ser Gly Ile Ser Ala Asp His Leu Ser
            100                 105                 110

Arg Ala Leu Ser His Asn Lys Val Met Gly Arg Leu Asn Leu Asp Glu
        115                 120                 125

Val Cys Ile Leu Asp Phe Arg Thr Val Leu Asp Thr Ser Leu Lys His
    130                 135                 140

Leu Thr Asp Ser Arg Ser Asn Gly Ile Lys Glu His Ile Arg Ala Val
145                 150                 155                 160

His Arg Lys Ile Arg Met Arg Arg Lys Ser Gly Lys Thr Ala Arg Ala
                165                 170                 175

Leu Arg Lys Gln Tyr Phe Ala Leu Arg Arg Gln Trp Lys Ala Gly His
            180                 185                 190

Lys Pro Asn Ser Ile Arg Glu Gly Asn Ser Leu Thr Ala Leu Arg Ala
        195                 200                 205

Val Gly Phe Asp Val Gly Val Ser Glu Gly Thr Glu Pro Met Pro Ala
    210                 215                 220
```

```
Pro Gln Thr Glu Val Val Leu Ser Val Phe Tyr Lys Gly Ser Ala Thr
225                 230                 235                 240

Arg Ile Leu Arg Ile Ser Ser Pro His Pro Ile Ala Lys Arg Ser Trp
                245                 250                 255

Lys Val Lys Ile Ala Gly Ile Lys Ala Leu Lys Leu Ile Arg Arg Glu
            260                 265                 270

His Asp Phe Ser Phe Gly Arg Glu Thr Tyr Asn Ala Ser Gln Arg Ala
        275                 280                 285

Glu Lys Arg Lys Phe Ser Pro His Ala Ala Arg Lys Asp Phe Phe Asn
    290                 295                 300

Ser Phe Ala Val Gln Leu Asp Arg Leu Ala Gln Gln Leu Cys Val Ser
305                 310                 315                 320

Ser Val Glu Asn Leu Trp Val Thr Glu Pro Gln Gln Lys Leu Leu Thr
                325                 330                 335

Leu Ala Lys Asp Thr Ala Pro Tyr Gly Ile Arg Glu Gly Ala Arg Phe
            340                 345                 350

Ala Asp Thr Arg Ala Arg Leu Ala Trp Asn Trp Val Phe Arg Val Cys
        355                 360                 365

Gly Phe Thr Arg Ala Leu His Gln Glu Gln Glu Pro Thr Pro Tyr Cys
    370                 375                 380

Arg Phe Thr Trp Arg Ser Lys Met
385                 390


<210> 130
<211> 1120
<212> PRT
<213> Listeria seeligeri

<400> 130
Met Trp Ile Ser Ile Lys Thr Leu Ile His His Leu Gly Val Leu Phe
1               5                   10                  15

Phe Cys Asp Tyr Met Tyr Asn Arg Arg Glu Lys Lys Ile Ile Glu Val
            20                  25                  30
```

```
Lys Thr Met Arg Ile Thr Lys Val Glu Val Asp Arg Lys Lys Val Leu
        35                  40                  45

Ile Ser Arg Asp Lys Asn Gly Gly Lys Leu Val Tyr Glu Asn Glu Met
    50                  55                  60

Gln Asp Asn Thr Glu Gln Ile Met His His Lys Lys Ser Ser Phe Tyr
65                  70                  75                  80

Lys Ser Val Val Asn Lys Thr Ile Cys Arg Pro Glu Gln Lys Gln Met
                85                  90                  95

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

Lys Val Ser Asp Val Thr Lys Leu Asn Ile Ser Asn Phe Leu Asn His
        115                 120                 125

Arg Phe Lys Lys Ser Leu Tyr Tyr Phe Pro Glu Asn Ser Pro Asp Lys
    130                 135                 140

Ser Glu Glu Tyr Arg Ile Glu Ile Asn Leu Ser Gln Leu Leu Glu Asp
145                 150                 155                 160

Ser Leu Lys Lys Gln Gln Gly Thr Phe Ile Cys Trp Glu Ser Phe Ser
                165                 170                 175

Lys Asp Met Glu Leu Tyr Ile Asn Trp Ala Glu Asn Tyr Ile Ser Ser
            180                 185                 190

Lys Thr Lys Leu Ile Lys Lys Ser Ile Arg Asn Asn Arg Ile Gln Ser
        195                 200                 205

Thr Glu Ser Arg Ser Gly Gln Leu Met Asp Arg Tyr Met Lys Asp Ile
    210                 215                 220

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

Gln Leu Glu Lys Leu Thr Ser Ala Leu Lys Ala Thr Phe Lys Glu Ala
                245                 250                 255

Lys Lys Asn Asp Lys Glu Ile Asn Tyr Lys Leu Lys Ser Thr Leu Gln
```

```
            260                 265                 270

Asn His Glu Arg Gln Ile Ile Glu Glu Leu Lys Glu Asn Ser Glu Leu
        275                 280                 285

Asn Gln Phe Asn Ile Glu Ile Arg Lys His Leu Glu Thr Tyr Phe Pro
    290                 295                 300

Ile Lys Lys Thr Asn Arg Lys Val Gly Asp Ile Arg Asn Leu Glu Ile
305                 310                 315                 320

Gly Glu Ile Gln Lys Ile Val Asn His Arg Leu Lys Asn Lys Ile Val
                325                 330                 335

Gln Arg Ile Leu Gln Glu Gly Lys Leu Ala Ser Tyr Glu Ile Glu Ser
            340                 345                 350

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

Ala Leu Lys Phe Ile Asn Ala Cys Leu Phe Ala Ser Asn Asn Leu Arg
    370                 375                 380

Asn Met Val Tyr Pro Val Cys Lys Lys Asp Ile Leu Met Ile Gly Glu
385                 390                 395                 400

Phe Lys Asn Ser Phe Lys Glu Ile Lys His Lys Lys Phe Ile Arg Gln
                405                 410                 415

Trp Ser Gln Phe Phe Ser Gln Glu Ile Thr Val Asp Asp Ile Glu Leu
            420                 425                 430

Ala Ser Trp Gly Leu Arg Gly Ala Ile Ala Pro Ile Arg Asn Glu Ile
        435                 440                 445

Ile His Leu Lys Lys His Ser Trp Lys Lys Phe Phe Asn Asn Pro Thr
    450                 455                 460

Phe Lys Val Lys Lys Ser Lys Ile Ile Asn Gly Lys Thr Lys Asp Val
465                 470                 475                 480

Thr Ser Glu Phe Leu Tyr Lys Glu Thr Leu Phe Lys Asp Tyr Phe Tyr
                485                 490                 495
```

```
Ser Glu Leu Asp Ser Val Pro Glu Leu Ile Ile Asn Lys Met Glu Ser
            500                 505                 510

Ser Lys Ile Leu Asp Tyr Tyr Ser Ser Asp Gln Leu Asn Gln Val Phe
        515                 520                 525

Thr Ile Pro Asn Phe Glu Leu Ser Leu Leu Thr Ser Ala Val Pro Phe
    530                 535                 540

Ala Pro Ser Phe Lys Arg Val Tyr Leu Lys Gly Phe Asp Tyr Gln Asn
545                 550                 555                 560

Gln Asp Glu Ala Gln Pro Asp Tyr Asn Leu Lys Leu Asn Ile Tyr Asn
                565                 570                 575

Glu Lys Ala Phe Asn Ser Glu Ala Phe Gln Ala Gln Tyr Ser Leu Phe
            580                 585                 590

Lys Met Val Tyr Tyr Gln Val Phe Leu Pro Gln Phe Thr Thr Asn Asn
        595                 600                 605

Asp Leu Phe Lys Ser Ser Val Asp Phe Ile Leu Thr Leu Asn Lys Glu
    610                 615                 620

Arg Lys Gly Tyr Ala Lys Ala Phe Gln Asp Ile Arg Lys Met Asn Lys
625                 630                 635                 640

Asp Glu Lys Pro Ser Glu Tyr Met Ser Tyr Ile Gln Ser Gln Leu Met
                645                 650                 655

Leu Tyr Gln Lys Lys Gln Glu Glu Lys Glu Lys Ile Asn His Phe Glu
            660                 665                 670

Lys Phe Ile Asn Gln Val Phe Ile Lys Gly Phe Asn Ser Phe Ile Glu
        675                 680                 685

Lys Asn Arg Leu Thr Tyr Ile Cys His Pro Thr Lys Asn Thr Val Pro
    690                 695                 700

Glu Asn Asp Asn Ile Glu Ile Pro Phe His Thr Asp Met Asp Asp Ser
705                 710                 715                 720

Asn Ile Ala Phe Trp Leu Met Cys Lys Leu Leu Asp Ala Lys Gln Leu
```

```
                725                 730                 735

Ser Glu Leu Arg Asn Glu Met Ile Lys Phe Ser Cys Ser Leu Gln Ser
            740                 745                 750

Thr Glu Glu Ile Ser Thr Phe Thr Lys Ala Arg Glu Val Ile Gly Leu
        755                 760                 765

Ala Leu Leu Asn Gly Glu Lys Gly Cys Asn Asp Trp Lys Glu Leu Phe
    770                 775                 780

Asp Asp Lys Glu Ala Trp Lys Lys Asn Met Ser Leu Tyr Val Ser Glu
785                 790                 795                 800

Glu Leu Leu Gln Ser Leu Pro Tyr Thr Gln Glu Asp Gly Gln Thr Pro
                805                 810                 815

Val Ile Asn Arg Ser Ile Asp Leu Val Lys Lys Tyr Gly Thr Glu Thr
            820                 825                 830

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

Lys Asp Ile Ala Lys Leu His Glu Tyr Asp Val Thr Glu Lys Ile Ala
    850                 855                 860

Gln Gln Glu Ser Leu His Lys Gln Trp Ile Glu Lys Pro Gly Leu Ala
865                 870                 875                 880

Arg Asp Ser Ala Trp Thr Lys Lys Tyr Gln Asn Val Ile Asn Asp Ile
                885                 890                 895

Ser Asn Tyr Gln Trp Ala Lys Thr Lys Val Glu Leu Thr Gln Val Arg
            900                 905                 910

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

Met Ser Ile Ala Asp Arg Asp Phe Gln Phe Ser Ser Asn Tyr Ile Leu
    930                 935                 940

Glu Arg Glu Asn Ser Glu Tyr Arg Val Thr Ser Trp Ile Leu Leu Ser
945                 950                 955                 960
```

```
Glu Asn Lys Asn Lys Asn Lys Tyr Asn Asp Tyr Glu Leu Tyr Asn Leu
                965                 970                 975

Lys Asn Ala Ser Ile Lys Val Ser Ser Lys Asn Asp Pro Gln Leu Lys
            980                 985                 990

Val Asp Leu Lys Gln Leu Arg Leu  Thr Leu Glu Tyr Leu  Glu Leu Phe
        995                 1000                1005

Asp Asn  Arg Leu Lys Glu Lys  Arg Asn Asn Ile Ser  His Phe Asn
    1010                1015                1020

Tyr Leu  Asn Gly Gln Leu Gly  Asn Ser Ile Leu Glu  Leu Phe Asp
    1025                1030                1035

Asp Ala  Arg Asp Val Leu Ser  Tyr Asp Arg Lys Leu  Lys Asn Ala
    1040                1045                1050

Val Ser  Lys Ser Leu Lys Glu  Ile Leu Ser Ser His  Gly Met Glu
    1055                1060                1065

Val Thr  Phe Lys Pro Leu Tyr  Gln Thr Asn His His  Leu Lys Ile
    1070                1075                1080

Asp Lys  Leu Gln Pro Lys Lys  Ile His His Leu Gly  Glu Lys Ser
    1085                1090                1095

Thr Val  Ser Ser Asn Gln Val  Ser Asn Glu Tyr Cys  Gln Leu Val
    1100                1105                1110

Arg Thr  Leu Leu Thr Met Lys
    1115                1120


<210> 131
<211> 1159
<212> PRT
<213> Leptotrichia buccalis

<400> 131
Met Lys Val Thr Lys Val Gly Gly Ile Ser His Lys Lys Tyr Thr Ser
1               5                   10                  15

Glu Gly Arg Leu Val Lys Ser Glu Ser Glu Glu Asn Arg Thr Asp Glu
            20                  25                  30
```

```
Arg Leu Ser Ala Leu Leu Asn Met Arg Leu Asp Met Tyr Ile Lys Asn
        35                  40                  45

Pro Ser Ser Thr Glu Thr Lys Glu Asn Gln Lys Arg Ile Gly Lys Leu
    50                  55                  60

Lys Lys Phe Phe Ser Asn Lys Met Val Tyr Leu Lys Asp Asn Thr Leu
65                  70                  75                  80

Ser Leu Lys Asn Gly Lys Lys Glu Asn Ile Asp Arg Glu Tyr Ser Glu
                85                  90                  95

Thr Asp Ile Leu Glu Ser Asp Val Arg Asp Lys Lys Asn Phe Ala Val
            100                 105                 110

Leu Lys Lys Ile Tyr Leu Asn Glu Asn Val Asn Ser Glu Glu Leu Glu
        115                 120                 125

Val Phe Arg Asn Asp Ile Lys Lys Lys Leu Asn Lys Ile Asn Ser Leu
    130                 135                 140

Lys Tyr Ser Phe Glu Lys Asn Lys Ala Asn Tyr Gln Lys Ile Asn Glu
145                 150                 155                 160

Asn Asn Ile Glu Lys Val Glu Gly Lys Ser Lys Arg Asn Ile Ile Tyr
                165                 170                 175

Asp Tyr Tyr Arg Glu Ser Ala Lys Arg Asp Ala Tyr Val Ser Asn Val
            180                 185                 190

Lys Glu Ala Phe Asp Lys Leu Tyr Lys Glu Glu Asp Ile Ala Lys Leu
        195                 200                 205

Val Leu Glu Ile Glu Asn Leu Thr Lys Leu Glu Lys Tyr Lys Ile Arg
    210                 215                 220

Glu Phe Tyr His Glu Ile Ile Gly Arg Lys Asn Asp Lys Glu Asn Phe
225                 230                 235                 240

Ala Lys Ile Ile Tyr Glu Glu Ile Gln Asn Val Asn Asn Met Lys Glu
                245                 250                 255

Leu Ile Glu Lys Val Pro Asp Met Ser Glu Leu Lys Lys Ser Gln Val
```

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            260                 265                 270

Phe Tyr Lys Tyr Tyr Leu Asp Lys Glu Glu Leu Asn Asp Lys Asn Ile
        275                 280                 285

Lys Tyr Ala Phe Cys His Phe Val Glu Ile Glu Met Ser Gln Leu Leu
    290                 295                 300

Lys Asn Tyr Val Tyr Lys Arg Leu Ser Asn Ile Ser Asn Asp Lys Ile
305                 310                 315                 320

Lys Arg Ile Phe Glu Tyr Gln Asn Leu Lys Lys Leu Ile Glu Asn Lys
                325                 330                 335

Leu Leu Asn Lys Leu Asp Thr Tyr Val Arg Asn Cys Gly Lys Tyr Asn
            340                 345                 350

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

Asn Arg Gln Asn Glu Ala Phe Leu Arg Asn Ile Ile Gly Val Ser Ser
    370                 375                 380

Val Ala Tyr Phe Ser Leu Arg Asn Ile Leu Glu Thr Glu Asn Glu Asn
385                 390                 395                 400

Asp Ile Thr Gly Arg Met Arg Gly Lys Thr Val Lys Asn Asn Lys Gly
                405                 410                 415

Glu Glu Lys Tyr Val Ser Gly Glu Val Asp Lys Ile Tyr Asn Glu Asn
            420                 425                 430

Lys Lys Asn Glu Val Lys Glu Asn Leu Lys Met Phe Tyr Ser Tyr Asp
        435                 440                 445

Phe Asn Met Asp Asn Lys Asn Glu Ile Glu Asp Phe Phe Ala Asn Ile
    450                 455                 460

Asp Glu Ala Ile Ser Ser Ile Arg His Gly Ile Val His Phe Asn Leu
465                 470                 475                 480

Glu Leu Glu Gly Lys Asp Ile Phe Ala Phe Lys Asn Ile Ala Pro Ser
                485                 490                 495
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```
Glu Ile Ser Lys Lys Met Phe Gln Asn Glu Ile Asn Glu Lys Lys Leu
            500                 505                 510

Lys Leu Lys Ile Phe Arg Gln Leu Asn Ser Ala Asn Val Phe Arg Tyr
        515                 520                 525

Leu Glu Lys Tyr Lys Ile Leu Asn Tyr Leu Lys Arg Thr Arg Phe Glu
    530                 535                 540

Phe Val Asn Lys Asn Ile Pro Phe Val Pro Ser Phe Thr Lys Leu Tyr
545                 550                 555                 560

Ser Arg Ile Asp Asp Leu Lys Asn Ser Leu Gly Ile Tyr Trp Lys Thr
                565                 570                 575

Pro Lys Thr Asn Asp Asp Asn Lys Thr Lys Glu Ile Ile Asp Ala Gln
            580                 585                 590

Ile Tyr Leu Leu Lys Asn Ile Tyr Tyr Gly Glu Phe Leu Asn Tyr Phe
        595                 600                 605

Met Ser Asn Asn Gly Asn Phe Phe Glu Ile Ser Lys Glu Ile Ile Glu
    610                 615                 620

Leu Asn Lys Asn Asp Lys Arg Asn Leu Lys Thr Gly Phe Tyr Lys Leu
625                 630                 635                 640

Gln Lys Phe Glu Asp Ile Gln Glu Lys Ile Pro Lys Glu Tyr Leu Ala
                645                 650                 655

Asn Ile Gln Ser Leu Tyr Met Ile Asn Ala Gly Asn Gln Asp Glu Glu
            660                 665                 670

Glu Lys Asp Thr Tyr Ile Asp Phe Ile Gln Lys Ile Phe Leu Lys Gly
        675                 680                 685

Phe Met Thr Tyr Leu Ala Asn Asn Gly Arg Leu Ser Leu Ile Tyr Ile
    690                 695                 700

Gly Ser Asp Glu Glu Thr Asn Thr Ser Leu Ala Glu Lys Lys Gln Glu
705                 710                 715                 720

Phe Asp Lys Phe Leu Lys Lys Tyr Glu Gln Asn Asn Asn Ile Lys Ile
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                725                 730                 735

Pro Tyr Glu Ile Asn Glu Phe Leu Arg Glu Ile Lys Leu Gly Asn Ile
            740                 745                 750

Leu Lys Tyr Thr Glu Arg Leu Asn Met Phe Tyr Leu Ile Leu Lys Leu
        755                 760                 765

Leu Asn His Lys Glu Leu Thr Asn Leu Lys Gly Ser Leu Glu Lys Tyr
    770                 775                 780

Gln Ser Ala Asn Lys Glu Glu Ala Phe Ser Asp Gln Leu Glu Leu Ile
785                 790                 795                 800

Asn Leu Leu Asn Leu Asp Asn Asn Arg Val Thr Glu Asp Phe Glu Leu
                805                 810                 815

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

Lys Asp Asn Lys Glu Leu Lys Lys Phe Asp Thr Asn Lys Ile Tyr Phe
        835                 840                 845

Asp Gly Glu Asn Ile Ile Lys His Arg Ala Phe Tyr Asn Ile Lys Lys
    850                 855                 860

Tyr Gly Met Leu Asn Leu Leu Glu Lys Ile Ala Asp Lys Ala Gly Tyr
865                 870                 875                 880

Lys Ile Ser Ile Glu Glu Leu Lys Lys Tyr Ser Asn Lys Lys Asn Glu
                885                 890                 895

Ile Glu Lys Asn His Lys Met Gln Glu Asn Leu His Arg Lys Tyr Ala
            900                 905                 910

Arg Pro Arg Lys Asp Glu Lys Phe Thr Asp Glu Asp Tyr Glu Ser Tyr
        915                 920                 925

Lys Gln Ala Ile Glu Asn Ile Glu Glu Tyr Thr His Leu Lys Asn Lys
    930                 935                 940

Val Glu Phe Asn Glu Leu Asn Leu Leu Gln Gly Leu Leu Leu Arg Ile
945                 950                 955                 960
```

```
Leu His Arg Leu Val Gly Tyr Thr Ser Ile Trp Glu Arg Asp Leu Arg
               965                 970                 975

Phe Arg Leu Lys Gly Glu Phe Pro Glu Asn Gln Tyr Ile Glu Glu Ile
           980                 985                 990

Phe Asn Phe Glu Asn Lys Lys Asn  Val Lys Tyr Lys Gly  Gly Gln Ile
        995                 1000                1005

Val Glu  Lys Tyr Ile Lys Phe  Tyr Lys Glu Leu His  Gln Asn Asp
    1010                1015                1020

Glu Val  Lys Ile Asn Lys Tyr  Ser Ser Ala Asn Ile  Lys Val Leu
    1025                1030                1035

Lys Gln  Glu Lys Lys Asp Leu  Tyr Ile Arg Asn Tyr  Ile Ala His
    1040                1045                1050

Phe Asn  Tyr Ile Pro His Ala  Glu Ile Ser Leu Leu  Glu Val Leu
    1055                1060                1065

Glu Asn  Leu Arg Lys Leu Leu  Ser Tyr Asp Arg Lys  Leu Lys Asn
    1070                1075                1080

Ala Val  Met Lys Ser Val Val  Asp Ile Leu Lys Glu  Tyr Gly Phe
    1085                1090                1095

Val Ala  Thr Phe Lys Ile Gly  Ala Asp Lys Lys Ile  Gly Ile Gln
    1100                1105                1110

Thr Leu  Glu Ser Glu Lys Ile  Val His Leu Lys Asn  Leu Lys Lys
    1115                1120                1125

Lys Lys  Leu Met Thr Asp Arg  Asn Ser Glu Glu Leu  Cys Lys Leu
    1130                1135                1140

Val Lys  Ile Met Phe Glu Tyr  Lys Met Glu Glu Lys  Lys Ser Glu
    1145                1150                1155

Asn
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<211> 1389
<212> PRT
<213> Leptotrichia shahii

<400> 132
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
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```
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
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        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
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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
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    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

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<212> PRT
<213> Rhodobacter capsulatus

<400> 133
Met Gln Ile Gly Lys Val Gln Gly Arg Thr Ile Ser Glu Phe Gly Asp
1 5 10 15

Pro Ala Gly Gly Leu Lys Arg Lys Ile Ser Thr Asp Gly Lys Asn Arg
20 25 30

Lys Glu Leu Pro Ala His Leu Ser Ser Asp Pro Lys Ala Leu Ile Gly
35 40 45

Gln Trp Ile Ser Gly Ile Asp Lys Ile Tyr Arg Lys Pro Asp Ser Arg
50 55 60

Lys Ser Asp Gly Lys Ala Ile His Ser Pro Thr Pro Ser Lys Met Gln
65 70 75 80

Phe Asp Ala Arg Asp Asp Leu Gly Glu Ala Phe Trp Lys Leu Val Ser
85 90 95

Glu Ala Gly Leu Ala Gln Asp Ser Asp Tyr Asp Gln Phe Lys Arg Arg
100 105 110

Leu His Pro Tyr Gly Asp Lys Phe Gln Pro Ala Asp Ser Gly Ala Lys
115 120 125

Leu Lys Phe Glu Ala Asp Pro Pro Glu Pro Gln Ala Phe His Gly Arg
130 135 140

Trp Tyr Gly Ala Met Ser Lys Arg Gly Asn Asp Ala Lys Glu Leu Ala
145 150 155 160

```
Ala Ala Leu Tyr Glu His Leu His Val Asp Glu Lys Arg Ile Asp Gly
                165                 170                 175

Gln Pro Lys Arg Asn Pro Lys Thr Asp Lys Phe Ala Pro Gly Leu Val
            180                 185                 190

Val Ala Arg Ala Leu Gly Ile Glu Ser Ser Val Leu Pro Arg Gly Met
        195                 200                 205

Ala Arg Leu Ala Arg Asn Trp Gly Glu Glu Glu Ile Gln Thr Tyr Phe
    210                 215                 220

Val Val Asp Val Ala Ala Ser Val Lys Glu Val Ala Lys Ala Ala Val
225                 230                 235                 240

Ser Ala Ala Gln Ala Phe Asp Pro Pro Arg Gln Val Ser Gly Arg Ser
                245                 250                 255

Leu Ser Pro Lys Val Gly Phe Ala Leu Ala Glu His Leu Glu Arg Val
            260                 265                 270

Thr Gly Ser Lys Arg Cys Ser Phe Asp Pro Ala Ala Gly Pro Ser Val
        275                 280                 285

Leu Ala Leu His Asp Glu Val Lys Lys Thr Tyr Lys Arg Leu Cys Ala
    290                 295                 300

Arg Gly Lys Asn Ala Ala Arg Ala Phe Pro Ala Asp Lys Thr Glu Leu
305                 310                 315                 320

Leu Ala Leu Met Arg His Thr His Glu Asn Arg Val Arg Asn Gln Met
                325                 330                 335

Val Arg Met Gly Arg Val Ser Glu Tyr Arg Gly Gln Gln Ala Gly Asp
            340                 345                 350

Leu Ala Gln Ser His Tyr Trp Thr Ser Ala Gly Gln Thr Glu Ile Lys
        355                 360                 365

Glu Ser Glu Ile Phe Val Arg Leu Trp Val Gly Ala Phe Ala Leu Ala
    370                 375                 380

Gly Arg Ser Met Lys Ala Trp Ile Asp Pro Met Gly Lys Ile Val Asn
```

385 390 395 400

Thr Glu Lys Asn Asp Arg Asp Leu Thr Ala Ala Val Asn Ile Arg Gln
405 410 415

Val Ile Ser Asn Lys Glu Met Val Ala Glu Ala Met Ala Arg Arg Gly
420 425 430

Ile Tyr Phe Gly Glu Thr Pro Glu Leu Asp Arg Leu Gly Ala Glu Gly
435 440 445

Asn Glu Gly Phe Val Phe Ala Leu Leu Arg Tyr Leu Arg Gly Cys Arg
450 455 460

Asn Gln Thr Phe His Leu Gly Ala Arg Ala Gly Phe Leu Lys Glu Ile
465 470 475 480

Arg Lys Glu Leu Glu Lys Thr Arg Trp Gly Lys Ala Lys Glu Ala Glu
485 490 495

His Val Val Leu Thr Asp Lys Thr Val Ala Ala Ile Arg Ala Ile Ile
500 505 510

Asp Asn Asp Ala Lys Ala Leu Gly Ala Arg Leu Leu Ala Asp Leu Ser
515 520 525

Gly Ala Phe Val Ala His Tyr Ala Ser Lys Glu His Phe Ser Thr Leu
530 535 540

Tyr Ser Glu Ile Val Lys Ala Val Lys Asp Ala Pro Glu Val Ser Ser
545 550 555 560

Gly Leu Pro Arg Leu Lys Leu Leu Leu Lys Arg Ala Asp Gly Val Arg
565 570 575

Gly Tyr Val His Gly Leu Arg Asp Thr Arg Lys His Ala Phe Ala Thr
580 585 590

Lys Leu Pro Pro Pro Pro Ala Pro Arg Glu Leu Asp Asp Pro Ala Thr
595 600 605

Lys Ala Arg Tyr Ile Ala Leu Leu Arg Leu Tyr Asp Gly Pro Phe Arg
610 615 620

```
Ala Tyr Ala Ser Gly Ile Thr Gly Thr Ala Leu Ala Gly Pro Ala Ala
625                 630                 635                 640

Arg Ala Lys Glu Ala Ala Thr Ala Leu Ala Gln Ser Val Asn Val Thr
                645                 650                 655

Lys Ala Tyr Ser Asp Val Met Glu Gly Arg Ser Ser Arg Leu Arg Pro
            660                 665                 670

Pro Asn Asp Gly Glu Thr Leu Arg Glu Tyr Leu Ser Ala Leu Thr Gly
        675                 680                 685

Glu Thr Ala Thr Glu Phe Arg Val Gln Ile Gly Tyr Glu Ser Asp Ser
    690                 695                 700

Glu Asn Ala Arg Lys Gln Ala Glu Phe Ile Glu Asn Tyr Arg Arg Asp
705                 710                 715                 720

Met Leu Ala Phe Met Phe Glu Asp Tyr Ile Arg Ala Lys Gly Phe Asp
                725                 730                 735

Trp Ile Leu Lys Ile Glu Pro Gly Ala Thr Ala Met Thr Arg Ala Pro
            740                 745                 750

Val Leu Pro Glu Pro Ile Asp Thr Arg Gly Gln Tyr Glu His Trp Gln
        755                 760                 765

Ala Ala Leu Tyr Leu Val Met His Phe Val Pro Ala Ser Asp Val Ser
    770                 775                 780

Asn Leu Leu His Gln Leu Arg Lys Trp Glu Ala Leu Gln Gly Lys Tyr
785                 790                 795                 800

Glu Leu Val Gln Asp Gly Asp Ala Thr Asp Gln Ala Asp Ala Arg Arg
                805                 810                 815

Glu Ala Leu Asp Leu Val Lys Arg Phe Arg Asp Val Leu Val Leu Phe
            820                 825                 830

Leu Lys Thr Gly Glu Ala Arg Phe Glu Gly Arg Ala Ala Pro Phe Asp
        835                 840                 845

Leu Lys Pro Phe Arg Ala Leu Phe Ala Asn Pro Ala Thr Phe Asp Arg
```

```
    850                 855                 860

Leu Phe Met Ala Thr Pro Thr Thr Ala Arg Pro Ala Glu Asp Asp Pro
865                 870                 875                 880

Glu Gly Asp Gly Ala Ser Glu Pro Glu Leu Arg Val Ala Arg Thr Leu
                885                 890                 895

Arg Gly Leu Arg Gln Ile Ala Arg Tyr Asn His Met Ala Val Leu Ser
            900                 905                 910

Asp Leu Phe Ala Lys His Lys Val Arg Asp Glu Glu Val Ala Arg Leu
        915                 920                 925

Ala Glu Ile Glu Asp Glu Thr Gln Glu Lys Ser Gln Ile Val Ala Ala
    930                 935                 940

Gln Glu Leu Arg Thr Asp Leu His Asp Lys Val Met Lys Cys His Pro
945                 950                 955                 960

Lys Thr Ile Ser Pro Glu Glu Arg Gln Ser Tyr Ala Ala Ala Ile Lys
                965                 970                 975

Thr Ile Glu Glu His Arg Phe Leu Val Gly Arg Val Tyr Leu Gly Asp
            980                 985                 990

His Leu Arg Leu His Arg Leu Met  Met Asp Val Ile Gly  Arg Leu Ile
        995                 1000                1005

Asp Tyr  Ala Gly Ala Tyr Glu  Arg Asp Thr Gly Thr  Phe Leu Ile
    1010                1015                1020

Asn Ala  Ser Lys Gln Leu Gly  Ala Gly Ala Asp Trp  Ala Val Thr
    1025                1030                1035

Ile Ala  Gly Ala Ala Asn Thr  Asp Ala Arg Thr Gln  Thr Arg Lys
    1040                1045                1050

Asp Leu  Ala His Phe Asn Val  Leu Asp Arg Ala Asp  Gly Thr Pro
    1055                1060                1065

Asp Leu  Thr Ala Leu Val Asn  Arg Ala Arg Glu Met  Met Ala Tyr
    1070                1075                1080
```

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Asp Arg  Lys Arg Lys Asn Ala  Val Pro Arg Ser Ile  Leu Asp Met
    1085                1090                1095

Leu Ala  Arg Leu Gly Leu Thr  Leu Lys Trp Gln Met  Lys Asp His
    1100                1105                1110

Leu Leu  Gln Asp Ala Thr Ile  Thr Gln Ala Ala Ile  Lys His Leu
    1115                1120                1125

Asp Lys  Val Arg Leu Thr Val  Gly Gly Pro Ala Ala  Val Thr Glu
    1130                1135                1140

Ala Arg  Phe Ser Gln Asp Tyr  Leu Gln Met Val Ala  Ala Val Phe
    1145                1150                1155

Asn Gly  Ser Val Gln Asn Pro  Lys Pro Arg Arg Arg  Asp Asp Gly
    1160                1165                1170

Asp Ala  Trp His Lys Pro Pro  Lys Pro Ala Thr Ala  Gln Ser Gln
    1175                1180                1185

Pro Asp  Gln Lys Pro Pro Asn  Lys Ala Pro Ser Ala  Gly Ser Arg
    1190                1195                1200

Leu Pro  Pro Pro Gln Val Gly  Glu Val Tyr Glu Gly  Val Val Val
    1205                1210                1215

Lys Val  Ile Asp Thr Gly Ser  Leu Gly Phe Leu Ala  Val Glu Gly
    1220                1225                1230

Val Ala  Gly Asn Ile Gly Leu  His Ile Ser Arg Leu  Arg Arg Ile
    1235                1240                1245

Arg Glu  Asp Ala Ile Ile Val  Gly Arg Arg Tyr Arg  Phe Arg Val
    1250                1255                1260

Glu Ile  Tyr Val Pro Pro Lys  Ser Asn Thr Ser Lys  Leu Asn Ala
    1265                1270                1275

Ala Asp  Leu Val Arg Ile Asp
    1280                1285
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<211> 1175
<212> PRT
<213> Carnobacterium gallinarum

<400> 134
Met Arg Ile Thr Lys Val Lys Ile Lys Leu Asp Asn Lys Leu Tyr Gln
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Val Thr Met Gln Lys Glu Glu Lys Tyr Gly Thr Leu Lys Leu Asn Glu
            20   25   30

Glu Ser Arg Lys Ser Thr Ala Glu Ile Leu Arg Leu Lys Lys Ala Ser
        35   40   45

Phe Asn Lys Ser Phe His Ser Lys Thr Ile Asn Ser Gln Lys Glu Asn
    50   55   60

Lys Asn Ala Thr Ile Lys Lys Asn Gly Asp Tyr Ile Ser Gln Ile Phe
65   70   75   80

Glu Lys Leu Val Gly Val Asp Thr Asn Lys Asn Ile Arg Lys Pro Lys
                85   90   95

Met Ser Leu Thr Asp Leu Lys Asp Leu Pro Lys Lys Asp Leu Ala Leu
            100   105   110

Phe Ile Lys Arg Lys Phe Lys Asn Asp Asp Ile Val Glu Ile Lys Asn
        115   120   125

Leu Asp Leu Ile Ser Leu Phe Tyr Asn Ala Leu Gln Lys Val Pro Gly
    130   135   140

Glu His Phe Thr Asp Glu Ser Trp Ala Asp Phe Cys Gln Glu Met Met
145   150   155   160

Pro Tyr Arg Glu Tyr Lys Asn Lys Phe Ile Glu Arg Lys Ile Ile Leu
                165   170   175

Leu Ala Asn Ser Ile Glu Gln Asn Lys Gly Phe Ser Ile Asn Pro Glu
            180   185   190

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

Gln Glu Arg Gly Asp Phe Ser Ile Leu Asp Glu Lys Leu Ser Lys Leu

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    210                 215                 220

Ala Glu Ile Tyr Asn Phe Lys Lys Met Cys Lys Arg Val Gln Asp Glu
225                 230                 235                 240

Leu Asn Asp Leu Glu Lys Ser Met Lys Lys Gly Lys Asn Pro Glu Lys
                245                 250                 255

Glu Lys Glu Ala Tyr Lys Lys Gln Lys Asn Phe Lys Ile Lys Thr Ile
            260                 265                 270

Trp Lys Asp Tyr Pro Tyr Lys Thr His Ile Gly Leu Ile Glu Lys Ile
        275                 280                 285

Lys Glu Asn Glu Glu Leu Asn Gln Phe Asn Ile Glu Ile Gly Lys Tyr
    290                 295                 300

Phe Glu His Tyr Phe Pro Ile Lys Lys Glu Arg Cys Thr Glu Asp Glu
305                 310                 315                 320

Pro Tyr Tyr Leu Asn Ser Glu Thr Ile Ala Thr Thr Val Asn Tyr Gln
                325                 330                 335

Leu Lys Asn Ala Leu Ile Ser Tyr Leu Met Gln Ile Gly Lys Tyr Lys
            340                 345                 350

Gln Phe Gly Leu Glu Asn Gln Val Leu Asp Ser Lys Lys Leu Gln Glu
        355                 360                 365

Ile Gly Ile Tyr Glu Gly Phe Gln Thr Lys Phe Met Asp Ala Cys Val
    370                 375                 380

Phe Ala Thr Ser Ser Leu Lys Asn Ile Ile Glu Pro Met Arg Ser Gly
385                 390                 395                 400

Asp Ile Leu Gly Lys Arg Glu Phe Lys Glu Ala Ile Ala Thr Ser Ser
                405                 410                 415

Phe Val Asn Tyr His His Phe Phe Pro Tyr Phe Pro Phe Glu Leu Lys
            420                 425                 430

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

Gln Ile Arg Asn Glu Ile Phe His Ser Phe Asp Lys Asn Gln Lys Phe
465                 470                 475                 480

Asn Leu Pro Gln Leu Asp Lys Ser Asn Phe Glu Phe Asp Ala Ser Glu
                485                 490                 495

Asn Ser Thr Gly Lys Ser Gln Ser Tyr Ile Glu Thr Asp Tyr Lys Phe
            500                 505                 510

Leu Phe Glu Ala Glu Lys Asn Gln Leu Glu Gln Phe Phe Ile Glu Arg
        515                 520                 525

Ile Lys Ser Ser Gly Ala Leu Glu Tyr Tyr Pro Leu Lys Ser Leu Glu
    530                 535                 540

Lys Leu Phe Ala Lys Lys Glu Met Lys Phe Ser Leu Gly Ser Gln Val
545                 550                 555                 560

Val Ala Phe Ala Pro Ser Tyr Lys Lys Leu Val Lys Lys Gly His Ser
                565                 570                 575

Tyr Gln Thr Ala Thr Glu Gly Thr Ala Asn Tyr Leu Gly Leu Ser Tyr
            580                 585                 590

Tyr Asn Arg Tyr Glu Leu Lys Glu Glu Ser Phe Gln Ala Gln Tyr Tyr
        595                 600                 605

Leu Leu Lys Leu Ile Tyr Gln Tyr Val Phe Leu Pro Asn Phe Ser Gln
    610                 615                 620

Gly Asn Ser Pro Ala Phe Arg Glu Thr Val Lys Ala Ile Leu Arg Ile
625                 630                 635                 640

Asn Lys Asp Glu Ala Arg Lys Lys Met Lys Lys Asn Lys Lys Phe Leu
                645                 650                 655

Arg Lys Tyr Ala Phe Glu Gln Val Arg Glu Met Glu Phe Lys Glu Thr
            660                 665                 670

Pro Asp Gln Tyr Met Ser Tyr Leu Gln Ser Glu Met Arg Glu Glu Lys
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        675                 680                 685

Val Arg Lys Ala Glu Lys Asn Asp Lys Gly Phe Glu Lys Asn Ile Thr
    690                 695                 700

Met Asn Phe Glu Lys Leu Leu Met Gln Ile Phe Val Lys Gly Phe Asp
705                 710                 715                 720

Val Phe Leu Thr Thr Phe Ala Gly Lys Glu Leu Leu Leu Ser Ser Glu
                725                 730                 735

Glu Lys Val Ile Lys Glu Thr Glu Ile Ser Leu Ser Lys Lys Ile Asn
            740                 745                 750

Glu Arg Glu Lys Thr Leu Lys Ala Ser Ile Gln Val Glu His Gln Leu
        755                 760                 765

Val Ala Thr Asn Ser Ala Ile Ser Tyr Trp Leu Phe Cys Lys Leu Leu
    770                 775                 780

Asp Ser Arg His Leu Asn Glu Leu Arg Asn Glu Met Ile Lys Phe Lys
785                 790                 795                 800

Gln Ser Arg Ile Lys Phe Asn His Thr Gln His Ala Glu Leu Ile Gln
                805                 810                 815

Asn Leu Leu Pro Ile Val Glu Leu Thr Ile Leu Ser Asn Asp Tyr Asp
            820                 825                 830

Glu Lys Asn Asp Ser Gln Asn Val Asp Val Ser Ala Tyr Phe Glu Asp
        835                 840                 845

Lys Ser Leu Tyr Glu Thr Ala Pro Tyr Val Gln Thr Asp Asp Arg Thr
    850                 855                 860

Arg Val Ser Phe Arg Pro Ile Leu Lys Leu Glu Lys Tyr His Thr Lys
865                 870                 875                 880

Ser Leu Ile Glu Ala Leu Leu Lys Asp Asn Pro Gln Phe Arg Val Ala
                885                 890                 895

Ala Thr Asp Ile Gln Glu Trp Met His Lys Arg Glu Glu Ile Gly Glu
            900                 905                 910
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Leu Val Glu Lys Arg Lys Asn Leu His Thr Glu Trp Ala Glu Gly Gln
        915                 920                 925

Gln Thr Leu Gly Ala Glu Lys Arg Glu Glu Tyr Arg Asp Tyr Cys Lys
    930                 935                 940

Lys Ile Asp Arg Phe Asn Trp Lys Ala Asn Lys Val Thr Leu Thr Tyr
945                 950                 955                 960

Leu Ser Gln Leu His Tyr Leu Ile Thr Asp Leu Leu Gly Arg Met Val
                965                 970                 975

Gly Phe Ser Ala Leu Phe Glu Arg Asp Leu Val Tyr Phe Ser Arg Ser
            980                 985                 990

Phe Ser Glu Leu Gly Gly Glu Thr  Tyr His Ile Ser Asp  Tyr Lys Asn
        995                 1000                1005

Leu Ser  Gly Val Leu Arg Leu  Asn Ala Glu Val Lys  Pro Ile Lys
    1010                1015                1020

Ile Lys  Asn Ile Lys Val Ile  Asp Asn Glu Glu Asn  Pro Tyr Lys
    1025                1030                1035

Gly Asn  Glu Pro Glu Val Lys  Pro Phe Leu Asp Arg  Leu His Ala
    1040                1045                1050

Tyr Leu  Glu Asn Val Ile Gly  Ile Lys Ala Val His  Gly Lys Ile
    1055                1060                1065

Arg Asn  Gln Thr Ala His Leu  Ser Val Leu Gln Leu  Glu Leu Ser
    1070                1075                1080

Met Ile  Glu Ser Met Asn Asn  Leu Arg Asp Leu Met  Ala Tyr Asp
    1085                1090                1095

Arg Lys  Leu Lys Asn Ala Val  Thr Lys Ser Met Ile  Lys Ile Leu
    1100                1105                1110

Asp Lys  His Gly Met Ile Leu  Lys Leu Lys Ile Asp  Glu Asn His
    1115                1120                1125

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

1130 1135 1140

Leu Lys Asp Lys Ala Ile Lys Thr Asn Gln Val Ser Glu Glu Tyr
1145 1150 1155

Cys Gln Leu Val Leu Ala Leu Leu Thr Thr Asn Pro Gly Asn Gln
1160 1165 1170

Leu Asn
1175

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<212> PRT
<213> Herbinix hemicellulosilytica

<400> 135
Met Lys Leu Thr Arg Arg Arg Ile Ser Gly Asn Ser Val Asp Gln Lys
1 5 10 15

Ile Thr Ala Ala Phe Tyr Arg Asp Met Ser Gln Gly Leu Leu Tyr Tyr
20 25 30

Asp Ser Glu Asp Asn Asp Cys Thr Asp Lys Val Ile Glu Ser Met Asp
35 40 45

Phe Glu Arg Ser Trp Arg Gly Arg Ile Leu Lys Asn Gly Glu Asp Asp
50 55 60

Lys Asn Pro Phe Tyr Met Phe Val Lys Gly Leu Val Gly Ser Asn Asp
65 70 75 80

Lys Ile Val Cys Glu Pro Ile Asp Val Asp Ser Asp Pro Asp Asn Leu
85 90 95

Asp Ile Leu Ile Asn Lys Asn Leu Thr Gly Phe Gly Arg Asn Leu Lys
100 105 110

Ala Pro Asp Ser Asn Asp Thr Leu Glu Asn Leu Ile Arg Lys Ile Gln
115 120 125

Ala Gly Ile Pro Glu Glu Glu Val Leu Pro Glu Leu Lys Lys Ile Lys
130 135 140

Glu Met Ile Gln Lys Asp Ile Val Asn Arg Lys Glu Gln Leu Leu Lys

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145                 150                 155                 160

Ser Ile Lys Asn Asn Arg Ile Pro Phe Ser Leu Glu Gly Ser Lys Leu
                165                 170                 175

Val Pro Ser Thr Lys Lys Met Lys Trp Leu Phe Lys Leu Ile Asp Val
            180                 185                 190

Pro Asn Lys Thr Phe Asn Glu Lys Met Leu Glu Lys Tyr Trp Glu Ile
        195                 200                 205

Tyr Asp Tyr Asp Lys Leu Lys Ala Asn Ile Thr Asn Arg Leu Asp Lys
    210                 215                 220

Thr Asp Lys Lys Ala Arg Ser Ile Ser Arg Ala Val Ser Glu Glu Leu
225                 230                 235                 240

Arg Glu Tyr His Lys Asn Leu Arg Thr Asn Tyr Asn Arg Phe Val Ser
                245                 250                 255

Gly Asp Arg Pro Ala Ala Gly Leu Asp Asn Gly Gly Ser Ala Lys Tyr
            260                 265                 270

Asn Pro Asp Lys Glu Glu Phe Leu Leu Phe Leu Lys Glu Val Glu Gln
        275                 280                 285

Tyr Phe Lys Lys Tyr Phe Pro Val Lys Ser Lys His Ser Asn Lys Ser
    290                 295                 300

Lys Asp Lys Ser Leu Val Asp Lys Tyr Lys Asn Tyr Cys Ser Tyr Lys
305                 310                 315                 320

Val Val Lys Lys Glu Val Asn Arg Ser Ile Ile Asn Gln Leu Val Ala
                325                 330                 335

Gly Leu Ile Gln Gln Gly Lys Leu Leu Tyr Tyr Phe Tyr Tyr Asn Asp
            340                 345                 350

Thr Trp Gln Glu Asp Phe Leu Asn Ser Tyr Gly Leu Ser Tyr Ile Gln
        355                 360                 365

Val Glu Glu Ala Phe Lys Lys Ser Val Met Thr Ser Leu Ser Trp Gly
    370                 375                 380
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Ile Asn Arg Leu Thr Ser Phe Phe Ile Asp Asp Ser Asn Thr Val Lys
385                 390                 395                 400

Phe Asp Asp Ile Thr Thr Lys Lys Ala Lys Glu Ala Ile Glu Ser Asn
                405                 410                 415

Tyr Phe Asn Lys Leu Arg Thr Cys Ser Arg Met Gln Asp His Phe Lys
            420                 425                 430

Glu Lys Leu Ala Phe Phe Tyr Pro Val Tyr Val Lys Asp Lys Lys Asp
        435                 440                 445

Arg Pro Asp Asp Asp Ile Glu Asn Leu Ile Val Leu Val Lys Asn Ala
    450                 455                 460

Ile Glu Ser Val Ser Tyr Leu Arg Asn Arg Thr Phe His Phe Lys Glu
465                 470                 475                 480

Ser Ser Leu Leu Glu Leu Leu Lys Glu Leu Asp Asp Lys Asn Ser Gly
                485                 490                 495

Gln Asn Lys Ile Asp Tyr Ser Val Ala Ala Glu Phe Ile Lys Arg Asp
            500                 505                 510

Ile Glu Asn Leu Tyr Asp Val Phe Arg Glu Gln Ile Arg Ser Leu Gly
        515                 520                 525

Ile Ala Glu Tyr Tyr Lys Ala Asp Met Ile Ser Asp Cys Phe Lys Thr
    530                 535                 540

Cys Gly Leu Glu Phe Ala Leu Tyr Ser Pro Lys Asn Ser Leu Met Pro
545                 550                 555                 560

Ala Phe Lys Asn Val Tyr Lys Arg Gly Ala Asn Leu Asn Lys Ala Tyr
                565                 570                 575

Ile Arg Asp Lys Gly Pro Lys Glu Thr Gly Asp Gln Gly Gln Asn Ser
            580                 585                 590

Tyr Lys Ala Leu Glu Glu Tyr Arg Glu Leu Thr Trp Tyr Ile Glu Val
        595                 600                 605

Lys Asn Asn Asp Gln Ser Tyr Asn Ala Tyr Lys Asn Leu Leu Gln Leu
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610 615 620

Ile Tyr Tyr His Ala Phe Leu Pro Glu Val Arg Glu Asn Glu Ala Leu
625 630 635 640

Ile Thr Asp Phe Ile Asn Arg Thr Lys Glu Trp Asn Arg Lys Glu Thr
645 650 655

Glu Glu Arg Leu Asn Thr Lys Asn Asn Lys Lys His Lys Asn Phe Asp
660 665 670

Glu Asn Asp Asp Ile Thr Val Asn Thr Tyr Arg Tyr Glu Ser Ile Pro
675 680 685

Asp Tyr Gln Gly Glu Ser Leu Asp Asp Tyr Leu Lys Val Leu Gln Arg
690 695 700

Lys Gln Met Ala Arg Ala Lys Glu Val Asn Glu Lys Glu Glu Gly Asn
705 710 715 720

Asn Asn Tyr Ile Gln Phe Ile Arg Asp Val Val Val Trp Ala Phe Gly
725 730 735

Ala Tyr Leu Glu Asn Lys Leu Lys Asn Tyr Lys Asn Glu Leu Gln Pro
740 745 750

Pro Leu Ser Lys Glu Asn Ile Gly Leu Asn Asp Thr Leu Lys Glu Leu
755 760 765

Phe Pro Glu Glu Lys Val Lys Ser Pro Phe Asn Ile Lys Cys Arg Phe
770 775 780

Ser Ile Ser Thr Phe Ile Asp Asn Lys Gly Lys Ser Thr Asp Asn Thr
785 790 795 800

Ser Ala Glu Ala Val Lys Thr Asp Gly Lys Glu Asp Glu Lys Asp Lys
805 810 815

Lys Asn Ile Lys Arg Lys Asp Leu Leu Cys Phe Tyr Leu Phe Leu Arg
820 825 830

Leu Leu Asp Glu Asn Glu Ile Cys Lys Leu Gln His Gln Phe Ile Lys
835 840 845

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Tyr Arg Cys Ser Leu Lys Glu Arg Arg Phe Pro Gly Asn Arg Thr Lys
    850                 855                 860

Leu Glu Lys Glu Thr Glu Leu Leu Ala Glu Leu Glu Glu Leu Met Glu
865                 870                 875                 880

Leu Val Arg Phe Thr Met Pro Ser Ile Pro Glu Ile Ser Ala Lys Ala
                885                 890                 895

Glu Ser Gly Tyr Asp Thr Met Ile Lys Lys Tyr Phe Lys Asp Phe Ile
            900                 905                 910

Glu Lys Lys Val Phe Lys Asn Pro Lys Thr Ser Asn Leu Tyr Tyr His
        915                 920                 925

Ser Asp Ser Lys Thr Pro Val Thr Arg Lys Tyr Met Ala Leu Leu Met
    930                 935                 940

Arg Ser Ala Pro Leu His Leu Tyr Lys Asp Ile Phe Lys Gly Tyr Tyr
945                 950                 955                 960

Leu Ile Thr Lys Lys Glu Cys Leu Glu Tyr Ile Lys Leu Ser Asn Ile
                965                 970                 975

Ile Lys Asp Tyr Gln Asn Ser Leu Asn Glu Leu His Glu Gln Leu Glu
            980                 985                 990

Arg Ile Lys Leu Lys Ser Glu Lys  Gln Asn Gly Lys Asp  Ser Leu Tyr
        995                 1000                1005

Leu Asp  Lys Lys Asp Phe Tyr  Lys Val Lys Glu Tyr  Val Glu Asn
    1010                1015                1020

Leu Glu  Gln Val Ala Arg Tyr  Lys His Leu Gln His  Lys Ile Asn
    1025                1030                1035

Phe Glu  Ser Leu Tyr Arg Ile  Phe Arg Ile His Val  Asp Ile Ala
    1040                1045                1050

Ala Arg  Met Val Gly Tyr Thr  Gln Asp Trp Glu Arg  Asp Met His
    1055                1060                1065

Phe Leu  Phe Lys Ala Leu Val  Tyr Asn Gly Val Leu  Glu Glu Arg
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    1070                1075                1080

Arg Phe  Glu Ala Ile Phe Asn  Asn Asn Asp Asp Asn  Asn Asp Gly
    1085                1090                1095

Arg Ile  Val Lys Lys Ile Gln  Asn Asn Leu Asn Asn  Lys Asn Arg
    1100                1105                1110

Glu Leu  Val Ser Met Leu Cys  Trp Asn Lys Lys Leu  Asn Lys Asn
    1115                1120                1125

Glu Phe  Gly Ala Ile Ile Trp  Lys Arg Asn Pro Ile  Ala His Leu
    1130                1135                1140

Asn His  Phe Thr Gln Thr Glu  Gln Asn Ser Lys Ser  Ser Leu Glu
    1145                1150                1155

Ser Leu  Ile Asn Ser Leu Arg  Ile Leu Leu Ala Tyr  Asp Arg Lys
    1160                1165                1170

Arg Gln  Asn Ala Val Thr Lys  Thr Ile Asn Asp Leu  Leu Leu Asn
    1175                1180                1185

Asp Tyr  His Ile Arg Ile Lys  Trp Glu Gly Arg Val  Asp Glu Gly
    1190                1195                1200

Gln Ile  Tyr Phe Asn Ile Lys  Glu Lys Glu Asp Ile  Glu Asn Glu
    1205                1210                1215

Pro Ile  Ile His Leu Lys His  Leu His Lys Lys Asp  Cys Tyr Ile
    1220                1225                1230

Tyr Lys  Asn Ser Tyr Met Phe  Asp Lys Gln Lys Glu  Trp Ile Cys
    1235                1240                1245

Asn Gly  Ile Lys Glu Glu Val  Tyr Asp Lys Ser Ile  Leu Lys Cys
    1250                1255                1260

Ile Gly  Asn Leu Phe Lys Phe  Asp Tyr Glu Asp Lys  Asn Lys Ser
    1265                1270                1275

Ser Ala  Asn Pro Lys His Thr
    1280                1285
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<210> 136
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<213> Paludibacter propionicigenes

<400> 136
Met Arg Val Ser Lys Val Lys Val Lys Asp Gly Gly Lys Asp Lys Met
1   5   10   15

Val Leu Val His Arg Lys Thr Thr Gly Ala Gln Leu Val Tyr Ser Gly
            20   25   30

Gln Pro Val Ser Asn Glu Thr Ser Asn Ile Leu Pro Glu Lys Lys Arg
        35   40   45

Gln Ser Phe Asp Leu Ser Thr Leu Asn Lys Thr Ile Ile Lys Phe Asp
    50   55   60

Thr Ala Lys Lys Gln Lys Leu Asn Val Asp Gln Tyr Lys Ile Val Glu
65   70   75   80

Lys Ile Phe Lys Tyr Pro Lys Gln Glu Leu Pro Lys Gln Ile Lys Ala
                85   90   95

Glu Glu Ile Leu Pro Phe Leu Asn His Lys Phe Gln Glu Pro Val Lys
            100   105   110

Tyr Trp Lys Asn Gly Lys Glu Glu Ser Phe Asn Leu Thr Leu Leu Ile
        115   120   125

Val Glu Ala Val Gln Ala Gln Asp Lys Arg Lys Leu Gln Pro Tyr Tyr
    130   135   140

Asp Trp Lys Thr Trp Tyr Ile Gln Thr Lys Ser Asp Leu Leu Lys Lys
145   150   155   160

Ser Ile Glu Asn Asn Arg Ile Asp Leu Thr Glu Asn Leu Ser Lys Arg
                165   170   175

Lys Lys Ala Leu Leu Ala Trp Glu Thr Glu Phe Thr Ala Ser Gly Ser
            180   185   190

Ile Asp Leu Thr His Tyr His Lys Val Tyr Met Thr Asp Val Leu Cys
        195   200   205

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Lys Met Leu Gln Asp Val Lys Pro Leu Thr Asp Asp Lys Gly Lys Ile
    210                 215                 220

Asn Thr Asn Ala Tyr His Arg Gly Leu Lys Lys Ala Leu Gln Asn His
225                 230                 235                 240

Gln Pro Ala Ile Phe Gly Thr Arg Glu Val Pro Asn Glu Ala Asn Arg
                245                 250                 255

Ala Asp Asn Gln Leu Ser Ile Tyr His Leu Glu Val Val Lys Tyr Leu
            260                 265                 270

Glu His Tyr Phe Pro Ile Lys Thr Ser Lys Arg Arg Asn Thr Ala Asp
        275                 280                 285

Asp Ile Ala His Tyr Leu Lys Ala Gln Thr Leu Lys Thr Thr Ile Glu
    290                 295                 300

Lys Gln Leu Val Asn Ala Ile Arg Ala Asn Ile Ile Gln Gln Gly Lys
305                 310                 315                 320

Thr Asn His His Glu Leu Lys Ala Asp Thr Thr Ser Asn Asp Leu Ile
                325                 330                 335

Arg Ile Lys Thr Asn Glu Ala Phe Val Leu Asn Leu Thr Gly Thr Cys
            340                 345                 350

Ala Phe Ala Ala Asn Asn Ile Arg Asn Met Val Asp Asn Glu Gln Thr
        355                 360                 365

Asn Asp Ile Leu Gly Lys Gly Asp Phe Ile Lys Ser Leu Leu Lys Asp
    370                 375                 380

Asn Thr Asn Ser Gln Leu Tyr Ser Phe Phe Phe Gly Glu Gly Leu Ser
385                 390                 395                 400

Thr Asn Lys Ala Glu Lys Glu Thr Gln Leu Trp Gly Ile Arg Gly Ala
                405                 410                 415

Val Gln Gln Ile Arg Asn Asn Val Asn His Tyr Lys Lys Asp Ala Leu
            420                 425                 430

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

Pro Lys Gln Gln Thr Asn Tyr Ala Asp Thr Ile Tyr Lys Ala Arg Phe
    450                 455                 460

Ile Asn Glu Leu Glu Lys Ile Pro Glu Ala Phe Ala Gln Gln Leu Lys
465                 470                 475                 480

Thr Gly Gly Ala Val Ser Tyr Tyr Thr Ile Glu Asn Leu Lys Ser Leu
                485                 490                 495

Leu Thr Thr Phe Gln Phe Ser Leu Cys Arg Ser Thr Ile Pro Phe Ala
            500                 505                 510

Pro Gly Phe Lys Lys Val Phe Asn Gly Gly Ile Asn Tyr Gln Asn Ala
        515                 520                 525

Lys Gln Asp Glu Ser Phe Tyr Glu Leu Met Leu Glu Gln Tyr Leu Arg
    530                 535                 540

Lys Glu Asn Phe Ala Glu Glu Ser Tyr Asn Ala Arg Tyr Phe Met Leu
545                 550                 555                 560

Lys Leu Ile Tyr Asn Asn Leu Phe Leu Pro Gly Phe Thr Thr Asp Arg
                565                 570                 575

Lys Ala Phe Ala Asp Ser Val Gly Phe Val Gln Met Gln Asn Lys Lys
            580                 585                 590

Gln Ala Glu Lys Val Asn Pro Arg Lys Lys Glu Ala Tyr Ala Phe Glu
        595                 600                 605

Ala Val Arg Pro Met Thr Ala Ala Asp Ser Ile Ala Asp Tyr Met Ala
    610                 615                 620

Tyr Val Gln Ser Glu Leu Met Gln Glu Gln Asn Lys Lys Glu Glu Lys
625                 630                 635                 640

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

Phe Ile Lys Gly Phe Asp Ser Phe Leu Arg Ala Lys Glu Phe Asp Phe
            660                 665                 670
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Val Gln Met Pro Gln Pro Gln Leu Thr Ala Thr Ala Ser Asn Gln Gln
        675                 680                 685

Lys Ala Asp Lys Leu Asn Gln Leu Glu Ala Ser Ile Thr Ala Asp Cys
    690                 695                 700

Lys Leu Thr Pro Gln Tyr Ala Lys Ala Asp Asp Ala Thr His Ile Ala
705                 710                 715                 720

Phe Tyr Val Phe Cys Lys Leu Leu Asp Ala Ala His Leu Ser Asn Leu
                725                 730                 735

Arg Asn Glu Leu Ile Lys Phe Arg Glu Ser Val Asn Glu Phe Lys Phe
            740                 745                 750

His His Leu Leu Glu Ile Ile Glu Ile Cys Leu Leu Ser Ala Asp Val
        755                 760                 765

Val Pro Thr Asp Tyr Arg Asp Leu Tyr Ser Ser Glu Ala Asp Cys Leu
    770                 775                 780

Ala Arg Leu Arg Pro Phe Ile Glu Gln Gly Ala Asp Ile Thr Asn Trp
785                 790                 795                 800

Ser Asp Leu Phe Val Gln Ser Asp Lys His Ser Pro Val Ile His Ala
                805                 810                 815

Asn Ile Glu Leu Ser Val Lys Tyr Gly Thr Thr Lys Leu Leu Glu Gln
            820                 825                 830

Ile Ile Asn Lys Asp Thr Gln Phe Lys Thr Thr Glu Ala Asn Phe Thr
        835                 840                 845

Ala Trp Asn Thr Ala Gln Lys Ser Ile Glu Gln Leu Ile Lys Gln Arg
    850                 855                 860

Glu Asp His His Glu Gln Trp Val Lys Ala Lys Asn Ala Asp Asp Lys
865                 870                 875                 880

Glu Lys Gln Glu Arg Lys Arg Glu Lys Ser Asn Phe Ala Gln Lys Phe
                885                 890                 895

Ile Glu Lys His Gly Asp Asp Tyr Leu Asp Ile Cys Asp Tyr Ile Asn
```

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            900                 905                 910

Thr Tyr Asn Trp Leu Asp Asn Lys Met His Phe Val His Leu Asn Arg
        915                 920                 925

Leu His Gly Leu Thr Ile Glu Leu Leu Gly Arg Met Ala Gly Phe Val
    930                 935                 940

Ala Leu Phe Asp Arg Asp Phe Gln Phe Phe Asp Glu Gln Gln Ile Ala
945                 950                 955                 960

Asp Glu Phe Lys Leu His Gly Phe Val Asn Leu His Ser Ile Asp Lys
                965                 970                 975

Lys Leu Asn Glu Val Pro Thr Lys Lys Ile Lys Glu Ile Tyr Asp Ile
            980                 985                 990

Arg Asn Lys Ile Ile Gln Ile Asn  Gly Asn Lys Ile Asn  Glu Ser Val
        995                 1000                1005

Arg Ala  Asn Leu Ile Gln Phe  Ile Ser Ser Lys Arg  Asn Tyr Tyr
    1010                1015                1020

Asn Asn  Ala Phe Leu His Val  Ser Asn Asp Glu Ile  Lys Glu Lys
    1025                1030                1035

Gln Met  Tyr Asp Ile Arg Asn  His Ile Ala His Phe  Asn Tyr Leu
    1040                1045                1050

Thr Lys  Asp Ala Ala Asp Phe  Ser Leu Ile Asp Leu  Ile Asn Glu
    1055                1060                1065

Leu Arg  Glu Leu Leu His Tyr  Asp Arg Lys Leu Lys  Asn Ala Val
    1070                1075                1080

Ser Lys  Ala Phe Ile Asp Leu  Phe Asp Lys His Gly  Met Ile Leu
    1085                1090                1095

Lys Leu  Lys Leu Asn Ala Asp  His Lys Leu Lys Val  Glu Ser Leu
    1100                1105                1110

Glu Pro  Lys Lys Ile Tyr His  Leu Gly Ser Ser Ala  Lys Asp Lys
    1115                1120                1125
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Pro Glu Tyr Gln Tyr Cys Thr Asn Gln Val Met Met Ala Tyr Cys
    1130   1135   1140

Asn Met Cys Arg Ser Leu Leu Glu Met Lys Lys
    1145   1150

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<212> PRT
<213> Leptotrichia wadei

<400> 137
Met Tyr Met Lys Ile Thr Lys Ile Asp Gly Val Ser His Tyr Lys Lys
1   5   10   15

Gln Asp Lys Gly Ile Leu Lys Lys Lys Trp Lys Asp Leu Asp Glu Arg
            20   25   30

Lys Gln Arg Glu Lys Ile Glu Ala Arg Tyr Asn Lys Gln Ile Glu Ser
        35   40   45

Lys Ile Tyr Lys Glu Phe Phe Arg Leu Lys Asn Lys Lys Arg Ile Glu
    50   55   60

Lys Glu Glu Asp Gln Asn Ile Lys Ser Leu Tyr Phe Phe Ile Lys Glu
65   70   75   80

Leu Tyr Leu Asn Glu Lys Asn Glu Glu Trp Glu Leu Lys Asn Ile Asn
                85   90   95

Leu Glu Ile Leu Asp Asp Lys Glu Arg Val Ile Lys Gly Tyr Lys Phe
            100   105   110

Lys Glu Asp Val Tyr Phe Phe Lys Glu Gly Tyr Lys Glu Tyr Tyr Leu
        115   120   125

Arg Ile Leu Phe Asn Asn Leu Ile Glu Lys Val Gln Asn Glu Asn Arg
    130   135   140

Glu Lys Val Arg Lys Asn Lys Glu Phe Leu Asp Leu Lys Glu Ile Phe
145   150   155   160

Lys Lys Tyr Lys Asn Arg Lys Ile Asp Leu Leu Leu Lys Ser Ile Asn
                165   170   175

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Asn Asn Lys Ile Asn Leu Glu Tyr Lys Lys Glu Asn Val Asn Glu Glu
            180                 185                 190

Ile Tyr Gly Ile Asn Pro Thr Asn Asp Arg Glu Met Thr Phe Tyr Glu
        195                 200                 205

Leu Leu Lys Glu Ile Ile Glu Lys Lys Asp Glu Gln Lys Ser Ile Leu
    210                 215                 220

Glu Glu Lys Leu Asp Asn Phe Asp Ile Thr Asn Phe Leu Glu Asn Ile
225                 230                 235                 240

Glu Lys Ile Phe Asn Glu Glu Thr Glu Ile Asn Ile Ile Lys Gly Lys
                245                 250                 255

Val Leu Asn Glu Leu Arg Glu Tyr Ile Lys Glu Lys Glu Glu Asn Asn
            260                 265                 270

Ser Asp Asn Lys Leu Lys Gln Ile Tyr Asn Leu Glu Leu Lys Lys Tyr
        275                 280                 285

Ile Glu Asn Asn Phe Ser Tyr Lys Lys Gln Lys Ser Lys Ser Lys Asn
    290                 295                 300

Gly Lys Asn Asp Tyr Leu Tyr Leu Asn Phe Leu Lys Lys Ile Met Phe
305                 310                 315                 320

Ile Glu Glu Val Asp Glu Lys Lys Glu Ile Asn Lys Glu Lys Phe Lys
                325                 330                 335

Asn Lys Ile Asn Ser Asn Phe Lys Asn Leu Phe Val Gln His Ile Leu
            340                 345                 350

Asp Tyr Gly Lys Leu Leu Tyr Tyr Lys Glu Asn Asp Glu Tyr Ile Lys
        355                 360                 365

Asn Thr Gly Gln Leu Glu Thr Lys Asp Leu Glu Tyr Ile Lys Thr Lys
    370                 375                 380

Glu Thr Leu Ile Arg Lys Met Ala Val Leu Val Ser Phe Ala Ala Asn
385                 390                 395                 400

Ser Tyr Tyr Asn Leu Phe Gly Arg Val Ser Gly Asp Ile Leu Gly Thr
```

405 410 415

Glu Val Val Lys Ser Ser Lys Thr Asn Val Ile Lys Val Gly Ser His
420 425 430

Ile Phe Lys Glu Lys Met Leu Asn Tyr Phe Phe Asp Phe Glu Ile Phe
435 440 445

Asp Ala Asn Lys Ile Val Glu Ile Leu Glu Ser Ile Ser Tyr Ser Ile
450 455 460

Tyr Asn Val Arg Asn Gly Val Gly His Phe Asn Lys Leu Ile Leu Gly
465 470 475 480

Lys Tyr Lys Lys Lys Asp Ile Asn Thr Asn Lys Arg Ile Glu Glu Asp
485 490 495

Leu Asn Asn Asn Glu Glu Ile Lys Gly Tyr Phe Ile Lys Lys Arg Gly
500 505 510

Glu Ile Glu Arg Lys Val Lys Glu Lys Phe Leu Ser Asn Asn Leu Gln
515 520 525

Tyr Tyr Tyr Ser Lys Glu Lys Ile Glu Asn Tyr Phe Glu Val Tyr Glu
530 535 540

Phe Glu Ile Leu Lys Arg Lys Ile Pro Phe Ala Pro Asn Phe Lys Arg
545 550 555 560

Ile Ile Lys Lys Gly Glu Asp Leu Phe Asn Asn Lys Asn Asn Lys Lys
565 570 575

Tyr Glu Tyr Phe Lys Asn Phe Asp Lys Asn Ser Ala Glu Glu Lys Lys
580 585 590

Glu Phe Leu Lys Thr Arg Asn Phe Leu Leu Lys Glu Leu Tyr Tyr Asn
595 600 605

Asn Phe Tyr Lys Glu Phe Leu Ser Lys Lys Glu Glu Phe Glu Lys Ile
610 615 620

Val Leu Glu Val Lys Glu Glu Lys Lys Ser Arg Gly Asn Ile Asn Asn
625 630 635 640

```
Lys Lys Ser Gly Val Ser Phe Gln Ser Ile Asp Asp Tyr Asp Thr Lys
                645                 650                 655

Ile Asn Ile Ser Asp Tyr Ile Ala Ser Ile His Lys Lys Glu Met Glu
            660                 665                 670

Arg Val Glu Lys Tyr Asn Glu Glu Lys Gln Lys Asp Thr Ala Lys Tyr
        675                 680                 685

Ile Arg Asp Phe Val Glu Glu Ile Phe Leu Thr Gly Phe Ile Asn Tyr
    690                 695                 700

Leu Glu Lys Asp Lys Arg Leu His Phe Leu Lys Glu Glu Phe Ser Ile
705                 710                 715                 720

Leu Cys Asn Asn Asn Asn Asn Val Val Asp Phe Asn Ile Asn Ile Asn
                725                 730                 735

Glu Glu Lys Ile Lys Glu Phe Leu Lys Glu Asn Asp Ser Lys Thr Leu
            740                 745                 750

Asn Leu Tyr Leu Phe Phe Asn Met Ile Asp Ser Lys Arg Ile Ser Glu
        755                 760                 765

Phe Arg Asn Glu Leu Val Lys Tyr Lys Gln Phe Thr Lys Lys Arg Leu
    770                 775                 780

Asp Glu Glu Lys Glu Phe Leu Gly Ile Lys Ile Glu Leu Tyr Glu Thr
785                 790                 795                 800

Leu Ile Glu Phe Val Ile Leu Thr Arg Glu Lys Leu Asp Thr Lys Lys
                805                 810                 815

Ser Glu Glu Ile Asp Ala Trp Leu Val Asp Lys Leu Tyr Val Lys Asp
            820                 825                 830

Ser Asn Glu Tyr Lys Glu Tyr Glu Glu Ile Leu Lys Leu Phe Val Asp
        835                 840                 845

Glu Lys Ile Leu Ser Ser Lys Glu Ala Pro Tyr Tyr Ala Thr Asp Asn
    850                 855                 860

Lys Thr Pro Ile Leu Leu Ser Asn Phe Glu Lys Thr Arg Lys Tyr Gly
```

```
865                 870                 875                 880

Thr Gln Ser Phe Leu Ser Glu Ile Gln Ser Asn Tyr Lys Tyr Ser Lys
                885                 890                 895

Val Glu Lys Glu Asn Ile Glu Asp Tyr Asn Lys Lys Glu Glu Ile Glu
            900                 905                 910

Gln Lys Lys Lys Ser Asn Ile Glu Lys Leu Gln Asp Leu Lys Val Glu
        915                 920                 925

Leu His Lys Lys Trp Glu Gln Asn Lys Ile Thr Glu Lys Glu Ile Glu
    930                 935                 940

Lys Tyr Asn Asn Thr Thr Arg Lys Ile Asn Glu Tyr Asn Tyr Leu Lys
945                 950                 955                 960

Asn Lys Glu Glu Leu Gln Asn Val Tyr Leu Leu His Glu Met Leu Ser
                965                 970                 975

Asp Leu Leu Ala Arg Asn Val Ala Phe Phe Asn Lys Trp Glu Arg Asp
            980                 985                 990

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

Lys Glu  Lys Val Asn Glu Phe  Leu Asn Pro Pro Asp  Asn Ser Lys
    1010                1015                1020

Gly Lys  Lys Val Tyr Phe Ser  Val Ser Lys Tyr Lys  Asn Thr Val
    1025                1030                1035

Glu Asn  Ile Asp Gly Ile His  Lys Asn Phe Met Asn  Leu Ile Phe
    1040                1045                1050

Leu Asn  Asn Lys Phe Met Asn  Arg Lys Ile Asp Lys  Met Asn Cys
    1055                1060                1065

Ala Ile  Trp Val Tyr Phe Arg  Asn Tyr Ile Ala His  Phe Leu His
    1070                1075                1080

Leu His  Thr Lys Asn Glu Lys  Ile Ser Leu Ile Ser  Gln Met Asn
    1085                1090                1095
```

```
Leu Leu  Ile Lys Leu Phe Ser  Tyr Asp Lys Lys Val  Gln Asn His
    1100                1105                1110


Ile Leu  Lys Ser Thr Lys Thr  Leu Leu Glu Lys Tyr  Asn Ile Gln
    1115                1120                1125


Ile Asn  Phe Glu Ile Ser Asn  Asp Lys Asn Glu Val  Phe Lys Tyr
    1130                1135                1140


Lys Ile  Lys Asn Arg Leu Tyr  Ser Lys Lys Gly Lys  Met Leu Gly
    1145                1150                1155


Lys Asn  Asn Lys Phe Glu Ile  Leu Glu Asn Glu Phe  Leu Glu Asn
    1160                1165                1170


Val Lys  Ala Met Leu Glu Tyr  Ser Glu
    1175                1180
```

<210> 138
<211> 1224
<212> PRT
<213> Bergeyella zoohelcum

<400> 138

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Met Glu Asn Lys Thr Ser Leu Gly Asn Asn Ile Tyr Tyr Asn Pro Phe
1               5                  10                  15


Lys Pro Gln Asp Lys Ser Tyr Phe Ala Gly Tyr Phe Asn Ala Ala Met
            20                  25                  30


Glu Asn Thr Asp Ser Val Phe Arg Glu Leu Gly Lys Arg Leu Lys Gly
        35                  40                  45


Lys Glu Tyr Thr Ser Glu Asn Phe Phe Asp Ala Ile Phe Lys Glu Asn
    50                  55                  60


Ile Ser Leu Val Glu Tyr Glu Arg Tyr Val Lys Leu Leu Ser Asp Tyr
65                  70                  75                  80


Phe Pro Met Ala Arg Leu Leu Asp Lys Lys Glu Val Pro Ile Lys Glu
                85                  90                  95


Arg Lys Glu Asn Phe Lys Lys Asn Phe Lys Gly Ile Ile Lys Ala Val
            100                 105                 110
```

```
Arg Asp Leu Arg Asn Phe Tyr Thr His Lys Glu His Gly Glu Val Glu
        115                 120                 125

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

Val Leu Thr Val Lys Lys Lys Lys Val Lys Thr Asp Lys Thr Lys Glu
145                 150                 155                 160

Ile Leu Lys Lys Ser Ile Glu Lys Gln Leu Asp Ile Leu Cys Gln Lys
                165                 170                 175

Lys Leu Glu Tyr Leu Arg Asp Thr Ala Arg Lys Ile Glu Glu Lys Arg
            180                 185                 190

Arg Asn Gln Arg Glu Arg Gly Glu Lys Glu Leu Val Ala Pro Phe Lys
        195                 200                 205

Tyr Ser Asp Lys Arg Asp Asp Leu Ile Ala Ala Ile Tyr Asn Asp Ala
    210                 215                 220

Phe Asp Val Tyr Ile Asp Lys Lys Lys Asp Ser Leu Lys Glu Ser Ser
225                 230                 235                 240

Lys Ala Lys Tyr Asn Thr Lys Ser Asp Pro Gln Gln Glu Glu Gly Asp
                245                 250                 255

Leu Lys Ile Pro Ile Ser Lys Asn Gly Val Val Phe Leu Leu Ser Leu
            260                 265                 270

Phe Leu Thr Lys Gln Glu Ile His Ala Phe Lys Ser Lys Ile Ala Gly
        275                 280                 285

Phe Lys Ala Thr Val Ile Asp Glu Ala Thr Val Ser Glu Ala Thr Val
    290                 295                 300

Ser His Gly Lys Asn Ser Ile Cys Phe Met Ala Thr His Glu Ile Phe
305                 310                 315                 320

Ser His Leu Ala Tyr Lys Lys Leu Lys Arg Lys Val Arg Thr Ala Glu
                325                 330                 335

Ile Asn Tyr Gly Glu Ala Glu Asn Ala Glu Gln Leu Ser Val Tyr Ala
```

```
            340                 345                 350

Lys Glu Thr Leu Met Met Gln Met Leu Asp Glu Leu Ser Lys Val Pro
        355                 360                 365

Asp Val Val Tyr Gln Asn Leu Ser Glu Asp Val Gln Lys Thr Phe Ile
    370                 375                 380

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

Met Glu Glu Glu Gln Val Ile His Pro Val Ile Arg Lys Arg Tyr Glu
                405                 410                 415

Asp Lys Phe Asn Tyr Phe Ala Ile Arg Phe Leu Asp Glu Phe Ala Gln
            420                 425                 430

Phe Pro Thr Leu Arg Phe Gln Val His Leu Gly Asn Tyr Leu His Asp
        435                 440                 445

Ser Arg Pro Lys Glu Asn Leu Ile Ser Asp Arg Arg Ile Lys Glu Lys
    450                 455                 460

Ile Thr Val Phe Gly Arg Leu Ser Glu Leu Glu His Lys Lys Ala Leu
465                 470                 475                 480

Phe Ile Lys Asn Thr Glu Thr Asn Glu Asp Arg Glu His Tyr Trp Glu
                485                 490                 495

Ile Phe Pro Asn Pro Asn Tyr Asp Phe Pro Lys Glu Asn Ile Ser Val
            500                 505                 510

Asn Asp Lys Asp Phe Pro Ile Ala Gly Ser Ile Leu Asp Arg Glu Lys
        515                 520                 525

Gln Pro Val Ala Gly Lys Ile Gly Ile Lys Val Lys Leu Leu Asn Gln
    530                 535                 540

Gln Tyr Val Ser Glu Val Asp Lys Ala Val Lys Ala His Gln Leu Lys
545                 550                 555                 560

Gln Arg Lys Ala Ser Lys Pro Ser Ile Gln Asn Ile Ile Glu Glu Ile
                565                 570                 575
```

```
Val Pro Ile Asn Glu Ser Asn Pro Lys Glu Ala Ile Val Phe Gly Gly
            580                 585                 590

Gln Pro Thr Ala Tyr Leu Ser Met Asn Asp Ile His Ser Ile Leu Tyr
        595                 600                 605

Glu Phe Phe Asp Lys Trp Glu Lys Lys Lys Glu Lys Leu Glu Lys Lys
    610                 615                 620

Gly Glu Lys Glu Leu Arg Lys Glu Ile Gly Lys Glu Leu Glu Lys Lys
625                 630                 635                 640

Ile Val Gly Lys Ile Gln Ala Gln Ile Gln Gln Ile Ile Asp Lys Asp
                645                 650                 655

Thr Asn Ala Lys Ile Leu Lys Pro Tyr Gln Asp Gly Asn Ser Thr Ala
            660                 665                 670

Ile Asp Lys Glu Lys Leu Ile Lys Asp Leu Lys Gln Glu Gln Asn Ile
        675                 680                 685

Leu Gln Lys Leu Lys Asp Glu Gln Thr Val Arg Glu Lys Glu Tyr Asn
    690                 695                 700

Asp Phe Ile Ala Tyr Gln Asp Lys Asn Arg Glu Ile Asn Lys Val Arg
705                 710                 715                 720

Asp Arg Asn His Lys Gln Tyr Leu Lys Asp Asn Leu Lys Arg Lys Tyr
                725                 730                 735

Pro Glu Ala Pro Ala Arg Lys Glu Val Leu Tyr Tyr Arg Glu Lys Gly
            740                 745                 750

Lys Val Ala Val Trp Leu Ala Asn Asp Ile Lys Arg Phe Met Pro Thr
        755                 760                 765

Asp Phe Lys Asn Glu Trp Lys Gly Glu Gln His Ser Leu Leu Gln Lys
    770                 775                 780

Ser Leu Ala Tyr Tyr Glu Gln Cys Lys Glu Glu Leu Lys Asn Leu Leu
785                 790                 795                 800

Pro Glu Lys Val Phe Gln His Leu Pro Phe Lys Leu Gly Gly Tyr Phe
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                805                 810                 815

Gln Gln Lys Tyr Leu Tyr Gln Phe Tyr Thr Cys Tyr Leu Asp Lys Arg
            820                 825                 830

Leu Glu Tyr Ile Ser Gly Leu Val Gln Gln Ala Glu Asn Phe Lys Ser
        835                 840                 845

Glu Asn Lys Val Phe Lys Lys Val Glu Asn Glu Cys Phe Lys Phe Leu
    850                 855                 860

Lys Lys Gln Asn Tyr Thr His Lys Glu Leu Asp Ala Arg Val Gln Ser
865                 870                 875                 880

Ile Leu Gly Tyr Pro Ile Phe Leu Glu Arg Gly Phe Met Asp Glu Lys
                885                 890                 895

Pro Thr Ile Ile Lys Gly Lys Thr Phe Lys Gly Asn Glu Ala Leu Phe
            900                 905                 910

Ala Asp Trp Phe Arg Tyr Tyr Lys Glu Tyr Gln Asn Phe Gln Thr Phe
        915                 920                 925

Tyr Asp Thr Glu Asn Tyr Pro Leu Val Glu Leu Glu Lys Lys Gln Ala
    930                 935                 940

Asp Arg Lys Arg Lys Thr Lys Ile Tyr Gln Gln Lys Lys Asn Asp Val
945                 950                 955                 960

Phe Thr Leu Leu Met Ala Lys His Ile Phe Lys Ser Val Phe Lys Gln
                965                 970                 975

Asp Ser Ile Asp Gln Phe Ser Leu Glu Asp Leu Tyr Gln Ser Arg Glu
            980                 985                 990

Glu Arg Leu Gly Asn Gln Glu Arg  Ala Arg Gln Thr Gly  Glu Arg Asn
        995                 1000                1005

Thr Asn  Tyr Ile Trp Asn Lys  Thr Val Asp Leu Lys  Leu Cys Asp
    1010                1015                1020

Gly Lys  Ile Thr Val Glu Asn  Val Lys Leu Lys Asn  Val Gly Asp
    1025                1030                1035
```

Phe Ile Lys Tyr Glu Tyr Asp Gln Arg Val Gln Ala Phe Leu Lys
1040 1045 1050

Tyr Glu Glu Asn Ile Glu Trp Gln Ala Phe Leu Ile Lys Glu Ser
1055 1060 1065

Lys Glu Glu Glu Asn Tyr Pro Tyr Val Val Glu Arg Glu Ile Glu
1070 1075 1080

Gln Tyr Glu Lys Val Arg Arg Glu Glu Leu Leu Lys Glu Val His
1085 1090 1095

Leu Ile Glu Glu Tyr Ile Leu Glu Lys Val Lys Asp Lys Glu Ile
1100 1105 1110

Leu Lys Lys Gly Asp Asn Gln Asn Phe Lys Tyr Tyr Ile Leu Asn
1115 1120 1125

Gly Leu Leu Lys Gln Leu Lys Asn Glu Asp Val Glu Ser Tyr Lys
1130 1135 1140

Val Phe Asn Leu Asn Thr Glu Pro Glu Asp Val Asn Ile Asn Gln
1145 1150 1155

Leu Lys Gln Glu Ala Thr Asp Leu Glu Gln Lys Ala Phe Val Leu
1160 1165 1170

Thr Tyr Ile Arg Asn Lys Phe Ala His Asn Gln Leu Pro Lys Lys
1175 1180 1185

Glu Phe Trp Asp Tyr Cys Gln Glu Lys Tyr Gly Lys Ile Glu Lys
1190 1195 1200

Glu Lys Thr Tyr Ala Glu Tyr Phe Ala Glu Val Phe Lys Lys Glu
1205 1210 1215

Lys Glu Ala Leu Ile Lys
1220

<210> 139
<211> 1126
<212> PRT
<213> Prevotella intermedia

<400> 139
Met Glu Asp Asp Lys Lys Thr Thr Asp Ser Ile Arg Tyr Glu Leu Lys
1 5 10 15

Asp Lys His Phe Trp Ala Ala Phe Leu Asn Leu Ala Arg His Asn Val
20 25 30

Tyr Ile Thr Val Asn His Ile Asn Lys Ile Leu Glu Glu Gly Glu Ile
35 40 45

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

Lys Asp Ile Asn Lys Lys Asp Arg Leu Ser Lys Leu Ile Ile Lys His
65 70 75 80

Phe Pro Phe Leu Glu Ala Ala Thr Tyr Arg Leu Asn Pro Thr Asp Thr
85 90 95

Thr Lys Gln Lys Glu Glu Lys Gln Ala Glu Ala Gln Ser Leu Glu Ser
100 105 110

Leu Arg Lys Ser Phe Phe Val Phe Ile Tyr Lys Leu Arg Asp Leu Arg
115 120 125

Asn His Tyr Ser His Tyr Lys His Ser Lys Ser Leu Glu Arg Pro Lys
130 135 140

Phe Glu Glu Gly Leu Leu Glu Lys Met Tyr Asn Ile Phe Asn Ala Ser
145 150 155 160

Ile Arg Leu Val Lys Glu Asp Tyr Gln Tyr Asn Lys Asp Ile Asn Pro
165 170 175

Asp Glu Asp Phe Lys His Leu Asp Arg Thr Glu Glu Glu Phe Asn Tyr
180 185 190

Tyr Phe Thr Lys Asp Asn Glu Gly Asn Ile Thr Glu Ser Gly Leu Leu
195 200 205

Phe Phe Val Ser Leu Phe Leu Glu Lys Lys Asp Ala Ile Trp Met Gln
210 215 220

Gln Lys Leu Arg Gly Phe Lys Asp Asn Arg Glu Asn Lys Lys Lys Met

```
225                 230                 235                 240

Thr Asn Glu Val Phe Cys Arg Ser Arg Met Leu Leu Pro Lys Leu Arg
                245                 250                 255

Leu Gln Ser Thr Gln Thr Gln Asp Trp Ile Leu Leu Asp Met Leu Asn
            260                 265                 270

Glu Leu Ile Arg Cys Pro Lys Ser Leu Tyr Glu Arg Leu Arg Glu Glu
        275                 280                 285

Asp Arg Glu Lys Phe Arg Val Pro Ile Glu Ile Ala Asp Glu Asp Tyr
    290                 295                 300

Asp Ala Glu Gln Glu Pro Phe Lys Asn Thr Leu Val Arg His Gln Asp
305                 310                 315                 320

Arg Phe Pro Tyr Phe Ala Leu Arg Tyr Phe Asp Tyr Asn Glu Ile Phe
                325                 330                 335

Thr Asn Leu Arg Phe Gln Ile Asp Leu Gly Thr Tyr His Phe Ser Ile
            340                 345                 350

Tyr Lys Lys Gln Ile Gly Asp Tyr Lys Glu Ser His His Leu Thr His
        355                 360                 365

Lys Leu Tyr Gly Phe Glu Arg Ile Gln Glu Phe Thr Lys Gln Asn Arg
    370                 375                 380

Pro Asp Glu Trp Arg Lys Phe Val Lys Thr Phe Asn Ser Phe Glu Thr
385                 390                 395                 400

Ser Lys Glu Pro Tyr Ile Pro Glu Thr Thr Pro His Tyr His Leu Glu
                405                 410                 415

Asn Gln Lys Ile Gly Ile Arg Phe Arg Asn Asp Asn Asp Lys Ile Trp
            420                 425                 430

Pro Ser Leu Lys Thr Asn Ser Glu Lys Asn Glu Lys Ser Lys Tyr Lys
        435                 440                 445

Leu Asp Lys Ser Phe Gln Ala Glu Ala Phe Leu Ser Val His Glu Leu
    450                 455                 460
```

```
Leu Pro Met Met Phe Tyr Tyr Leu Leu Leu Lys Thr Glu Asn Thr Asp
465                 470                 475                 480

Asn Asp Asn Glu Ile Glu Thr Lys Lys Lys Glu Asn Lys Asn Asp Lys
                485                 490                 495

Gln Glu Lys His Lys Ile Glu Glu Ile Ile Glu Asn Lys Ile Thr Glu
            500                 505                 510

Ile Tyr Ala Leu Tyr Asp Thr Phe Ala Asn Gly Glu Ile Lys Ser Ile
        515                 520                 525

Asp Glu Leu Glu Glu Tyr Cys Lys Gly Lys Asp Ile Glu Ile Gly His
    530                 535                 540

Leu Pro Lys Gln Met Ile Ala Ile Leu Lys Asp Glu His Lys Val Met
545                 550                 555                 560

Ala Thr Glu Ala Glu Arg Lys Gln Glu Glu Met Leu Val Asp Val Gln
                565                 570                 575

Lys Ser Leu Glu Ser Leu Asp Asn Gln Ile Asn Glu Glu Ile Glu Asn
            580                 585                 590

Val Glu Arg Lys Asn Ser Ser Leu Lys Ser Gly Lys Ile Ala Ser Trp
        595                 600                 605

Leu Val Asn Asp Met Met Arg Phe Gln Pro Val Gln Lys Asp Asn Glu
    610                 615                 620

Gly Lys Pro Leu Asn Asn Ser Lys Ala Asn Ser Thr Glu Tyr Gln Leu
625                 630                 635                 640

Leu Gln Arg Thr Leu Ala Phe Phe Gly Ser Glu His Glu Arg Leu Ala
                645                 650                 655

Pro Tyr Phe Lys Gln Thr Lys Leu Ile Glu Ser Ser Asn Pro His Pro
            660                 665                 670

Phe Leu Lys Asp Thr Glu Trp Glu Lys Cys Asn Asn Ile Leu Ser Phe
        675                 680                 685

Tyr Arg Ser Tyr Leu Glu Ala Lys Lys Asn Phe Leu Glu Ser Leu Lys
```

```
    690                 695                 700

Pro Glu Asp Trp Glu Lys Asn Gln Tyr Phe Leu Lys Leu Lys Glu Pro
705                 710                 715                 720

Lys Thr Lys Pro Lys Thr Leu Val Gln Gly Trp Lys Asn Gly Phe Asn
                725                 730                 735

Leu Pro Arg Gly Ile Phe Thr Glu Pro Ile Arg Lys Trp Phe Met Lys
            740                 745                 750

His Arg Glu Asn Ile Thr Val Ala Glu Leu Lys Arg Val Gly Leu Val
        755                 760                 765

Ala Lys Val Ile Pro Leu Phe Phe Ser Glu Glu Tyr Lys Asp Ser Val
    770                 775                 780

Gln Pro Phe Tyr Asn Tyr His Phe Asn Val Gly Asn Ile Asn Lys Pro
785                 790                 795                 800

Asp Glu Lys Asn Phe Leu Asn Cys Glu Glu Arg Arg Glu Leu Leu Arg
                805                 810                 815

Lys Lys Lys Asp Glu Phe Lys Lys Met Thr Asp Lys Glu Lys Glu Glu
            820                 825                 830

Asn Pro Ser Tyr Leu Glu Phe Lys Ser Trp Asn Lys Phe Glu Arg Glu
        835                 840                 845

Leu Arg Leu Val Arg Asn Gln Asp Ile Val Thr Trp Leu Leu Cys Met
    850                 855                 860

Glu Leu Phe Asn Lys Lys Lys Ile Lys Glu Leu Asn Val Glu Lys Ile
865                 870                 875                 880

Tyr Leu Lys Asn Ile Asn Thr Asn Thr Thr Lys Lys Glu Lys Asn Thr
                885                 890                 895

Glu Glu Lys Asn Gly Glu Glu Lys Asn Ile Lys Glu Lys Asn Asn Ile
            900                 905                 910

Leu Asn Arg Ile Met Pro Met Arg Leu Pro Ile Lys Val Tyr Gly Arg
        915                 920                 925
```

```
Glu Asn Phe Ser Lys Asn Lys Lys Lys Lys Ile Arg Arg Asn Thr Phe
    930                 935                 940

Phe Thr Val Tyr Ile Glu Glu Lys Gly Thr Lys Leu Leu Lys Gln Gly
945                 950                 955                 960

Asn Phe Lys Ala Leu Glu Arg Asp Arg Arg Leu Gly Gly Leu Phe Ser
                965                 970                 975

Phe Val Lys Thr Pro Ser Lys Ala Glu Ser Lys Ser Asn Thr Ile Ser
            980                 985                 990

Lys Leu Arg Val Glu Tyr Glu Leu  Gly Glu Tyr Gln Lys  Ala Arg Ile
        995                 1000                1005

Glu Ile  Ile Lys Asp Met Leu  Ala Leu Glu Lys Thr  Leu Ile Asp
    1010                1015                1020

Lys Tyr  Asn Ser Leu Asp Thr  Asp Asn Phe Asn Lys  Met Leu Thr
    1025                1030                1035

Asp Trp  Leu Glu Leu Lys Gly  Glu Pro Asp Lys Ala  Ser Phe Gln
    1040                1045                1050

Asn Asp  Val Asp Leu Leu Ile  Ala Val Arg Asn Ala  Phe Ser His
    1055                1060                1065

Asn Gln  Tyr Pro Met Arg Asn  Arg Ile Ala Phe Ala  Asn Ile Asn
    1070                1075                1080

Pro Phe  Ser Leu Ser Ser Ala  Asn Thr Ser Glu Glu  Lys Gly Leu
    1085                1090                1095

Gly Ile  Ala Asn Gln Leu Lys  Asp Lys Thr His Lys  Thr Ile Glu
    1100                1105                1110

Lys Ile  Ile Glu Ile Glu Lys  Pro Ile Glu Thr Lys  Glu
    1115                1120                1125
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<210> 140
<211> 1127
<212> PRT
<213> Prevotella buccae

<400> 140
Met Gln Lys Gln Asp Lys Leu Phe Val Asp Arg Lys Lys Asn Ala Ile
1 5 10 15

Phe Ala Phe Pro Lys Tyr Ile Thr Ile Met Glu Asn Lys Glu Lys Pro
20 25 30

Glu Pro Ile Tyr Tyr Glu Leu Thr Asp Lys His Phe Trp Ala Ala Phe
35 40 45

Leu Asn Leu Ala Arg His Asn Val Tyr Thr Thr Ile Asn His Ile Asn
50 55 60

Arg Arg Leu Glu Ile Ala Glu Leu Lys Asp Asp Gly Tyr Met Met Gly
65 70 75 80

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

Arg Leu Arg Asp Leu Ile Met Lys His Phe Pro Phe Leu Glu Ala Ala
100 105 110

Ala Tyr Glu Met Thr Asn Ser Lys Ser Pro Asn Asn Lys Glu Gln Arg
115 120 125

Glu Lys Glu Gln Ser Glu Ala Leu Ser Leu Asn Asn Leu Lys Asn Val
130 135 140

Leu Phe Ile Phe Leu Glu Lys Leu Gln Val Leu Arg Asn Tyr Tyr Ser
145 150 155 160

His Tyr Lys Tyr Ser Glu Glu Ser Pro Lys Pro Ile Phe Glu Thr Ser
165 170 175

Leu Leu Lys Asn Met Tyr Lys Val Phe Asp Ala Asn Val Arg Leu Val
180 185 190

Lys Arg Asp Tyr Met His His Glu Asn Ile Asp Met Gln Arg Asp Phe
195 200 205

Thr His Leu Asn Arg Lys Lys Gln Val Gly Arg Thr Lys Asn Ile Ile
210 215 220

Asp Ser Pro Asn Phe His Tyr His Phe Ala Asp Lys Glu Gly Asn Met

225 230 235 240

Thr Ile Ala Gly Leu Leu Phe Phe Val Ser Leu Phe Leu Asp Lys Lys
245 250 255

Asp Ala Ile Trp Met Gln Lys Lys Leu Lys Gly Phe Lys Asp Gly Arg
260 265 270

Asn Leu Arg Glu Gln Met Thr Asn Glu Val Phe Cys Arg Ser Arg Ile
275 280 285

Ser Leu Pro Lys Leu Lys Leu Glu Asn Val Gln Thr Lys Asp Trp Met
290 295 300

Gln Leu Asp Met Leu Asn Glu Leu Val Arg Cys Pro Lys Ser Leu Tyr
305 310 315 320

Glu Arg Leu Arg Glu Lys Asp Arg Glu Ser Phe Lys Val Pro Phe Asp
325 330 335

Ile Phe Ser Asp Asp Tyr Asn Ala Glu Glu Glu Pro Phe Lys Asn Thr
340 345 350

Leu Val Arg His Gln Asp Arg Phe Pro Tyr Phe Val Leu Arg Tyr Phe
355 360 365

Asp Leu Asn Glu Ile Phe Glu Gln Leu Arg Phe Gln Ile Asp Leu Gly
370 375 380

Thr Tyr His Phe Ser Ile Tyr Asn Lys Arg Ile Gly Asp Glu Asp Glu
385 390 395 400

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

Phe Ala Pro Gln Asn Gln Pro Glu Glu Trp Arg Lys Leu Val Lys Asp
420 425 430

Leu Asp His Phe Glu Thr Ser Gln Glu Pro Tyr Ile Ser Lys Thr Ala
435 440 445

Pro His Tyr His Leu Glu Asn Glu Lys Ile Gly Ile Lys Phe Cys Ser
450 455 460

```
Ala His Asn Asn Leu Phe Pro Ser Leu Gln Thr Asp Lys Thr Cys Asn
465                 470                 475                 480

Gly Arg Ser Lys Phe Asn Leu Gly Thr Gln Phe Thr Ala Glu Ala Phe
                485                 490                 495

Leu Ser Val His Glu Leu Leu Pro Met Met Phe Tyr Tyr Leu Leu Leu
            500                 505                 510

Thr Lys Asp Tyr Ser Arg Lys Glu Ser Ala Asp Lys Val Glu Gly Ile
        515                 520                 525

Ile Arg Lys Glu Ile Ser Asn Ile Tyr Ala Ile Tyr Asp Ala Phe Ala
    530                 535                 540

Asn Asn Glu Ile Asn Ser Ile Ala Asp Leu Thr Arg Arg Leu Gln Asn
545                 550                 555                 560

Thr Asn Ile Leu Gln Gly His Leu Pro Lys Gln Met Ile Ser Ile Leu
                565                 570                 575

Lys Gly Arg Gln Lys Asp Met Gly Lys Glu Ala Glu Arg Lys Ile Gly
            580                 585                 590

Glu Met Ile Asp Asp Thr Gln Arg Arg Leu Asp Leu Leu Cys Lys Gln
        595                 600                 605

Thr Asn Gln Lys Ile Arg Ile Gly Lys Arg Asn Ala Gly Leu Leu Lys
    610                 615                 620

Ser Gly Lys Ile Ala Asp Trp Leu Val Asn Asp Met Met Arg Phe Gln
625                 630                 635                 640

Pro Val Gln Lys Asp Gln Asn Asn Ile Pro Ile Asn Asn Ser Lys Ala
                645                 650                 655

Asn Ser Thr Glu Tyr Arg Met Leu Gln Arg Ala Leu Ala Leu Phe Gly
            660                 665                 670

Ser Glu Asn Phe Arg Leu Lys Ala Tyr Phe Asn Gln Met Asn Leu Val
        675                 680                 685

Gly Asn Asp Asn Pro His Pro Phe Leu Ala Glu Thr Gln Trp Glu His
```

690 695 700

Gln Thr Asn Ile Leu Ser Phe Tyr Arg Asn Tyr Leu Glu Ala Arg Lys
705 710 715 720

Lys Tyr Leu Lys Gly Leu Lys Pro Gln Asn Trp Lys Gln Tyr Gln His
725 730 735

Phe Leu Ile Leu Lys Val Gln Lys Thr Asn Arg Asn Thr Leu Val Thr
740 745 750

Gly Trp Lys Asn Ser Phe Asn Leu Pro Arg Gly Ile Phe Thr Gln Pro
755 760 765

Ile Arg Glu Trp Phe Glu Lys His Asn Asn Ser Lys Arg Ile Tyr Asp
770 775 780

Gln Ile Leu Ser Phe Asp Arg Val Gly Phe Val Ala Lys Ala Ile Pro
785 790 795 800

Leu Tyr Phe Ala Glu Glu Tyr Lys Asp Asn Val Gln Pro Phe Tyr Asp
805 810 815

Tyr Pro Phe Asn Ile Gly Asn Arg Leu Lys Pro Lys Lys Arg Gln Phe
820 825 830

Leu Asp Lys Lys Glu Arg Val Glu Leu Trp Gln Lys Asn Lys Glu Leu
835 840 845

Phe Lys Asn Tyr Pro Ser Glu Lys Lys Lys Thr Asp Leu Ala Tyr Leu
850 855 860

Asp Phe Leu Ser Trp Lys Lys Phe Glu Arg Glu Leu Arg Leu Ile Lys
865 870 875 880

Asn Gln Asp Ile Val Thr Trp Leu Met Phe Lys Glu Leu Phe Asn Met
885 890 895

Ala Thr Val Glu Gly Leu Lys Ile Gly Glu Ile His Leu Arg Asp Ile
900 905 910

Asp Thr Asn Thr Ala Asn Glu Glu Ser Asn Asn Ile Leu Asn Arg Ile
915 920 925

```
Met Pro Met Lys Leu Pro Val Lys Thr Tyr Glu Thr Asp Asn Lys Gly
    930                 935                 940

Asn Ile Leu Lys Glu Arg Pro Leu Ala Thr Phe Tyr Ile Glu Glu Thr
945                 950                 955                 960

Glu Thr Lys Val Leu Lys Gln Gly Asn Phe Lys Ala Leu Val Lys Asp
                965                 970                 975

Arg Arg Leu Asn Gly Leu Phe Ser Phe Ala Glu Thr Thr Asp Leu Asn
            980                 985                 990

Leu Glu Glu His Pro Ile Ser Lys  Leu Ser Val Asp Leu  Glu Leu Ile
        995                 1000                1005

Lys Tyr  Gln Thr Thr Arg Ile  Ser Ile Phe Glu Met  Thr Leu Gly
    1010                1015                1020

Leu Glu  Lys Lys Leu Ile Asp  Lys Tyr Ser Thr Leu  Pro Thr Asp
    1025                1030                1035

Ser Phe  Arg Asn Met Leu Glu  Arg Trp Leu Gln Cys  Lys Ala Asn
    1040                1045                1050

Arg Pro  Glu Leu Lys Asn Tyr  Val Asn Ser Leu Ile  Ala Val Arg
    1055                1060                1065

Asn Ala  Phe Ser His Asn Gln  Tyr Pro Met Tyr Asp  Ala Thr Leu
    1070                1075                1080

Phe Ala  Glu Val Lys Lys Phe  Thr Leu Phe Pro Ser  Val Asp Thr
    1085                1090                1095

Lys Lys  Ile Glu Leu Asn Ile  Ala Pro Gln Leu Leu  Glu Ile Val
    1100                1105                1110

Gly Lys  Ala Ile Lys Glu Ile  Glu Lys Ser Glu Asn  Lys Asn
    1115                1120                1125
```

<210> 141
<211> 1135
<212> PRT
<213> Porphyromonas gingivalis

<400> 141
Met Asn Thr Val Pro Ala Ser Glu Asn Lys Gly Gln Ser Arg Thr Val
1 5 10 15

Glu Asp Asp Pro Gln Tyr Phe Gly Leu Tyr Leu Asn Leu Ala Arg Glu
20 25 30

Asn Leu Ile Glu Val Glu Ser His Val Arg Ile Lys Phe Gly Lys Lys
35 40 45

Lys Leu Asn Glu Glu Ser Leu Lys Gln Ser Leu Leu Cys Asp His Leu
50 55 60

Leu Ser Val Asp Arg Trp Thr Lys Val Tyr Gly His Ser Arg Arg Tyr
65 70 75 80

Leu Pro Phe Leu His Tyr Phe Asp Pro Asp Ser Gln Ile Glu Lys Asp
85 90 95

His Asp Ser Lys Thr Gly Val Asp Pro Asp Ser Ala Gln Arg Leu Ile
100 105 110

Arg Glu Leu Tyr Ser Leu Leu Asp Phe Leu Arg Asn Asp Phe Ser His
115 120 125

Asn Arg Leu Asp Gly Thr Thr Phe Glu His Leu Glu Val Ser Pro Asp
130 135 140

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

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

Lys Asn Arg Lys Glu Gln Leu Ile Ser Val Ala Asp Gly Lys Glu Cys
180 185 190

Leu Thr Val Ser Gly Phe Ala Phe Phe Ile Cys Leu Phe Leu Asp Arg
195 200 205

Glu Gln Ala Ser Gly Met Leu Ser Arg Ile Arg Gly Phe Lys Arg Thr
210 215 220

Asp Glu Asn Trp Ala Arg Ala Val His Glu Thr Phe Cys Asp Leu Cys

```
225                 230                 235                 240

Ile Arg His Pro His Asp Arg Leu Glu Ser Ser Asn Thr Lys Glu Ala
                245                 250                 255

Leu Leu Leu Asp Met Leu Asn Glu Leu Asn Arg Cys Pro Arg Ile Leu
            260                 265                 270

Tyr Asp Met Leu Pro Glu Glu Glu Arg Ala Gln Phe Leu Pro Ala Leu
        275                 280                 285

Asp Glu Asn Ser Met Asn Asn Leu Ser Glu Asn Ser Leu Asp Glu Glu
    290                 295                 300

Ser Arg Leu Leu Trp Asp Gly Ser Ser Asp Trp Ala Glu Ala Leu Thr
305                 310                 315                 320

Lys Arg Ile Arg His Gln Asp Arg Phe Pro Tyr Leu Met Leu Arg Phe
                325                 330                 335

Ile Glu Glu Met Asp Leu Leu Lys Gly Ile Arg Phe Arg Val Asp Leu
            340                 345                 350

Gly Glu Ile Glu Leu Asp Ser Tyr Ser Lys Lys Val Gly Arg Asn Gly
        355                 360                 365

Glu Tyr Asp Arg Thr Ile Thr Asp His Ala Leu Ala Phe Gly Lys Leu
    370                 375                 380

Ser Asp Phe Gln Asn Glu Glu Glu Val Ser Arg Met Ile Ser Gly Glu
385                 390                 395                 400

Ala Ser Tyr Pro Val Arg Phe Ser Leu Phe Ala Pro Arg Tyr Ala Ile
                405                 410                 415

Tyr Asp Asn Lys Ile Gly Tyr Cys His Thr Ser Asp Pro Val Tyr Pro
            420                 425                 430

Lys Ser Lys Thr Gly Glu Lys Arg Ala Leu Ser Asn Pro Gln Ser Met
        435                 440                 445

Gly Phe Ile Ser Val His Asp Leu Arg Lys Leu Leu Leu Met Glu Leu
    450                 455                 460
```

```
Leu Cys Glu Gly Ser Phe Ser Arg Met Gln Ser Asp Phe Leu Arg Lys
465                 470                 475                 480

Ala Asn Arg Ile Leu Asp Glu Thr Ala Glu Gly Lys Leu Gln Phe Ser
                485                 490                 495

Ala Leu Phe Pro Glu Met Arg His Arg Phe Ile Pro Pro Gln Asn Pro
            500                 505                 510

Lys Ser Lys Asp Arg Arg Glu Lys Ala Glu Thr Thr Leu Glu Lys Tyr
        515                 520                 525

Lys Gln Glu Ile Lys Gly Arg Lys Asp Lys Leu Asn Ser Gln Leu Leu
    530                 535                 540

Ser Ala Phe Asp Met Asp Gln Arg Gln Leu Pro Ser Arg Leu Leu Asp
545                 550                 555                 560

Glu Trp Met Asn Ile Arg Pro Ala Ser His Ser Val Lys Leu Arg Thr
                565                 570                 575

Tyr Val Lys Gln Leu Asn Glu Asp Cys Arg Leu Arg Leu Arg Lys Phe
            580                 585                 590

Arg Lys Asp Gly Asp Gly Lys Ala Arg Ala Ile Pro Leu Val Gly Glu
        595                 600                 605

Met Ala Thr Phe Leu Ser Gln Asp Ile Val Arg Met Ile Ile Ser Glu
    610                 615                 620

Glu Thr Lys Lys Leu Ile Thr Ser Ala Tyr Tyr Asn Glu Met Gln Arg
625                 630                 635                 640

Ser Leu Ala Gln Tyr Ala Gly Glu Glu Asn Arg Arg Gln Phe Arg Ala
                645                 650                 655

Ile Val Ala Glu Leu Arg Leu Leu Asp Pro Ser Ser Gly His Pro Phe
            660                 665                 670

Leu Ser Ala Thr Met Glu Thr Ala His Arg Tyr Thr Glu Gly Phe Tyr
        675                 680                 685

Lys Cys Tyr Leu Glu Lys Lys Arg Glu Trp Leu Ala Lys Ile Phe Tyr
```

```
    690                 695                 700

Arg Pro Glu Gln Asp Glu Asn Thr Lys Arg Arg Ile Ser Val Phe Phe
705                 710                 715                 720

Val Pro Asp Gly Glu Ala Arg Lys Leu Leu Pro Leu Leu Ile Arg Arg
                725                 730                 735

Arg Met Lys Glu Gln Asn Asp Leu Gln Asp Trp Ile Arg Asn Lys Gln
            740                 745                 750

Ala His Pro Ile Asp Leu Pro Ser His Leu Phe Asp Ser Lys Val Met
        755                 760                 765

Glu Leu Leu Lys Val Lys Asp Gly Lys Lys Lys Trp Asn Glu Ala Phe
    770                 775                 780

Lys Asp Trp Trp Ser Thr Lys Tyr Pro Asp Gly Met Gln Pro Phe Tyr
785                 790                 795                 800

Gly Leu Arg Arg Glu Leu Asn Ile His Gly Lys Ser Val Ser Tyr Ile
                805                 810                 815

Pro Ser Asp Gly Lys Lys Phe Ala Asp Cys Tyr Thr His Leu Met Glu
            820                 825                 830

Lys Thr Val Arg Asp Lys Lys Arg Glu Leu Arg Thr Ala Gly Lys Pro
        835                 840                 845

Val Pro Pro Asp Leu Ala Ala Asp Ile Lys Arg Ser Phe His Arg Ala
    850                 855                 860

Val Asn Glu Arg Glu Phe Met Leu Arg Leu Val Gln Glu Asp Asp Arg
865                 870                 875                 880

Leu Met Leu Met Ala Ile Asn Lys Met Met Thr Asp Arg Glu Glu Asp
                885                 890                 895

Ile Leu Pro Gly Leu Lys Asn Ile Asp Ser Ile Leu Asp Glu Glu Asn
            900                 905                 910

Gln Phe Ser Leu Ala Val His Ala Lys Val Leu Glu Lys Glu Gly Glu
        915                 920                 925
```

```
Gly Gly Asp Asn Ser Leu Ser Leu Val Pro Ala Thr Ile Glu Ile Lys
    930                 935                 940

Ser Lys Arg Lys Asp Trp Ser Lys Tyr Ile Arg Tyr Arg Tyr Asp Arg
945                 950                 955                 960

Arg Val Pro Gly Leu Met Ser His Phe Pro Glu His Lys Ala Thr Leu
                965                 970                 975

Asp Glu Val Lys Thr Leu Leu Gly Glu Tyr Asp Arg Cys Arg Ile Lys
            980                 985                 990

Ile Phe Asp Trp Ala Phe Ala Leu  Glu Gly Ala Ile Met  Ser Asp Arg
        995                 1000                1005

Asp Leu  Lys Pro Tyr Leu His  Glu Ser Ser Ser Arg  Glu Gly Lys
    1010                1015                1020

Ser Gly  Glu His Ser Thr Leu  Val Lys Met Leu Val  Glu Lys Lys
    1025                1030                1035

Gly Cys  Leu Thr Pro Asp Glu  Ser Gln Tyr Leu Ile  Leu Ile Arg
    1040                1045                1050

Asn Lys  Ala Ala His Asn Gln  Phe Pro Cys Ala Ala  Glu Met Pro
    1055                1060                1065

Leu Ile  Tyr Arg Asp Val Ser  Ala Lys Val Gly Ser  Ile Glu Gly
    1070                1075                1080

Ser Ser  Ala Lys Asp Leu Pro  Glu Gly Ser Ser Leu  Val Asp Ser
    1085                1090                1095

Leu Trp  Lys Lys Tyr Glu Met  Ile Ile Arg Lys Ile  Leu Pro Ile
    1100                1105                1110

Leu Asp  Pro Glu Asn Arg Phe  Phe Gly Lys Leu Leu  Asn Asn Met
    1115                1120                1125

Ser Gln  Pro Ile Asn Asp Leu
    1130                1135
```

<210> 142

<211> 1115
<212> PRT
<213> Bacteroides pyogenes

<400> 142
Met Glu Ser Ile Lys Asn Ser Gln Lys Ser Thr Gly Lys Thr Leu Gln
1 5 10 15

Lys Asp Pro Pro Tyr Phe Gly Leu Tyr Leu Asn Met Ala Leu Leu Asn
20 25 30

Val Arg Lys Val Glu Asn His Ile Arg Lys Trp Leu Gly Asp Val Ala
35 40 45

Leu Leu Pro Glu Lys Ser Gly Phe His Ser Leu Leu Thr Thr Asp Asn
50 55 60

Leu Ser Ser Ala Lys Trp Thr Arg Phe Tyr Tyr Lys Ser Arg Lys Phe
65 70 75 80

Leu Pro Phe Leu Glu Met Phe Asp Ser Asp Lys Lys Ser Tyr Glu Asn
85 90 95

Arg Arg Glu Thr Ala Glu Cys Leu Asp Thr Ile Asp Arg Gln Lys Ile
100 105 110

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

Ala Phe Ser His Tyr His Ile Asp Asp Gln Ser Val Lys His Thr Ala
130 135 140

Leu Ile Ile Ser Ser Glu Met His Arg Phe Ile Glu Asn Ala Tyr Ser
145 150 155 160

Phe Ala Leu Gln Lys Thr Arg Ala Arg Phe Thr Gly Val Phe Val Glu
165 170 175

Thr Asp Phe Leu Gln Ala Glu Glu Lys Gly Asp Asn Lys Lys Phe Phe
180 185 190

Ala Ile Gly Gly Asn Glu Gly Ile Lys Leu Lys Asp Asn Ala Leu Ile
195 200 205

Phe Leu Ile Cys Leu Phe Leu Asp Arg Glu Glu Ala Phe Lys Phe Leu

```
    210                 215                 220

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

Val Arg Glu Thr Phe Cys Ala Leu Cys Cys Arg Gln Pro His Glu Arg
                245                 250                 255

Leu Leu Ser Val Asn Pro Arg Glu Ala Leu Leu Met Asp Met Leu Asn
            260                 265                 270

Glu Leu Asn Arg Cys Pro Asp Ile Leu Phe Glu Met Leu Asp Glu Lys
        275                 280                 285

Asp Gln Lys Ser Phe Leu Pro Leu Leu Gly Glu Glu Glu Gln Ala His
    290                 295                 300

Ile Leu Glu Asn Ser Leu Asn Asp Glu Leu Cys Glu Ala Ile Asp Asp
305                 310                 315                 320

Pro Phe Glu Met Ile Ala Ser Leu Ser Lys Arg Val Arg Tyr Lys Asn
                325                 330                 335

Arg Phe Pro Tyr Leu Met Leu Arg Tyr Ile Glu Glu Lys Asn Leu Leu
            340                 345                 350

Pro Phe Ile Arg Phe Arg Ile Asp Leu Gly Cys Leu Glu Leu Ala Ser
        355                 360                 365

Tyr Pro Lys Lys Met Gly Glu Glu Asn Asn Tyr Glu Arg Ser Val Thr
    370                 375                 380

Asp His Ala Met Ala Phe Gly Arg Leu Thr Asp Phe His Asn Glu Asp
385                 390                 395                 400

Ala Val Leu Gln Gln Ile Thr Lys Gly Ile Thr Asp Glu Val Arg Phe
                405                 410                 415

Ser Leu Tyr Ala Pro Arg Tyr Ala Ile Tyr Asn Asn Lys Ile Gly Phe
            420                 425                 430

Val Arg Thr Ser Gly Ser Asp Lys Ile Ser Phe Pro Thr Leu Lys Lys
        435                 440                 445
```

```
Lys Gly Gly Glu Gly His Cys Val Ala Tyr Thr Leu Gln Asn Thr Lys
    450                 455                 460

Ser Phe Gly Phe Ile Ser Ile Tyr Asp Leu Arg Lys Ile Leu Leu Leu
465                 470                 475                 480

Ser Phe Leu Asp Lys Asp Lys Ala Lys Asn Ile Val Ser Gly Leu Leu
                485                 490                 495

Glu Gln Cys Glu Lys His Trp Lys Asp Leu Ser Glu Asn Leu Phe Asp
            500                 505                 510

Ala Ile Arg Thr Glu Leu Gln Lys Glu Phe Pro Val Pro Leu Ile Arg
        515                 520                 525

Tyr Thr Leu Pro Arg Ser Lys Gly Gly Lys Leu Val Ser Ser Lys Leu
    530                 535                 540

Ala Asp Lys Gln Glu Lys Tyr Glu Ser Glu Phe Glu Arg Arg Lys Glu
545                 550                 555                 560

Lys Leu Thr Glu Ile Leu Ser Glu Lys Asp Phe Asp Leu Ser Gln Ile
                565                 570                 575

Pro Arg Arg Met Ile Asp Glu Trp Leu Asn Val Leu Pro Thr Ser Arg
            580                 585                 590

Glu Lys Lys Leu Lys Gly Tyr Val Glu Thr Leu Lys Leu Asp Cys Arg
        595                 600                 605

Glu Arg Leu Arg Val Phe Glu Lys Arg Glu Lys Gly Glu His Pro Leu
    610                 615                 620

Pro Pro Arg Ile Gly Glu Met Ala Thr Asp Leu Ala Lys Asp Ile Ile
625                 630                 635                 640

Arg Met Val Ile Asp Gln Gly Val Lys Gln Arg Ile Thr Ser Ala Tyr
                645                 650                 655

Tyr Ser Glu Ile Gln Arg Cys Leu Ala Gln Tyr Ala Gly Asp Asp Asn
            660                 665                 670

Arg Arg His Leu Asp Ser Ile Ile Arg Glu Leu Arg Leu Lys Asp Thr
```

```
        675                 680                 685

Lys Asn Gly His Pro Phe Leu Gly Lys Val Leu Arg Pro Gly Leu Gly
    690                 695                 700

His Thr Glu Lys Leu Tyr Gln Arg Tyr Phe Glu Glu Lys Lys Glu Trp
705                 710                 715                 720

Leu Glu Ala Thr Phe Tyr Pro Ala Ala Ser Pro Lys Arg Val Pro Arg
                725                 730                 735

Phe Val Asn Pro Pro Thr Gly Lys Gln Lys Glu Leu Pro Leu Ile Ile
            740                 745                 750

Arg Asn Leu Met Lys Glu Arg Pro Glu Trp Arg Asp Trp Lys Gln Arg
        755                 760                 765

Lys Asn Ser His Pro Ile Asp Leu Pro Ser Gln Leu Phe Glu Asn Glu
    770                 775                 780

Ile Cys Arg Leu Leu Lys Asp Lys Ile Gly Lys Glu Pro Ser Gly Lys
785                 790                 795                 800

Leu Lys Trp Asn Glu Met Phe Lys Leu Tyr Trp Asp Lys Glu Phe Pro
                805                 810                 815

Asn Gly Met Gln Arg Phe Tyr Arg Cys Lys Arg Arg Val Glu Val Phe
            820                 825                 830

Asp Lys Val Val Glu Tyr Glu Tyr Ser Glu Glu Gly Gly Asn Tyr Lys
        835                 840                 845

Lys Tyr Tyr Glu Ala Leu Ile Asp Glu Val Val Arg Gln Lys Ile Ser
    850                 855                 860

Ser Ser Lys Glu Lys Ser Lys Leu Gln Val Glu Asp Leu Thr Leu Ser
865                 870                 875                 880

Val Arg Arg Val Phe Lys Arg Ala Ile Asn Glu Lys Glu Tyr Gln Leu
                885                 890                 895

Arg Leu Leu Cys Glu Asp Asp Arg Leu Leu Phe Met Ala Val Arg Asp
            900                 905                 910
```

```
Leu Tyr Asp Trp Lys Glu Ala Gln Leu Asp Leu Asp Lys Ile Asp Asn
        915                 920                 925

Met Leu Gly Glu Pro Val Ser Val Ser Gln Val Ile Gln Leu Glu Gly
    930                 935                 940

Gly Gln Pro Asp Ala Val Ile Lys Ala Glu Cys Lys Leu Lys Asp Val
945                 950                 955                 960

Ser Lys Leu Met Arg Tyr Cys Tyr Asp Gly Arg Val Lys Gly Leu Met
                965                 970                 975

Pro Tyr Phe Ala Asn His Glu Ala Thr Gln Glu Gln Val Glu Met Glu
            980                 985                 990

Leu Arg His Tyr Glu Asp His Arg  Arg Arg Val Phe Asn  Trp Val Phe
        995                 1000                1005

Ala Leu  Glu Lys Ser Val Leu  Lys Asn Glu Lys Leu  Arg Arg Phe
    1010                1015                1020

Tyr Glu  Glu Ser Gln Gly Gly  Cys Glu His Arg Arg  Cys Ile Asp
    1025                1030                1035

Ala Leu  Arg Lys Ala Ser Leu  Val Ser Glu Glu Glu  Tyr Glu Phe
    1040                1045                1050

Leu Val  His Ile Arg Asn Lys  Ser Ala His Asn Gln  Phe Pro Asp
    1055                1060                1065

Leu Glu  Ile Gly Lys Leu Pro  Pro Asn Val Thr Ser  Gly Phe Cys
    1070                1075                1080

Glu Cys  Ile Trp Ser Lys Tyr  Lys Ala Ile Ile Cys  Arg Ile Ile
    1085                1090                1095

Pro Phe  Ile Asp Pro Glu Arg  Arg Phe Phe Gly Lys  Leu Leu Glu
    1100                1105                1110

Gln Lys
    1115
```

<210> 143

<211> 668
<212> PRT
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
Cas13c sequence"

<400> 143

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

Ile Val Lys Lys Asp Ile Phe Ser Gln Thr Pro Asp Asn Met Ile Arg
            20                  25                  30

Asn Tyr Lys Ile Thr Leu Lys Ile Ser Glu Lys Asn Pro Arg Val Val
        35                  40                  45

Glu Ala Glu Ile Glu Asp Leu Met Asn Ser Thr Ile Leu Lys Asp Gly
    50                  55                  60

Arg Arg Ser Ala Arg Arg Glu Lys Ser Met Thr Glu Arg Lys Leu Ile
65                  70                  75                  80

Glu Glu Lys Val Ala Glu Asn Tyr Ser Leu Leu Ala Asn Cys Pro Met
                85                  90                  95

Glu Glu Val Asp Ser Ile Lys Ile Tyr Lys Ile Lys Arg Phe Leu Thr
            100                 105                 110

Tyr Arg Ser Asn Met Leu Leu Tyr Phe Ala Ser Ile Asn Ser Phe Leu
        115                 120                 125

Cys Glu Gly Ile Lys Gly Lys Asp Asn Glu Thr Glu Glu Ile Trp His
    130                 135                 140

Leu Lys Asp Asn Asp Val Arg Lys Glu Lys Val Lys Glu Asn Phe Lys
145                 150                 155                 160

Asn Lys Leu Ile Gln Ser Thr Glu Asn Tyr Asn Ser Ser Leu Lys Asn
                165                 170                 175

Gln Ile Glu Glu Lys Glu Lys Leu Leu Arg Lys Glu Ser Lys Lys Gly
            180                 185                 190
```

```
Ala Phe Tyr Arg Thr Ile Ile Lys Lys Leu Gln Gln Glu Arg Ile Lys
        195                 200                 205

Glu Leu Ser Glu Lys Ser Leu Thr Glu Asp Cys Glu Lys Ile Ile Lys
    210                 215                 220

Leu Tyr Ser Glu Leu Arg His Pro Leu Met His Tyr Asp Tyr Gln Tyr
225                 230                 235                 240

Phe Glu Asn Leu Phe Glu Asn Lys Glu Asn Ser Glu Leu Thr Lys Asn
                245                 250                 255

Leu Asn Leu Asp Ile Phe Lys Ser Leu Pro Leu Val Arg Lys Met Lys
            260                 265                 270

Leu Asn Asn Lys Val Asn Tyr Leu Glu Asp Asn Asp Thr Leu Phe Val
        275                 280                 285

Leu Gln Lys Thr Lys Lys Ala Lys Thr Leu Tyr Gln Ile Tyr Asp Ala
    290                 295                 300

Leu Cys Glu Gln Lys Asn Gly Phe Asn Lys Phe Ile Asn Asp Phe Phe
305                 310                 315                 320

Val Ser Asp Gly Glu Glu Asn Thr Val Phe Lys Gln Ile Ile Asn Glu
                325                 330                 335

Lys Phe Gln Ser Glu Met Glu Phe Leu Glu Lys Arg Ile Ser Glu Ser
            340                 345                 350

Glu Lys Lys Asn Glu Lys Leu Lys Lys Lys Phe Asp Ser Met Lys Ala
        355                 360                 365

His Phe His Asn Ile Asn Ser Glu Asp Thr Lys Glu Ala Tyr Phe Trp
    370                 375                 380

Asp Ile His Ser Ser Ser Asn Tyr Lys Thr Lys Tyr Asn Glu Arg Lys
385                 390                 395                 400

Asn Leu Val Asn Glu Tyr Thr Glu Leu Leu Gly Ser Ser Lys Glu Lys
                405                 410                 415

Lys Leu Leu Arg Glu Glu Ile Thr Gln Ile Asn Arg Lys Leu Leu Lys
            420                 425                 430
```

```
Leu Lys Gln Glu Met Glu Glu Ile Thr Lys Lys Asn Ser Leu Phe Arg
        435                 440                 445

Leu Glu Tyr Lys Met Lys Ile Ala Phe Gly Phe Leu Phe Cys Glu Phe
    450                 455                 460

Asp Gly Asn Ile Ser Lys Phe Lys Asp Glu Phe Asp Ala Ser Asn Gln
465                 470                 475                 480

Glu Lys Ile Ile Gln Tyr His Lys Asn Gly Glu Lys Tyr Leu Thr Tyr
                485                 490                 495

Phe Leu Lys Glu Glu Glu Lys Glu Lys Phe Asn Leu Glu Lys Met Gln
            500                 505                 510

Lys Ile Ile Gln Lys Thr Glu Glu Glu Asp Trp Leu Leu Pro Glu Thr
        515                 520                 525

Lys Asn Asn Leu Phe Lys Phe Tyr Leu Leu Thr Tyr Leu Leu Leu Pro
    530                 535                 540

Tyr Glu Leu Lys Gly Asp Phe Leu Gly Phe Val Lys Lys His Tyr Tyr
545                 550                 555                 560

Asp Ile Lys Asn Val Asp Phe Met Asp Glu Asn Gln Asn Asn Ile Gln
                565                 570                 575

Val Ser Gln Thr Val Glu Lys Gln Glu Asp Tyr Phe Tyr His Lys Ile
            580                 585                 590

Arg Leu Phe Glu Lys Asn Thr Lys Lys Tyr Glu Ile Val Lys Tyr Ser
        595                 600                 605

Ile Val Pro Asn Glu Lys Leu Lys Gln Tyr Phe Glu Asp Leu Gly Ile
    610                 615                 620

Asp Ile Lys Tyr Leu Thr Gly Ser Val Glu Ser Gly Glu Lys Trp Leu
625                 630                 635                 640

Gly Glu Asn Leu Gly Ile Asp Ile Lys Tyr Leu Thr Val Glu Gln Lys
                645                 650                 655
```

Ser Glu Val Ser Glu Glu Lys Ile Lys Lys Phe Leu
660 665

<210> 144
<211> 796
<212> PRT
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
Cas13c sequence"

<400> 144
Met Glu Lys Asp Lys Lys Gly Glu Lys Ile Asp Ile Ser Gln Glu Met
1 5 10 15

Ile Glu Glu Asp Leu Arg Lys Ile Leu Ile Leu Phe Ser Arg Leu Arg
20 25 30

His Ser Met Val His Tyr Asp Tyr Glu Phe Tyr Gln Ala Leu Tyr Ser
35 40 45

Gly Lys Asp Phe Val Ile Ser Asp Lys Asn Asn Leu Glu Asn Arg Met
50 55 60

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

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

Thr Ile His Val Leu Gly Gln Asp Ile Lys Ala Ile Arg Leu Leu Asp
100 105 110

Ile Tyr Arg Asp Ile Cys Gly Ser Lys Asn Gly Phe Asn Lys Phe Ile
115 120 125

Asn Thr Met Ile Thr Ile Ser Gly Glu Glu Asp Arg Glu Tyr Lys Glu
130 135 140

Lys Val Ile Glu His Phe Asn Lys Lys Met Glu Asn Leu Ser Thr Tyr
145 150 155 160

Leu Glu Lys Leu Glu Lys Gln Asp Asn Ala Lys Arg Asn Asn Lys Arg
165 170 175

```
Val Tyr Asn Leu Leu Lys Gln Lys Leu Ile Glu Gln Gln Lys Leu Lys
            180                 185                 190

Glu Trp Phe Gly Gly Pro Tyr Val Tyr Asp Ile His Ser Ser Lys Arg
        195                 200                 205

Tyr Lys Glu Leu Tyr Ile Glu Arg Lys Lys Leu Val Asp Arg His Ser
    210                 215                 220

Lys Leu Phe Glu Glu Gly Leu Asp Glu Lys Asn Lys Lys Glu Leu Thr
225                 230                 235                 240

Lys Ile Asn Asp Glu Leu Ser Lys Leu Asn Ser Glu Met Lys Glu Met
                245                 250                 255

Thr Lys Leu Asn Ser Lys Tyr Arg Leu Gln Tyr Lys Leu Gln Leu Ala
            260                 265                 270

Phe Gly Phe Ile Leu Glu Glu Phe Asp Leu Asn Ile Asp Thr Phe Ile
        275                 280                 285

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

Lys Arg Asp Ile Tyr Leu Asn Arg Val Leu Asp Arg Gly Asp Asn Arg
305                 310                 315                 320

Leu Lys Asn Ile Ile Lys Glu Tyr Lys Phe Arg Asp Thr Glu Asp Ile
                325                 330                 335

Phe Cys Asn Asp Arg Asp Asn Asn Leu Val Lys Leu Tyr Ile Leu Met
            340                 345                 350

Tyr Ile Leu Leu Pro Val Glu Ile Arg Gly Asp Phe Leu Gly Phe Val
        355                 360                 365

Lys Lys Asn Tyr Tyr Asp Met Lys His Val Asp Phe Ile Asp Lys Lys
    370                 375                 380

Asp Lys Glu Asp Lys Asp Thr Phe Phe His Asp Leu Arg Leu Phe Glu
385                 390                 395                 400

Lys Asn Ile Arg Lys Leu Glu Ile Thr Asp Tyr Ser Leu Ser Ser Gly
```

```
                405                 410                 415

Phe Leu Ser Lys Glu His Lys Val Asp Ile Glu Lys Lys Ile Asn Asp
            420                 425                 430

Phe Ile Asn Arg Asn Gly Ala Met Lys Leu Pro Glu Asp Ile Thr Ile
        435                 440                 445

Glu Glu Phe Asn Lys Ser Leu Ile Leu Pro Ile Met Lys Asn Tyr Gln
    450                 455                 460

Ile Asn Phe Lys Leu Leu Asn Asp Ile Glu Ile Ser Ala Leu Phe Lys
465                 470                 475                 480

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

Lys Asn Glu Asp Ile Lys Lys Asn Ser Lys Lys Asn Asp Lys Asn Asn
            500                 505                 510

His Lys Asp Lys Asn Ile Asn Phe Thr Gln Leu Met Lys Arg Ala Leu
        515                 520                 525

His Glu Lys Ile Pro Tyr Lys Ala Gly Met Tyr Gln Ile Arg Asn Asn
    530                 535                 540

Ile Ser His Ile Asp Met Glu Gln Leu Tyr Ile Asp Pro Leu Asn Ser
545                 550                 555                 560

Tyr Met Asn Ser Asn Lys Asn Asn Ile Thr Ile Ser Glu Gln Ile Glu
                565                 570                 575

Lys Ile Ile Asp Val Cys Val Thr Gly Gly Val Thr Gly Lys Glu Leu
            580                 585                 590

Asn Asn Asn Ile Ile Asn Asp Tyr Tyr Met Lys Lys Glu Lys Leu Val
        595                 600                 605

Phe Asn Leu Lys Leu Arg Lys Gln Asn Asp Ile Val Ser Ile Glu Ser
    610                 615                 620

Gln Glu Lys Asn Lys Arg Glu Glu Phe Val Phe Lys Lys Tyr Gly Leu
625                 630                 635                 640
```

```
Asp Tyr Lys Asp Gly Glu Ile Asn Ile Ile Glu Val Ile Gln Lys Val
                645                 650                 655

Asn Ser Leu Gln Glu Glu Leu Arg Asn Ile Lys Glu Thr Ser Lys Glu
            660                 665                 670

Lys Leu Lys Asn Lys Glu Thr Leu Phe Arg Asp Ile Ser Leu Ile Asn
        675                 680                 685

Gly Thr Ile Arg Lys Asn Ile Asn Phe Lys Ile Lys Glu Met Val Leu
    690                 695                 700

Asp Ile Val Arg Met Asp Glu Ile Arg His Ile Asn Ile His Ile Tyr
705                 710                 715                 720

Tyr Lys Gly Glu Asn Tyr Thr Arg Ser Asn Ile Ile Lys Phe Lys Tyr
                725                 730                 735

Ala Ile Asp Gly Glu Asn Lys Lys Tyr Tyr Leu Lys Gln His Glu Ile
            740                 745                 750

Asn Asp Ile Asn Leu Glu Leu Lys Asp Lys Phe Val Thr Leu Ile Cys
        755                 760                 765

Asn Met Asp Lys His Pro Asn Lys Asn Lys Gln Thr Ile Asn Leu Glu
    770                 775                 780

Ser Asn Tyr Ile Gln Asn Val Lys Phe Ile Ile Pro
785                 790                 795


<210> 145
<211> 897
<212> PRT
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
      Cas13c sequence"

<400> 145
Met Glu Asn Lys Gly Asn Asn Lys Lys Ile Asp Phe Asp Glu Asn Tyr
1               5                   10                  15

Asn Ile Leu Val Ala Gln Ile Lys Glu Tyr Phe Thr Lys Glu Ile Glu
            20                  25                  30
```

```
Asn Tyr Asn Asn Arg Ile Asp Asn Ile Ile Asp Lys Lys Glu Leu Leu
        35                  40                  45

Lys Tyr Ser Glu Lys Lys Glu Glu Ser Glu Lys Asn Lys Lys Leu Glu
    50                  55                  60

Glu Leu Asn Lys Leu Lys Ser Gln Lys Leu Lys Ile Leu Thr Asp Glu
65                  70                  75                  80

Glu Ile Lys Ala Asp Val Ile Lys Ile Ile Lys Ile Phe Ser Asp Leu
                85                  90                  95

Arg His Ser Leu Met His Tyr Glu Tyr Lys Tyr Phe Glu Asn Leu Phe
            100                 105                 110

Glu Asn Lys Lys Asn Glu Glu Leu Ala Glu Leu Leu Asn Leu Asn Leu
        115                 120                 125

Phe Lys Asn Leu Thr Leu Leu Arg Gln Met Lys Ile Glu Asn Lys Thr
    130                 135                 140

Asn Tyr Leu Glu Gly Arg Glu Glu Phe Asn Ile Ile Gly Lys Asn Ile
145                 150                 155                 160

Lys Ala Lys Glu Val Leu Gly His Tyr Asn Leu Leu Ala Glu Gln Lys
                165                 170                 175

Asn Gly Phe Asn Asn Phe Ile Asn Ser Phe Phe Val Gln Asp Gly Thr
            180                 185                 190

Glu Asn Leu Glu Phe Lys Lys Leu Ile Asp Glu His Phe Val Asn Ala
        195                 200                 205

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

Glu Leu Glu Lys Met Glu Gln His Tyr Gln Arg Leu Asn Cys Ala Tyr
225                 230                 235                 240

Val Trp Asp Ile His Thr Ser Thr Thr Tyr Lys Lys Leu Tyr Asn Lys
                245                 250                 255
```

```
Arg Lys Ser Leu Ile Glu Glu Tyr Asn Lys Gln Ile Asn Glu Ile Lys
            260                 265                 270

Asp Lys Glu Val Ile Thr Ala Ile Asn Val Glu Leu Leu Arg Ile Lys
        275                 280                 285

Lys Glu Met Glu Glu Ile Thr Lys Ser Asn Ser Leu Phe Arg Leu Lys
    290                 295                 300

Tyr Lys Met Gln Ile Ala Tyr Ala Phe Leu Glu Ile Glu Phe Gly Gly
305                 310                 315                 320

Asn Ile Ala Lys Phe Lys Asp Glu Phe Asp Cys Ser Lys Met Glu Glu
                325                 330                 335

Val Gln Lys Tyr Leu Lys Lys Gly Val Lys Tyr Leu Lys Tyr Tyr Lys
            340                 345                 350

Asp Lys Glu Ala Gln Lys Asn Tyr Glu Phe Pro Phe Glu Glu Ile Phe
        355                 360                 365

Glu Asn Lys Asp Thr His Asn Glu Glu Trp Leu Glu Asn Thr Ser Glu
    370                 375                 380

Asn Asn Leu Phe Lys Phe Tyr Ile Leu Thr Tyr Leu Leu Leu Pro Met
385                 390                 395                 400

Glu Phe Lys Gly Asp Phe Leu Gly Val Val Lys Lys His Tyr Tyr Asp
                405                 410                 415

Ile Lys Asn Val Asp Phe Thr Asp Glu Ser Glu Lys Glu Leu Ser Gln
            420                 425                 430

Val Gln Leu Asp Lys Met Ile Gly Asp Ser Phe Phe His Lys Ile Arg
        435                 440                 445

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

Leu Thr Ser Asp Glu Ile Lys Arg Tyr Phe Arg Leu Leu Glu Leu Asp
465                 470                 475                 480

Val Pro Tyr Phe Glu Tyr Glu Lys Gly Thr Asp Glu Ile Gly Ile Phe
                485                 490                 495
```

```
Asn Lys Asn Ile Ile Leu Thr Ile Phe Lys Tyr Tyr Gln Ile Ile Phe
            500                 505                 510

Arg Leu Tyr Asn Asp Leu Glu Ile His Gly Leu Phe Asn Ile Ser Ser
        515                 520                 525

Asp Leu Asp Lys Ile Leu Arg Asp Leu Lys Ser Tyr Gly Asn Lys Asn
    530                 535                 540

Ile Asn Phe Arg Glu Phe Leu Tyr Val Ile Lys Gln Asn Asn Asn Ser
545                 550                 555                 560

Ser Thr Glu Glu Glu Tyr Arg Lys Ile Trp Glu Asn Leu Glu Ala Lys
                565                 570                 575

Tyr Leu Arg Leu His Leu Leu Thr Pro Glu Lys Glu Glu Ile Lys Thr
            580                 585                 590

Lys Thr Lys Glu Glu Leu Glu Lys Leu Asn Glu Ile Ser Asn Leu Arg
        595                 600                 605

Asn Gly Ile Cys His Leu Asn Tyr Lys Glu Ile Ile Glu Glu Ile Leu
    610                 615                 620

Lys Thr Glu Ile Ser Glu Lys Asn Lys Glu Ala Thr Leu Asn Glu Lys
625                 630                 635                 640

Ile Arg Lys Val Ile Asn Phe Ile Lys Glu Asn Glu Leu Asp Lys Val
                645                 650                 655

Glu Leu Gly Phe Asn Phe Ile Asn Asp Phe Phe Met Lys Lys Glu Gln
            660                 665                 670

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

Ile Thr Thr Glu Arg Glu Arg Lys Glu Lys Asn Asn Lys Lys Leu Lys
    690                 695                 700

Glu Thr Tyr Glu Leu Asn Cys Asp Asn Leu Ser Glu Phe Tyr Glu Thr
705                 710                 715                 720
```

```
Ser Asn Asn Leu Arg Glu Arg Ala Asn Ser Ser Ser Leu Leu Glu Asp
                725                 730                 735

Ser Ala Phe Leu Lys Lys Ile Gly Leu Tyr Lys Val Lys Asn Asn Lys
            740                 745                 750

Val Asn Ser Lys Val Lys Asp Glu Glu Lys Arg Ile Glu Asn Ile Lys
        755                 760                 765

Arg Lys Leu Leu Lys Asp Ser Ser Asp Ile Met Gly Met Tyr Lys Ala
    770                 775                 780

Glu Val Val Lys Lys Leu Lys Glu Lys Leu Ile Leu Ile Phe Lys His
785                 790                 795                 800

Asp Glu Glu Lys Arg Ile Tyr Val Thr Val Tyr Asp Thr Ser Lys Ala
                805                 810                 815

Val Pro Glu Asn Ile Ser Lys Glu Ile Leu Val Lys Arg Asn Asn Ser
            820                 825                 830

Lys Glu Glu Tyr Phe Phe Glu Asp Asn Asn Lys Lys Tyr Val Thr Glu
        835                 840                 845

Tyr Tyr Thr Leu Glu Ile Thr Glu Thr Asn Glu Leu Lys Val Ile Pro
    850                 855                 860

Ala Lys Lys Leu Glu Gly Lys Glu Phe Lys Thr Glu Lys Asn Lys Glu
865                 870                 875                 880

Asn Lys Leu Met Leu Asn Asn His Tyr Cys Phe Asn Val Lys Ile Ile
                885                 890                 895

Tyr
```

<210> 146
<211> 919
<212> PRT
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
Cas13c sequence"

<400> 146

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Met Glu Glu Ile Lys His Lys Lys Asn Lys Ser Ser Ile Ile Arg Val
1               5                  10                  15

Ile Val Ser Asn Tyr Asp Met Thr Gly Ile Lys Glu Ile Lys Val Leu
            20                  25                  30

Tyr Gln Lys Gln Gly Gly Val Asp Thr Phe Asn Leu Lys Thr Ile Ile
        35                  40                  45

Asn Leu Glu Ser Gly Asn Leu Glu Ile Ile Ser Cys Lys Pro Lys Glu
    50                  55                  60

Arg Glu Lys Tyr Arg Tyr Glu Phe Asn Cys Lys Thr Glu Ile Asn Thr
65                  70                  75                  80

Ile Ser Ile Thr Lys Lys Asp Lys Val Leu Lys Lys Glu Ile Arg Lys
                85                  90                  95

Tyr Ser Leu Glu Leu Tyr Phe Lys Asn Glu Lys Lys Asp Thr Val Val
            100                 105                 110

Ala Lys Val Thr Asp Leu Leu Lys Ala Pro Asp Lys Ile Glu Gly Glu
        115                 120                 125

Arg Asn His Leu Arg Lys Leu Ser Ser Ser Thr Glu Arg Lys Leu Leu
    130                 135                 140

Ser Lys Thr Leu Cys Lys Asn Tyr Ser Glu Ile Ser Lys Thr Pro Ile
145                 150                 155                 160

Glu Glu Ile Asp Ser Ile Lys Ile Tyr Lys Ile Lys Arg Phe Leu Asn
                165                 170                 175

Tyr Arg Ser Asn Phe Leu Ile Tyr Phe Ala Leu Ile Asn Asp Phe Leu
            180                 185                 190

Cys Ala Gly Val Lys Glu Asp Asp Ile Asn Glu Val Trp Leu Ile Gln
        195                 200                 205

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

Asp Tyr Ile Phe Asp Lys Leu Ser Lys Asp Ile Glu Asn Lys Lys Asn
```

225 230 235 240

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

Lys Thr Glu Thr Leu Glu Lys Asn Lys Thr Phe Tyr Ile Asp Ser Ile
260 265 270

Lys Thr Lys Ile Thr Asn Leu Glu Asn Lys Ile Thr Glu Leu Ser Leu
275 280 285

Tyr Asn Ser Lys Glu Ser Leu Lys Glu Asp Leu Ile Lys Ile Ile Ser
290 295 300

Ile Phe Thr Asn Leu Arg His Ser Leu Met His Tyr Asp Tyr Lys Ser
305 310 315 320

Phe Glu Asn Leu Phe Glu Asn Ile Glu Asn Glu Glu Leu Lys Asn Leu
325 330 335

Leu Asp Leu Asn Leu Phe Lys Ser Ile Arg Met Ser Asp Glu Phe Lys
340 345 350

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

Val Lys Lys His Gln Asn Leu Lys Lys Leu Tyr Thr Tyr Tyr Asn Asn
370 375 380

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

Val Thr Asp Gly Ile Glu Asn Thr Asp Phe Lys Asn Leu Ile Ile Leu
405 410 415

His Phe Glu Lys Glu Met Glu Glu Tyr Lys Lys Ser Ile Glu Tyr Tyr
420 425 430

Lys Ile Lys Ile Ser Asn Glu Lys Asn Lys Ser Lys Lys Glu Lys Leu
435 440 445

Lys Glu Lys Ile Asp Leu Leu Gln Ser Glu Leu Ile Asn Met Arg Glu
450 455 460

```
His Lys Asn Leu Leu Lys Gln Ile Tyr Phe Phe Asp Ile His Asn Ser
465                 470                 475                 480

Ile Lys Tyr Lys Glu Leu Tyr Ser Glu Arg Lys Asn Leu Ile Glu Gln
                485                 490                 495

Tyr Asn Leu Gln Ile Asn Gly Val Lys Asp Val Thr Ala Ile Asn His
            500                 505                 510

Ile Asn Thr Lys Leu Leu Ser Leu Lys Asn Lys Met Asp Lys Ile Thr
        515                 520                 525

Lys Gln Asn Ser Leu Tyr Arg Leu Lys Tyr Lys Leu Lys Ile Ala Tyr
    530                 535                 540

Ser Phe Leu Met Ile Glu Phe Asp Gly Asp Val Ser Lys Phe Lys Asn
545                 550                 555                 560

Asn Phe Asp Pro Thr Asn Leu Glu Lys Arg Val Glu Tyr Leu Asp Lys
                565                 570                 575

Lys Glu Glu Tyr Leu Asn Tyr Thr Ala Pro Lys Asn Lys Phe Asn Phe
            580                 585                 590

Ala Lys Leu Glu Glu Glu Leu Gln Lys Ile Gln Ser Thr Ser Glu Met
        595                 600                 605

Gly Ala Asp Tyr Leu Asn Val Ser Pro Glu Asn Asn Leu Phe Lys Phe
    610                 615                 620

Tyr Ile Leu Thr Tyr Ile Met Leu Pro Val Glu Phe Lys Gly Asp Phe
625                 630                 635                 640

Leu Gly Phe Val Lys Asn His Tyr Tyr Asn Ile Lys Asn Val Asp Phe
                645                 650                 655

Met Asp Glu Ser Leu Leu Asp Glu Asn Glu Val Asp Ser Asn Lys Leu
            660                 665                 670

Asn Glu Lys Ile Glu Asn Leu Lys Asp Ser Ser Phe Phe Asn Lys Ile
        675                 680                 685

Arg Leu Phe Glu Lys Asn Ile Lys Lys Tyr Glu Ile Val Lys Tyr Ser
```

```
    690                 695                 700

Val Ser Thr Gln Glu Asn Met Lys Glu Tyr Phe Lys Gln Leu Asn Leu
705                 710                 715                 720

Asp Ile Pro Tyr Leu Asp Tyr Lys Ser Thr Asp Glu Ile Gly Ile Phe
                725                 730                 735

Asn Lys Asn Met Ile Leu Pro Ile Phe Lys Tyr Tyr Gln Asn Val Phe
            740                 745                 750

Lys Leu Cys Asn Asp Ile Glu Ile His Ala Leu Leu Ala Leu Ala Asn
        755                 760                 765

Lys Lys Gln Gln Asn Leu Glu Tyr Ala Ile Tyr Cys Cys Ser Lys Lys
    770                 775                 780

Asn Ser Leu Asn Tyr Asn Glu Leu Leu Lys Thr Phe Asn Arg Lys Thr
785                 790                 795                 800

Tyr Gln Asn Leu Ser Phe Ile Arg Asn Lys Ile Ala His Leu Asn Tyr
                805                 810                 815

Lys Glu Leu Phe Ser Asp Leu Phe Asn Asn Glu Leu Asp Leu Asn Thr
            820                 825                 830

Lys Val Arg Cys Leu Ile Glu Phe Ser Gln Asn Asn Lys Phe Asp Gln
        835                 840                 845

Ile Asp Leu Gly Met Asn Phe Ile Asn Asp Tyr Tyr Met Lys Lys Thr
    850                 855                 860

Arg Phe Ile Phe Asn Gln Arg Arg Leu Arg Asp Leu Asn Val Pro Ser
865                 870                 875                 880

Lys Glu Lys Ile Ile Asp Gly Lys Arg Lys Gln Gln Asn Asp Ser Asn
                885                 890                 895

Asn Glu Leu Leu Lys Lys Tyr Gly Leu Ser Arg Thr Asn Ile Lys Asp
            900                 905                 910

Ile Phe Asn Lys Ala Trp Tyr
        915
```

<210> 147
<211> 1110
<212> PRT
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
Cas13c sequence"

<400> 147
Met Lys Val Arg Tyr Arg Lys Gln Ala Gln Leu Asp Thr Phe Ile Ile
1 5 10 15

Lys Thr Glu Ile Val Asn Asn Asp Ile Phe Ile Lys Ser Ile Ile Glu
20 25 30

Lys Ala Arg Glu Lys Tyr Arg Tyr Ser Phe Leu Phe Asp Gly Glu Glu
35 40 45

Lys Tyr His Phe Lys Asn Lys Ser Ser Val Glu Ile Val Lys Asn Asp
50 55 60

Ile Phe Ser Gln Thr Pro Asp Asn Met Ile Arg Asn Tyr Lys Ile Thr
65 70 75 80

Leu Lys Ile Ser Glu Lys Asn Pro Arg Val Val Glu Ala Glu Ile Glu
85 90 95

Asp Leu Met Asn Ser Thr Ile Leu Lys Asp Gly Arg Arg Ser Ala Arg
100 105 110

Arg Glu Lys Ser Met Thr Glu Arg Lys Leu Ile Glu Glu Lys Val Ala
115 120 125

Glu Asn Tyr Ser Leu Leu Ala Asn Cys Pro Ile Glu Glu Val Asp Ser
130 135 140

Ile Lys Ile Tyr Lys Ile Lys Arg Phe Leu Thr Tyr Arg Ser Asn Met
145 150 155 160

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

Gly Lys Asp Asn Glu Thr Glu Glu Ile Trp His Leu Lys Asp Asn Asp
180 185 190

```
Val Arg Lys Glu Lys Val Lys Glu Asn Phe Lys Asn Lys Leu Ile Gln
        195                 200                 205

Ser Thr Glu Asn Tyr Asn Ser Ser Leu Lys Asn Gln Ile Glu Glu Lys
    210                 215                 220

Glu Lys Leu Ser Ser Lys Glu Phe Lys Lys Gly Ala Phe Tyr Arg Thr
225                 230                 235                 240

Ile Ile Lys Lys Leu Gln Gln Glu Arg Ile Lys Glu Leu Ser Glu Lys
                245                 250                 255

Ser Leu Thr Glu Asp Cys Glu Lys Ile Ile Lys Leu Tyr Ser Glu Leu
            260                 265                 270

Arg His Pro Leu Met His Tyr Asp Tyr Gln Tyr Phe Glu Asn Leu Phe
        275                 280                 285

Glu Asn Lys Glu Asn Ser Glu Leu Thr Lys Asn Leu Asn Leu Asp Ile
    290                 295                 300

Phe Lys Ser Leu Pro Leu Val Arg Lys Met Lys Leu Asn Asn Lys Val
305                 310                 315                 320

Asn Tyr Leu Glu Asp Asn Asp Thr Leu Phe Val Leu Gln Lys Thr Lys
                325                 330                 335

Lys Ala Lys Thr Leu Tyr Gln Ile Tyr Asp Ala Leu Cys Glu Gln Lys
            340                 345                 350

Asn Gly Phe Asn Lys Phe Ile Asn Asp Phe Phe Val Ser Asp Gly Glu
        355                 360                 365

Glu Asn Thr Val Phe Lys Gln Ile Ile Asn Glu Lys Phe Gln Ser Glu
    370                 375                 380

Met Glu Phe Leu Glu Lys Arg Ile Ser Glu Ser Glu Lys Lys Asn Glu
385                 390                 395                 400

Lys Leu Lys Lys Lys Leu Asp Ser Met Lys Ala His Phe Arg Asn Ile
                405                 410                 415
```

```
Asn Ser Glu Asp Thr Lys Glu Ala Tyr Phe Trp Asp Ile His Ser Ser
            420                 425                 430

Arg Asn Tyr Lys Thr Lys Tyr Asn Glu Arg Lys Asn Leu Val Asn Glu
        435                 440                 445

Tyr Thr Lys Leu Leu Gly Ser Ser Lys Glu Lys Lys Leu Leu Arg Glu
    450                 455                 460

Glu Ile Thr Lys Ile Asn Arg Gln Leu Leu Lys Leu Lys Gln Glu Met
465                 470                 475                 480

Glu Glu Ile Thr Lys Lys Asn Ser Leu Phe Arg Leu Glu Tyr Lys Met
                485                 490                 495

Lys Ile Ala Phe Gly Phe Leu Phe Cys Glu Phe Asp Gly Asn Ile Ser
            500                 505                 510

Lys Phe Lys Asp Glu Phe Asp Ala Ser Asn Gln Glu Lys Ile Ile Gln
        515                 520                 525

Tyr His Lys Asn Gly Glu Lys Tyr Leu Thr Ser Phe Leu Lys Glu Glu
    530                 535                 540

Glu Lys Glu Lys Phe Asn Leu Glu Lys Met Gln Lys Ile Ile Gln Lys
545                 550                 555                 560

Thr Glu Glu Glu Asp Trp Leu Leu Pro Glu Thr Lys Asn Asn Leu Phe
                565                 570                 575

Lys Phe Tyr Leu Leu Thr Tyr Leu Leu Leu Pro Tyr Glu Leu Lys Gly
            580                 585                 590

Asp Phe Leu Gly Phe Val Lys Lys His Tyr Tyr Asp Ile Lys Asn Val
        595                 600                 605

Asp Phe Met Asp Glu Asn Gln Asn Asn Ile Gln Val Ser Gln Thr Val
    610                 615                 620

Glu Lys Gln Glu Asp Tyr Phe Tyr His Lys Ile Arg Leu Phe Glu Lys
625                 630                 635                 640

Asn Thr Lys Lys Tyr Glu Ile Val Lys Tyr Ser Ile Val Pro Asn Glu
                645                 650                 655
```

```
Lys Leu Lys Gln Tyr Phe Glu Asp Leu Gly Ile Asp Ile Lys Tyr Leu
            660                 665                 670

Thr Gly Ser Val Glu Ser Gly Glu Lys Trp Leu Gly Glu Asn Leu Gly
        675                 680                 685

Ile Asp Ile Lys Tyr Leu Thr Val Glu Gln Lys Ser Glu Val Ser Glu
    690                 695                 700

Glu Lys Asn Lys Lys Val Ser Leu Lys Asn Asn Gly Met Phe Asn Lys
705                 710                 715                 720

Thr Ile Leu Leu Phe Val Phe Lys Tyr Tyr Gln Ile Ala Phe Lys Leu
                725                 730                 735

Phe Asn Asp Ile Glu Leu Tyr Ser Leu Phe Phe Leu Arg Glu Lys Ser
            740                 745                 750

Glu Lys Pro Phe Glu Val Phe Leu Glu Glu Leu Lys Asp Lys Met Ile
        755                 760                 765

Gly Lys Gln Leu Asn Phe Gly Gln Leu Leu Tyr Val Val Tyr Glu Val
    770                 775                 780

Leu Val Lys Asn Lys Asp Leu Asp Lys Ile Leu Ser Lys Lys Ile Asp
785                 790                 795                 800

Tyr Arg Lys Asp Lys Ser Phe Ser Pro Glu Ile Ala Tyr Leu Arg Asn
                805                 810                 815

Phe Leu Ser His Leu Asn Tyr Ser Lys Phe Leu Asp Asn Phe Met Lys
            820                 825                 830

Ile Asn Thr Asn Lys Ser Asp Glu Asn Lys Glu Val Leu Ile Pro Ser
        835                 840                 845

Ile Lys Ile Gln Lys Met Ile Gln Phe Ile Glu Lys Cys Asn Leu Gln
    850                 855                 860

Asn Gln Ile Asp Phe Asp Phe Asn Phe Val Asn Asp Phe Tyr Met Arg
865                 870                 875                 880
```

```
Lys Glu Lys Met Phe Phe Ile Gln Leu Lys Gln Ile Phe Pro Asp Ile
                885                 890                 895

Asn Ser Thr Glu Lys Gln Lys Lys Ser Glu Lys Glu Glu Ile Leu Arg
            900                 905                 910

Lys Arg Tyr His Leu Ile Asn Lys Lys Asn Glu Gln Ile Lys Asp Glu
        915                 920                 925

His Glu Ala Gln Ser Gln Leu Tyr Glu Lys Ile Leu Ser Leu Gln Lys
    930                 935                 940

Ile Phe Ser Cys Asp Lys Asn Asn Phe Tyr Arg Arg Leu Lys Glu Glu
945                 950                 955                 960

Lys Leu Leu Phe Leu Glu Lys Gln Gly Lys Lys Lys Ile Ser Met Lys
                965                 970                 975

Glu Ile Lys Asp Lys Ile Ala Ser Asp Ile Ser Asp Leu Leu Gly Ile
            980                 985                 990

Leu Lys Lys Glu Ile Thr Arg Asp  Ile Lys Asp Lys Leu  Thr Glu Lys
        995                 1000                1005

Phe Arg  Tyr Cys Glu Glu Lys  Leu Leu Asn Ile Ser  Phe Tyr Asn
    1010                1015                1020

His Gln  Asp Lys Lys Lys Glu  Glu Gly Ile Arg Val  Phe Leu Ile
    1025                1030                1035

Arg Asp  Lys Asn Ser Asp Asn  Phe Lys Phe Glu Ser  Ile Leu Asp
    1040                1045                1050

Asp Gly  Ser Asn Lys Ile Phe  Ile Ser Lys Asn Gly  Lys Glu Ile
    1055                1060                1065

Thr Ile  Gln Cys Cys Asp Lys  Val Leu Glu Thr Leu  Met Ile Glu
    1070                1075                1080

Lys Asn  Thr Leu Lys Ile Ser  Ser Asn Gly Lys Ile  Ile Ser Leu
    1085                1090                1095

Ile Pro  His Tyr Ser Tyr Ser  Ile Asp Val Lys Tyr
    1100                1105                1110
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<210> 148
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 148
tggaacaagt tgtggagg
18

<210> 149
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 149
tgcagcatca tatagatctt ga
22

<210> 150
<211> 49
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 150
tagtgatgct tttgggttgt tcaattgtat gagtatgctc aaaaattgg
49

<210> 151
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 151

gtgtagtatt gggcaatgct gctccttggt gtacctctgt
40

<210> 152
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 152
tatggtagaa tcctgcttct cc
22

<210> 153
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 153
tggcctaggc ataatgggag a
21

<210> 154
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 154
aacaagttgt ggaggtgta
19

<210> 155
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 155
ccattttctt tgagttgttc ag
22

<210> 156
<211> 46
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 156
tagtgatgct tttgggttgt tcaagagtat gctcaaaaat tgggtg
46

<210> 157
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 157
gtattgggca atgctgctgg catatagatc ttgattcctt ggtg
44

<210> 158
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 158
atatggtaga atcctgcttc tc
22

<210> 159
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<221> source

<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 159
cctaggcata atgggagaat ac
22

<210> 160
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 160
atagtgatgc ttttgggttg ttcaagtatg ctcaaaaatt gggtg
45

<210> 161
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 161
gctgctggcc taggcataat gcatcatata gatcttgatt cctt
44

<210> 162
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 162
gggagaatac agaggtacac
20

<210> 163
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 163
gggtcttagc aaaatcagtt
20

<210> 164
<211> 42
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 164
gaatcctgct tctccaccca attgacacgc tagtgtacaa gc
42

<210> 165
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 165
cctccacaac ttgttccatt tct
23

<210> 166
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 166
tggcctaggc ataatgggag
20

<210> 167
<211> 20
<212> DNA

<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 167
aagcagaaat ggaacaagtt
20

<210> 168
<211> 43
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 168
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43

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22

<210> 171

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<400> 171
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<400> 172
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39

<210> 173
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<400> 173
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19

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42

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44

<210> 177
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<400> 177
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<400> 178

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23

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<400> 179
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42

<210> 181
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<400> 181
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24

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<400> 183
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<400> 185
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43

<210> 190
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primer"

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<210> 191
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<400> 191
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<400> 192
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<400> 193
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<400> 194
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<210> 198

<211> 16
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<400> 198
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primer"

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primer"

<400> 205

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<220>
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<400> 206
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<210> 207
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<220>
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44

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<400> 209
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<223> /note="Description of Artificial Sequence: Synthetic primer"

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41

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43

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<400> 247
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23

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<210> 249
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41

<210> 251
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41

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41

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41

<210> 256
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41

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oligonucleotide"

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21

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21

<210> 262
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20

<210> 263
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<210> 265
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primer"

<400> 265
ttgtgttcac gctcaccgtg
20

<210> 266
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 266
gacttgaaga tgtctttgca
20

<210> 267
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<221> source

<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 267
cagatcttga ggctctc
17

<210> 268
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 268
gtcttgtctt gtctttagcc a
21

<210> 269
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 269
ttagtcagag gtgacaggat tg
22

<210> 270
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 270
tttggacaaa gcgtctacg
19

<210> 271
<211> 24
<212> RNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 271
uuuguguuca cgcucaccgu gccc
24

<210> 272
<211> 24
<212> RNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 272
uuuagccauu ccaugagagc cuca
24

<210> 273
<211> 24
<212> RNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 273
uuuggacaaa gcgucuacgc ugca
24

<210> 274
<211> 707
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 274
Met Ala Asp Thr Pro Thr Leu Phe Thr Gln Phe Leu Arg His His Leu
1 5 10 15

Pro Gly Gln Arg Phe Arg Lys Asp Ile Leu Lys Gln Ala Gly Arg Ile
20 25 30

```
Leu Ala Asn Lys Gly Glu Asp Ala Thr Ile Ala Phe Leu Arg Gly Lys
        35                  40                  45

Ser Glu Glu Ser Pro Pro Asp Phe Gln Pro Pro Val Lys Cys Pro Ile
    50                  55                  60

Ile Ala Cys Ser Arg Pro Leu Thr Glu Trp Pro Ile Tyr Gln Ala Ser
65                  70                  75                  80

Val Ala Ile Gln Gly Tyr Val Tyr Gly Gln Ser Leu Ala Glu Phe Glu
                85                  90                  95

Ala Ser Asp Pro Gly Cys Ser Lys Asp Gly Leu Leu Gly Trp Phe Asp
            100                 105                 110

Lys Thr Gly Val Cys Thr Asp Tyr Phe Ser Val Gln Gly Leu Asn Leu
        115                 120                 125

Ile Phe Gln Asn Ala Arg Lys Arg Tyr Ile Gly Val Gln Thr Lys Val
    130                 135                 140

Thr Asn Arg Asn Glu Lys Arg His Lys Lys Leu Lys Arg Ile Asn Ala
145                 150                 155                 160

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

Ser Ala Leu Asp Glu Thr Gly His Leu Ile Asp Pro Pro Gly Leu Asn
            180                 185                 190

Thr Asn Ile Tyr Cys Tyr Gln Gln Val Ser Pro Lys Pro Leu Ala Leu
        195                 200                 205

Ser Glu Val Asn Gln Leu Pro Thr Ala Tyr Ala Gly Tyr Ser Thr Ser
    210                 215                 220

Gly Asp Asp Pro Ile Gln Pro Met Val Thr Lys Asp Arg Leu Ser Ile
225                 230                 235                 240

Ser Lys Gly Gln Pro Gly Tyr Ile Pro Glu His Gln Arg Ala Leu Leu
                245                 250                 255

Ser Gln Lys Lys His Arg Arg Met Arg Gly Tyr Gly Leu Lys Ala Arg
```

```
            260                 265                 270

Ala Leu Leu Val Ile Val Arg Ile Gln Asp Asp Trp Ala Val Ile Asp
        275                 280                 285

Leu Arg Ser Leu Leu Arg Asn Ala Tyr Trp Arg Arg Ile Val Gln Thr
    290                 295                 300

Lys Glu Pro Ser Thr Ile Thr Lys Leu Leu Lys Leu Val Thr Gly Asp
305                 310                 315                 320

Pro Val Leu Asp Ala Thr Arg Met Val Ala Thr Phe Thr Tyr Lys Pro
                325                 330                 335

Gly Ile Val Gln Val Arg Ser Ala Lys Cys Leu Lys Asn Lys Gln Gly
            340                 345                 350

Ser Lys Leu Phe Ser Glu Arg Tyr Leu Asn Glu Thr Val Ser Val Thr
        355                 360                 365

Ser Ile Asp Leu Gly Ser Asn Asn Leu Val Ala Val Ala Thr Tyr Arg
    370                 375                 380

Leu Val Asn Gly Asn Thr Pro Glu Leu Leu Gln Arg Phe Thr Leu Pro
385                 390                 395                 400

Ser His Leu Val Lys Asp Phe Glu Arg Tyr Lys Gln Ala His Asp Thr
                405                 410                 415

Leu Glu Asp Ser Ile Gln Lys Thr Ala Val Ala Ser Leu Pro Gln Gly
            420                 425                 430

Gln Gln Thr Glu Ile Arg Met Trp Ser Met Tyr Gly Phe Arg Glu Ala
        435                 440                 445

Gln Glu Arg Val Cys Gln Glu Leu Gly Leu Ala Asp Gly Ser Ile Pro
    450                 455                 460

Trp Asn Val Met Thr Ala Thr Ser Thr Ile Leu Thr Asp Leu Phe Leu
465                 470                 475                 480

Ala Arg Gly Gly Asp Pro Lys Lys Cys Met Phe Thr Ser Glu Pro Lys
                485                 490                 495
```

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

Trp Ala Lys Met Tyr Arg Thr Leu Leu Ser Lys Glu Thr Arg Glu Ala
        515                 520                 525

Trp Asn Lys Ala Leu Trp Gly Leu Lys Arg Gly Ser Pro Asp Tyr Ala
    530                 535                 540

Arg Leu Ser Lys Arg Lys Glu Glu Leu Ala Arg Arg Cys Val Asn Tyr
545                 550                 555                 560

Thr Ile Ser Thr Ala Glu Lys Arg Ala Gln Cys Gly Arg Thr Ile Val
                565                 570                 575

Ala Leu Glu Asp Leu Asn Ile Gly Phe Phe His Gly Arg Gly Lys Gln
            580                 585                 590

Glu Pro Gly Trp Val Gly Leu Phe Thr Arg Lys Lys Glu Asn Arg Trp
        595                 600                 605

Leu Met Gln Ala Leu His Lys Ala Phe Leu Glu Leu Ala His His Arg
    610                 615                 620

Gly Tyr His Val Ile Glu Val Asn Pro Ala Tyr Thr Ser Gln Thr Cys
625                 630                 635                 640

Pro Val Cys Arg His Cys Asp Pro Asp Asn Arg Asp Gln His Asn Arg
                645                 650                 655

Glu Ala Phe His Cys Ile Gly Cys Gly Phe Arg Gly Asn Ala Asp Leu
            660                 665                 670

Asp Val Ala Thr His Asn Ile Ala Met Val Ala Ile Thr Gly Glu Ser
        675                 680                 685

Leu Lys Arg Ala Arg Gly Ser Val Ala Ser Lys Thr Pro Gln Pro Leu
    690                 695                 700

Ala Ala Glu
705
```

<210> 275

<211> 757
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 275
Met Pro Lys Pro Ala Val Glu Ser Glu Phe Ser Lys Val Leu Lys Lys
1 5 10 15

His Phe Pro Gly Glu Arg Phe Arg Ser Ser Tyr Met Lys Arg Gly Gly
20 25 30

Lys Ile Leu Ala Ala Gln Gly Glu Glu Ala Val Val Ala Tyr Leu Gln
35 40 45

Gly Lys Ser Glu Glu Glu Pro Pro Asn Phe Gln Pro Pro Ala Lys Cys
50 55 60

His Val Val Thr Lys Ser Arg Asp Phe Ala Glu Trp Pro Ile Met Lys
65 70 75 80

Ala Ser Glu Ala Ile Gln Arg Tyr Ile Tyr Ala Leu Ser Thr Thr Glu
85 90 95

Arg Ala Ala Cys Lys Pro Gly Lys Ser Ser Glu Ser His Ala Ala Trp
100 105 110

Phe Ala Ala Thr Gly Val Ser Asn His Gly Tyr Ser His Val Gln Gly
115 120 125

Leu Asn Leu Ile Phe Asp His Thr Leu Gly Arg Tyr Asp Gly Val Leu
130 135 140

Lys Lys Val Gln Leu Arg Asn Glu Lys Ala Arg Ala Arg Leu Glu Ser
145 150 155 160

Ile Asn Ala Ser Arg Ala Asp Glu Gly Leu Pro Glu Ile Lys Ala Glu
165 170 175

Glu Glu Glu Val Ala Thr Asn Glu Thr Gly His Leu Leu Gln Pro Pro
180 185 190

```
Gly Ile Asn Pro Ser Phe Tyr Val Tyr Gln Thr Ile Ser Pro Gln Ala
        195                 200                 205

Tyr Arg Pro Arg Asp Glu Ile Val Leu Pro Pro Glu Tyr Ala Gly Tyr
    210                 215                 220

Val Arg Asp Pro Asn Ala Pro Ile Pro Leu Gly Val Val Arg Asn Arg
225                 230                 235                 240

Cys Asp Ile Gln Lys Gly Cys Pro Gly Tyr Ile Pro Glu Trp Gln Arg
                245                 250                 255

Glu Ala Gly Thr Ala Ile Ser Pro Lys Thr Gly Lys Ala Val Thr Val
            260                 265                 270

Pro Gly Leu Ser Pro Lys Lys Asn Lys Arg Met Arg Arg Tyr Trp Arg
        275                 280                 285

Ser Glu Lys Glu Lys Ala Gln Asp Ala Leu Leu Val Thr Val Arg Ile
    290                 295                 300

Gly Thr Asp Trp Val Val Ile Asp Val Arg Gly Leu Leu Arg Asn Ala
305                 310                 315                 320

Arg Trp Arg Thr Ile Ala Pro Lys Asp Ile Ser Leu Asn Ala Leu Leu
                325                 330                 335

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

Thr Phe Thr Tyr Thr Leu Asp Ala Cys Gly Thr Tyr Ala Arg Lys Trp
        355                 360                 365

Thr Leu Lys Gly Lys Gln Thr Lys Ala Thr Leu Asp Lys Leu Thr Ala
    370                 375                 380

Thr Gln Thr Val Ala Leu Val Ala Ile Asp Leu Gly Gln Thr Asn Pro
385                 390                 395                 400

Ile Ser Ala Gly Ile Ser Arg Val Thr Gln Glu Asn Gly Ala Leu Gln
                405                 410                 415

Cys Glu Pro Leu Asp Arg Phe Thr Leu Pro Asp Asp Leu Leu Lys Asp
            420                 425                 430
```

```
Ile Ser Ala Tyr Arg Ile Ala Trp Asp Arg Asn Glu Glu Glu Leu Arg
        435                 440                 445

Ala Arg Ser Val Glu Ala Leu Pro Glu Ala Gln Gln Ala Glu Val Arg
    450                 455                 460

Ala Leu Asp Gly Val Ser Lys Glu Thr Ala Arg Thr Gln Leu Cys Ala
465                 470                 475                 480

Asp Phe Gly Leu Asp Pro Lys Arg Leu Pro Trp Asp Lys Met Ser Ser
                485                 490                 495

Asn Thr Thr Phe Ile Ser Glu Ala Leu Leu Ser Asn Ser Val Ser Arg
            500                 505                 510

Asp Gln Val Phe Phe Thr Pro Ala Pro Lys Lys Gly Ala Lys Lys Lys
        515                 520                 525

Ala Pro Val Glu Val Met Arg Lys Asp Arg Thr Trp Ala Arg Ala Tyr
    530                 535                 540

Lys Pro Arg Leu Ser Val Glu Ala Gln Lys Leu Lys Asn Glu Ala Leu
545                 550                 555                 560

Trp Ala Leu Lys Arg Thr Ser Pro Glu Tyr Leu Lys Leu Ser Arg Arg
                565                 570                 575

Lys Glu Glu Leu Cys Arg Arg Ser Ile Asn Tyr Val Ile Glu Lys Thr
            580                 585                 590

Arg Arg Arg Thr Gln Cys Gln Ile Val Ile Pro Val Ile Glu Asp Leu
        595                 600                 605

Asn Val Arg Phe Phe His Gly Ser Gly Lys Arg Leu Pro Gly Trp Asp
    610                 615                 620

Asn Phe Phe Thr Ala Lys Lys Glu Asn Arg Trp Phe Ile Gln Gly Leu
625                 630                 635                 640

His Lys Ala Phe Ser Asp Leu Arg Thr His Arg Ser Phe Tyr Val Phe
                645                 650                 655
```

```
Glu Val Arg Pro Glu Arg Thr Ser Ile Thr Cys Pro Lys Cys Gly His
            660                 665                 670

Cys Glu Val Gly Asn Arg Asp Gly Glu Ala Phe Gln Cys Leu Ser Cys
        675                 680                 685

Gly Lys Thr Cys Asn Ala Asp Leu Asp Val Ala Thr His Asn Leu Thr
    690                 695                 700

Gln Val Ala Leu Thr Gly Lys Thr Met Pro Lys Arg Glu Glu Pro Arg
705                 710                 715                 720

Asp Ala Gln Gly Thr Ala Pro Ala Arg Lys Thr Lys Lys Ala Ser Lys
                725                 730                 735

Ser Lys Ala Pro Pro Ala Glu Arg Glu Asp Gln Thr Pro Ala Gln Glu
            740                 745                 750

Pro Ser Gln Thr Ser
        755


<210> 276
<211> 765
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 276
Met Tyr Ile Leu Glu Met Ala Asp Leu Lys Ser Glu Pro Ser Leu Leu
1               5                   10                  15

Ala Lys Leu Leu Arg Asp Arg Phe Pro Gly Lys Tyr Trp Leu Pro Lys
            20                  25                  30

Tyr Trp Lys Leu Ala Glu Lys Lys Arg Leu Thr Gly Gly Glu Glu Ala
        35                  40                  45

Ala Cys Glu Tyr Met Ala Asp Lys Gln Leu Asp Ser Pro Pro Pro Asn
    50                  55                  60

Phe Arg Pro Pro Ala Arg Cys Val Ile Leu Ala Lys Ser Arg Pro Phe
65                  70                  75                  80
```

```
Glu Asp Trp Pro Val His Arg Val Ala Ser Lys Ala Gln Ser Phe Val
                85                  90                  95

Ile Gly Leu Ser Glu Gln Gly Phe Ala Ala Leu Arg Ala Ala Pro Pro
            100                 105                 110

Ser Thr Ala Asp Ala Arg Arg Asp Trp Leu Arg Ser His Gly Ala Ser
        115                 120                 125

Glu Asp Asp Leu Met Ala Leu Glu Ala Gln Leu Leu Glu Thr Ile Met
    130                 135                 140

Gly Asn Ala Ile Ser Leu His Gly Gly Val Leu Lys Lys Ile Asp Asn
145                 150                 155                 160

Ala Asn Val Lys Ala Ala Lys Arg Leu Ser Gly Arg Asn Glu Ala Arg
                165                 170                 175

Leu Asn Lys Gly Leu Gln Glu Leu Pro Pro Glu Gln Glu Gly Ser Ala
            180                 185                 190

Tyr Gly Ala Asp Gly Leu Leu Val Asn Pro Pro Gly Leu Asn Leu Asn
        195                 200                 205

Ile Tyr Cys Arg Lys Ser Cys Cys Pro Lys Pro Val Lys Asn Thr Ala
    210                 215                 220

Arg Phe Val Gly His Tyr Pro Gly Tyr Leu Arg Asp Ser Asp Ser Ile
225                 230                 235                 240

Leu Ile Ser Gly Thr Met Asp Arg Leu Thr Ile Ile Glu Gly Met Pro
                245                 250                 255

Gly His Ile Pro Ala Trp Gln Arg Glu Gln Gly Leu Val Lys Pro Gly
            260                 265                 270

Gly Arg Arg Arg Arg Leu Ser Gly Ser Glu Ser Asn Met Arg Gln Lys
        275                 280                 285

Val Asp Pro Ser Thr Gly Pro Arg Arg Ser Thr Arg Ser Gly Thr Val
    290                 295                 300

Asn Arg Ser Asn Gln Arg Thr Gly Arg Asn Gly Asp Pro Leu Leu Val
```

```
305                 310                 315                 320

Glu Ile Arg Met Lys Glu Asp Trp Val Leu Leu Asp Ala Arg Gly Leu
                325                 330                 335

Leu Arg Asn Leu Arg Trp Arg Glu Ser Lys Arg Gly Leu Ser Cys Asp
            340                 345                 350

His Glu Asp Leu Ser Leu Ser Gly Leu Leu Ala Leu Phe Ser Gly Asp
        355                 360                 365

Pro Val Ile Asp Pro Val Arg Asn Glu Val Val Phe Leu Tyr Gly Glu
    370                 375                 380

Gly Ile Ile Pro Val Arg Ser Thr Lys Pro Val Gly Thr Arg Gln Ser
385                 390                 395                 400

Lys Lys Leu Leu Glu Arg Gln Ala Ser Met Gly Pro Leu Thr Leu Ile
                405                 410                 415

Ser Cys Asp Leu Gly Gln Thr Asn Leu Ile Ala Gly Arg Ala Ser Ala
            420                 425                 430

Ile Ser Leu Thr His Gly Ser Leu Gly Val Arg Ser Ser Val Arg Ile
        435                 440                 445

Glu Leu Asp Pro Glu Ile Ile Lys Ser Phe Glu Arg Leu Arg Lys Asp
    450                 455                 460

Ala Asp Arg Leu Glu Thr Glu Ile Leu Thr Ala Ala Lys Glu Thr Leu
465                 470                 475                 480

Ser Asp Glu Gln Arg Gly Glu Val Asn Ser His Glu Lys Asp Ser Pro
                485                 490                 495

Gln Thr Ala Lys Ala Ser Leu Cys Arg Glu Leu Gly Leu His Pro Pro
            500                 505                 510

Ser Leu Pro Trp Gly Gln Met Gly Pro Ser Thr Thr Phe Ile Ala Asp
        515                 520                 525

Met Leu Ile Ser His Gly Arg Asp Asp Asp Ala Phe Leu Ser His Gly
    530                 535                 540
```

```
Glu Phe Pro Thr Leu Glu Lys Arg Lys Lys Phe Asp Lys Arg Phe Cys
545                 550                 555                 560

Leu Glu Ser Arg Pro Leu Leu Ser Ser Glu Thr Arg Lys Ala Leu Asn
                565                 570                 575

Glu Ser Leu Trp Glu Val Lys Arg Thr Ser Ser Glu Tyr Ala Arg Leu
            580                 585                 590

Ser Gln Arg Lys Lys Glu Met Ala Arg Arg Ala Val Asn Phe Val Val
        595                 600                 605

Glu Ile Ser Arg Arg Lys Thr Gly Leu Ser Asn Val Ile Val Asn Ile
    610                 615                 620

Glu Asp Leu Asn Val Arg Ile Phe His Gly Gly Gly Lys Gln Ala Pro
625                 630                 635                 640

Gly Trp Asp Gly Phe Phe Arg Pro Lys Ser Glu Asn Arg Trp Phe Ile
                645                 650                 655

Gln Ala Ile His Lys Ala Phe Ser Asp Leu Ala Ala His His Gly Ile
            660                 665                 670

Pro Val Ile Glu Ser Asp Pro Gln Arg Thr Ser Met Thr Cys Pro Glu
        675                 680                 685

Cys Gly His Cys Asp Ser Lys Asn Arg Asn Gly Val Arg Phe Leu Cys
    690                 695                 700

Lys Gly Cys Gly Ala Ser Met Asp Ala Asp Phe Asp Ala Ala Cys Arg
705                 710                 715                 720

Asn Leu Glu Arg Val Ala Leu Thr Gly Lys Pro Met Pro Lys Pro Ser
                725                 730                 735

Thr Ser Cys Glu Arg Leu Leu Ser Ala Thr Thr Gly Lys Val Cys Ser
            740                 745                 750

Asp His Ser Leu Ser His Asp Ala Ile Glu Lys Ala Ser
        755                 760                 765
```

<210> 277

<211> 766
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 277
Met Glu Lys Glu Ile Thr Glu Leu Thr Lys Ile Arg Arg Glu Phe Pro
1 5 10 15

Asn Lys Lys Phe Ser Ser Thr Asp Met Lys Lys Ala Gly Lys Leu Leu
20 25 30

Lys Ala Glu Gly Pro Asp Ala Val Arg Asp Phe Leu Asn Ser Cys Gln
35 40 45

Glu Ile Ile Gly Asp Phe Lys Pro Pro Val Lys Thr Asn Ile Val Ser
50 55 60

Ile Ser Arg Pro Phe Glu Glu Trp Pro Val Ser Met Val Gly Arg Ala
65 70 75 80

Ile Gln Glu Tyr Tyr Phe Ser Leu Thr Lys Glu Glu Leu Glu Ser Val
85 90 95

His Pro Gly Thr Ser Ser Glu Asp His Lys Ser Phe Phe Asn Ile Thr
100 105 110

Gly Leu Ser Asn Tyr Asn Tyr Thr Ser Val Gln Gly Leu Asn Leu Ile
115 120 125

Phe Lys Asn Ala Lys Ala Ile Tyr Asp Gly Thr Leu Val Lys Ala Asn
130 135 140

Asn Lys Asn Lys Lys Leu Glu Lys Lys Phe Asn Glu Ile Asn His Lys
145 150 155 160

Arg Ser Leu Glu Gly Leu Pro Ile Ile Thr Pro Asp Phe Glu Glu Pro
165 170 175

Phe Asp Glu Asn Gly His Leu Asn Asn Pro Pro Gly Ile Asn Arg Asn
180 185 190

```
Ile Tyr Gly Tyr Gln Gly Cys Ala Ala Lys Val Phe Val Pro Ser Lys
        195                 200                 205

His Lys Met Val Ser Leu Pro Lys Glu Tyr Glu Gly Tyr Asn Arg Asp
    210                 215                 220

Pro Asn Leu Ser Leu Ala Gly Phe Arg Asn Arg Leu Glu Ile Pro Glu
225                 230                 235                 240

Gly Glu Pro Gly His Val Pro Trp Phe Gln Arg Met Asp Ile Pro Glu
                245                 250                 255

Gly Gln Ile Gly His Val Asn Lys Ile Gln Arg Phe Asn Phe Val His
            260                 265                 270

Gly Lys Asn Ser Gly Lys Val Lys Phe Ser Asp Lys Thr Gly Arg Val
        275                 280                 285

Lys Arg Tyr His His Ser Lys Tyr Lys Asp Ala Thr Lys Pro Tyr Lys
    290                 295                 300

Phe Leu Glu Glu Ser Lys Lys Val Ser Ala Leu Asp Ser Ile Leu Ala
305                 310                 315                 320

Ile Ile Thr Ile Gly Asp Asp Trp Val Val Phe Asp Ile Arg Gly Leu
                325                 330                 335

Tyr Arg Asn Val Phe Tyr Arg Glu Leu Ala Gln Lys Gly Leu Thr Ala
            340                 345                 350

Val Gln Leu Leu Asp Leu Phe Thr Gly Asp Pro Val Ile Asp Pro Lys
        355                 360                 365

Lys Gly Val Val Thr Phe Ser Tyr Lys Glu Gly Val Val Pro Val Phe
    370                 375                 380

Ser Gln Lys Ile Val Pro Arg Phe Lys Ser Arg Asp Thr Leu Glu Lys
385                 390                 395                 400

Leu Thr Ser Gln Gly Pro Val Ala Leu Leu Ser Val Asp Leu Gly Gln
                405                 410                 415

Asn Glu Pro Val Ala Ala Arg Val Cys Ser Leu Lys Asn Ile Asn Asp
            420                 425                 430
```

```
Lys Ile Thr Leu Asp Asn Ser Cys Arg Ile Ser Phe Leu Asp Asp Tyr
        435                 440                 445

Lys Lys Gln Ile Lys Asp Tyr Arg Asp Ser Leu Asp Glu Leu Glu Ile
    450                 455                 460

Lys Ile Arg Leu Glu Ala Ile Asn Ser Leu Glu Thr Asn Gln Gln Val
465                 470                 475                 480

Glu Ile Arg Asp Leu Asp Val Phe Ser Ala Asp Arg Ala Lys Ala Asn
                485                 490                 495

Thr Val Asp Met Phe Asp Ile Asp Pro Asn Leu Ile Ser Trp Asp Ser
            500                 505                 510

Met Ser Asp Ala Arg Val Ser Thr Gln Ile Ser Asp Leu Tyr Leu Lys
        515                 520                 525

Asn Gly Gly Asp Glu Ser Arg Val Tyr Phe Glu Ile Asn Asn Lys Arg
    530                 535                 540

Ile Lys Arg Ser Asp Tyr Asn Ile Ser Gln Leu Val Arg Pro Lys Leu
545                 550                 555                 560

Ser Asp Ser Thr Arg Lys Asn Leu Asn Asp Ser Ile Trp Lys Leu Lys
                565                 570                 575

Arg Thr Ser Glu Glu Tyr Leu Lys Leu Ser Lys Arg Lys Leu Glu Leu
            580                 585                 590

Ser Arg Ala Val Val Asn Tyr Thr Ile Arg Gln Ser Lys Leu Leu Ser
        595                 600                 605

Gly Ile Asn Asp Ile Val Ile Ile Leu Glu Asp Leu Asp Val Lys Lys
    610                 615                 620

Lys Phe Asn Gly Arg Gly Ile Arg Asp Ile Gly Trp Asp Asn Phe Phe
625                 630                 635                 640

Ser Ser Arg Lys Glu Asn Arg Trp Phe Ile Pro Ala Phe His Lys Ala
                645                 650                 655
```

```
Phe Ser Glu Leu Ser Ser Asn Arg Gly Leu Cys Val Ile Glu Val Asn
            660                 665                 670

Pro Ala Trp Thr Ser Ala Thr Cys Pro Asp Cys Gly Phe Cys Ser Lys
        675                 680                 685

Glu Asn Arg Asp Gly Ile Asn Phe Thr Cys Arg Lys Cys Gly Val Ser
    690                 695                 700

Tyr His Ala Asp Ile Asp Val Ala Thr Leu Asn Ile Ala Arg Val Ala
705                 710                 715                 720

Val Leu Gly Lys Pro Met Ser Gly Pro Ala Asp Arg Glu Arg Leu Gly
                725                 730                 735

Asp Thr Lys Lys Pro Arg Val Ala Arg Ser Arg Lys Thr Met Lys Arg
            740                 745                 750

Lys Asp Ile Ser Asn Ser Thr Val Glu Ala Met Val Thr Ala
        755                 760                 765
```

<210> 278
<211> 812
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 278

```
Met Asp Met Leu Asp Thr Glu Thr Asn Tyr Ala Thr Glu Thr Pro Ala
1               5                   10                  15

Gln Gln Gln Asp Tyr Ser Pro Lys Pro Pro Lys Lys Ala Gln Arg Ala
            20                  25                  30

Pro Lys Gly Phe Ser Lys Lys Ala Arg Pro Glu Lys Lys Pro Pro Lys
        35                  40                  45

Pro Ile Thr Leu Phe Thr Gln Lys His Phe Ser Gly Val Arg Phe Leu
    50                  55                  60

Lys Arg Val Ile Arg Asp Ala Ser Lys Ile Leu Lys Leu Ser Glu Ser
65                  70                  75                  80
```

```
Arg Thr Ile Thr Phe Leu Glu Gln Ala Ile Glu Arg Asp Gly Ser Ala
                85                  90                  95

Pro Pro Asp Val Thr Pro Pro Val His Asn Thr Ile Met Ala Val Thr
            100                 105                 110

Arg Pro Phe Glu Glu Trp Pro Glu Val Ile Leu Ser Lys Ala Leu Gln
        115                 120                 125

Lys His Cys Tyr Ala Leu Thr Lys Lys Ile Lys Ile Lys Thr Trp Pro
    130                 135                 140

Lys Lys Gly Pro Gly Lys Lys Cys Leu Ala Ala Trp Ser Ala Arg Thr
145                 150                 155                 160

Lys Ile Pro Leu Ile Pro Gly Gln Val Gln Ala Thr Asn Gly Leu Phe
                165                 170                 175

Asp Arg Ile Gly Ser Ile Tyr Asp Gly Val Glu Lys Lys Val Thr Asn
            180                 185                 190

Arg Asn Ala Asn Lys Lys Leu Glu Tyr Asp Glu Ala Ile Lys Glu Gly
        195                 200                 205

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

Thr Leu Ile Asn Lys Pro Gly Tyr Asn Pro Asn Leu Tyr Ile Thr Gln
225                 230                 235                 240

Ser Arg Thr Pro Arg Leu Ile Thr Glu Ala Asp Arg Pro Leu Val Glu
                245                 250                 255

Lys Ile Leu Trp Gln Met Val Glu Lys Lys Thr Gln Ser Arg Asn Gln
            260                 265                 270

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

Val Pro Lys Phe Val Pro Glu Lys Val Asp Arg Ser Gln Lys Ile Glu
    290                 295                 300

Ile Arg Ile Ile Asp Pro Leu Asp Lys Ile Glu Pro Tyr Met Pro Gln
```

```
305                 310                 315                 320

Asp Arg Met Ala Ile Lys Ala Ser Gln Asp Gly His Val Pro Tyr Trp
                325                 330                 335

Gln Arg Pro Phe Leu Ser Lys Arg Arg Asn Arg Arg Val Arg Ala Gly
            340                 345                 350

Trp Gly Lys Gln Val Ser Ser Ile Gln Ala Trp Leu Thr Gly Ala Leu
        355                 360                 365

Leu Val Ile Val Arg Leu Gly Asn Glu Ala Phe Leu Ala Asp Ile Arg
    370                 375                 380

Gly Ala Leu Arg Asn Ala Gln Trp Arg Lys Leu Leu Lys Pro Asp Ala
385                 390                 395                 400

Thr Tyr Gln Ser Leu Phe Asn Leu Phe Thr Gly Asp Pro Val Val Asn
                405                 410                 415

Thr Arg Thr Asn His Leu Thr Met Ala Tyr Arg Glu Gly Val Val Asn
            420                 425                 430

Ile Val Lys Ser Arg Ser Phe Lys Gly Arg Gln Thr Arg Glu His Leu
        435                 440                 445

Leu Thr Leu Leu Gly Gln Gly Lys Thr Val Ala Gly Val Ser Phe Asp
    450                 455                 460

Leu Gly Gln Lys His Ala Ala Gly Leu Leu Ala Ala His Phe Gly Leu
465                 470                 475                 480

Gly Glu Asp Gly Asn Pro Val Phe Thr Pro Ile Gln Ala Cys Phe Leu
                485                 490                 495

Pro Gln Arg Tyr Leu Asp Ser Leu Thr Asn Tyr Arg Asn Arg Tyr Asp
            500                 505                 510

Ala Leu Thr Leu Asp Met Arg Arg Gln Ser Leu Leu Ala Leu Thr Pro
        515                 520                 525

Ala Gln Gln Gln Glu Phe Ala Asp Ala Gln Arg Asp Pro Gly Gly Gln
    530                 535                 540
```

```
Ala Lys Arg Ala Cys Cys Leu Lys Leu Asn Leu Asn Pro Asp Glu Ile
545                 550                 555                 560

Arg Trp Asp Leu Val Ser Gly Ile Ser Thr Met Ile Ser Asp Leu Tyr
                565                 570                 575

Ile Glu Arg Gly Gly Asp Pro Arg Asp Val His Gln Gln Val Glu Thr
            580                 585                 590

Lys Pro Lys Gly Lys Arg Lys Ser Glu Ile Arg Ile Leu Lys Ile Arg
        595                 600                 605

Asp Gly Lys Trp Ala Tyr Asp Phe Arg Pro Lys Ile Ala Asp Glu Thr
    610                 615                 620

Arg Lys Ala Gln Arg Glu Gln Leu Trp Lys Leu Gln Lys Ala Ser Ser
625                 630                 635                 640

Glu Phe Glu Arg Leu Ser Arg Tyr Lys Ile Asn Ile Ala Arg Ala Ile
                645                 650                 655

Ala Asn Trp Ala Leu Gln Trp Gly Arg Glu Leu Ser Gly Cys Asp Ile
            660                 665                 670

Val Ile Pro Val Leu Glu Asp Leu Asn Val Gly Ser Lys Phe Phe Asp
        675                 680                 685

Gly Lys Gly Lys Trp Leu Leu Gly Trp Asp Asn Arg Phe Thr Pro Lys
    690                 695                 700

Lys Glu Asn Arg Trp Phe Ile Lys Val Leu His Lys Ala Val Ala Glu
705                 710                 715                 720

Leu Ala Pro His Arg Gly Val Pro Val Tyr Glu Val Met Pro His Arg
                725                 730                 735

Thr Ser Met Thr Cys Pro Ala Cys His Tyr Cys His Pro Thr Asn Arg
            740                 745                 750

Glu Gly Asp Arg Phe Glu Cys Gln Ser Cys His Val Val Lys Asn Thr
        755                 760                 765

Asp Arg Asp Val Ala Pro Tyr Asn Ile Leu Arg Val Ala Val Glu Gly
```

770 775 780

Lys Thr Leu Asp Arg Trp Gln Ala Glu Lys Lys Pro Gln Ala Glu Pro
785 790 795 800

Asp Arg Pro Met Ile Leu Ile Asp Asn Gln Glu Ser
805 810

<210> 279
<211> 812
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 279
Met Asp Met Leu Asp Thr Glu Thr Asn Tyr Ala Thr Glu Thr Pro Ala
1 5 10 15

Gln Gln Gln Asp Tyr Ser Pro Lys Pro Pro Lys Lys Ala Gln Arg Ala
20 25 30

Pro Lys Gly Phe Ser Lys Lys Ala Arg Pro Glu Lys Lys Pro Pro Lys
35 40 45

Pro Ile Thr Leu Phe Thr Gln Lys His Phe Ser Gly Val Arg Phe Leu
50 55 60

Lys Arg Val Ile Arg Asp Ala Ser Lys Ile Leu Lys Leu Ser Glu Ser
65 70 75 80

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

Pro Pro Asp Val Thr Pro Pro Val His Asn Thr Ile Met Ala Val Thr
100 105 110

Arg Pro Phe Glu Glu Trp Pro Glu Val Ile Leu Ser Lys Ala Leu Gln
115 120 125

Lys His Cys Tyr Ala Leu Thr Lys Lys Ile Lys Ile Lys Thr Trp Pro
130 135 140

```
Lys Lys Gly Pro Gly Lys Lys Cys Leu Ala Ala Trp Ser Ala Arg Thr
145                 150                 155                 160

Lys Ile Pro Leu Ile Pro Gly Gln Val Gln Ala Thr Asn Gly Leu Phe
                165                 170                 175

Asp Arg Ile Gly Ser Ile Tyr Asp Gly Val Glu Lys Lys Val Thr Asn
            180                 185                 190

Arg Asn Ala Asn Lys Lys Leu Glu Tyr Asp Glu Ala Ile Lys Glu Gly
        195                 200                 205

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

Thr Leu Ile Asn Lys Pro Gly Tyr Asn Pro Asn Leu Tyr Ile Thr Gln
225                 230                 235                 240

Ser Arg Thr Pro Arg Leu Ile Thr Glu Ala Asp Arg Pro Leu Val Glu
                245                 250                 255

Lys Ile Leu Trp Gln Met Val Glu Lys Lys Thr Gln Ser Arg Asn Gln
            260                 265                 270

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

Val Pro Lys Phe Val Pro Glu Lys Val Asp Arg Ser Gln Lys Ile Glu
    290                 295                 300

Ile Arg Ile Ile Asp Pro Leu Asp Lys Ile Glu Pro Tyr Met Pro Gln
305                 310                 315                 320

Asp Arg Met Ala Ile Lys Ala Ser Gln Asp Gly His Val Pro Tyr Trp
                325                 330                 335

Gln Arg Pro Phe Leu Ser Lys Arg Arg Asn Arg Arg Val Arg Ala Gly
            340                 345                 350

Trp Gly Lys Gln Val Ser Ser Ile Gln Ala Trp Leu Thr Gly Ala Leu
        355                 360                 365

Leu Val Ile Val Arg Leu Gly Asn Glu Ala Phe Leu Ala Asp Ile Arg
    370                 375                 380
```

```
Gly Ala Leu Arg Asn Ala Gln Trp Arg Lys Leu Leu Lys Pro Asp Ala
385                 390                 395                 400

Thr Tyr Gln Ser Leu Phe Asn Leu Phe Thr Gly Asp Pro Val Val Asn
                405                 410                 415

Thr Arg Thr Asn His Leu Thr Met Ala Tyr Arg Glu Gly Val Val Asp
            420                 425                 430

Ile Val Lys Ser Arg Ser Phe Lys Gly Arg Gln Thr Arg Glu His Leu
        435                 440                 445

Leu Thr Leu Leu Gly Gln Gly Lys Thr Val Ala Gly Val Ser Phe Asp
    450                 455                 460

Leu Gly Gln Lys His Ala Ala Gly Leu Leu Ala Ala His Phe Gly Leu
465                 470                 475                 480

Gly Glu Asp Gly Asn Pro Val Phe Thr Pro Ile Gln Ala Cys Phe Leu
                485                 490                 495

Pro Gln Arg Tyr Leu Asp Ser Leu Thr Asn Tyr Arg Asn Arg Tyr Asp
            500                 505                 510

Ala Leu Thr Leu Asp Met Arg Arg Gln Ser Leu Leu Ala Leu Thr Pro
        515                 520                 525

Ala Gln Gln Gln Glu Phe Ala Asp Ala Gln Arg Asp Pro Gly Gly Gln
    530                 535                 540

Ala Lys Arg Ala Cys Cys Leu Lys Leu Asn Leu Asn Pro Asp Glu Ile
545                 550                 555                 560

Arg Trp Asp Leu Val Ser Gly Ile Ser Thr Met Ile Ser Asp Leu Tyr
                565                 570                 575

Ile Glu Arg Gly Gly Asp Pro Arg Asp Val His Gln Gln Val Glu Thr
            580                 585                 590

Lys Pro Lys Gly Lys Arg Lys Ser Glu Ile Arg Ile Leu Lys Ile Arg
        595                 600                 605
```

```
Asp Gly Lys Trp Ala Tyr Asp Phe Arg Pro Lys Ile Ala Asp Glu Thr
    610                 615                 620

Arg Lys Ala Gln Arg Glu Gln Leu Trp Lys Leu Gln Lys Ala Ser Ser
625                 630                 635                 640

Glu Phe Glu Arg Leu Ser Arg Tyr Lys Ile Asn Ile Ala Arg Ala Ile
                645                 650                 655

Ala Asn Trp Ala Leu Gln Trp Gly Arg Glu Leu Ser Gly Cys Asp Ile
            660                 665                 670

Val Ile Pro Val Leu Glu Asp Leu Asn Val Gly Ser Lys Phe Phe Asp
        675                 680                 685

Gly Lys Gly Lys Trp Leu Leu Gly Trp Asp Asn Arg Phe Thr Pro Lys
    690                 695                 700

Lys Glu Asn Arg Trp Phe Ile Lys Val Leu His Lys Ala Val Ala Glu
705                 710                 715                 720

Leu Ala Pro His Lys Gly Val Pro Val Tyr Glu Val Met Pro His Arg
                725                 730                 735

Thr Ser Met Thr Cys Pro Ala Cys His Tyr Cys His Pro Thr Asn Arg
            740                 745                 750

Glu Gly Asp Arg Phe Glu Cys Gln Ser Cys His Val Val Lys Asn Thr
        755                 760                 765

Asp Arg Asp Val Ala Pro Tyr Asn Ile Leu Arg Val Ala Val Glu Gly
    770                 775                 780

Lys Thr Leu Asp Arg Trp Gln Ala Glu Lys Lys Pro Gln Ala Glu Pro
785                 790                 795                 800

Asp Arg Pro Met Ile Leu Ile Asp Asn Gln Glu Ser
                805                 810
```

<210> 280
<211> 793
<212> PRT
<213> Artificial Sequence

<220>

<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 280

```
Met Ser Ser Leu Pro Thr Pro Leu Glu Leu Leu Lys Gln Lys His Ala
1               5                  10                  15

Asp Leu Phe Lys Gly Leu Gln Phe Ser Ser Lys Asp Asn Lys Met Ala
            20                  25                  30

Gly Lys Val Leu Lys Lys Asp Gly Glu Glu Ala Ala Leu Ala Phe Leu
        35                  40                  45

Ser Glu Arg Gly Val Ser Arg Gly Glu Leu Pro Asn Phe Arg Pro Pro
    50                  55                  60

Ala Lys Thr Leu Val Val Ala Gln Ser Arg Pro Phe Glu Glu Phe Pro
65                  70                  75                  80

Ile Tyr Arg Val Ser Glu Ala Ile Gln Leu Tyr Val Tyr Ser Leu Ser
                85                  90                  95

Val Lys Glu Leu Glu Thr Val Pro Ser Gly Ser Ser Thr Lys Lys Glu
            100                 105                 110

His Gln Arg Phe Phe Gln Asp Ser Ser Val Pro Asp Phe Gly Tyr Thr
        115                 120                 125

Ser Val Gln Gly Leu Asn Lys Ile Phe Gly Leu Ala Arg Gly Ile Tyr
    130                 135                 140

Leu Gly Val Ile Thr Arg Gly Glu Asn Gln Leu Gln Lys Ala Lys Ser
145                 150                 155                 160

Lys His Glu Ala Leu Asn Lys Lys Arg Arg Ala Ser Gly Glu Ala Glu
                165                 170                 175

Thr Glu Phe Asp Pro Thr Pro Tyr Glu Tyr Met Thr Pro Glu Arg Lys
            180                 185                 190

Leu Ala Lys Pro Pro Gly Val Asn His Ser Ile Met Cys Tyr Val Asp
        195                 200                 205

Ile Ser Val Asp Glu Phe Asp Phe Arg Asn Pro Asp Gly Ile Val Leu
```

```
    210                 215                 220

Pro Ser Glu Tyr Ala Gly Tyr Cys Arg Glu Ile Asn Thr Ala Ile Glu
225                 230                 235                 240

Lys Gly Thr Val Asp Arg Leu Gly His Leu Lys Gly Gly Pro Gly Tyr
                245                 250                 255

Ile Pro Gly His Gln Arg Lys Glu Ser Thr Thr Glu Gly Pro Lys Ile
            260                 265                 270

Asn Phe Arg Lys Gly Arg Ile Arg Arg Ser Tyr Thr Ala Leu Tyr Ala
        275                 280                 285

Lys Arg Asp Ser Arg Arg Val Arg Gln Gly Lys Leu Ala Leu Pro Ser
    290                 295                 300

Tyr Arg His His Met Met Arg Leu Asn Ser Asn Ala Glu Ser Ala Ile
305                 310                 315                 320

Leu Ala Val Ile Phe Phe Gly Lys Asp Trp Val Val Phe Asp Leu Arg
                325                 330                 335

Gly Leu Leu Arg Asn Val Arg Trp Arg Asn Leu Phe Val Asp Gly Ser
            340                 345                 350

Thr Pro Ser Thr Leu Leu Gly Met Phe Gly Asp Pro Val Ile Asp Pro
        355                 360                 365

Lys Arg Gly Val Val Ala Phe Cys Tyr Lys Glu Gln Ile Val Pro Val
    370                 375                 380

Val Ser Lys Ser Ile Thr Lys Met Val Lys Ala Pro Glu Leu Leu Asn
385                 390                 395                 400

Lys Leu Tyr Leu Lys Ser Glu Asp Pro Leu Val Leu Val Ala Ile Asp
                405                 410                 415

Leu Gly Gln Thr Asn Pro Val Gly Val Gly Val Tyr Arg Val Met Asn
            420                 425                 430

Ala Ser Leu Asp Tyr Glu Val Val Thr Arg Phe Ala Leu Glu Ser Glu
        435                 440                 445
```

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

Ala Gln Ile Arg Ala Glu Thr Phe Asp Ala Met Thr Ser Glu Glu Gln
465                 470                 475                 480

Glu Glu Ile Thr Arg Val Arg Ala Phe Ser Ala Ser Lys Ala Lys Glu
                485                 490                 495

Asn Val Cys His Arg Phe Gly Met Pro Val Asp Ala Val Asp Trp Ala
            500                 505                 510

Thr Met Gly Ser Asn Thr Ile His Ile Ala Lys Trp Val Met Arg His
        515                 520                 525

Gly Asp Pro Ser Leu Val Glu Val Leu Glu Tyr Arg Lys Asp Asn Glu
    530                 535                 540

Ile Lys Leu Asp Lys Asn Gly Val Pro Lys Lys Val Lys Leu Thr Asp
545                 550                 555                 560

Lys Arg Ile Ala Asn Leu Thr Ser Ile Arg Leu Arg Phe Ser Gln Glu
                565                 570                 575

Thr Ser Lys His Tyr Asn Asp Thr Met Trp Glu Leu Arg Arg Lys His
            580                 585                 590

Pro Val Tyr Gln Lys Leu Ser Lys Ser Lys Ala Asp Phe Ser Arg Arg
        595                 600                 605

Val Val Asn Ser Ile Ile Arg Arg Val Asn His Leu Val Pro Arg Ala
    610                 615                 620

Arg Ile Val Phe Ile Ile Glu Asp Leu Lys Asn Leu Gly Lys Val Phe
625                 630                 635                 640

His Gly Ser Gly Lys Arg Glu Leu Gly Trp Asp Ser Tyr Phe Glu Pro
                645                 650                 655

Lys Ser Glu Asn Arg Trp Phe Ile Gln Val Leu His Lys Ala Phe Ser
            660                 665                 670

Glu Thr Gly Lys His Lys Gly Tyr Tyr Ile Ile Glu Cys Trp Pro Asn
```

675 680 685

Trp Thr Ser Cys Thr Cys Pro Lys Cys Ser Cys Cys Asp Ser Glu Asn
690 695 700

Arg His Gly Glu Val Phe Arg Cys Leu Ala Cys Gly Tyr Thr Cys Asn
705 710 715 720

Thr Asp Phe Gly Thr Ala Pro Asp Asn Leu Val Lys Ile Ala Thr Thr
725 730 735

Gly Lys Gly Leu Pro Gly Pro Lys Lys Arg Cys Lys Gly Ser Ser Lys
740 745 750

Gly Lys Asn Pro Lys Ile Ala Arg Ser Ser Glu Thr Gly Val Ser Val
755 760 765

Thr Glu Ser Gly Ala Pro Lys Val Lys Lys Ser Ser Pro Thr Gln Thr
770 775 780

Ser Gln Ser Ser Ser Gln Ser Ala Pro
785 790

<210> 281
<211> 441
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 281
Met Asn Lys Ile Glu Lys Glu Lys Thr Pro Leu Ala Lys Leu Met Asn
1 5 10 15

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

Gly Lys Lys Leu Leu Lys Glu Gly Glu Leu Lys Thr Ile Glu Tyr Met
35 40 45

Thr Gly Lys Gly Ser Ile Glu Pro Leu Pro Asn Phe Lys Pro Pro Val
50 55 60

```
Lys Cys Leu Ile Val Ala Lys Arg Arg Asp Leu Lys Tyr Phe Pro Ile
65                  70                  75                  80

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

Lys Asp Phe Met Asp Tyr Phe Ser Thr Pro Met Thr Ser Gln Lys Gln
            100                 105                 110

His Glu Glu Phe Phe Lys Lys Ser Gly Leu Asn Ile Glu Tyr Gln Asn
        115                 120                 125

Val Ala Gly Leu Asn Leu Ile Phe Asn Asn Val Lys Asn Thr Tyr Asn
    130                 135                 140

Gly Val Ile Leu Lys Val Lys Asn Arg Asn Glu Lys Leu Lys Lys Lys
145                 150                 155                 160

Ala Ile Lys Asn Asn Tyr Glu Phe Glu Glu Ile Lys Thr Phe Asn Asp
                165                 170                 175

Asp Gly Cys Leu Ile Asn Lys Pro Gly Ile Asn Asn Val Ile Tyr Cys
            180                 185                 190

Phe Gln Ser Ile Ser Pro Lys Ile Leu Lys Asn Ile Thr His Leu Pro
        195                 200                 205

Lys Glu Tyr Asn Asp Tyr Asp Cys Ser Val Asp Arg Asn Ile Ile Gln
    210                 215                 220

Lys Tyr Val Ser Arg Leu Asp Ile Pro Glu Ser Gln Pro Gly His Val
225                 230                 235                 240

Pro Glu Trp Gln Arg Lys Leu Pro Glu Phe Asn Asn Thr Asn Asn Pro
                245                 250                 255

Arg Arg Arg Arg Lys Trp Tyr Ser Asn Gly Arg Asn Ile Ser Lys Gly
            260                 265                 270

Tyr Ser Val Asp Gln Val Asn Gln Ala Lys Ile Glu Asp Ser Leu Leu
        275                 280                 285

Ala Gln Ile Lys Ile Gly Glu Asp Trp Ile Ile Leu Asp Ile Arg Gly
    290                 295                 300
```

```
Leu Leu Arg Asp Leu Asn Arg Arg Glu Leu Ile Ser Tyr Lys Asn Lys
305                 310                 315                 320


Leu Thr Ile Lys Asp Val Leu Gly Phe Phe Ser Asp Tyr Pro Ile Ile
                325                 330                 335


Asp Ile Lys Lys Asn Leu Val Thr Phe Cys Tyr Lys Glu Gly Val Ile
            340                 345                 350


Gln Val Val Ser Gln Lys Ser Ile Gly Asn Lys Lys Ser Lys Gln Leu
        355                 360                 365


Leu Glu Lys Leu Ile Glu Asn Lys Pro Ile Ala Leu Val Ser Ile Asp
    370                 375                 380


Leu Gly Gln Thr Asn Pro Val Ser Val Lys Ile Ser Lys Leu Asn Lys
385                 390                 395                 400


Ile Asn Asn Lys Ile Ser Ile Glu Ser Phe Thr Tyr Arg Phe Leu Asn
                405                 410                 415


Glu Glu Ile Leu Lys Glu Ile Glu Lys Tyr Arg Lys Asp Tyr Asp Lys
            420                 425                 430


Leu Glu Leu Lys Leu Ile Asn Glu Ala
        435                 440


<210> 282
<211> 812
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 282
Met Asp Met Leu Asp Thr Glu Thr Asn Tyr Ala Thr Glu Thr Pro Ser
1               5                   10                  15


Gln Gln Gln Asp Tyr Ser Pro Lys Pro Pro Lys Lys Asp Arg Arg Ala
            20                  25                  30


Pro Lys Gly Phe Ser Lys Lys Ala Arg Pro Glu Lys Lys Pro Pro Lys
```

```
        35                  40                  45

Pro Ile Thr Leu Phe Thr Gln Lys His Phe Ser Gly Val Arg Phe Leu
    50                  55                  60

Lys Arg Val Ile Arg Asp Ala Ser Lys Ile Leu Lys Leu Ser Glu Ser
65                  70                  75                  80

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

Pro Pro Asp Val Thr Pro Pro Val His Asn Thr Ile Met Ala Val Thr
            100                 105                 110

Arg Pro Phe Glu Glu Trp Pro Glu Val Ile Leu Ser Lys Ala Leu Gln
        115                 120                 125

Lys His Cys Tyr Ala Leu Thr Lys Lys Ile Lys Ile Lys Thr Trp Pro
    130                 135                 140

Lys Lys Gly Pro Gly Lys Lys Cys Leu Ala Ala Trp Ser Ala Arg Thr
145                 150                 155                 160

Lys Ile Pro Leu Ile Pro Gly Gln Val Gln Ala Thr Asn Gly Leu Phe
                165                 170                 175

Asp Arg Ile Gly Ser Ile Tyr Asp Gly Val Glu Lys Lys Val Thr Asn
            180                 185                 190

Arg Asn Ala Asn Lys Lys Leu Glu Tyr Asp Glu Ala Ile Lys Glu Gly
        195                 200                 205

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

Thr Leu Ile Asn Lys Pro Gly Tyr Asn Pro Asn Leu Tyr Ile Thr Gln
225                 230                 235                 240

Ser Arg Thr Pro Arg Leu Ile Thr Glu Ala Asp Arg Pro Leu Val Glu
                245                 250                 255

Lys Ile Leu Trp Gln Met Val Glu Lys Lys Thr Gln Ser Arg Asn Gln
            260                 265                 270
```

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

Val Pro Lys Phe Val Pro Glu Lys Val Asp Arg Ser Gln Lys Ile Glu
    290                 295                 300

Ile Arg Ile Ile Asp Pro Leu Asp Lys Ile Glu Pro Tyr Met Pro Gln
305                 310                 315                 320

Asp Arg Met Ala Ile Lys Ala Ser Gln Asp Gly His Val Pro Tyr Trp
                325                 330                 335

Gln Arg Pro Phe Leu Ser Lys Arg Arg Asn Arg Arg Val Arg Ala Gly
            340                 345                 350

Trp Gly Lys Gln Val Ser Ser Ile Gln Ala Trp Leu Thr Gly Ala Leu
        355                 360                 365

Leu Val Ile Val Arg Leu Gly Asn Glu Ala Phe Leu Ala Asp Ile Arg
    370                 375                 380

Gly Ala Leu Arg Asn Ala Gln Trp Arg Lys Leu Leu Lys Pro Asp Ala
385                 390                 395                 400

Thr Tyr Gln Ser Leu Phe Asn Leu Phe Thr Gly Asp Pro Val Val Asn
                405                 410                 415

Thr Arg Thr Asn His Leu Thr Met Ala Tyr Arg Glu Gly Val Val Asp
            420                 425                 430

Ile Val Lys Ser Arg Ser Phe Lys Gly Arg Gln Thr Arg Glu His Leu
        435                 440                 445

Leu Thr Leu Leu Gly Gln Gly Lys Thr Val Ala Gly Val Ser Phe Asp
    450                 455                 460

Leu Gly Gln Lys His Ala Ala Gly Leu Leu Ala Ala His Phe Gly Leu
465                 470                 475                 480

Gly Glu Asp Gly Asn Pro Val Phe Thr Pro Ile Gln Ala Cys Phe Leu
                485                 490                 495

Pro Gln Arg Tyr Leu Asp Ser Leu Thr Asn Tyr Arg Asn Arg Tyr Asp
```

```
            500                 505                 510

Ala Leu Thr Leu Asp Met Arg Arg Gln Ser Leu Leu Ala Leu Thr Pro
        515                 520                 525

Ala Gln Gln Gln Glu Phe Ala Asp Ala Gln Arg Asp Pro Gly Gly Gln
    530                 535                 540

Ala Lys Arg Ala Cys Cys Leu Lys Leu Asn Leu Asn Pro Asp Glu Ile
545                 550                 555                 560

Arg Trp Asp Leu Val Ser Gly Ile Ser Thr Met Ile Ser Asp Leu Tyr
                565                 570                 575

Ile Glu Arg Gly Gly Asp Pro Arg Asp Val His Gln Gln Val Glu Thr
            580                 585                 590

Lys Pro Lys Gly Lys Arg Lys Ser Glu Ile Arg Ile Leu Lys Ile Arg
        595                 600                 605

Asp Gly Lys Trp Ala Tyr Asp Phe Arg Pro Lys Ile Ala Asp Glu Thr
    610                 615                 620

Arg Lys Ala Gln Arg Glu Gln Leu Trp Lys Leu Gln Lys Ala Ser Ser
625                 630                 635                 640

Glu Phe Glu Arg Leu Ser Arg Tyr Lys Ile Asn Ile Ala Arg Ala Ile
                645                 650                 655

Ala Asn Trp Ala Leu Gln Trp Gly Arg Glu Leu Ser Gly Cys Asp Ile
            660                 665                 670

Val Ile Pro Val Leu Glu Asp Leu Asn Val Gly Ser Lys Phe Phe Asp
        675                 680                 685

Gly Lys Gly Lys Trp Leu Leu Gly Trp Asp Asn Arg Phe Thr Pro Lys
    690                 695                 700

Lys Glu Asn Arg Trp Phe Ile Lys Val Leu His Lys Ala Val Ala Glu
705                 710                 715                 720

Leu Ala Pro His Arg Gly Val Pro Val Tyr Glu Val Met Pro His Arg
                725                 730                 735
```

```
Thr Ser Met Thr Cys Pro Ala Cys His Tyr Cys His Pro Thr Asn Arg
            740                 745                 750

Glu Gly Asp Arg Phe Glu Cys Gln Ser Cys His Val Val Lys Asn Thr
        755                 760                 765

Asp Arg Asp Val Ala Pro Tyr Asn Ile Leu Arg Val Ala Val Glu Gly
    770                 775                 780

Lys Thr Leu Asp Arg Trp Gln Ala Glu Lys Lys Pro Gln Ala Glu Pro
785                 790                 795                 800

Asp Arg Pro Met Ile Leu Ile Asp Asn Gln Glu Ser
                805                 810
```

<210> 283
<211> 812
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 283

```
Met Asp Met Leu Asp Thr Glu Thr Asn Tyr Ala Thr Glu Thr Pro Ser
1               5                   10                  15

Gln Gln Gln Asp Tyr Ser Pro Lys Pro Pro Lys Lys Asp Arg Arg Ala
            20                  25                  30

Pro Lys Gly Phe Ser Lys Lys Ala Arg Pro Glu Lys Lys Pro Pro Lys
        35                  40                  45

Pro Ile Thr Leu Phe Thr Gln Lys His Phe Ser Gly Val Arg Phe Leu
    50                  55                  60

Lys Arg Val Ile Arg Asp Ala Ser Lys Ile Leu Lys Leu Ser Glu Ser
65                  70                  75                  80

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

Pro Pro Asp Val Thr Pro Pro Val His Asn Thr Ile Met Ala Val Thr
            100                 105                 110
```

```
Arg Pro Phe Glu Glu Trp Pro Glu Val Ile Leu Ser Lys Ala Leu Gln
        115                 120                 125

Lys His Cys Tyr Ala Leu Thr Lys Lys Ile Lys Ile Lys Thr Trp Pro
    130                 135                 140

Lys Lys Gly Pro Gly Lys Lys Cys Leu Ala Ala Trp Ser Ala Arg Thr
145                 150                 155                 160

Lys Ile Pro Leu Ile Pro Gly Gln Val Gln Ala Thr Asn Gly Leu Phe
                165                 170                 175

Asp Arg Ile Gly Ser Ile Tyr Asp Gly Val Glu Lys Lys Val Thr Asn
            180                 185                 190

Arg Asn Ala Asn Lys Lys Leu Glu Tyr Asp Glu Ala Ile Lys Glu Gly
        195                 200                 205

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

Thr Leu Ile Asn Lys Pro Gly Tyr Asn Pro Asn Leu Tyr Ile Thr Gln
225                 230                 235                 240

Ser Arg Thr Pro Arg Leu Ile Thr Glu Ala Asp Arg Pro Leu Val Glu
                245                 250                 255

Lys Ile Leu Trp Gln Met Val Glu Lys Lys Thr Gln Ser Arg Asn Gln
            260                 265                 270

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

Val Pro Lys Phe Val Pro Glu Lys Val Asp Arg Ser Gln Lys Ile Glu
    290                 295                 300

Ile Arg Ile Ile Asp Pro Leu Asp Lys Ile Glu Pro Tyr Met Pro Gln
305                 310                 315                 320

Asp Arg Met Ala Ile Lys Ala Ser Gln Asp Gly His Val Pro Tyr Trp
                325                 330                 335
```

```
Gln Arg Pro Phe Leu Ser Lys Arg Arg Asn Arg Arg Val Arg Ala Gly
            340                 345                 350

Trp Gly Lys Gln Val Ser Ser Ile Gln Ala Trp Leu Thr Gly Ala Leu
        355                 360                 365

Leu Val Ile Val Arg Leu Gly Asn Glu Ala Phe Leu Ala Asp Ile Arg
    370                 375                 380

Gly Ala Leu Arg Asn Ala Gln Trp Arg Lys Leu Leu Lys Pro Asp Ala
385                 390                 395                 400

Thr Tyr Gln Ser Leu Phe Asn Leu Phe Thr Gly Asp Pro Val Val Asn
                405                 410                 415

Thr Arg Thr Asn His Leu Thr Met Ala Tyr Arg Glu Gly Val Val Asn
            420                 425                 430

Ile Val Lys Ser Arg Ser Phe Lys Gly Arg Gln Thr Arg Glu His Leu
        435                 440                 445

Leu Thr Leu Leu Gly Gln Gly Lys Thr Val Ala Gly Val Ser Phe Asp
    450                 455                 460

Leu Gly Gln Lys His Ala Ala Gly Leu Leu Ala Ala His Phe Gly Leu
465                 470                 475                 480

Gly Glu Asp Gly Asn Pro Val Phe Thr Pro Ile Gln Ala Cys Phe Leu
                485                 490                 495

Pro Gln Arg Tyr Leu Asp Ser Leu Thr Asn Tyr Arg Asn Arg Tyr Asp
            500                 505                 510

Ala Leu Thr Leu Asp Met Arg Arg Gln Ser Leu Leu Ala Leu Thr Pro
        515                 520                 525

Ala Gln Gln Gln Glu Phe Ala Asp Ala Gln Arg Asp Pro Gly Gly Gln
    530                 535                 540

Ala Lys Arg Ala Cys Cys Leu Lys Leu Asn Leu Asn Pro Asp Glu Ile
545                 550                 555                 560

Arg Trp Asp Leu Val Ser Gly Ile Ser Thr Met Ile Ser Asp Leu Tyr
                565                 570                 575
```

```
Ile Glu Arg Gly Gly Asp Pro Arg Asp Val His Gln Gln Val Glu Thr
            580                 585                 590

Lys Pro Lys Gly Lys Arg Lys Ser Glu Ile Arg Ile Leu Lys Ile Arg
        595                 600                 605

Asp Gly Lys Trp Ala Tyr Asp Phe Arg Pro Lys Ile Ala Asp Glu Thr
    610                 615                 620

Arg Lys Ala Gln Arg Glu Gln Leu Trp Lys Leu Gln Lys Ala Ser Ser
625                 630                 635                 640

Glu Phe Glu Arg Leu Ser Arg Tyr Lys Ile Asn Ile Ala Arg Ala Ile
                645                 650                 655

Ala Asn Trp Ala Leu Gln Trp Gly Arg Glu Leu Ser Gly Cys Asp Ile
            660                 665                 670

Val Ile Pro Val Leu Glu Asp Leu Asn Val Gly Ser Lys Phe Phe Asp
        675                 680                 685

Gly Lys Gly Lys Trp Leu Leu Gly Trp Asp Asn Arg Phe Thr Pro Lys
    690                 695                 700

Lys Glu Asn Arg Trp Phe Ile Lys Val Leu His Lys Ala Val Ala Glu
705                 710                 715                 720

Leu Ala Pro His Arg Gly Val Pro Val Tyr Glu Val Met Pro His Arg
                725                 730                 735

Thr Ser Met Thr Cys Pro Ala Cys His Tyr Cys His Pro Thr Asn Arg
            740                 745                 750

Glu Gly Asp Arg Phe Glu Cys Gln Ser Cys His Val Val Lys Asn Thr
        755                 760                 765

Asp Arg Asp Val Ala Pro Tyr Asn Ile Leu Arg Val Ala Val Glu Gly
    770                 775                 780

Lys Thr Leu Asp Arg Trp Gln Ala Glu Lys Lys Pro Gln Ala Glu Pro
785                 790                 795                 800
```

Asp Arg Pro Met Ile Leu Ile Asp Asn Gln Glu Ser
805 810

<210> 284
<211> 761
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 284
Met Ser Asn Lys Thr Thr Pro Pro Ser Pro Leu Ser Leu Leu Leu Arg
1 5 10 15

Ala His Phe Pro Gly Leu Lys Phe Glu Ser Gln Asp Tyr Lys Ile Ala
20 25 30

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

Thr Gly Lys Gly Gln Ala Lys Leu Lys Asp Val Lys Pro Pro Ala Lys
50 55 60

Ala Phe Val Ile Ala Gln Ser Arg Pro Phe Ile Glu Trp Asp Leu Val
65 70 75 80

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

Lys Gly Arg Pro Lys Gln Asp Gly Leu Ser Glu Thr Ala Phe Asn Glu
100 105 110

Ala Val Ala Ser Leu Glu Val Asp Gly Lys Ser Lys Leu Asn Glu Glu
115 120 125

Thr Arg Ala Ala Phe Tyr Glu Val Leu Gly Leu Asp Ala Pro Ser Leu
130 135 140

His Ala Gln Ala Gln Asn Ala Leu Ile Lys Ser Ala Ile Ser Ile Arg
145 150 155 160

Glu Gly Val Leu Lys Lys Val Glu Asn Arg Asn Glu Lys Asn Leu Ser
165 170 175

```
Lys Thr Lys Arg Arg Lys Glu Ala Gly Glu Glu Ala Thr Phe Val Glu
            180                 185                 190

Glu Lys Ala His Asp Glu Arg Gly Tyr Leu Ile His Pro Pro Gly Val
        195                 200                 205

Asn Gln Thr Ile Pro Gly Tyr Gln Ala Val Val Ile Lys Ser Cys Pro
    210                 215                 220

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

Glu Ala Leu Thr Asp Tyr Leu Pro His Asp Arg Met Thr Ile Pro Lys
                245                 250                 255

Gly Gln Pro Gly Tyr Val Pro Glu Trp Gln His Pro Leu Leu Asn Arg
            260                 265                 270

Arg Lys Asn Arg Arg Arg Arg Asp Trp Tyr Ser Ala Ser Leu Asn Lys
        275                 280                 285

Pro Lys Ala Thr Cys Ser Lys Arg Ser Gly Thr Pro Asn Arg Lys Asn
    290                 295                 300

Ser Arg Thr Asp Gln Ile Gln Ser Gly Arg Phe Lys Gly Ala Ile Pro
305                 310                 315                 320

Val Leu Met Arg Phe Gln Asp Glu Trp Val Ile Ile Asp Ile Arg Gly
                325                 330                 335

Leu Leu Arg Asn Ala Arg Tyr Arg Lys Leu Leu Lys Glu Lys Ser Thr
            340                 345                 350

Ile Pro Asp Leu Leu Ser Leu Phe Thr Gly Asp Pro Ser Ile Asp Met
        355                 360                 365

Arg Gln Gly Val Cys Thr Phe Ile Tyr Lys Ala Gly Gln Ala Cys Ser
    370                 375                 380

Ala Lys Met Val Lys Thr Lys Asn Ala Pro Glu Ile Leu Ser Glu Leu
385                 390                 395                 400

Thr Lys Ser Gly Pro Val Val Leu Val Ser Ile Asp Leu Gly Gln Thr
```

```
                405                 410                 415

Asn Pro Ile Ala Ala Lys Val Ser Arg Val Thr Gln Leu Ser Asp Gly
            420                 425                 430

Gln Leu Ser His Glu Thr Leu Leu Arg Glu Leu Leu Ser Asn Asp Ser
        435                 440                 445

Ser Asp Gly Lys Glu Ile Ala Arg Tyr Arg Val Ala Ser Asp Arg Leu
    450                 455                 460

Arg Asp Lys Leu Ala Asn Leu Ala Val Glu Arg Leu Ser Pro Glu His
465                 470                 475                 480

Lys Ser Glu Ile Leu Arg Ala Lys Asn Asp Thr Pro Ala Leu Cys Lys
                485                 490                 495

Ala Arg Val Cys Ala Ala Leu Gly Leu Asn Pro Glu Met Ile Ala Trp
            500                 505                 510

Asp Lys Met Thr Pro Tyr Thr Glu Phe Leu Ala Thr Ala Tyr Leu Glu
        515                 520                 525

Lys Gly Gly Asp Arg Lys Val Ala Thr Leu Lys Pro Lys Asn Arg Pro
    530                 535                 540

Glu Met Leu Arg Arg Asp Ile Lys Phe Lys Gly Thr Glu Gly Val Arg
545                 550                 555                 560

Ile Glu Val Ser Pro Glu Ala Ala Glu Ala Tyr Arg Glu Ala Gln Trp
                565                 570                 575

Asp Leu Gln Arg Thr Ser Pro Glu Tyr Leu Arg Leu Ser Thr Trp Lys
            580                 585                 590

Gln Glu Leu Thr Lys Arg Ile Leu Asn Gln Leu Arg His Lys Ala Ala
        595                 600                 605

Lys Ser Ser Gln Cys Glu Val Val Val Met Ala Phe Glu Asp Leu Asn
    610                 615                 620

Ile Lys Met Met His Gly Asn Gly Lys Trp Ala Asp Gly Gly Trp Asp
625                 630                 635                 640
```

```
Ala Phe Phe Ile Lys Lys Arg Glu Asn Arg Trp Phe Met Gln Ala Phe
                645                 650                 655

His Lys Ser Leu Thr Glu Leu Gly Ala His Lys Gly Val Pro Thr Ile
            660                 665                 670

Glu Val Thr Pro His Arg Thr Ser Ile Thr Cys Thr Lys Cys Gly His
        675                 680                 685

Cys Asp Lys Ala Asn Arg Asp Gly Glu Arg Phe Ala Cys Gln Lys Cys
    690                 695                 700

Gly Phe Val Ala His Ala Asp Leu Glu Ile Ala Thr Asp Asn Ile Glu
705                 710                 715                 720

Arg Val Ala Leu Thr Gly Lys Pro Met Pro Lys Pro Glu Ser Glu Arg
                725                 730                 735

Ser Gly Asp Ala Lys Lys Ser Val Gly Ala Arg Lys Ala Ala Phe Lys
            740                 745                 750

Pro Glu Glu Asp Ala Glu Ala Ala Glu
        755                 760


<210> 285
<211> 717
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 285
Met Ile Lys Pro Thr Val Ser Gln Phe Leu Thr Pro Gly Phe Lys Leu
1               5                   10                  15

Ile Arg Asn His Ser Arg Thr Ala Gly Leu Lys Leu Lys Asn Glu Gly
            20                  25                  30

Glu Glu Ala Cys Lys Lys Phe Val Arg Glu Asn Glu Ile Pro Lys Asp
        35                  40                  45

Glu Cys Pro Asn Phe Gln Gly Gly Pro Ala Ile Ala Asn Ile Ile Ala
    50                  55                  60
```

```
Lys Ser Arg Glu Phe Thr Glu Trp Glu Ile Tyr Gln Ser Ser Leu Ala
65                  70                  75                  80

Ile Gln Glu Val Ile Phe Thr Leu Pro Lys Asp Lys Leu Pro Glu Pro
                85                  90                  95

Ile Leu Lys Glu Glu Trp Arg Ala Gln Trp Leu Ser Glu His Gly Leu
            100                 105                 110

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

Asn Ala Val Asn Thr Tyr Lys Gly Val Gln Val Lys Val Asp Asn Lys
    130                 135                 140

Asn Lys Asn Asn Leu Ala Lys Ile Asn Arg Lys Asn Glu Ile Ala Lys
145                 150                 155                 160

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

Asp Lys Gly Tyr Leu Leu Gln Lys Pro Ser Pro Asn Lys Ser Ile Tyr
            180                 185                 190

Cys Tyr Gln Ser Val Ser Pro Lys Pro Phe Ile Thr Ser Lys Tyr His
        195                 200                 205

Asn Val Asn Leu Pro Glu Glu Tyr Ile Gly Tyr Tyr Arg Lys Ser Asn
    210                 215                 220

Glu Pro Ile Val Ser Pro Tyr Gln Phe Asp Arg Leu Arg Ile Pro Ile
225                 230                 235                 240

Gly Glu Pro Gly Tyr Val Pro Lys Trp Gln Tyr Thr Phe Leu Ser Lys
                245                 250                 255

Lys Glu Asn Lys Arg Arg Lys Leu Ser Lys Arg Ile Lys Asn Val Ser
            260                 265                 270

Pro Ile Leu Gly Ile Ile Cys Ile Lys Lys Asp Trp Cys Val Phe Asp
        275                 280                 285
```

```
Met Arg Gly Leu Leu Arg Thr Asn His Trp Lys Lys Tyr His Lys Pro
    290                 295                 300

Thr Asp Ser Ile Asn Asp Leu Phe Asp Tyr Phe Thr Gly Asp Pro Val
305                 310                 315                 320

Ile Asp Thr Lys Ala Asn Val Val Arg Phe Arg Tyr Lys Met Glu Asn
                325                 330                 335

Gly Ile Val Asn Tyr Lys Pro Val Arg Glu Lys Lys Gly Lys Glu Leu
            340                 345                 350

Leu Glu Asn Ile Cys Asp Gln Asn Gly Ser Cys Lys Leu Ala Thr Val
        355                 360                 365

Asp Val Gly Gln Asn Asn Pro Val Ala Ile Gly Leu Phe Glu Leu Lys
    370                 375                 380

Lys Val Asn Gly Glu Leu Thr Lys Thr Leu Ile Ser Arg His Pro Thr
385                 390                 395                 400

Pro Ile Asp Phe Cys Asn Lys Ile Thr Ala Tyr Arg Glu Arg Tyr Asp
                405                 410                 415

Lys Leu Glu Ser Ser Ile Lys Leu Asp Ala Ile Lys Gln Leu Thr Ser
            420                 425                 430

Glu Gln Lys Ile Glu Val Asp Asn Tyr Asn Asn Asn Phe Thr Pro Gln
        435                 440                 445

Asn Thr Lys Gln Ile Val Cys Ser Lys Leu Asn Ile Asn Pro Asn Asp
    450                 455                 460

Leu Pro Trp Asp Lys Met Ile Ser Gly Thr His Phe Ile Ser Glu Lys
465                 470                 475                 480

Ala Gln Val Ser Asn Lys Ser Glu Ile Tyr Phe Thr Ser Thr Asp Lys
                485                 490                 495

Gly Lys Thr Lys Asp Val Met Lys Ser Asp Tyr Lys Trp Phe Gln Asp
            500                 505                 510

Tyr Lys Pro Lys Leu Ser Lys Glu Val Arg Asp Ala Leu Ser Asp Ile
        515                 520                 525
```

```
Glu Trp Arg Leu Arg Arg Glu Ser Leu Glu Phe Asn Lys Leu Ser Lys
    530                 535                 540

Ser Arg Glu Gln Asp Ala Arg Gln Leu Ala Asn Trp Ile Ser Ser Met
545                 550                 555                 560

Cys Asp Val Ile Gly Ile Glu Asn Leu Val Lys Lys Asn Asn Phe Phe
                565                 570                 575

Gly Gly Ser Gly Lys Arg Glu Pro Gly Trp Asp Asn Phe Tyr Lys Pro
            580                 585                 590

Lys Lys Glu Asn Arg Trp Trp Ile Asn Ala Ile His Lys Ala Leu Thr
        595                 600                 605

Glu Leu Ser Gln Asn Lys Gly Lys Arg Val Ile Leu Leu Pro Ala Met
    610                 615                 620

Arg Thr Ser Ile Thr Cys Pro Lys Cys Lys Tyr Cys Asp Ser Lys Asn
625                 630                 635                 640

Arg Asn Gly Glu Lys Phe Asn Cys Leu Lys Cys Gly Ile Glu Leu Asn
                645                 650                 655

Ala Asp Ile Asp Val Ala Thr Glu Asn Leu Ala Thr Val Ala Ile Thr
            660                 665                 670

Ala Gln Ser Met Pro Lys Pro Thr Cys Glu Arg Ser Gly Asp Ala Lys
        675                 680                 685

Lys Pro Val Arg Ala Arg Lys Ala Lys Ala Pro Glu Phe His Asp Lys
    690                 695                 700

Leu Ala Pro Ser Tyr Thr Val Val Leu Arg Glu Ala Val
705                 710                 715


<210> 286
<211> 781
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
```

polypeptide"

<400> 286

```
Met Arg Gln Pro Ala Glu Lys Thr Ala Phe Gln Val Phe Arg Gln Glu
1               5                  10                  15

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

Arg Leu Tyr Lys Gln Gly Lys Met Glu Ala Ala Arg Glu Trp Leu Leu
        35                  40                  45

Lys Gly Ala Arg Asp Asp Val Pro Pro Asn Phe Gln Pro Pro Ala Lys
    50                  55                  60

Cys Leu Val Val Ala Val Ser His Pro Phe Glu Glu Trp Asp Ile Ser
65                  70                  75                  80

Lys Thr Asn His Asp Val Gln Ala Tyr Ile Tyr Ala Gln Pro Leu Gln
                85                  90                  95

Ala Glu Gly His Leu Asn Gly Leu Ser Glu Lys Trp Glu Asp Thr Ser
            100                 105                 110

Ala Asp Gln His Lys Leu Trp Phe Glu Lys Thr Gly Val Pro Asp Arg
        115                 120                 125

Gly Leu Pro Val Gln Ala Ile Asn Lys Ile Ala Lys Ala Ala Val Asn
    130                 135                 140

Arg Ala Phe Gly Val Val Arg Lys Val Glu Asn Arg Asn Glu Lys Arg
145                 150                 155                 160

Arg Ser Arg Asp Asn Arg Ile Ala Glu His Asn Arg Glu Asn Gly Leu
                165                 170                 175

Thr Glu Val Val Arg Glu Ala Pro Glu Val Ala Thr Asn Ala Asp Gly
            180                 185                 190

Phe Leu Leu His Pro Pro Gly Ile Asp Pro Ser Ile Leu Ser Tyr Ala
        195                 200                 205

Ser Val Ser Pro Val Pro Tyr Asn Ser Ser Lys His Ser Phe Val Arg
    210                 215                 220
```

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

Pro Gln Phe Val Val Glu Asp Arg Phe Ala Ile Pro Pro Gly Gln Pro
                245                 250                 255

Gly Tyr Val Pro Glu Trp Gln Arg Leu Lys Cys Ser Thr Asn Lys His
            260                 265                 270

Arg Arg Met Arg Gln Trp Ser Asn Gln Asp Tyr Lys Pro Lys Ala Gly
        275                 280                 285

Arg Arg Ala Lys Pro Leu Glu Phe Gln Ala His Leu Thr Arg Glu Arg
    290                 295                 300

Ala Lys Gly Ala Leu Leu Val Val Met Arg Ile Lys Glu Asp Trp Val
305                 310                 315                 320

Val Phe Asp Val Arg Gly Leu Leu Arg Asn Val Glu Trp Arg Lys Val
                325                 330                 335

Leu Ser Glu Glu Ala Arg Glu Lys Leu Thr Leu Lys Gly Leu Leu Asp
            340                 345                 350

Leu Phe Thr Gly Asp Pro Val Ile Asp Thr Lys Arg Gly Ile Val Thr
        355                 360                 365

Phe Leu Tyr Lys Ala Glu Ile Thr Lys Ile Leu Ser Lys Arg Thr Val
    370                 375                 380

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

Glu Asp Gly Leu Arg Arg Glu Val Gly Leu Val Ala Val Asp Leu Gly
                405                 410                 415

Gln Thr His Pro Ile Ala Ala Ala Ile Tyr Arg Ile Gly Arg Thr Ser
            420                 425                 430

Ala Gly Ala Leu Glu Ser Thr Val Leu His Arg Gln Gly Leu Arg Glu
        435                 440                 445

Asp Gln Lys Glu Lys Leu Lys Glu Tyr Arg Lys Arg His Thr Ala Leu
```

```
    450                 455                 460

Asp Ser Arg Leu Arg Lys Glu Ala Phe Glu Thr Leu Ser Val Glu Gln
465                 470                 475                 480

Gln Lys Glu Ile Val Thr Val Ser Gly Ser Gly Ala Gln Ile Thr Lys
                485                 490                 495

Asp Lys Val Cys Asn Tyr Leu Gly Val Asp Pro Ser Thr Leu Pro Trp
            500                 505                 510

Glu Lys Met Gly Ser Tyr Thr His Phe Ile Ser Asp Asp Phe Leu Arg
        515                 520                 525

Arg Gly Gly Asp Pro Asn Ile Val His Phe Asp Arg Gln Pro Lys Lys
    530                 535                 540

Gly Lys Val Ser Lys Lys Ser Gln Arg Ile Lys Arg Ser Asp Ser Gln
545                 550                 555                 560

Trp Val Gly Arg Met Arg Pro Arg Leu Ser Gln Glu Thr Ala Lys Ala
                565                 570                 575

Arg Met Glu Ala Asp Trp Ala Ala Gln Asn Glu Asn Glu Glu Tyr Lys
            580                 585                 590

Arg Leu Ala Arg Ser Lys Gln Glu Leu Ala Arg Trp Cys Val Asn Thr
        595                 600                 605

Leu Leu Gln Asn Thr Arg Cys Ile Thr Gln Cys Asp Glu Ile Val Val
    610                 615                 620

Val Ile Glu Asp Leu Asn Val Lys Ser Leu His Gly Lys Gly Ala Arg
625                 630                 635                 640

Glu Pro Gly Trp Asp Asn Phe Phe Thr Pro Lys Thr Glu Asn Arg Trp
                645                 650                 655

Phe Ile Gln Ile Leu His Lys Thr Phe Ser Glu Leu Pro Lys His Arg
            660                 665                 670

Gly Glu His Val Ile Glu Gly Cys Pro Leu Arg Thr Ser Ile Thr Cys
        675                 680                 685
```

Pro Ala Cys Ser Tyr Cys Asp Lys Asn Ser Arg Asn Gly Glu Lys Phe
690 695 700

Val Cys Val Ala Cys Gly Ala Thr Phe His Ala Asp Phe Glu Val Ala
705 710 715 720

Thr Tyr Asn Leu Val Arg Leu Ala Thr Thr Gly Met Pro Met Pro Lys
725 730 735

Ser Leu Glu Arg Gln Gly Gly Gly Glu Lys Ala Gly Gly Ala Arg Lys
740 745 750

Ala Arg Lys Lys Ala Lys Gln Val Glu Lys Ile Val Val Gln Ala Asn
755 760 765

Ala Asn Val Thr Met Asn Gly Ala Ser Leu His Ser Pro
770 775 780

<210> 287
<211> 793
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 287
Met Ser Ser Leu Pro Thr Pro Leu Glu Leu Leu Lys Gln Lys His Ala
1 5 10 15

Asp Leu Phe Lys Gly Leu Gln Phe Ser Ser Lys Asp Asn Lys Met Ala
20 25 30

Gly Lys Val Leu Lys Lys Asp Gly Glu Glu Ala Ala Leu Ala Phe Leu
35 40 45

Ser Glu Arg Gly Val Ser Arg Gly Glu Leu Pro Asn Phe Arg Pro Pro
50 55 60

Ala Lys Thr Leu Val Val Ala Gln Ser Arg Pro Phe Glu Glu Phe Pro
65 70 75 80

Ile Tyr Arg Val Ser Glu Ala Ile Gln Leu Tyr Val Tyr Ser Leu Ser
85 90 95

```
Val Lys Glu Leu Glu Thr Val Pro Ser Gly Ser Ser Thr Lys Lys Glu
            100                 105                 110

His Gln Arg Phe Phe Gln Asp Ser Ser Val Pro Asp Phe Gly Tyr Thr
        115                 120                 125

Ser Val Gln Gly Leu Asn Lys Ile Phe Gly Leu Ala Arg Gly Ile Tyr
    130                 135                 140

Leu Gly Val Ile Thr Arg Gly Glu Asn Gln Leu Gln Lys Ala Lys Ser
145                 150                 155                 160

Lys His Glu Ala Leu Asn Lys Lys Arg Arg Ala Ser Gly Glu Ala Glu
                165                 170                 175

Thr Glu Phe Asp Pro Thr Pro Tyr Glu Tyr Met Thr Pro Glu Arg Lys
            180                 185                 190

Leu Ala Lys Pro Pro Gly Val Asn His Ser Ile Met Cys Tyr Val Asp
        195                 200                 205

Ile Ser Val Asp Glu Phe Asp Phe Arg Asn Pro Asp Gly Ile Val Leu
    210                 215                 220

Pro Ser Glu Tyr Ala Gly Tyr Cys Arg Glu Ile Asn Thr Ala Ile Glu
225                 230                 235                 240

Lys Gly Thr Val Asp Arg Leu Gly His Leu Lys Gly Gly Pro Gly Tyr
                245                 250                 255

Ile Pro Gly His Gln Arg Lys Glu Ser Thr Thr Glu Gly Pro Lys Ile
            260                 265                 270

Asn Phe Arg Lys Gly Arg Ile Arg Arg Ser Tyr Thr Ala Leu Tyr Ala
        275                 280                 285

Lys Arg Asp Ser Arg Arg Val Arg Gln Gly Lys Leu Ala Leu Pro Ser
    290                 295                 300

Tyr Arg His His Met Met Arg Leu Asn Ser Asn Ala Glu Ser Ala Ile
305                 310                 315                 320
```

```
Leu Ala Val Ile Phe Phe Gly Lys Asp Trp Val Val Phe Asp Leu Arg
                325                 330                 335

Gly Leu Leu Arg Asn Val Arg Trp Arg Asn Leu Phe Val Asp Gly Ser
            340                 345                 350

Thr Pro Ser Thr Leu Leu Gly Met Phe Gly Asp Pro Val Ile Asp Pro
        355                 360                 365

Lys Arg Gly Val Val Ala Phe Cys Tyr Lys Glu Gln Ile Val Pro Val
    370                 375                 380

Val Ser Lys Ser Ile Thr Lys Met Val Lys Ala Pro Glu Leu Leu Asn
385                 390                 395                 400

Lys Leu Tyr Leu Lys Ser Glu Asp Pro Leu Val Leu Val Ala Ile Asp
                405                 410                 415

Leu Gly Gln Thr Asn Pro Val Gly Val Gly Val Tyr Arg Val Met Asn
            420                 425                 430

Ala Ser Leu Asp Tyr Glu Val Val Thr Arg Phe Ala Leu Glu Ser Glu
        435                 440                 445

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

Ala Gln Ile Arg Ala Glu Thr Phe Asp Ala Met Thr Ser Glu Glu Gln
465                 470                 475                 480

Glu Glu Ile Thr Arg Val Arg Ala Phe Ser Ala Ser Lys Ala Lys Glu
                485                 490                 495

Asn Val Cys His Arg Phe Gly Met Pro Val Asp Ala Val Asp Trp Ala
            500                 505                 510

Thr Met Gly Ser Asn Thr Ile His Ile Ala Lys Trp Val Met Arg His
        515                 520                 525

Gly Asp Pro Ser Leu Val Glu Val Leu Glu Tyr Arg Lys Asp Asn Glu
    530                 535                 540

Ile Lys Leu Asp Lys Asn Gly Val Pro Lys Lys Val Lys Leu Thr Asp
545                 550                 555                 560
```

```
Lys Arg Ile Ala Asn Leu Thr Ser Ile Arg Leu Arg Phe Ser Gln Glu
                565                 570                 575

Thr Ser Lys His Tyr Asn Asp Thr Met Trp Glu Leu Arg Arg Lys His
            580                 585                 590

Pro Val Tyr Gln Lys Leu Ser Lys Ser Lys Ala Asp Phe Ser Arg Arg
        595                 600                 605

Val Val Asn Ser Ile Ile Arg Arg Val Asn His Leu Val Pro Arg Ala
    610                 615                 620

Arg Ile Val Phe Ile Ile Glu Asp Leu Lys Asn Leu Gly Lys Val Phe
625                 630                 635                 640

His Gly Ser Gly Lys Arg Glu Leu Gly Trp Asp Ser Tyr Phe Glu Pro
                645                 650                 655

Lys Ser Glu Asn Arg Trp Phe Ile Gln Val Leu His Lys Ala Phe Ser
            660                 665                 670

Glu Thr Gly Lys His Lys Gly Tyr Tyr Ile Ile Glu Cys Trp Pro Asn
        675                 680                 685

Trp Thr Ser Cys Thr Cys Pro Lys Cys Ser Cys Cys Asp Ser Glu Asn
    690                 695                 700

Arg His Gly Glu Val Phe Arg Cys Leu Ala Cys Gly Tyr Thr Cys Asn
705                 710                 715                 720

Thr Asp Phe Gly Thr Ala Pro Asp Asn Leu Val Lys Ile Ala Thr Thr
                725                 730                 735

Gly Lys Gly Leu Pro Gly Pro Lys Lys Arg Cys Lys Gly Ser Ser Lys
            740                 745                 750

Gly Lys Asn Pro Lys Ile Ala Arg Ser Ser Glu Thr Gly Val Ser Val
        755                 760                 765

Thr Glu Ser Gly Ala Pro Lys Val Lys Lys Ser Ser Pro Thr Gln Thr
    770                 775                 780
```

Ser Gln Ser Ser Ser Gln Ser Ala Pro
785 790

<210> 288
<211> 717
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 288
Met Ile Lys Pro Thr Val Ser Gln Phe Leu Thr Pro Gly Phe Lys Leu
1 5 10 15

Ile Arg Asn His Ser Arg Thr Ala Gly Leu Lys Leu Lys Asn Glu Gly
20 25 30

Glu Glu Ala Cys Lys Lys Phe Val Arg Glu Asn Glu Ile Pro Lys Asp
35 40 45

Glu Cys Pro Asn Phe Gln Gly Gly Pro Ala Ile Ala Asn Ile Ile Ala
50 55 60

Lys Ser Arg Glu Phe Thr Glu Trp Glu Ile Tyr Gln Ser Ser Leu Ala
65 70 75 80

Ile Gln Glu Val Ile Phe Thr Leu Pro Lys Asp Lys Leu Pro Glu Pro
85 90 95

Ile Leu Lys Glu Glu Trp Arg Ala Gln Trp Leu Ser Glu His Gly Leu
100 105 110

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

Asn Ala Val Asn Thr Tyr Lys Gly Val Gln Val Lys Val Asp Asn Lys
130 135 140

Asn Lys Asn Asn Leu Ala Lys Ile Asn Arg Lys Asn Glu Ile Ala Lys
145 150 155 160

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

```
Asp Lys Gly Tyr Leu Leu Gln Lys Pro Ser Pro Asn Lys Ser Ile Tyr
            180                 185                 190

Cys Tyr Gln Ser Val Ser Pro Lys Pro Phe Ile Thr Ser Lys Tyr His
        195                 200                 205

Asn Val Asn Leu Pro Glu Glu Tyr Ile Gly Tyr Tyr Arg Lys Ser Asn
    210                 215                 220

Glu Pro Ile Val Ser Pro Tyr Gln Phe Asp Arg Leu Arg Ile Pro Ile
225                 230                 235                 240

Gly Glu Pro Gly Tyr Val Pro Lys Trp Gln Tyr Thr Phe Leu Ser Lys
                245                 250                 255

Lys Glu Asn Lys Arg Arg Lys Leu Ser Lys Arg Ile Lys Asn Val Ser
            260                 265                 270

Pro Ile Leu Gly Ile Ile Cys Ile Lys Lys Asp Trp Cys Val Phe Asp
        275                 280                 285

Met Arg Gly Leu Leu Arg Thr Asn His Trp Lys Lys Tyr His Lys Pro
    290                 295                 300

Thr Asp Ser Ile Asn Asp Leu Phe Asp Tyr Phe Thr Gly Asp Pro Val
305                 310                 315                 320

Ile Asp Thr Lys Ala Asn Val Val Arg Phe Arg Tyr Lys Met Glu Asn
                325                 330                 335

Gly Ile Val Asn Tyr Lys Pro Val Arg Glu Lys Lys Gly Lys Glu Leu
            340                 345                 350

Leu Glu Asn Ile Cys Asp Gln Asn Gly Ser Cys Lys Leu Ala Thr Val
        355                 360                 365

Asp Val Gly Gln Asn Asn Pro Val Ala Ile Gly Leu Phe Glu Leu Lys
    370                 375                 380

Lys Val Asn Gly Glu Leu Thr Lys Thr Leu Ile Ser Arg His Pro Thr
385                 390                 395                 400

Pro Ile Asp Phe Cys Asn Lys Ile Thr Ala Tyr Arg Glu Arg Tyr Asp
```

```
                405                 410                 415

Lys Leu Glu Ser Ser Ile Lys Leu Asp Ala Ile Lys Gln Leu Thr Ser
            420                 425                 430

Glu Gln Lys Ile Glu Val Asp Asn Tyr Asn Asn Asn Phe Thr Pro Gln
        435                 440                 445

Asn Thr Lys Gln Ile Val Cys Ser Lys Leu Asn Ile Asn Pro Asn Asp
    450                 455                 460

Leu Pro Trp Asp Lys Met Ile Ser Gly Thr His Phe Ile Ser Glu Lys
465                 470                 475                 480

Ala Gln Val Ser Asn Lys Ser Glu Ile Tyr Phe Thr Ser Thr Asp Lys
                485                 490                 495

Gly Lys Thr Lys Asp Val Met Lys Ser Asp Tyr Lys Trp Phe Gln Asp
            500                 505                 510

Tyr Lys Pro Lys Leu Ser Lys Glu Val Arg Asp Ala Leu Ser Asp Ile
        515                 520                 525

Glu Trp Arg Leu Arg Arg Glu Ser Leu Glu Phe Asn Lys Leu Ser Lys
    530                 535                 540

Ser Arg Glu Gln Asp Ala Arg Gln Leu Ala Asn Trp Ile Ser Ser Met
545                 550                 555                 560

Cys Asp Val Ile Gly Ile Glu Asn Leu Val Lys Lys Asn Asn Phe Phe
                565                 570                 575

Gly Gly Ser Gly Lys Arg Glu Pro Gly Trp Asp Asn Phe Tyr Lys Pro
            580                 585                 590

Lys Lys Glu Asn Arg Trp Trp Ile Asn Ala Ile His Lys Ala Leu Thr
        595                 600                 605

Glu Leu Ser Gln Asn Lys Gly Lys Arg Val Ile Leu Leu Pro Ala Met
    610                 615                 620

Arg Thr Ser Ile Thr Cys Pro Lys Cys Lys Tyr Cys Asp Ser Lys Asn
625                 630                 635                 640
```

```
Arg Asn Gly Glu Lys Phe Asn Cys Leu Lys Cys Gly Ile Glu Leu Asn
                645                 650                 655

Ala Asp Ile Asp Val Ala Thr Glu Asn Leu Ala Thr Val Ala Ile Thr
            660                 665                 670

Ala Gln Ser Met Pro Lys Pro Thr Cys Glu Arg Ser Gly Asp Ala Lys
        675                 680                 685

Lys Pro Val Arg Ala Arg Lys Ala Lys Ala Pro Glu Phe His Asp Lys
    690                 695                 700

Leu Ala Pro Ser Tyr Thr Val Val Leu Arg Glu Ala Val
705                 710                 715
```

<210> 289
<211> 761
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 289

```
Met Ser Asn Lys Thr Thr Pro Pro Ser Pro Leu Ser Leu Leu Leu Arg
1               5                   10                  15

Ala His Phe Pro Gly Leu Lys Phe Glu Ser Gln Asp Tyr Lys Ile Ala
            20                  25                  30

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

Thr Gly Lys Gly Gln Ala Lys Leu Lys Asp Val Lys Pro Pro Ala Lys
    50                  55                  60

Ala Phe Val Ile Ala Gln Ser Arg Pro Phe Ile Glu Trp Asp Leu Val
65                  70                  75                  80

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

Lys Gly Arg Pro Lys Gln Asp Gly Leu Ser Glu Thr Ala Phe Asn Glu
            100                 105                 110
```

```
Ala Val Ala Ser Leu Glu Val Asp Gly Lys Ser Lys Leu Asn Glu Glu
        115                 120                 125

Thr Arg Ala Ala Phe Tyr Glu Val Leu Gly Leu Asp Ala Pro Ser Leu
    130                 135                 140

His Ala Gln Ala Gln Asn Ala Leu Ile Lys Ser Ala Ile Ser Ile Arg
145                 150                 155                 160

Glu Gly Val Leu Lys Lys Val Glu Asn Arg Asn Glu Lys Asn Leu Ser
                165                 170                 175

Lys Thr Lys Arg Arg Lys Glu Ala Gly Glu Glu Ala Thr Phe Val Glu
            180                 185                 190

Glu Lys Ala His Asp Glu Arg Gly Tyr Leu Ile His Pro Pro Gly Val
        195                 200                 205

Asn Gln Thr Ile Pro Gly Tyr Gln Ala Val Val Ile Lys Ser Cys Pro
    210                 215                 220

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

Glu Ala Leu Thr Asp Tyr Leu Pro His Asp Arg Met Thr Ile Pro Lys
                245                 250                 255

Gly Gln Pro Gly Tyr Val Pro Glu Trp Gln His Pro Leu Leu Asn Arg
            260                 265                 270

Arg Lys Asn Arg Arg Arg Arg Asp Trp Tyr Ser Ala Ser Leu Asn Lys
        275                 280                 285

Pro Lys Ala Thr Cys Ser Lys Arg Ser Gly Thr Pro Asn Arg Lys Asn
    290                 295                 300

Ser Arg Thr Asp Gln Ile Gln Ser Gly Arg Phe Lys Gly Ala Ile Pro
305                 310                 315                 320

Val Leu Met Arg Phe Gln Asp Glu Trp Val Ile Ile Asp Ile Arg Gly
                325                 330                 335
```

```
Leu Leu Arg Asn Ala Arg Tyr Arg Lys Leu Leu Lys Glu Lys Ser Thr
            340                 345                 350

Ile Pro Asp Leu Leu Ser Leu Phe Thr Gly Asp Pro Ser Ile Asp Met
        355                 360                 365

Arg Gln Gly Val Cys Thr Phe Ile Tyr Lys Ala Gly Gln Ala Cys Ser
    370                 375                 380

Ala Lys Met Val Lys Thr Lys Asn Ala Pro Glu Ile Leu Ser Glu Leu
385                 390                 395                 400

Thr Lys Ser Gly Pro Val Val Leu Val Ser Ile Asp Leu Gly Gln Thr
                405                 410                 415

Asn Pro Ile Ala Ala Lys Val Ser Arg Val Thr Gln Leu Ser Asp Gly
            420                 425                 430

Gln Leu Ser His Glu Thr Leu Leu Arg Glu Leu Leu Ser Asn Asp Ser
        435                 440                 445

Ser Asp Gly Lys Glu Ile Ala Arg Tyr Arg Val Ala Ser Asp Arg Leu
    450                 455                 460

Arg Asp Lys Leu Ala Asn Leu Ala Val Glu Arg Leu Ser Pro Glu His
465                 470                 475                 480

Lys Ser Glu Ile Leu Arg Ala Lys Asn Asp Thr Pro Ala Leu Cys Lys
                485                 490                 495

Ala Arg Val Cys Ala Ala Leu Gly Leu Asn Pro Glu Met Ile Ala Trp
            500                 505                 510

Asp Lys Met Thr Pro Tyr Thr Glu Phe Leu Ala Thr Ala Tyr Leu Glu
        515                 520                 525

Lys Gly Gly Asp Arg Lys Val Ala Thr Leu Lys Pro Lys Asn Arg Pro
    530                 535                 540

Glu Met Leu Arg Arg Asp Ile Lys Phe Lys Gly Thr Glu Gly Val Arg
545                 550                 555                 560

Ile Glu Val Ser Pro Glu Ala Ala Glu Ala Tyr Arg Glu Ala Gln Trp
                565                 570                 575
```

```
Asp Leu Gln Arg Thr Ser Pro Glu Tyr Leu Arg Leu Ser Thr Trp Lys
            580                 585                 590

Gln Glu Leu Thr Lys Arg Ile Leu Asn Gln Leu Arg His Lys Ala Ala
        595                 600                 605

Lys Ser Ser Gln Cys Glu Val Val Val Met Ala Phe Glu Asp Leu Asn
    610                 615                 620

Ile Lys Met Met His Gly Asn Gly Lys Trp Ala Asp Gly Gly Trp Asp
625                 630                 635                 640

Ala Phe Phe Ile Lys Lys Arg Glu Asn Arg Trp Phe Met Gln Ala Phe
                645                 650                 655

His Lys Ser Leu Thr Glu Leu Gly Ala His Lys Gly Val Pro Thr Ile
            660                 665                 670

Glu Val Thr Pro His Arg Thr Ser Ile Thr Cys Thr Lys Cys Gly His
        675                 680                 685

Cys Asp Lys Ala Asn Arg Asp Gly Glu Arg Phe Ala Cys Gln Lys Cys
    690                 695                 700

Gly Phe Val Ala His Ala Asp Leu Glu Ile Ala Thr Asp Asn Ile Glu
705                 710                 715                 720

Arg Val Ala Leu Thr Gly Lys Pro Met Pro Lys Pro Glu Ser Glu Arg
                725                 730                 735

Ser Gly Asp Ala Lys Lys Ser Val Gly Ala Arg Lys Ala Ala Phe Lys
            740                 745                 750

Pro Glu Glu Asp Ala Glu Ala Ala Glu
        755                 760
```

<210> 290
<211> 765
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic

polypeptide"

<400> 290

```
Met Tyr Ser Leu Glu Met Ala Asp Leu Lys Ser Glu Pro Ser Leu Leu
1               5                  10                  15

Ala Lys Leu Leu Arg Asp Arg Phe Pro Gly Lys Tyr Trp Leu Pro Lys
            20                  25                  30

Tyr Trp Lys Leu Ala Glu Lys Lys Arg Leu Thr Gly Gly Glu Glu Ala
        35                  40                  45

Ala Cys Glu Tyr Met Ala Asp Lys Gln Leu Asp Ser Pro Pro Pro Asn
    50                  55                  60

Phe Arg Pro Pro Ala Arg Cys Val Ile Leu Ala Lys Ser Arg Pro Phe
65                  70                  75                  80

Glu Asp Trp Pro Val His Arg Val Ala Ser Lys Ala Gln Ser Phe Val
                85                  90                  95

Ile Gly Leu Ser Glu Gln Gly Phe Ala Ala Leu Arg Ala Ala Pro Pro
            100                 105                 110

Ser Thr Ala Asp Ala Arg Arg Asp Trp Leu Arg Ser His Gly Ala Ser
        115                 120                 125

Glu Asp Asp Leu Met Ala Leu Glu Ala Gln Leu Leu Glu Thr Ile Met
    130                 135                 140

Gly Asn Ala Ile Ser Leu His Gly Gly Val Leu Lys Lys Ile Asp Asn
145                 150                 155                 160

Ala Asn Val Lys Ala Ala Lys Arg Leu Ser Gly Arg Asn Glu Ala Arg
                165                 170                 175

Leu Asn Lys Gly Leu Gln Glu Leu Pro Pro Glu Gln Glu Gly Ser Ala
            180                 185                 190

Tyr Gly Ala Asp Gly Leu Leu Val Asn Pro Pro Gly Leu Asn Leu Asn
        195                 200                 205

Ile Tyr Cys Arg Lys Ser Cys Cys Pro Lys Pro Val Lys Asn Thr Ala
    210                 215                 220
```

```
Arg Phe Val Gly His Tyr Pro Gly Tyr Leu Arg Asp Ser Asp Ser Ile
225                 230                 235                 240

Leu Ile Ser Gly Thr Met Asp Arg Leu Thr Ile Ile Glu Gly Met Pro
                245                 250                 255

Gly His Ile Pro Ala Trp Gln Arg Glu Gln Gly Leu Val Lys Pro Gly
            260                 265                 270

Gly Arg Arg Arg Arg Leu Ser Gly Ser Glu Ser Asn Met Arg Gln Lys
        275                 280                 285

Val Asp Pro Ser Thr Gly Pro Arg Arg Ser Thr Arg Ser Gly Thr Val
    290                 295                 300

Asn Arg Ser Asn Gln Arg Thr Gly Arg Asn Gly Asp Pro Leu Leu Val
305                 310                 315                 320

Glu Ile Arg Met Lys Glu Asp Trp Val Leu Leu Asp Ala Arg Gly Leu
                325                 330                 335

Leu Arg Asn Leu Arg Trp Arg Glu Ser Lys Arg Gly Leu Ser Cys Asp
            340                 345                 350

His Glu Asp Leu Ser Leu Ser Gly Leu Leu Ala Leu Phe Ser Gly Asp
        355                 360                 365

Pro Val Ile Asp Pro Val Arg Asn Glu Val Val Phe Leu Tyr Gly Glu
    370                 375                 380

Gly Ile Ile Pro Val Arg Ser Thr Lys Pro Val Gly Thr Arg Gln Ser
385                 390                 395                 400

Lys Lys Leu Leu Glu Arg Gln Ala Ser Met Gly Pro Leu Thr Leu Ile
                405                 410                 415

Ser Cys Asp Leu Gly Gln Thr Asn Leu Ile Ala Gly Arg Ala Ser Ala
            420                 425                 430

Ile Ser Leu Thr His Gly Ser Leu Gly Val Arg Ser Ser Val Arg Ile
        435                 440                 445

Glu Leu Asp Pro Glu Ile Ile Lys Ser Phe Glu Arg Leu Arg Lys Asp
```

```
    450                 455                 460

Ala Asp Arg Leu Glu Thr Glu Ile Leu Thr Ala Ala Lys Glu Thr Leu
465                 470                 475                 480

Ser Asp Glu Gln Arg Gly Glu Val Asn Ser His Glu Lys Asp Ser Pro
                485                 490                 495

Gln Thr Ala Lys Ala Ser Leu Cys Arg Glu Leu Gly Leu His Pro Pro
            500                 505                 510

Ser Leu Pro Trp Gly Gln Met Gly Pro Ser Thr Thr Phe Ile Ala Asp
        515                 520                 525

Met Leu Ile Ser His Gly Arg Asp Asp Asp Ala Phe Leu Ser His Gly
    530                 535                 540

Glu Phe Pro Thr Leu Glu Lys Arg Lys Lys Phe Asp Lys Arg Phe Cys
545                 550                 555                 560

Leu Glu Ser Arg Pro Leu Leu Ser Ser Glu Thr Arg Lys Ala Leu Asn
                565                 570                 575

Glu Ser Leu Trp Glu Val Lys Arg Thr Ser Ser Glu Tyr Ala Arg Leu
            580                 585                 590

Ser Gln Arg Lys Lys Glu Met Ala Arg Arg Ala Val Asn Phe Val Val
        595                 600                 605

Glu Ile Ser Arg Arg Lys Thr Gly Leu Ser Asn Val Ile Val Asn Ile
    610                 615                 620

Glu Asp Leu Asn Val Arg Ile Phe His Gly Gly Gly Lys Gln Ala Pro
625                 630                 635                 640

Gly Trp Asp Gly Phe Phe Arg Pro Lys Ser Glu Asn Arg Trp Phe Ile
                645                 650                 655

Gln Ala Ile His Lys Ala Phe Ser Asp Leu Ala Ala His His Gly Ile
            660                 665                 670

Pro Val Ile Glu Ser Asp Pro Gln Arg Thr Ser Met Thr Cys Pro Glu
        675                 680                 685
```

```
Cys Gly His Cys Asp Ser Lys Asn Arg Asn Gly Val Arg Phe Leu Cys
    690                 695                 700

Lys Gly Cys Gly Ala Ser Met Asp Ala Asp Phe Asp Ala Ala Cys Arg
705                 710                 715                 720

Asn Leu Glu Arg Val Ala Leu Thr Gly Lys Pro Met Pro Lys Pro Ser
                725                 730                 735

Thr Ser Cys Glu Arg Leu Leu Ser Ala Thr Thr Gly Lys Val Cys Ser
            740                 745                 750

Asp His Ser Leu Ser His Asp Ala Ile Glu Lys Ala Ser
        755                 760                 765
```

<210> 291
<211> 766
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 291

```
Met Glu Lys Glu Ile Thr Glu Leu Thr Lys Ile Arg Arg Glu Phe Pro
1               5                   10                  15

Asn Lys Lys Phe Ser Ser Thr Asp Met Lys Lys Ala Gly Lys Leu Leu
            20                  25                  30

Lys Ala Glu Gly Pro Asp Ala Val Arg Asp Phe Leu Asn Ser Cys Gln
        35                  40                  45

Glu Ile Ile Gly Asp Phe Lys Pro Pro Val Lys Thr Asn Ile Val Ser
    50                  55                  60

Ile Ser Arg Pro Phe Glu Glu Trp Pro Val Ser Met Val Gly Arg Ala
65                  70                  75                  80

Ile Gln Glu Tyr Tyr Phe Ser Leu Thr Lys Glu Glu Leu Glu Ser Val
                85                  90                  95

His Pro Gly Thr Ser Ser Glu Asp His Lys Ser Phe Phe Asn Ile Thr
            100                 105                 110
```

```
Gly Leu Ser Asn Tyr Asn Tyr Thr Ser Val Gln Gly Leu Asn Leu Ile
        115                 120                 125

Phe Lys Asn Ala Lys Ala Ile Tyr Asp Gly Thr Leu Val Lys Ala Asn
    130                 135                 140

Asn Lys Asn Lys Lys Leu Glu Lys Lys Phe Asn Glu Ile Asn His Lys
145                 150                 155                 160

Arg Ser Leu Glu Gly Leu Pro Ile Ile Thr Pro Asp Phe Glu Glu Pro
                165                 170                 175

Phe Asp Glu Asn Gly His Leu Asn Asn Pro Pro Gly Ile Asn Arg Asn
            180                 185                 190

Ile Tyr Gly Tyr Gln Gly Cys Ala Ala Lys Val Phe Val Pro Ser Lys
        195                 200                 205

His Lys Met Val Ser Leu Pro Lys Glu Tyr Glu Gly Tyr Asn Arg Asp
    210                 215                 220

Pro Asn Leu Ser Leu Ala Gly Phe Arg Asn Arg Leu Glu Ile Pro Glu
225                 230                 235                 240

Gly Glu Pro Gly His Val Pro Trp Phe Gln Arg Met Asp Ile Pro Glu
                245                 250                 255

Gly Gln Ile Gly His Val Asn Lys Ile Gln Arg Phe Asn Phe Val His
            260                 265                 270

Gly Lys Asn Ser Gly Lys Val Lys Phe Ser Asp Lys Thr Gly Arg Val
        275                 280                 285

Lys Arg Tyr His His Ser Lys Tyr Lys Asp Ala Thr Lys Pro Tyr Lys
    290                 295                 300

Phe Leu Glu Glu Ser Lys Lys Val Ser Ala Leu Asp Ser Ile Leu Ala
305                 310                 315                 320

Ile Ile Thr Ile Gly Asp Asp Trp Val Val Phe Asp Ile Arg Gly Leu
                325                 330                 335
```

```
Tyr Arg Asn Val Phe Tyr Arg Glu Leu Ala Gln Lys Gly Leu Thr Ala
            340                 345                 350

Val Gln Leu Leu Asp Leu Phe Thr Gly Asp Pro Val Ile Asp Pro Lys
        355                 360                 365

Lys Gly Val Val Thr Phe Ser Tyr Lys Glu Gly Val Val Pro Val Phe
    370                 375                 380

Ser Gln Lys Ile Val Pro Arg Phe Lys Ser Arg Asp Thr Leu Glu Lys
385                 390                 395                 400

Leu Thr Ser Gln Gly Pro Val Ala Leu Leu Ser Val Asp Leu Gly Gln
                405                 410                 415

Asn Glu Pro Val Ala Ala Arg Val Cys Ser Leu Lys Asn Ile Asn Asp
            420                 425                 430

Lys Ile Thr Leu Asp Asn Ser Cys Arg Ile Ser Phe Leu Asp Asp Tyr
        435                 440                 445

Lys Lys Gln Ile Lys Asp Tyr Arg Asp Ser Leu Asp Glu Leu Glu Ile
    450                 455                 460

Lys Ile Arg Leu Glu Ala Ile Asn Ser Leu Glu Thr Asn Gln Gln Val
465                 470                 475                 480

Glu Ile Arg Asp Leu Asp Val Phe Ser Ala Asp Arg Ala Lys Ala Asn
                485                 490                 495

Thr Val Asp Met Phe Asp Ile Asp Pro Asn Leu Ile Ser Trp Asp Ser
            500                 505                 510

Met Ser Asp Ala Arg Val Ser Thr Gln Ile Ser Asp Leu Tyr Leu Lys
        515                 520                 525

Asn Gly Gly Asp Glu Ser Arg Val Tyr Phe Glu Ile Asn Asn Lys Arg
    530                 535                 540

Ile Lys Arg Ser Asp Tyr Asn Ile Ser Gln Leu Val Arg Pro Lys Leu
545                 550                 555                 560

Ser Asp Ser Thr Arg Lys Asn Leu Asn Asp Ser Ile Trp Lys Leu Lys
                565                 570                 575
```

```
Arg Thr Ser Glu Glu Tyr Leu Lys Leu Ser Lys Arg Lys Leu Glu Leu
            580                 585                 590

Ser Arg Ala Val Val Asn Tyr Thr Ile Arg Gln Ser Lys Leu Leu Ser
        595                 600                 605

Gly Ile Asn Asp Ile Val Ile Ile Leu Glu Asp Leu Asp Val Lys Lys
    610                 615                 620

Lys Phe Asn Gly Arg Gly Ile Arg Asp Ile Gly Trp Asp Asn Phe Phe
625                 630                 635                 640

Ser Ser Arg Lys Glu Asn Arg Trp Phe Ile Pro Ala Phe His Lys Thr
                645                 650                 655

Phe Ser Glu Leu Ser Ser Asn Arg Gly Leu Cys Val Ile Glu Val Asn
            660                 665                 670

Pro Ala Trp Thr Ser Ala Thr Cys Pro Asp Cys Gly Phe Cys Ser Lys
        675                 680                 685

Glu Asn Arg Asp Gly Ile Asn Phe Thr Cys Arg Lys Cys Gly Val Ser
    690                 695                 700

Tyr His Ala Asp Ile Asp Val Ala Thr Leu Asn Ile Ala Arg Val Ala
705                 710                 715                 720

Val Leu Gly Lys Pro Met Ser Gly Pro Ala Asp Arg Glu Arg Leu Gly
                725                 730                 735

Asp Thr Lys Lys Pro Arg Val Ala Arg Ser Arg Lys Thr Met Lys Arg
            740                 745                 750

Lys Asp Ile Ser Asn Ser Thr Val Glu Ala Met Val Thr Ala
        755                 760                 765
```

<210> 292
<211> 870
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic

polypeptide"

<400> 292

```
Met Leu Val Arg Thr Ser Thr Leu Val Gln Asp Asn Lys Asn Ser Arg
1               5                  10                  15

Ser Ala Ser Arg Ala Phe Leu Lys Lys Pro Lys Met Pro Lys Asn Lys
            20                  25                  30

His Ile Lys Glu Pro Thr Glu Leu Ala Lys Leu Ile Arg Glu Leu Phe
        35                  40                  45

Pro Gly Gln Arg Phe Thr Arg Ala Ile Asn Thr Gln Ala Gly Lys Ile
    50                  55                  60

Leu Lys His Lys Gly Arg Asp Glu Val Val Glu Phe Leu Lys Asn Lys
65                  70                  75                  80

Gly Ile Asp Lys Glu Gln Phe Met Asp Phe Arg Pro Pro Thr Lys Ala
                85                  90                  95

Arg Ile Val Ala Thr Ser Gly Ala Ile Glu Glu Phe Ser Tyr Leu Arg
            100                 105                 110

Val Ser Met Ala Ile Gln Glu Cys Cys Phe Gly Lys Tyr Lys Phe Pro
        115                 120                 125

Lys Glu Lys Val Asn Gly Lys Leu Val Leu Glu Thr Val Gly Leu Thr
    130                 135                 140

Lys Glu Glu Leu Asp Asp Phe Leu Pro Lys Lys Tyr Tyr Glu Asn Lys
145                 150                 155                 160

Lys Ser Arg Asp Arg Phe Phe Leu Lys Thr Gly Ile Cys Asp Tyr Gly
                165                 170                 175

Tyr Thr Tyr Ala Gln Gly Leu Asn Glu Ile Phe Arg Asn Thr Arg Ala
            180                 185                 190

Ile Tyr Glu Gly Val Phe Thr Lys Val Asn Asn Arg Asn Glu Lys Arg
        195                 200                 205

Arg Glu Lys Lys Asp Lys Tyr Asn Glu Glu Arg Arg Ser Lys Gly Leu
    210                 215                 220
```

```
Ser Glu Glu Pro Tyr Asp Glu Asp Glu Ser Ala Thr Asp Glu Ser Gly
225                 230                 235                 240

His Leu Ile Asn Pro Pro Gly Val Asn Leu Asn Ile Trp Thr Cys Glu
                245                 250                 255

Gly Phe Cys Lys Gly Pro Tyr Val Thr Lys Leu Ser Gly Thr Pro Gly
            260                 265                 270

Tyr Glu Val Ile Leu Pro Lys Val Phe Asp Gly Tyr Asn Arg Asp Pro
        275                 280                 285

Asn Glu Ile Ile Ser Cys Gly Ile Thr Asp Arg Phe Ala Ile Pro Glu
    290                 295                 300

Gly Glu Pro Gly His Ile Pro Trp His Gln Arg Leu Glu Ile Pro Glu
305                 310                 315                 320

Gly Gln Pro Gly Tyr Val Pro Gly His Gln Arg Phe Ala Asp Thr Gly
                325                 330                 335

Gln Asn Asn Ser Gly Lys Ala Asn Pro Asn Lys Lys Gly Arg Met Arg
            340                 345                 350

Lys Tyr Tyr Gly His Gly Thr Lys Tyr Thr Gln Pro Gly Glu Tyr Gln
        355                 360                 365

Glu Val Phe Arg Lys Gly His Arg Glu Gly Asn Lys Arg Arg Tyr Trp
    370                 375                 380

Glu Glu Asp Phe Arg Ser Glu Ala His Asp Cys Ile Leu Tyr Val Ile
385                 390                 395                 400

His Ile Gly Asp Asp Trp Val Val Cys Asp Leu Arg Gly Pro Leu Arg
                405                 410                 415

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

Glu Leu Cys Asn Leu Phe Ser Gly Asp Pro Val Ile Asp Pro Lys His
        435                 440                 445

Gly Val Val Thr Phe Cys Tyr Lys Asn Gly Leu Val Arg Ala Gln Lys
```

```
    450                 455                 460

Thr Ile Ser Ala Gly Lys Lys Ser Arg Glu Leu Leu Gly Ala Leu Thr
465                 470                 475                 480

Ser Gln Gly Pro Ile Ala Leu Ile Gly Val Asp Leu Gly Gln Thr Glu
                485                 490                 495

Pro Val Gly Ala Arg Ala Phe Ile Val Asn Gln Ala Arg Gly Ser Leu
            500                 505                 510

Ser Leu Pro Thr Leu Lys Gly Ser Phe Leu Leu Thr Ala Glu Asn Ser
        515                 520                 525

Ser Ser Trp Asn Val Phe Lys Gly Glu Ile Lys Ala Tyr Arg Glu Ala
    530                 535                 540

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

Ser Val Glu Gln Gln Thr Glu Ile Glu Ser Tyr Glu Ala Phe Ser Ala
                565                 570                 575

Glu Asp Ala Lys Gln Leu Ala Cys Glu Lys Phe Gly Val Asp Ser Ser
            580                 585                 590

Phe Ile Leu Trp Glu Asp Met Thr Pro Tyr His Thr Gly Pro Ala Thr
        595                 600                 605

Tyr Tyr Phe Ala Lys Gln Phe Leu Lys Lys Asn Gly Gly Asn Lys Ser
    610                 615                 620

Leu Ile Glu Tyr Ile Pro Tyr Gln Lys Lys Lys Ser Lys Lys Thr Pro
625                 630                 635                 640

Lys Ala Val Leu Arg Ser Asp Tyr Asn Ile Ala Cys Cys Val Arg Pro
                645                 650                 655

Lys Leu Leu Pro Glu Thr Arg Lys Ala Leu Asn Glu Ala Ile Arg Ile
            660                 665                 670

Val Gln Lys Asn Ser Asp Glu Tyr Gln Arg Leu Ser Lys Arg Lys Leu
        675                 680                 685
```

```
Glu Phe Cys Arg Arg Val Val Asn Tyr Leu Val Arg Lys Ala Lys Lys
    690                 695                 700

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

Leu Glu Lys Phe Phe Thr Gly Ser Gly Lys Arg Asp Asn Gly Trp Ser
                725                 730                 735

Asn Phe Phe Arg Pro Lys Lys Glu Asn Arg Trp Phe Ile Pro Ala Phe
            740                 745                 750

His Lys Ala Phe Ser Glu Leu Ala Pro Asn Arg Gly Phe Tyr Val Ile
        755                 760                 765

Glu Cys Asn Pro Ala Arg Thr Ser Ile Thr Asp Pro Asp Cys Gly Tyr
    770                 775                 780

Cys Asp Gly Asp Asn Arg Asp Gly Ile Lys Phe Glu Cys Lys Lys Cys
785                 790                 795                 800

Gly Ala Lys His His Thr Asp Leu Asp Val Ala Pro Leu Asn Ile Ala
                805                 810                 815

Ile Val Ala Val Thr Gly Arg Pro Met Pro Lys Thr Val Ser Asn Lys
            820                 825                 830

Ser Lys Arg Glu Arg Ser Gly Gly Glu Lys Ser Val Gly Ala Ser Arg
        835                 840                 845

Lys Arg Asn His Arg Lys Ser Lys Ala Asn Gln Glu Met Leu Asp Ala
    850                 855                 860

Thr Ser Ser Ala Ala Glu
865                 870


<210> 293
<211> 830
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"
```

<400> 293
Met Pro Lys Ile Lys Lys Pro Thr Glu Ile Ser Leu Leu Arg Lys Glu
1 5 10 15

Val Phe Pro Asp Leu His Phe Ala Lys Asp Arg Met Arg Ala Ala Ser
20 25 30

Leu Val Leu Lys Asn Glu Gly Arg Glu Ala Ala Ile Glu Tyr Leu Arg
35 40 45

Val Asn His Glu Asp Lys Pro Pro Asn Phe Met Pro Pro Ala Lys Thr
50 55 60

Pro Tyr Val Ala Leu Ser Arg Pro Leu Glu Gln Trp Pro Ile Ala Gln
65 70 75 80

Ala Ser Ile Ala Ile Gln Lys Tyr Ile Phe Gly Leu Thr Lys Asp Glu
85 90 95

Phe Ser Ala Thr Lys Lys Leu Leu Tyr Gly Asp Lys Ser Thr Pro Asn
100 105 110

Thr Glu Ser Arg Lys Arg Trp Phe Glu Val Thr Gly Val Pro Asn Phe
115 120 125

Gly Tyr Met Ser Ala Gln Gly Leu Asn Ala Ile Phe Ser Gly Ala Leu
130 135 140

Ala Arg Tyr Glu Gly Val Val Gln Lys Val Glu Asn Arg Asn Lys Lys
145 150 155 160

Arg Phe Glu Lys Leu Ser Glu Lys Asn Gln Leu Leu Ile Glu Glu Gly
165 170 175

Gln Pro Val Lys Asp Tyr Val Pro Asp Thr Ala Tyr His Thr Pro Glu
180 185 190

Thr Leu Gln Lys Leu Ala Glu Asn Asn His Val Arg Val Glu Asp Leu
195 200 205

Gly Asp Met Ile Asp Arg Leu Val His Pro Pro Gly Ile His Arg Ser
210 215 220

```
Ile Tyr Gly Tyr Gln Gln Val Pro Pro Phe Ala Tyr Asp Pro Asp Asn
225                 230                 235                 240

Pro Lys Gly Ile Ile Leu Pro Lys Ala Tyr Ala Gly Tyr Thr Arg Lys
                245                 250                 255

Pro His Asp Ile Ile Glu Ala Met Pro Asn Arg Leu Asn Ile Pro Glu
            260                 265                 270

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

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

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

Arg Leu Arg Gly Lys Glu Ala Ile Leu Ala Val Phe Gln Ile Glu Glu
                325                 330                 335

Asp Trp Ala Leu Ile Asp Met Arg Gly Leu Leu Arg Asn Val Tyr Met
            340                 345                 350

Arg Lys Leu Ile Ala Ala Gly Glu Leu Thr Pro Thr Thr Leu Leu Gly
        355                 360                 365

Tyr Phe Thr Glu Thr Leu Thr Leu Asp Pro Arg Arg Thr Glu Ala Thr
    370                 375                 380

Phe Cys Tyr His Leu Arg Ser Glu Gly Ala Leu His Ala Glu Tyr Val
385                 390                 395                 400

Arg His Gly Lys Asn Thr Arg Glu Leu Leu Leu Asp Leu Thr Lys Asp
                405                 410                 415

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

Leu Ala Ala Ala Ile Phe Arg Val Gly Arg Asp Ala Ser Gly Asp Leu
        435                 440                 445

Thr Glu Asn Ser Leu Glu Pro Val Ser Arg Met Leu Leu Pro Gln Ala
    450                 455                 460
```

```
Tyr Leu Asp Gln Ile Lys Ala Tyr Arg Asp Ala Tyr Asp Ser Phe Arg
465                 470                 475                 480

Gln Asn Ile Trp Asp Thr Ala Leu Ala Ser Leu Thr Pro Glu Gln Gln
                485                 490                 495

Arg Gln Ile Leu Ala Tyr Glu Ala Tyr Thr Pro Asp Asp Ser Lys Glu
            500                 505                 510

Asn Val Leu Arg Leu Leu Leu Gly Gly Asn Val Met Pro Asp Asp Leu
        515                 520                 525

Pro Trp Glu Asp Met Thr Lys Asn Thr His Tyr Ile Ser Asp Arg Tyr
    530                 535                 540

Leu Ala Asp Gly Gly Asp Pro Ser Lys Val Trp Phe Val Pro Gly Pro
545                 550                 555                 560

Arg Lys Arg Lys Lys Asn Ala Pro Pro Leu Lys Lys Pro Pro Lys Pro
                565                 570                 575

Arg Glu Leu Val Lys Arg Ser Asp His Asn Ile Ser His Leu Ser Glu
            580                 585                 590

Phe Arg Pro Gln Leu Leu Lys Glu Thr Arg Asp Ala Phe Glu Lys Ala
        595                 600                 605

Lys Ile Asp Thr Glu Arg Gly His Val Gly Tyr Gln Lys Leu Ser Thr
    610                 615                 620

Arg Lys Asp Gln Leu Cys Lys Glu Ile Leu Asn Trp Leu Glu Ala Glu
625                 630                 635                 640

Ala Val Arg Leu Thr Arg Cys Lys Thr Met Val Leu Gly Leu Glu Asp
                645                 650                 655

Leu Asn Gly Pro Phe Phe Asn Gln Gly Lys Gly Lys Val Arg Gly Trp
            660                 665                 670

Val Ser Phe Phe Arg Gln Lys Gln Glu Asn Arg Trp Ile Val Asn Gly
        675                 680                 685
```

```
Phe Arg Lys Asn Ala Leu Ala Arg Ala His Asp Lys Gly Lys Tyr Ile
    690                 695                 700

Leu Glu Leu Trp Pro Ser Trp Thr Ser Gln Thr Cys Pro Lys Cys Lys
705                 710                 715                 720

His Val His Ala Asp Asn Arg His Gly Asp Asp Phe Val Cys Leu Gln
                725                 730                 735

Cys Gly Ala Arg Leu His Ala Asp Ala Glu Val Ala Thr Trp Asn Leu
            740                 745                 750

Ala Val Val Ala Ile Gln Gly His Ser Leu Pro Gly Pro Val Arg Glu
        755                 760                 765

Lys Ser Asn Asp Arg Lys Lys Ser Gly Ser Ala Arg Lys Ser Lys Lys
    770                 775                 780

Ala Asn Glu Ser Gly Lys Val Val Gly Ala Trp Ala Ala Gln Ala Thr
785                 790                 795                 800

Pro Lys Arg Ala Thr Ser Lys Lys Glu Thr Gly Thr Ala Arg Asn Pro
                805                 810                 815

Val Tyr Asn Pro Leu Glu Thr Gln Ala Ser Cys Pro Ala Pro
            820                 825                 830


<210> 294
<211> 790
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 294
Met Thr Pro Ser Pro Gln Ile Ala Arg Leu Val Glu Thr Pro Leu Ala
1               5                   10                  15

Ala Ala Leu Lys Ala His His Pro Gly Lys Lys Phe Arg Ser Asp Tyr
            20                  25                  30

Leu Lys Lys Ala Gly Lys Ile Leu Lys Asp Gln Gly Val Glu Ala Ala
        35                  40                  45
```

```
Met Ala His Leu Asp Gly Lys Asp Gln Ala Glu Pro Pro Asn Phe Lys
    50                  55                  60

Pro Pro Ala Lys Cys Arg Ile Val Ala Arg Ser Arg Glu Phe Ser Glu
65                  70                  75                  80

Trp Pro Ile Val Lys Ala Ser Val Glu Ile Gln Lys Tyr Ile Tyr Gly
                85                  90                  95

Leu Thr Leu Glu Glu Arg Lys Ala Cys Asp Pro Gly Lys Ser Ser Ala
            100                 105                 110

Ser His Lys Ala Trp Phe Ala Lys Thr Gly Val Asn Thr Phe Gly Tyr
        115                 120                 125

Ser Ser Val Gln Gly Phe Asn Leu Ile Phe Gly His Thr Leu Gly Arg
    130                 135                 140

Tyr Asp Gly Val Leu Val Lys Thr Glu Asn Leu Asn Lys Lys Arg Ala
145                 150                 155                 160

Glu Lys Asn Glu Arg Phe Arg Ala Lys Ala Leu Ala Glu Gly Arg Ala
                165                 170                 175

Glu Pro Val Cys Pro Pro Leu Val Thr Ala Thr Asn Asp Thr Gly Gln
            180                 185                 190

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

Gln Pro Pro Gly Ile Asn Pro Asn Ile Tyr Ala Tyr Gln Gln Val Ser
    210                 215                 220

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

Gly Tyr Ser Arg Asp Pro Asn Ala Val Ile Leu Pro Leu Val Pro Arg
                245                 250                 255

Asp Arg Leu Ser Ile Pro Lys Gly Gln Pro Gly Tyr Val Pro Glu Pro
            260                 265                 270

His Arg Glu Gly Leu Thr Gly Arg Lys Asp Arg Arg Met Arg Arg Tyr
```

275 280 285

Tyr Glu Thr Glu Arg Gly Thr Lys Leu Lys Arg Pro Pro Leu Thr Ala
290 295 300

Lys Gly Arg Ala Asp Lys Ala Asn Glu Ala Leu Leu Val Val Val Arg
305 310 315 320

Ile Asp Ser Asp Trp Val Val Met Asp Val Arg Gly Leu Leu Arg Asn
325 330 335

Ala Arg Trp Arg Arg Leu Val Ser Lys Glu Gly Ile Thr Leu Asn Gly
340 345 350

Leu Leu Asp Leu Phe Thr Gly Asp Pro Val Leu Asn Pro Lys Asp Cys
355 360 365

Ser Val Ser Arg Asp Thr Gly Asp Pro Val Asn Asp Pro Arg His Gly
370 375 380

Val Val Thr Phe Cys Tyr Lys Leu Gly Val Val Asp Val Cys Ser Lys
385 390 395 400

Asp Arg Pro Ile Lys Gly Phe Arg Thr Lys Glu Val Leu Glu Arg Leu
405 410 415

Thr Ser Ser Gly Thr Val Gly Met Val Ser Ile Asp Leu Gly Gln Thr
420 425 430

Asn Pro Val Ala Ala Ala Val Ser Arg Val Thr Lys Gly Leu Gln Ala
435 440 445

Glu Thr Leu Glu Thr Phe Thr Leu Pro Asp Asp Leu Leu Gly Lys Val
450 455 460

Arg Ala Tyr Arg Ala Lys Thr Asp Arg Met Glu Glu Gly Phe Arg Arg
465 470 475 480

Asn Ala Leu Arg Lys Leu Thr Ala Glu Gln Gln Ala Glu Ile Thr Arg
485 490 495

Tyr Asn Asp Ala Thr Glu Gln Gln Ala Lys Ala Leu Val Cys Ser Thr
500 505 510

```
Tyr Gly Ile Gly Pro Glu Glu Val Pro Trp Glu Arg Met Thr Ser Asn
        515                 520                 525

Thr Thr Tyr Ile Ser Asp His Ile Leu Asp His Gly Gly Asp Pro Asp
    530                 535                 540

Thr Val Phe Phe Met Ala Thr Lys Arg Gly Gln Asn Lys Pro Thr Leu
545                 550                 555                 560

His Lys Arg Lys Asp Lys Ala Trp Gly Gln Lys Phe Arg Pro Ala Ile
                565                 570                 575

Ser Val Glu Thr Arg Leu Ala Arg Gln Ala Ala Glu Trp Glu Leu Arg
            580                 585                 590

Arg Ala Ser Leu Glu Phe Gln Lys Leu Ser Val Trp Lys Thr Glu Leu
        595                 600                 605

Cys Arg Gln Ala Val Asn Tyr Val Met Glu Arg Thr Lys Lys Arg Thr
    610                 615                 620

Gln Cys Asp Val Ile Ile Pro Val Ile Glu Asp Leu Pro Val Pro Leu
625                 630                 635                 640

Phe His Gly Ser Gly Lys Arg Asp Pro Gly Trp Ala Asn Phe Phe Val
                645                 650                 655

His Lys Arg Glu Asn Arg Trp Phe Ile Asp Gly Leu His Lys Ala Phe
            660                 665                 670

Ser Glu Leu Gly Lys His Arg Gly Ile Tyr Val Phe Glu Val Cys Pro
        675                 680                 685

Gln Arg Thr Ser Ile Thr Cys Pro Lys Cys Gly His Cys Asp Pro Asp
    690                 695                 700

Asn Arg Asp Gly Glu Lys Phe Val Cys Leu Ser Cys Gln Ala Thr Leu
705                 710                 715                 720

Asn Ala Asp Leu Asp Val Ala Thr Thr Asn Leu Val Arg Val Ala Leu
                725                 730                 735

Thr Gly Lys Val Met Pro Arg Ser Glu Arg Ser Gly Asp Ala Gln Thr
```

740 745 750

Pro Gly Pro Ala Arg Lys Ala Arg Thr Gly Lys Ile Lys Gly Ser Lys
755 760 765

Pro Thr Ser Ala Pro Gln Gly Ala Thr Gln Thr Asp Ala Lys Ala His
770 775 780

Leu Ser Gln Thr Gly Val
785 790

<210> 295
<211> 790
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 295
Met Thr Pro Ser Pro Gln Ile Ala Arg Leu Val Glu Thr Pro Leu Ala
1 5 10 15

Ala Ala Leu Lys Ala His His Pro Gly Lys Lys Phe Arg Ser Asp Tyr
20 25 30

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

Met Ala His Leu Asp Gly Lys Asp Gln Ala Glu Pro Pro Asn Phe Lys
50 55 60

Pro Pro Ala Lys Cys Arg Ile Val Ala Arg Ser Arg Glu Phe Ser Glu
65 70 75 80

Trp Pro Ile Val Lys Ala Ser Val Glu Ile Gln Lys Tyr Ile Tyr Gly
85 90 95

Leu Thr Leu Glu Glu Arg Lys Ala Cys Asp Pro Gly Lys Ser Ser Ala
100 105 110

Ser His Lys Ala Trp Phe Ala Lys Thr Gly Val Asn Thr Phe Gly Tyr
115 120 125

```
Ser Ser Val Gln Gly Phe Asn Leu Ile Phe Gly His Thr Leu Gly Arg
    130                 135                 140

Tyr Asp Gly Val Leu Val Lys Thr Glu Asn Leu Asn Lys Lys Arg Ala
145                 150                 155                 160

Glu Lys Asn Glu Arg Phe Arg Ala Lys Ala Leu Ala Glu Gly Arg Ala
                165                 170                 175

Glu Pro Val Cys Pro Pro Leu Val Thr Ala Thr Asn Asp Thr Gly Gln
            180                 185                 190

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

Gln Pro Pro Gly Ile Asn Pro Asn Ile Tyr Ala Tyr Gln Gln Val Ser
    210                 215                 220

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

Gly Tyr Ser Arg Asp Pro Asn Ala Val Ile Leu Pro Leu Val Pro Arg
                245                 250                 255

Asp Arg Leu Ser Ile Pro Lys Gly Gln Pro Gly Tyr Val Pro Glu Pro
            260                 265                 270

His Arg Glu Gly Leu Thr Gly Arg Lys Asp Arg Arg Met Arg Arg Tyr
        275                 280                 285

Tyr Glu Thr Glu Arg Gly Thr Lys Leu Lys Arg Pro Pro Leu Thr Ala
    290                 295                 300

Lys Gly Arg Ala Asp Lys Ala Asn Glu Ala Leu Leu Val Val Val Arg
305                 310                 315                 320

Ile Asp Ser Asp Trp Val Val Met Asp Val Arg Gly Leu Leu Arg Asn
                325                 330                 335

Ala Arg Trp Arg Arg Leu Val Ser Lys Glu Gly Ile Thr Leu Asn Gly
            340                 345                 350

Leu Leu Asp Leu Phe Thr Gly Asp Pro Val Leu Asn Pro Lys Asp Cys
        355                 360                 365
```

```
Ser Val Ser Arg Asp Thr Gly Asp Pro Val Asn Asp Pro Arg His Gly
    370                 375                 380

Val Val Thr Phe Cys Tyr Lys Leu Gly Val Val Asp Val Cys Ser Lys
385                 390                 395                 400

Asp Arg Pro Ile Lys Gly Phe Arg Thr Lys Glu Val Leu Glu Arg Leu
                405                 410                 415

Thr Ser Ser Gly Thr Val Gly Met Val Ser Ile Asp Leu Gly Gln Thr
            420                 425                 430

Asn Pro Val Ala Ala Ala Val Ser Arg Val Thr Lys Gly Leu Gln Ala
        435                 440                 445

Glu Thr Leu Glu Thr Phe Thr Leu Pro Asp Asp Leu Leu Gly Lys Val
    450                 455                 460

Arg Ala Tyr Arg Ala Lys Thr Asp Arg Met Glu Glu Gly Phe Arg Arg
465                 470                 475                 480

Asn Ala Leu Arg Lys Leu Thr Ala Glu Gln Gln Ala Glu Ile Thr Arg
                485                 490                 495

Tyr Asn Asp Ala Thr Glu Gln Gln Ala Lys Ala Leu Val Cys Ser Thr
            500                 505                 510

Tyr Gly Ile Gly Pro Glu Glu Val Pro Trp Glu Arg Met Thr Ser Asn
        515                 520                 525

Thr Thr Tyr Ile Ser Asp His Ile Leu Asp His Gly Gly Asp Pro Asp
    530                 535                 540

Thr Val Phe Phe Met Ala Thr Lys Arg Gly Gln Asn Lys Pro Thr Leu
545                 550                 555                 560

His Lys Arg Lys Asp Lys Ala Trp Gly Gln Lys Phe Arg Pro Ala Ile
                565                 570                 575

Ser Val Glu Thr Arg Leu Ala Arg Gln Ala Ala Glu Trp Glu Leu Arg
            580                 585                 590
```

```
Arg Ala Ser Leu Glu Phe Gln Lys Leu Ser Val Trp Lys Thr Glu Leu
        595                 600                 605

Cys Arg Gln Ala Val Asn Tyr Val Met Glu Arg Thr Lys Lys Arg Thr
    610                 615                 620

Gln Cys Asp Val Ile Ile Pro Val Ile Glu Asp Leu Pro Val Pro Leu
625                 630                 635                 640

Phe His Gly Ser Gly Lys Arg Asp Pro Gly Trp Ala Asn Phe Phe Val
                645                 650                 655

His Lys Arg Glu Asn Arg Trp Phe Ile Asp Gly Leu His Lys Ala Phe
            660                 665                 670

Ser Glu Leu Gly Lys His Arg Gly Ile Tyr Val Phe Glu Val Cys Pro
        675                 680                 685

Gln Arg Thr Ser Ile Thr Cys Pro Lys Cys Gly His Cys Asp Pro Asp
    690                 695                 700

Asn Arg Asp Gly Glu Lys Phe Val Cys Leu Ser Cys Gln Ala Thr Leu
705                 710                 715                 720

His Ala Asp Leu Asp Val Ala Thr Thr Asn Leu Val Arg Val Ala Leu
                725                 730                 735

Thr Gly Lys Val Met Pro Arg Ser Glu Arg Ser Gly Asp Ala Gln Thr
            740                 745                 750

Pro Gly Pro Ala Arg Lys Ala Arg Thr Gly Lys Ile Lys Gly Ser Lys
        755                 760                 765

Pro Thr Ser Ala Pro Gln Gly Ala Thr Gln Thr Asp Ala Lys Ala His
    770                 775                 780

Leu Ser Gln Thr Gly Val
785                 790
```

<210> 296
<211> 782
<212> PRT
<213> Artificial Sequence

<220>

<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 296
Met Lys Thr Glu Lys Pro Lys Thr Ala Leu Thr Leu Leu Arg Glu Glu
1 5 10 15

Val Phe Pro Gly Lys Lys Tyr Arg Leu Asp Val Leu Lys Glu Ala Gly
20 25 30

Lys Lys Leu Ser Thr Lys Gly Arg Glu Ala Thr Ile Glu Phe Leu Thr
35 40 45

Gly Lys Asp Glu Glu Arg Pro Gln Asn Phe Gln Pro Pro Ala Lys Thr
50 55 60

Ser Ile Val Ala Gln Ser Arg Pro Phe Asp Gln Trp Pro Ile Val Gln
65 70 75 80

Val Ser Leu Ala Val Gln Lys Tyr Ile Tyr Gly Leu Thr Gln Ser Glu
85 90 95

Phe Glu Ala Asn Lys Lys Ala Leu Tyr Gly Glu Thr Gly Lys Ala Ile
100 105 110

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

Phe Gly Phe Thr Ala Ala Gln Gly Ile Asn Pro Ile Phe Ser Gln Ala
130 135 140

Val Ala Arg Tyr Glu Gly Val Ile Lys Lys Val Glu Asn Arg Asn Glu
145 150 155 160

Lys Lys Leu Lys Lys Leu Thr Lys Lys Asn Leu Leu Arg Leu Glu Ser
165 170 175

Gly Glu Glu Ile Glu Asp Phe Glu Pro Glu Ala Thr Phe Asn Glu Glu
180 185 190

Gly Arg Leu Leu Gln Pro Pro Gly Ala Asn Pro Asn Ile Tyr Cys Tyr
195 200 205

Gln Gln Ile Ser Pro Arg Ile Tyr Asp Pro Ser Asp Pro Lys Gly Val

```
    210                 215                 220

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

Ile Ser Ala Gly Val Pro Asn Arg Leu Ala Ile Pro Glu Gly Gln Pro
                245                 250                 255

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

Ile Arg Cys Arg Ala Ser Val Glu Ala Lys Ala Arg Ala Ala Ile Leu
        275                 280                 285

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

Leu Leu Arg Asn Val Tyr Trp Arg Lys Leu Ala Ser Pro Gly Thr Leu
305                 310                 315                 320

Thr Leu Lys Gly Leu Leu Asp Phe Phe Thr Gly Gly Pro Val Leu Asp
                325                 330                 335

Ala Arg Arg Gly Ile Ala Thr Phe Ser Tyr Thr Leu Lys Ser Ala Ala
            340                 345                 350

Ala Val His Ala Glu Asn Thr Tyr Lys Gly Lys Gly Thr Arg Glu Val
        355                 360                 365

Leu Leu Lys Leu Thr Glu Asn Asn Ser Val Ala Leu Val Thr Val Asp
    370                 375                 380

Leu Gly Gln Arg Asn Pro Leu Ala Ala Met Ile Ala Arg Val Ser Arg
385                 390                 395                 400

Thr Ser Gln Gly Asp Leu Thr Tyr Pro Glu Ser Val Glu Pro Leu Thr
                405                 410                 415

Arg Leu Phe Leu Pro Asp Pro Phe Leu Glu Glu Val Arg Lys Tyr Arg
            420                 425                 430

Ser Ser Tyr Asp Ala Leu Arg Leu Ser Ile Arg Glu Ala Ala Ile Ala
        435                 440                 445
```

```
Ser Leu Thr Pro Glu Gln Gln Ala Glu Ile Arg Tyr Ile Glu Lys Phe
    450                 455                 460

Ser Ala Gly Asp Ala Lys Lys Asn Val Ala Glu Val Phe Gly Ile Asp
465                 470                 475                 480

Pro Thr Gln Leu Pro Trp Asp Ala Met Thr Pro Arg Thr Thr Tyr Ile
                485                 490                 495

Ser Asp Leu Phe Leu Arg Met Gly Gly Asp Arg Ser Arg Val Phe Phe
            500                 505                 510

Glu Val Pro Pro Lys Lys Ala Lys Lys Ala Pro Lys Lys Pro Pro Lys
        515                 520                 525

Lys Pro Ala Gly Pro Arg Ile Val Lys Arg Thr Asp Gly Met Ile Ala
    530                 535                 540

Arg Leu Arg Glu Ile Arg Pro Arg Leu Ser Ala Glu Thr Asn Lys Ala
545                 550                 555                 560

Phe Gln Glu Ala Arg Trp Glu Gly Glu Arg Ser Asn Val Ala Phe Gln
                565                 570                 575

Lys Leu Ser Val Arg Arg Lys Gln Phe Ala Arg Thr Val Val Asn His
            580                 585                 590

Leu Val Gln Thr Ala Gln Lys Met Ser Arg Cys Asp Thr Val Val Leu
        595                 600                 605

Gly Ile Glu Asp Leu Asn Val Pro Phe Phe His Gly Arg Gly Lys Tyr
    610                 615                 620

Gln Pro Gly Trp Glu Gly Phe Phe Arg Gln Lys Lys Glu Asn Arg Trp
625                 630                 635                 640

Leu Ile Asn Asp Met His Lys Ala Leu Ser Glu Arg Gly Pro His Arg
                645                 650                 655

Gly Gly Tyr Val Leu Glu Leu Thr Pro Phe Trp Thr Ser Leu Arg Cys
            660                 665                 670

Pro Lys Cys Gly His Thr Asp Ser Ala Asn Arg Asp Gly Asp Asp Phe
```

675 680 685

Val Cys Val Lys Cys Gly Ala Lys Leu His Ser Asp Leu Glu Val Ala
690 695 700

Thr Ala Asn Leu Ala Leu Val Ala Ile Thr Gly Gln Ser Ile Pro Arg
705 710 715 720

Pro Pro Arg Glu Gln Ser Ser Gly Lys Lys Ser Thr Gly Thr Ala Arg
725 730 735

Met Lys Lys Thr Ser Gly Glu Thr Gln Gly Lys Gly Ser Lys Ala Cys
740 745 750

Val Ser Glu Ala Leu Asn Lys Ile Glu Gln Gly Thr Ala Arg Asp Pro
755 760 765

Val Tyr Asn Pro Leu Asn Ser Gln Val Ser Cys Pro Ala Pro
770 775 780

<210> 297
<211> 774
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 297
Val Tyr Asn Pro Asp Met Lys Lys Pro Asn Asn Ile Arg Arg Ile Arg
1 5 10 15

Glu Glu His Phe Glu Gly Leu Cys Phe Gly Lys Asp Val Leu Thr Lys
20 25 30

Ala Gly Lys Ile Tyr Glu Lys Asp Gly Glu Glu Ala Ala Ile Asp Phe
35 40 45

Leu Met Gly Lys Asp Glu Glu Asp Pro Pro Asn Phe Lys Pro Pro Ala
50 55 60

Lys Thr Thr Ile Val Ala Gln Ser Arg Pro Phe Asp Gln Trp Pro Ile
65 70 75 80

```
Tyr Gln Val Ser Gln Ala Val Gln Glu Arg Val Phe Ala Tyr Thr Glu
                85                  90                  95

Glu Glu Phe Asn Ala Ser Lys Glu Ala Leu Phe Ser Gly Asp Ile Ser
            100                 105                 110

Ser Lys Ser Arg Asp Phe Trp Phe Lys Thr Asn Asn Ile Ser Asp Gln
        115                 120                 125

Gly Ile Gly Ala Gln Gly Leu Asn Thr Ile Leu Ser His Ala Phe Ser
    130                 135                 140

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

Leu Lys Lys Leu Ser Lys Lys Asn Gln Leu Lys Ile Glu Glu Gly Leu
                165                 170                 175

Glu Ile Leu Glu Phe Lys Pro Asp Ser Ala Phe Asn Glu Asn Gly Leu
            180                 185                 190

Leu Ala Gln Pro Pro Gly Ile Asn Pro Asn Ile Tyr Gly Tyr Gln Ala
        195                 200                 205

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

Pro Lys Gln Tyr Glu Gly Tyr Ser Arg Lys Pro Asp Asp Ile Ile Glu
225                 230                 235                 240

Lys Gly Pro Ser Arg Leu Asp Ile Pro Lys Gly Gln Pro Gly Tyr Val
                245                 250                 255

Pro Glu His Gln Arg Lys Asn Leu Lys Lys Lys Gly Arg Val Arg Leu
            260                 265                 270

Tyr Arg Arg Thr Pro Pro Lys Thr Lys Ala Leu Ala Ser Ile Leu Ala
        275                 280                 285

Val Leu Gln Ile Gly Lys Asp Trp Val Leu Phe Asp Met Arg Gly Leu
    290                 295                 300

Leu Arg Ser Val Tyr Met Arg Glu Ala Ala Thr Pro Gly Gln Ile Ser
305                 310                 315                 320
```

```
Ala Lys Asp Leu Leu Asp Thr Phe Thr Gly Cys Pro Val Leu Asn Thr
                325                 330                 335

Arg Thr Gly Glu Phe Thr Phe Cys Tyr Lys Leu Arg Ser Glu Gly Ala
            340                 345                 350

Leu His Ala Arg Lys Ile Tyr Thr Lys Gly Glu Thr Arg Thr Leu Leu
        355                 360                 365

Thr Ser Leu Thr Ser Glu Asn Asn Thr Ile Ala Leu Val Thr Val Asp
    370                 375                 380

Leu Gly Gln Arg Asn Pro Ala Ala Ile Met Ile Ser Arg Leu Ser Arg
385                 390                 395                 400

Lys Glu Glu Leu Ser Glu Lys Asp Ile Gln Pro Val Ser Arg Arg Leu
                405                 410                 415

Leu Pro Asp Arg Tyr Leu Asn Glu Leu Lys Arg Tyr Arg Asp Ala Tyr
            420                 425                 430

Asp Ala Phe Arg Gln Glu Val Arg Asp Glu Ala Phe Thr Ser Leu Cys
        435                 440                 445

Pro Glu His Gln Glu Gln Val Gln Gln Tyr Glu Ala Leu Thr Pro Glu
    450                 455                 460

Lys Ala Lys Asn Leu Val Leu Lys His Phe Phe Gly Thr His Asp Pro
465                 470                 475                 480

Asp Leu Pro Trp Asp Asp Met Thr Ser Asn Thr His Tyr Ile Ala Asn
                485                 490                 495

Leu Tyr Leu Glu Arg Gly Gly Asp Pro Ser Lys Val Phe Phe Thr Arg
            500                 505                 510

Pro Leu Lys Lys Asp Ser Lys Ser Lys Lys Pro Arg Lys Pro Thr Lys
        515                 520                 525

Arg Thr Asp Ala Ser Ile Ser Arg Leu Pro Glu Ile Arg Pro Lys Met
    530                 535                 540
```

```
Pro Glu Asp Ala Arg Lys Ala Phe Glu Lys Ala Lys Trp Glu Ile Tyr
545                 550                 555                 560

Thr Gly His Glu Lys Phe Pro Lys Leu Ala Lys Arg Val Asn Gln Leu
                565                 570                 575

Cys Arg Glu Ile Ala Asn Trp Ile Glu Lys Glu Ala Lys Arg Leu Thr
            580                 585                 590

Leu Cys Asp Thr Val Val Val Gly Ile Glu Asp Leu Ser Leu Pro Pro
        595                 600                 605

Lys Arg Gly Lys Gly Lys Phe Gln Glu Thr Trp Gln Gly Phe Phe Arg
    610                 615                 620

Gln Lys Phe Glu Asn Arg Trp Val Ile Asp Thr Leu Lys Lys Ala Ile
625                 630                 635                 640

Gln Asn Arg Ala His Asp Lys Gly Lys Tyr Val Leu Gly Leu Ala Pro
                645                 650                 655

Tyr Trp Thr Ser Gln Arg Cys Pro Ala Cys Gly Phe Ile His Lys Ser
            660                 665                 670

Asn Arg Asn Gly Asp His Phe Lys Cys Leu Lys Cys Glu Ala Leu Phe
        675                 680                 685

His Ala Asp Ser Glu Val Ala Thr Trp Asn Leu Ala Leu Val Ala Val
    690                 695                 700

Leu Gly Lys Gly Ile Thr Asn Pro Asp Ser Lys Lys Pro Ser Gly Gln
705                 710                 715                 720

Lys Lys Thr Gly Thr Thr Arg Lys Lys Gln Ile Lys Gly Lys Asn Lys
                725                 730                 735

Gly Lys Glu Thr Val Asn Val Pro Pro Thr Thr Gln Glu Val Glu Asp
            740                 745                 750

Ile Ile Ala Phe Phe Glu Lys Asp Asp Glu Thr Val Arg Asn Pro Val
        755                 760                 765

Tyr Lys Pro Thr Gly Thr
    770
```

<210> 298
<211> 769
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 298
Met Lys Lys Pro Asn Asn Ile Arg Arg Ile Arg Glu Glu His Phe Glu
1 5 10 15

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

Glu Lys Asp Gly Glu Glu Ala Ala Ile Asp Phe Leu Met Gly Lys Asp
35 40 45

Glu Glu Asp Pro Pro Asn Phe Lys Pro Pro Ala Lys Thr Thr Ile Val
50 55 60

Ala Gln Ser Arg Pro Phe Asp Gln Trp Pro Ile Tyr Gln Val Ser Gln
65 70 75 80

Ala Val Gln Glu Arg Val Phe Ala Tyr Thr Glu Glu Glu Phe Asn Ala
85 90 95

Ser Lys Glu Ala Leu Phe Ser Gly Asp Ile Ser Ser Lys Ser Arg Asp
100 105 110

Phe Trp Phe Lys Thr Asn Asn Ile Ser Asp Gln Gly Ile Gly Ala Gln
115 120 125

Gly Leu Asn Thr Ile Leu Ser His Ala Phe Ser Arg Tyr Ser Gly Val
130 135 140

Ile Lys Lys Val Glu Asn Arg Asn Lys Lys Arg Leu Lys Lys Leu Ser
145 150 155 160

Lys Lys Asn Gln Leu Lys Ile Glu Glu Gly Leu Glu Ile Leu Glu Phe
165 170 175

Lys Pro Asp Ser Ala Phe Asn Glu Asn Gly Leu Leu Ala Gln Pro Pro

```
            180                 185                 190

Gly Ile Asn Pro Asn Ile Tyr Gly Tyr Gln Ala Val Thr Pro Phe Val
        195                 200                 205

Phe Asp Pro Asp Asn Pro Gly Asp Val Ile Leu Pro Lys Gln Tyr Glu
    210                 215                 220

Gly Tyr Ser Arg Lys Pro Asp Asp Ile Ile Glu Lys Gly Pro Ser Arg
225                 230                 235                 240

Leu Asp Ile Pro Lys Gly Gln Pro Gly Tyr Val Pro Glu His Gln Arg
                245                 250                 255

Lys Asn Leu Lys Lys Lys Gly Arg Val Arg Leu Tyr Arg Arg Thr Pro
            260                 265                 270

Pro Lys Thr Lys Ala Leu Ala Ser Ile Leu Ala Val Leu Gln Ile Gly
        275                 280                 285

Lys Asp Trp Val Leu Phe Asp Met Arg Gly Leu Leu Arg Ser Val Tyr
    290                 295                 300

Met Arg Glu Ala Ala Thr Pro Gly Gln Ile Ser Ala Lys Asp Leu Leu
305                 310                 315                 320

Asp Thr Phe Thr Gly Cys Pro Val Leu Asn Thr Arg Thr Gly Glu Phe
                325                 330                 335

Thr Phe Cys Tyr Lys Leu Arg Ser Glu Gly Ala Leu His Ala Arg Lys
            340                 345                 350

Ile Tyr Thr Lys Gly Glu Thr Arg Thr Leu Leu Thr Ser Leu Thr Ser
        355                 360                 365

Glu Asn Asn Thr Ile Ala Leu Val Thr Val Asp Leu Gly Gln Arg Asn
    370                 375                 380

Pro Ala Ala Ile Met Ile Ser Arg Leu Ser Arg Lys Glu Glu Leu Ser
385                 390                 395                 400

Glu Lys Asp Ile Gln Pro Val Ser Arg Arg Leu Leu Pro Asp Arg Tyr
                405                 410                 415
```

```
Leu Asn Glu Leu Lys Arg Tyr Arg Asp Ala Tyr Asp Ala Phe Arg Gln
            420                 425                 430

Glu Val Arg Asp Glu Ala Phe Thr Ser Leu Cys Pro Glu His Gln Glu
        435                 440                 445

Gln Val Gln Gln Tyr Glu Ala Leu Thr Pro Glu Lys Ala Lys Asn Leu
    450                 455                 460

Val Leu Lys His Phe Phe Gly Thr His Asp Pro Asp Leu Pro Trp Asp
465                 470                 475                 480

Asp Met Thr Ser Asn Thr His Tyr Ile Ala Asn Leu Tyr Leu Glu Arg
                485                 490                 495

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

Ser Lys Ser Lys Lys Pro Arg Lys Pro Thr Lys Arg Thr Asp Ala Ser
        515                 520                 525

Ile Ser Arg Leu Pro Glu Ile Arg Pro Lys Met Pro Glu Asp Ala Arg
    530                 535                 540

Lys Ala Phe Glu Lys Ala Lys Trp Glu Ile Tyr Thr Gly His Glu Lys
545                 550                 555                 560

Phe Pro Lys Leu Ala Lys Arg Val Asn Gln Leu Cys Arg Glu Ile Ala
                565                 570                 575

Asn Trp Ile Glu Lys Glu Ala Lys Arg Leu Thr Leu Cys Asp Thr Val
            580                 585                 590

Val Val Gly Ile Glu Asp Leu Ser Leu Pro Pro Lys Arg Gly Lys Gly
        595                 600                 605

Lys Phe Gln Glu Thr Trp Gln Gly Phe Phe Arg Gln Lys Phe Glu Asn
    610                 615                 620

Arg Trp Val Ile Asp Thr Leu Lys Lys Ala Ile Gln Asn Arg Ala His
625                 630                 635                 640

Asp Lys Gly Lys Tyr Val Leu Gly Leu Ala Pro Tyr Trp Thr Ser Gln
```

645 650 655

Arg Cys Pro Ala Cys Gly Phe Ile His Lys Ser Asn Arg Asn Gly Asp
660 665 670

His Phe Lys Cys Leu Lys Cys Glu Ala Leu Phe His Ala Asp Ser Glu
675 680 685

Val Ala Thr Trp Asn Leu Ala Leu Val Ala Val Leu Gly Lys Gly Ile
690 695 700

Thr Asn Pro Asp Ser Lys Lys Pro Ser Gly Gln Lys Lys Thr Gly Thr
705 710 715 720

Thr Arg Lys Lys Gln Ile Lys Gly Lys Asn Lys Gly Lys Glu Thr Val
725 730 735

Asn Val Pro Pro Thr Thr Gln Glu Val Glu Asp Ile Ile Ala Phe Phe
740 745 750

Glu Lys Asp Asp Glu Thr Val Arg Asn Pro Val Tyr Lys Pro Thr Gly
755 760 765

Thr

<210> 299
<211> 767
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 299
Val Ile Lys Thr His Phe Pro Ala Gly Arg Phe Arg Lys Asp His Gln
1 5 10 15

Lys Thr Ala Gly Lys Lys Leu Lys His Glu Gly Glu Glu Ala Cys Val
20 25 30

Glu Tyr Leu Arg Asn Lys Val Ser Asp Tyr Pro Pro Asn Phe Lys Pro
35 40 45

```
Pro Ala Lys Gly Thr Ile Val Ala Gln Ser Arg Pro Phe Ser Glu Trp
    50                  55                  60

Pro Ile Val Arg Ala Ser Glu Ala Ile Gln Lys Tyr Val Tyr Gly Leu
65                  70                  75                  80

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

His Ala Glu Trp Phe Ala Lys Thr Gly Val Glu Asn Tyr Gly Tyr Arg
            100                 105                 110

Gln Val Gln Gly Leu Asn Thr Ile Phe Gln Asn Thr Val Asn Arg Phe
        115                 120                 125

Lys Gly Val Leu Lys Lys Val Glu Asn Arg Asn Lys Lys Ser Leu Lys
    130                 135                 140

Arg Gln Glu Gly Ala Asn Arg Arg Arg Val Glu Glu Gly Leu Pro Glu
145                 150                 155                 160

Val Pro Val Thr Val Glu Ser Ala Thr Asp Asp Glu Gly Arg Leu Leu
                165                 170                 175

Gln Pro Pro Gly Val Asn Pro Ser Ile Tyr Gly Tyr Gln Gly Val Ala
            180                 185                 190

Pro Arg Val Cys Thr Asp Leu Gln Gly Phe Ser Gly Met Ser Val Asp
        195                 200                 205

Phe Ala Gly Tyr Arg Arg Asp Pro Asp Ala Val Leu Val Glu Ser Leu
    210                 215                 220

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

Glu Trp Gln Arg Asp Pro Glu Arg Asn Lys Phe Pro Leu Arg Glu Gly
                245                 250                 255

Ser Arg Arg Gln Arg Lys Trp Tyr Ser Asn Ala Cys His Lys Pro Lys
            260                 265                 270

Pro Gly Arg Thr Ser Lys Tyr Asp Pro Glu Ala Leu Lys Lys Ala Ser
        275                 280                 285
```

```
Ala Lys Asp Ala Leu Leu Val Ser Ile Ser Ile Gly Glu Asp Trp Ala
    290                 295                 300

Ile Ile Asp Val Arg Gly Leu Leu Arg Asp Ala Arg Arg Arg Gly Phe
305                 310                 315                 320

Thr Pro Glu Glu Gly Leu Ser Leu Asn Ser Leu Leu Gly Leu Phe Thr
                325                 330                 335

Glu Tyr Pro Val Phe Asp Val Gln Arg Gly Leu Ile Thr Phe Thr Tyr
            340                 345                 350

Lys Leu Gly Gln Val Asp Val His Ser Arg Lys Thr Val Pro Thr Phe
        355                 360                 365

Arg Ser Arg Ala Leu Leu Glu Ser Leu Val Ala Lys Glu Glu Ile Ala
    370                 375                 380

Leu Val Ser Val Asp Leu Gly Gln Thr Asn Pro Ala Ser Met Lys Val
385                 390                 395                 400

Ser Arg Val Arg Ala Gln Glu Gly Ala Leu Val Ala Glu Pro Val His
                405                 410                 415

Arg Met Phe Leu Ser Asp Val Leu Leu Gly Glu Leu Ser Ser Tyr Arg
            420                 425                 430

Lys Arg Met Asp Ala Phe Glu Asp Ala Ile Arg Ala Gln Ala Phe Glu
        435                 440                 445

Thr Met Thr Pro Glu Gln Gln Ala Glu Ile Thr Arg Val Cys Asp Val
    450                 455                 460

Ser Val Glu Val Ala Arg Arg Arg Val Cys Glu Lys Tyr Ser Ile Ser
465                 470                 475                 480

Pro Gln Asp Val Pro Trp Gly Glu Met Thr Gly His Ser Thr Phe Ile
                485                 490                 495

Val Asp Ala Val Leu Arg Lys Gly Gly Asp Glu Ser Leu Val Tyr Phe
            500                 505                 510
```

```
Lys Asn Lys Glu Gly Glu Thr Leu Lys Phe Arg Asp Leu Arg Ile Ser
        515                 520                 525

Arg Met Glu Gly Val Arg Pro Arg Leu Thr Lys Asp Thr Arg Asp Ala
    530                 535                 540

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

Lys Leu Ala Lys Gln Lys Leu Glu Leu Ala Arg Arg Cys Val Asn Phe
                565                 570                 575

Ile Glu Arg Glu Ala Lys Arg Tyr Thr Gln Cys Glu Arg Val Val Phe
            580                 585                 590

Val Ile Glu Asp Leu Asn Val Gly Phe Phe His Gly Lys Gly Lys Arg
        595                 600                 605

Asp Arg Gly Trp Asp Ala Phe Phe Thr Ala Lys Lys Glu Asn Arg Trp
    610                 615                 620

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

Gly Ser Tyr Val Ile Glu Val Thr Pro Gln Arg Thr Ser Met Thr Cys
                645                 650                 655

Pro Arg Cys Gly His Cys Asp Lys Gly Asn Arg Asn Gly Glu Lys Phe
            660                 665                 670

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

Thr Asp Asn Ile Glu Arg Val Ala Leu Thr Gly Lys Ala Met Pro Lys
    690                 695                 700

Pro Pro Val Arg Glu Arg Ser Gly Asp Val Gln Lys Ala Gly Thr Ala
705                 710                 715                 720

Arg Lys Ala Arg Lys Pro Leu Lys Pro Lys Gln Lys Thr Glu Pro Ser
                725                 730                 735

Val Gln Glu Gly Ser Ser Asp Asp Gly Val Asp Lys Ser Pro Gly Asp
            740                 745                 750
```

Ala Ser Arg Asn Pro Val Tyr Asn Pro Ser Asp Thr Leu Ser Ile
        755   760   765

<210> 300
<211> 763
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 300
Met Ala Lys Ala Lys Thr Leu Ala Ala Leu Leu Arg Glu Leu Leu Pro
1   5   10   15

Gly Gln His Leu Ala Pro His His Arg Trp Val Ala Asn Lys Leu Leu
            20   25   30

Met Thr Ser Gly Asp Ala Ala Ala Phe Val Ile Gly Lys Ser Val Ser
        35   40   45

Asp Pro Val Arg Gly Ser Phe Arg Lys Asp Val Ile Thr Lys Ala Gly
    50   55   60

Arg Ile Phe Lys Lys Asp Gly Pro Asp Ala Ala Ala Ala Phe Leu Asp
65   70   75   80

Gly Lys Trp Glu Asp Arg Pro Pro Asn Phe Gln Pro Pro Ala Lys Ala
                85   90   95

Ala Ile Val Ala Ile Ser Arg Ser Phe Asp Glu Trp Pro Ile Val Lys
            100   105   110

Val Ser Cys Ala Ile Gln Gln Tyr Leu Tyr Ala Leu Pro Val Gln Glu
        115   120   125

Phe Glu Ser Ser Val Pro Glu Ala Arg Ala Gln Ala His Ala Ala Trp
    130   135   140

Phe Gln Asp Thr Gly Val Asp Asp Cys Asn Phe Lys Ser Thr Gln Gly
145   150   155   160

Leu Asn Ala Ile Phe Asn His Gly Lys Arg Thr Tyr Glu Gly Val Leu

```
                165                 170                 175

Lys Lys Ala Gln Asn Arg Asn Asp Lys Lys Asn Leu Arg Leu Glu Arg
            180                 185                 190

Ile Asn Ala Lys Arg Ala Glu Ala Gly Gln Ala Pro Leu Val Ala Gly
        195                 200                 205

Pro Asp Glu Ser Pro Thr Asp Asp Ala Gly Cys Leu Leu His Pro Pro
    210                 215                 220

Gly Ile Asn Ala Asn Ile Tyr Cys Tyr Gln Gln Val Ser Pro Arg Pro
225                 230                 235                 240

Tyr Glu Gln Ser Cys Gly Ile Gln Leu Pro Pro Glu Tyr Ala Gly Tyr
                245                 250                 255

Asn Arg Leu Ser Asn Val Ala Ile Pro Pro Met Pro Asn Arg Leu Asp
            260                 265                 270

Ile Pro Gln Gly Gln Pro Gly Tyr Val Pro Glu His His Arg His Gly
        275                 280                 285

Ile Lys Lys Phe Gly Arg Val Arg Lys Arg Tyr Gly Val Val Pro Gly
    290                 295                 300

Arg Asn Arg Asp Ala Asp Gly Lys Arg Thr Arg Gln Val Leu Thr Glu
305                 310                 315                 320

Ala Gly Ala Ala Ala Lys Ala Arg Asp Ser Val Leu Ala Val Ile Arg
                325                 330                 335

Ile Gly Asp Asp Trp Thr Val Val Asp Leu Arg Gly Leu Leu Arg Asn
            340                 345                 350

Ala Gln Trp Arg Lys Leu Val Pro Asp Gly Gly Ile Thr Val Gln Gly
        355                 360                 365

Leu Leu Asp Leu Phe Thr Gly Asp Pro Val Ile Asp Pro Arg Arg Gly
    370                 375                 380

Val Val Thr Phe Ile Tyr Lys Ala Asp Ser Val Gly Ile His Ser Glu
385                 390                 395                 400
```

```
Lys Val Cys Arg Gly Lys Gln Ser Lys Asn Leu Leu Glu Arg Leu Cys
                405                 410                 415

Ala Met Pro Glu Lys Ser Ser Thr Arg Leu Asp Cys Ala Arg Gln Ala
            420                 425                 430

Val Ala Leu Val Ser Val Asp Leu Gly Gln Arg Asn Pro Val Ala Ala
        435                 440                 445

Arg Phe Ser Arg Val Ser Leu Ala Glu Gly Gln Leu Gln Ala Gln Leu
    450                 455                 460

Val Ser Ala Gln Phe Leu Asp Asp Ala Met Val Ala Met Ile Arg Ser
465                 470                 475                 480

Tyr Arg Glu Glu Tyr Asp Arg Phe Glu Ser Leu Val Arg Glu Gln Ala
                485                 490                 495

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

Ala Asp Ser Ala Glu Ser Val Lys Ser Cys Val Cys Ala Lys Phe Gly
        515                 520                 525

Ile Asp Pro Ala Gly Leu Ser Trp Asp Lys Met Thr Ser Gly Thr Trp
    530                 535                 540

Arg Ile Ala Asp His Val Gln Ala Ala Gly Gly Asp Val Glu Trp Phe
545                 550                 555                 560

Phe Phe Lys Thr Cys Gly Lys Gly Lys Glu Ile Lys Thr Val Arg Arg
                565                 570                 575

Ser Asp Phe Asn Val Ala Lys Gln Phe Arg Leu Arg Leu Ser Pro Glu
            580                 585                 590

Thr Arg Lys Asp Trp Asn Asp Ala Ile Trp Glu Leu Lys Arg Gly Asn
        595                 600                 605

Pro Ala Tyr Val Ser Phe Ser Lys Arg Lys Ser Glu Phe Ala Arg Arg
    610                 615                 620

Val Val Asn Asp Leu Val His Arg Ala Arg Arg Ala Val Arg Cys Asp
```

625 630 635 640

Glu Val Val Phe Ala Ile Glu Asp Leu Asn Ile Ser Phe Phe His Gly
645 650 655

Lys Gly Gln Arg Gln Met Gly Trp Asp Ala Phe Phe Glu Val Lys Gln
660 665 670

Glu Asn Arg Trp Phe Ile Gln Ala Leu His Lys Ala Phe Val Glu Arg
675 680 685

Ala Thr His Lys Gly Gly Tyr Val Leu Glu Val Ala Pro Ala Arg Thr
690 695 700

Ser Thr Thr Cys Pro Glu Cys Arg His Cys Asp Pro Glu Ser Arg Arg
705 710 715 720

Gly Glu Gln Phe Cys Cys Ile Lys Cys Arg His Thr Cys His Ala Asp
725 730 735

Leu Glu Val Ala Thr Phe Asn Ile Glu Gln Val Ala Leu Thr Gly Val
740 745 750

Ser Leu Pro Lys Arg Leu Ser Ser Thr Leu Leu
755 760

<210> 301
<211> 761
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 301
Met Ser Lys Glu Lys Thr Pro Pro Ser Ala Tyr Ala Ile Leu Lys Ala
1 5 10 15

Lys His Phe Pro Asp Leu Asp Phe Glu Lys Lys His Lys Met Met Ala
20 25 30

Gly Arg Met Phe Lys Asn Gly Ala Ser Glu Gln Glu Val Val Gln Tyr
35 40 45

```
Leu Gln Gly Lys Gly Ser Glu Ser Leu Met Asp Val Lys Pro Pro Ala
    50                  55                  60

Lys Ser Pro Ile Leu Ala Gln Ser Arg Pro Phe Asp Glu Trp Glu Met
65                  70                  75                  80

Val Arg Thr Ser Arg Leu Ile Gln Glu Thr Ile Phe Gly Ile Pro Lys
                85                  90                  95

Arg Gly Ser Ile Pro Lys Arg Asp Gly Leu Ser Glu Thr Gln Phe Asn
            100                 105                 110

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

Gln Thr Arg Ala Ile Phe Tyr Gly Leu Leu Gly Ile Lys Pro Pro Thr
    130                 135                 140

Phe His Ala Met Ala Gln Asn Ile Leu Ile Asp Leu Ala Ile Asn Ile
145                 150                 155                 160

Arg Lys Gly Val Leu Lys Lys Val Asp Asn Leu Asn Glu Lys Asn Arg
                165                 170                 175

Lys Lys Val Lys Arg Ile Arg Asp Ala Gly Glu Gln Asp Val Met Val
            180                 185                 190

Pro Ala Glu Val Thr Ala His Asp Asp Arg Gly Tyr Leu Asn His Pro
        195                 200                 205

Pro Gly Val Asn Pro Thr Ile Pro Gly Tyr Gln Gly Val Val Ile Pro
    210                 215                 220

Phe Pro Glu Gly Phe Glu Gly Leu Pro Ser Gly Met Thr Pro Val Asp
225                 230                 235                 240

Trp Ser His Val Leu Val Asp Tyr Leu Pro His Asp Arg Leu Ser Ile
                245                 250                 255

Pro Lys Gly Ser Pro Gly Tyr Ile Pro Glu Trp Gln Arg Pro Leu Leu
            260                 265                 270

Asn Arg His Lys Gly Arg Arg His Arg Ser Trp Tyr Ala Asn Ser Leu
        275                 280                 285
```

```
Asn Lys Pro Arg Lys Ser Arg Thr Glu Glu Ala Lys Asp Arg Gln Asn
    290                 295                 300

Ala Gly Lys Arg Thr Ala Leu Ile Glu Ala Glu Arg Leu Lys Gly Val
305                 310                 315                 320

Leu Pro Val Leu Met Arg Phe Lys Glu Asp Trp Leu Ile Ile Asp Ala
                325                 330                 335

Arg Gly Leu Leu Arg Asn Ala Arg Tyr Arg Gly Val Leu Pro Glu Gly
            340                 345                 350

Ser Thr Leu Gly Asn Leu Ile Asp Leu Phe Ser Asp Ser Pro Arg Val
        355                 360                 365

Asp Thr Arg Arg Gly Ile Cys Thr Phe Leu Tyr Arg Lys Gly Arg Ala
    370                 375                 380

Tyr Ser Thr Lys Pro Val Lys Arg Lys Glu Ser Lys Glu Thr Leu Leu
385                 390                 395                 400

Lys Leu Thr Glu Lys Ser Thr Ile Ala Leu Val Ser Ile Asp Leu Gly
                405                 410                 415

Gln Thr Asn Pro Leu Thr Ala Lys Leu Ser Lys Val Arg Gln Val Asp
            420                 425                 430

Gly Cys Leu Val Ala Glu Pro Val Leu Arg Lys Leu Ile Asp Asn Ala
        435                 440                 445

Ser Glu Asp Gly Lys Glu Ile Ala Arg Tyr Arg Val Ala His Asp Leu
    450                 455                 460

Leu Arg Ala Arg Ile Leu Glu Asp Ala Ile Asp Leu Leu Gly Ile Tyr
465                 470                 475                 480

Lys Asp Glu Val Val Arg Ala Arg Ser Asp Thr Pro Asp Leu Cys Lys
                485                 490                 495

Glu Arg Val Cys Arg Phe Leu Gly Leu Asp Ser Gln Ala Ile Asp Trp
            500                 505                 510
```

```
Asp Arg Met Thr Pro Tyr Thr Asp Phe Ile Ala Gln Ala Phe Val Ala
        515                 520                 525

Lys Gly Gly Asp Pro Lys Val Val Thr Ile Lys Pro Asn Gly Lys Pro
    530                 535                 540

Lys Met Phe Arg Lys Asp Arg Ser Ile Lys Asn Met Lys Gly Ile Arg
545                 550                 555                 560

Leu Asp Ile Ser Lys Glu Ala Ser Ser Ala Tyr Arg Glu Ala Gln Trp
                565                 570                 575

Ala Ile Gln Arg Glu Ser Pro Asp Phe Gln Arg Leu Ala Val Trp Gln
            580                 585                 590

Ser Gln Leu Thr Lys Arg Ile Val Asn Gln Leu Val Ala Trp Ala Lys
        595                 600                 605

Lys Cys Thr Gln Cys Asp Thr Val Val Leu Ala Phe Glu Asp Leu Asn
    610                 615                 620

Ile Gly Met Met His Gly Ser Gly Lys Trp Ala Asn Gly Gly Trp Asn
625                 630                 635                 640

Ala Leu Phe Leu His Lys Gln Glu Asn Arg Trp Phe Met Gln Ala Phe
                645                 650                 655

His Lys Ala Leu Thr Glu Leu Ser Ala His Lys Gly Ile Pro Thr Ile
            660                 665                 670

Glu Val Leu Pro His Arg Thr Ser Ile Thr Cys Thr Gln Cys Gly His
        675                 680                 685

Cys His Pro Gly Asn Arg Asp Gly Glu Arg Phe Lys Cys Leu Lys Cys
    690                 695                 700

Glu Phe Leu Ala Asn Thr Asp Leu Glu Ile Ala Thr Asp Asn Ile Glu
705                 710                 715                 720

Arg Val Ala Leu Thr Gly Leu Pro Met Pro Lys Gly Glu Arg Ser Ser
                725                 730                 735

Ala Lys Arg Lys Pro Gly Gly Thr Arg Lys Thr Lys Lys Ser Lys His
            740                 745                 750
```

Ser Gly Asn Ser Pro Leu Ala Ala Glu
755 760

<210> 302
<211> 746
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 302
Met Glu Lys Ala Gly Pro Thr Ser Pro Leu Ser Val Leu Ile His Lys
1 5 10 15

Asn Phe Glu Gly Cys Arg Phe Gln Ile Asp His Leu Lys Ile Ala Gly
20 25 30

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

Asp Lys Lys Cys Glu Gly Leu Pro Pro Asn Phe Gln Pro Pro Ala Lys
50 55 60

Gly Asn Val Ile Ala Gln Ser Arg Pro Phe Thr Glu Trp Ala Pro Tyr
65 70 75 80

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

Glu Arg Lys Val Cys Asp Pro Gly Ser Ser Ser Asp Ser His Glu Lys
100 105 110

Trp Phe Lys Gln Thr Gly Val Gln Asn Tyr Gly Tyr Thr His Val Gln
115 120 125

Gly Leu Asn Leu Ile Phe Lys His Ala Leu Ala Arg Tyr Asp Gly Val
130 135 140

Leu Lys Lys Val Asp Asn Arg Asn Glu Lys Asn Arg Lys Lys Ala Glu
145 150 155 160

Arg Val Asn Ser Phe Arg Arg Glu Glu Gly Leu Pro Glu Glu Val Phe

```
                165                 170                 175

Glu Glu Glu Lys Ala Thr Asp Glu Thr Gly His Leu Leu Gln Pro Pro
            180                 185                 190

Gly Val Asn His Ser Ile Tyr Cys Tyr Gln Ser Val Arg Pro Lys Pro
        195                 200                 205

Phe Asn Pro Arg Lys Pro Gly Gly Ile Ser Leu Pro Glu Ala Tyr Ser
    210                 215                 220

Gly Tyr Ser Leu Lys Pro Gln Asp Glu Leu Pro Ile Gly Ser Leu Asp
225                 230                 235                 240

Arg Leu Ser Ile Pro Pro Gly Gln Pro Gly Tyr Val Pro Glu Trp Gln
                245                 250                 255

Arg Ser Gln Leu Thr Thr Gln Lys His Arg Arg Lys Arg Ser Trp Tyr
            260                 265                 270

Ser Ala Gln Lys Trp Lys Pro Arg Thr Gly Arg Thr Ser Thr Phe Asp
        275                 280                 285

Pro Asp Arg Leu Asn Cys Ala Arg Ala Gln Gly Ala Ile Leu Ala Val
    290                 295                 300

Val Arg Ile His Glu Asp Trp Val Val Phe Asp Val Arg Gly Leu Leu
305                 310                 315                 320

Arg Asn Ala Leu Trp Arg Glu Leu Ala Gly Lys Gly Leu Thr Val Arg
                325                 330                 335

Asp Leu Leu Asp Phe Phe Thr Gly Asp Pro Val Val Asp Thr Lys Arg
            340                 345                 350

Gly Val Val Thr Phe Thr Tyr Lys Leu Gly Lys Val Asp Val His Ser
        355                 360                 365

Leu Arg Thr Val Arg Gly Lys Arg Ser Lys Lys Val Leu Glu Asp Leu
    370                 375                 380

Thr Leu Ser Ser Asp Val Gly Leu Val Thr Ile Asp Leu Gly Gln Thr
385                 390                 395                 400
```

```
Asn Val Leu Ala Ala Asp Tyr Ser Lys Val Thr Arg Ser Glu Asn Gly
                405                 410                 415

Glu Leu Leu Ala Val Pro Leu Ser Lys Ser Phe Leu Pro Lys His Leu
            420                 425                 430

Leu His Glu Val Thr Ala Tyr Arg Thr Ser Tyr Asp Gln Met Glu Glu
        435                 440                 445

Gly Phe Arg Arg Lys Ala Leu Leu Thr Leu Thr Glu Asp Gln Gln Val
    450                 455                 460

Glu Val Thr Leu Val Arg Asp Phe Ser Val Glu Ser Ser Lys Thr Lys
465                 470                 475                 480

Leu Leu Gln Leu Gly Val Asp Val Thr Ser Leu Pro Trp Glu Lys Met
                485                 490                 495

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

Asp Pro Ala Ser Leu Phe Phe Asp Gly Glu Arg Asp Gly Lys Pro Cys
        515                 520                 525

Arg His Lys Lys Lys Asp Arg Thr Trp Ala Tyr Leu Val Arg Pro Lys
    530                 535                 540

Val Ser Pro Glu Thr Arg Lys Ala Leu Asn Glu Ala Leu Trp Ala Leu
545                 550                 555                 560

Lys Asn Thr Ser Pro Glu Phe Glu Ser Leu Ser Lys Arg Lys Ile Gln
                565                 570                 575

Phe Ser Arg Arg Cys Met Asn Tyr Leu Leu Asn Glu Ala Lys Arg Ile
            580                 585                 590

Ser Gly Cys Gly Gln Val Val Phe Val Ile Glu Asp Leu Asn Val Arg
        595                 600                 605

Val His His Gly Arg Gly Lys Arg Ala Ile Gly Trp Asp Asn Phe Phe
    610                 615                 620

Lys Pro Lys Arg Glu Asn Arg Trp Phe Met Gln Ala Leu His Lys Ala
```

625 630 635 640

Ala Ser Glu Leu Ala Ile His Arg Gly Met His Ile Ile Glu Ala Cys
645 650 655

Pro Ala Arg Ser Ser Ile Thr Cys Pro Lys Cys Gly His Cys Asp Pro
660 665 670

Glu Asn Arg Cys Ser Ser Asp Arg Glu Lys Phe Leu Cys Val Lys Cys
675 680 685

Gly Ala Ala Phe His Ala Asp Leu Glu Val Ala Thr Phe Asn Leu Arg
690 695 700

Lys Val Ala Leu Thr Gly Thr Ala Leu Pro Lys Ser Ile Asp His Ser
705 710 715 720

Arg Asp Gly Leu Ile Pro Lys Gly Ala Arg Asn Arg Lys Leu Lys Glu
725 730 735

Pro Gln Ala Asn Asp Glu Lys Ala Cys Ala
740 745

<210> 303
<211> 735
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 303
Met Lys Glu Gln Ser Pro Leu Ser Ser Val Leu Lys Ser Asn Phe Pro
1 5 10 15

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

Ala Gln Leu Gly Glu Ala Ala Ala Val Glu Tyr Leu Ser Pro Arg Gln
35 40 45

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

```
Ala Lys Ser Arg Pro Phe Glu Glu Trp Pro Ile Tyr Lys Ala Ser Val
65                  70                  75                  80

Leu Leu Gln Glu Gln Ile Tyr Gly Met Thr Gly Gln Glu Phe Glu Glu
                85                  90                  95

Arg Cys Gly Ser Ile Pro Thr Ser Leu Ser Gly Leu Arg Gln Trp Ala
            100                 105                 110

Ser Ser Val Gly Leu Gly Ala Ala Met Glu Gly Leu His Val Gln Gly
        115                 120                 125

Met Asn Leu Met Val Lys Asn Ala Ile Asn Arg Tyr Lys Gly Val Leu
    130                 135                 140

Val Lys Val Glu Asn Arg Asn Lys Lys Leu Val Glu Ala Asn Glu Ala
145                 150                 155                 160

Lys Asn Ser Ser Arg Glu Glu Arg Gly Leu Pro Pro Leu Arg Pro Pro
                165                 170                 175

Glu Leu Gly Ser Ala Phe Gly Pro Asp Gly Arg Leu Val Asn Pro Pro
            180                 185                 190

Gly Ile Asp Lys Ser Ile Arg Leu Tyr Gln Gly Val Ser Pro Val Pro
        195                 200                 205

Val Val Lys Thr Thr Gly Arg Pro Thr Val His Arg Leu Asp Ile Pro
    210                 215                 220

Ala Gly Glu Lys Gly His Val Pro Leu Trp Gln Arg Glu Ala Gly Leu
225                 230                 235                 240

Val Lys Glu Gly Pro Arg Arg Arg Arg Met Trp Tyr Ser Asn Ser Asn
                245                 250                 255

Leu Lys Arg Ser Arg Lys Asp Arg Ser Ala Glu Ala Ser Glu Ala Arg
            260                 265                 270

Lys Ala Asp Ser Val Val Val Arg Val Ser Val Lys Glu Asp Trp Val
        275                 280                 285

Asp Ile Asp Val Arg Gly Leu Leu Arg Asn Val Ala Trp Arg Gly Ile
    290                 295                 300
```

```
Glu Arg Ala Gly Glu Ser Thr Glu Asp Leu Leu Ser Leu Phe Ser Gly
305                 310                 315                 320

Asp Pro Val Val Asp Pro Ser Arg Asp Ser Val Val Phe Leu Tyr Lys
                325                 330                 335

Glu Gly Val Val Asp Val Leu Ser Lys Lys Val Val Gly Ala Gly Lys
            340                 345                 350

Ser Arg Lys Gln Leu Glu Lys Met Val Ser Glu Gly Pro Val Ala Leu
        355                 360                 365

Val Ser Cys Asp Leu Gly Gln Thr Asn Tyr Val Ala Ala Arg Val Ser
    370                 375                 380

Val Leu Asp Glu Ser Leu Ser Pro Val Arg Ser Phe Arg Val Asp Pro
385                 390                 395                 400

Arg Glu Phe Pro Ser Ala Asp Gly Ser Gln Gly Val Val Gly Ser Leu
                405                 410                 415

Asp Arg Ile Arg Ala Asp Ser Asp Arg Leu Glu Ala Lys Leu Leu Ser
            420                 425                 430

Glu Ala Glu Ala Ser Leu Pro Glu Pro Val Arg Ala Glu Ile Glu Phe
        435                 440                 445

Leu Arg Ser Glu Arg Pro Ser Ala Val Ala Gly Arg Leu Cys Leu Lys
    450                 455                 460

Leu Gly Ile Asp Pro Arg Ser Ile Pro Trp Glu Lys Met Gly Ser Thr
465                 470                 475                 480

Thr Ser Phe Ile Ser Glu Ala Leu Ser Ala Lys Gly Ser Pro Leu Ala
                485                 490                 495

Leu His Asp Gly Ala Pro Ile Lys Asp Ser Arg Phe Ala His Ala Ala
            500                 505                 510

Arg Gly Arg Leu Ser Pro Glu Ser Arg Lys Ala Leu Asn Glu Ala Leu
        515                 520                 525
```

```
Trp Glu Arg Lys Ser Ser Ser Arg Glu Tyr Gly Val Ile Ser Arg Arg
    530                 535                 540

Lys Ser Glu Ala Ser Arg Arg Met Ala Asn Ala Val Leu Ser Glu Ser
545                 550                 555                 560

Arg Arg Leu Thr Gly Leu Ala Val Val Ala Val Asn Leu Glu Asp Leu
                565                 570                 575

Asn Met Val Ser Lys Phe Phe His Gly Arg Gly Lys Arg Ala Pro Gly
            580                 585                 590

Trp Ala Gly Phe Phe Thr Pro Lys Met Glu Asn Arg Trp Phe Ile Arg
        595                 600                 605

Ser Ile His Lys Ala Met Cys Asp Leu Ser Lys His Arg Gly Ile Thr
    610                 615                 620

Val Ile Glu Ser Arg Pro Glu Arg Thr Ser Ile Ser Cys Pro Glu Cys
625                 630                 635                 640

Gly His Cys Asp Pro Glu Asn Arg Ser Gly Glu Arg Phe Ser Cys Lys
                645                 650                 655

Ser Cys Gly Val Ser Leu His Ala Asp Phe Glu Val Ala Thr Arg Asn
            660                 665                 670

Leu Glu Arg Val Ala Leu Thr Gly Lys Pro Met Pro Arg Arg Glu Asn
        675                 680                 685

Leu His Ser Pro Glu Gly Ala Thr Ala Ser Arg Lys Thr Arg Lys Lys
    690                 695                 700

Pro Arg Glu Ala Thr Ala Ser Thr Phe Leu Asp Leu Arg Ser Val Leu
705                 710                 715                 720

Ser Ser Ala Glu Asn Glu Gly Ser Gly Pro Ala Ala Arg Ala Gly
                725                 730                 735
```

<210> 304
<211> 725
<212> PRT
<213> Artificial Sequence

<220>

<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 304
Met Leu Pro Pro Ser Asn Lys Ile Gly Lys Ser Met Ser Leu Lys Glu
1 5 10 15

Phe Ile Asn Lys Arg Asn Phe Lys Ser Ser Ile Ile Lys Gln Ala Gly
20 25 30

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

Asp Asn Tyr Val Glu Gly Tyr Lys Lys Arg Asp Phe Pro Ile Thr Ala
50 55 60

Lys Cys Asn Ile Val Ala Ser Asn Arg Lys Ile Glu Asp Phe Asp Ile
65 70 75 80

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

Asp Asn Phe Glu Glu Phe Ser Lys Ile Lys Tyr Asn Arg Lys Ser Phe
100 105 110

Asp Glu Leu Tyr Lys Lys Ile Ala Asn Glu Ile Gly Leu Glu Lys Pro
115 120 125

Asn Tyr Glu Asn Ile Gln Gly Glu Ile Ala Val Ile Arg Asn Ala Ile
130 135 140

Asn Ile Tyr Asn Gly Val Leu Lys Lys Val Glu Asn Arg Asn Lys Lys
145 150 155 160

Ile Gln Glu Lys Asn Gln Ser Lys Asp Pro Pro Lys Leu Leu Ser Ala
165 170 175

Phe Asp Asp Asn Gly Phe Leu Ala Glu Arg Pro Gly Ile Asn Glu Thr
180 185 190

Ile Tyr Gly Tyr Gln Ser Val Arg Leu Arg His Leu Asp Val Glu Lys
195 200 205

Asp Lys Asp Ile Ile Val Gln Leu Pro Asp Ile Tyr Gln Lys Tyr Asn

```
    210                 215                 220

Lys Lys Ser Thr Asp Lys Ile Ser Val Lys Lys Arg Leu Asn Lys Tyr
225                 230                 235                 240

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

Ile Asn Lys Asp Asp Ala Ile Leu Cys Val Ser Asn Phe Gly Asp Asp
            260                 265                 270

Trp Ile Ile Phe Asp Ala Arg Gly Leu Leu Arg Gln Thr Tyr Arg Tyr
        275                 280                 285

Lys Leu Lys Lys Lys Gly Leu Cys Ile Lys Asp Leu Leu Asn Leu Phe
    290                 295                 300

Thr Gly Asp Pro Ile Ile Asn Pro Thr Lys Thr Asp Leu Lys Glu Ala
305                 310                 315                 320

Leu Ser Leu Ser Phe Lys Asp Gly Ile Ile Asn Asn Arg Thr Leu Lys
                325                 330                 335

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

Asp Lys Gly Lys Val Ala Met Ile Ser Ile Asp Leu Gly Gln Thr Asn
        355                 360                 365

Pro Ile Ser Tyr Arg Leu Ser Lys Phe Thr Ala Asn Asn Val Ala Tyr
    370                 375                 380

Ile Glu Asn Gly Val Ile Ser Glu Asp Asp Ile Val Lys Met Lys Lys
385                 390                 395                 400

Trp Arg Glu Lys Ser Asp Lys Leu Glu Asn Leu Ile Lys Glu Glu Ala
                405                 410                 415

Ile Ala Ser Leu Ser Asp Asp Glu Gln Arg Glu Val Arg Leu Tyr Glu
            420                 425                 430

Asn Asp Ile Ala Asp Asn Thr Lys Lys Lys Ile Leu Glu Lys Phe Asn
        435                 440                 445
```

```
Ile Arg Glu Glu Asp Leu Asp Phe Ser Lys Met Ser Asn Asn Thr Tyr
    450                 455                 460

Phe Ile Arg Asp Cys Leu Lys Asn Lys Asn Ile Asp Glu Ser Glu Phe
465                 470                 475                 480

Thr Phe Glu Lys Asn Gly Lys Lys Leu Asp Pro Thr Asp Ala Cys Phe
                485                 490                 495

Ala Arg Glu Tyr Lys Asn Lys Leu Ser Glu Leu Thr Arg Lys Lys Ile
            500                 505                 510

Asn Glu Lys Ile Trp Glu Ile Lys Lys Asn Ser Lys Glu Tyr His Lys
        515                 520                 525

Ile Ser Ile Tyr Lys Lys Glu Thr Ile Arg Tyr Ile Val Asn Lys Leu
    530                 535                 540

Ile Lys Gln Ser Lys Glu Lys Ser Glu Cys Asp Asp Ile Ile Val Asn
545                 550                 555                 560

Ile Glu Lys Leu Gln Ile Gly Gly Asn Phe Phe Gly Gly Arg Gly Lys
                565                 570                 575

Arg Asp Pro Gly Trp Asn Asn Phe Phe Leu Pro Lys Glu Glu Asn Arg
            580                 585                 590

Trp Phe Ile Asn Ala Cys His Lys Ala Phe Ser Glu Leu Ala Pro His
        595                 600                 605

Lys Gly Ile Ile Val Ile Glu Ser Asp Pro Ala Tyr Thr Ser Gln Thr
    610                 615                 620

Cys Pro Lys Cys Glu Asn Cys Asp Lys Glu Asn Arg Asn Gly Glu Lys
625                 630                 635                 640

Phe Lys Cys Lys Lys Cys Asn Tyr Glu Ala Asn Ala Asp Ile Asp Val
                645                 650                 655

Ala Thr Glu Asn Leu Glu Lys Ile Ala Lys Asn Gly Arg Arg Leu Ile
            660                 665                 670

Lys Asn Phe Asp Gln Leu Gly Glu Arg Leu Pro Gly Ala Glu Met Pro
```

675 680 685

Gly Gly Ala Arg Lys Arg Lys Pro Ser Lys Ser Leu Pro Lys Asn Gly
690 695 700

Arg Gly Ala Gly Val Gly Ser Glu Pro Glu Leu Ile Asn Gln Ser Pro
705 710 715 720

Ser Gln Val Ile Ala
725

<210> 305
<211> 718
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 305
Val Pro Asp Lys Lys Glu Thr Pro Leu Val Ala Leu Cys Lys Lys Ser
1 5 10 15

Phe Pro Gly Leu Arg Phe Lys Lys His Asp Ser Arg Gln Ala Gly Arg
20 25 30

Ile Leu Lys Ser Lys Gly Glu Gly Ala Ala Val Ala Phe Leu Glu Gly
35 40 45

Lys Gly Gly Thr Thr Gln Pro Asn Phe Lys Pro Pro Val Lys Cys Asn
50 55 60

Ile Val Ala Met Ser Arg Pro Leu Glu Glu Trp Pro Ile Tyr Lys Ala
65 70 75 80

Ser Val Val Ile Gln Lys Tyr Val Tyr Ala Gln Ser Tyr Glu Glu Phe
85 90 95

Lys Ala Thr Asp Pro Gly Lys Ser Glu Ala Gly Leu Arg Ala Trp Leu
100 105 110

Lys Ala Thr Arg Val Asp Thr Asp Gly Tyr Phe Asn Val Gln Gly Leu
115 120 125

```
Asn Leu Ile Phe Gln Asn Ala Arg Ala Thr Tyr Glu Gly Val Leu Lys
    130                 135                 140

Lys Val Glu Asn Arg Asn Ser Lys Lys Val Ala Lys Ile Glu Gln Arg
145                 150                 155                 160

Asn Glu His Arg Ala Glu Arg Gly Leu Pro Leu Leu Thr Leu Asp Glu
                165                 170                 175

Pro Glu Thr Ala Leu Asp Glu Thr Gly His Leu Arg His Arg Pro Gly
            180                 185                 190

Ile Asn Cys Ser Val Phe Gly Tyr Gln His Met Lys Leu Lys Pro Tyr
        195                 200                 205

Val Pro Gly Ser Ile Pro Gly Val Thr Gly Tyr Ser Arg Asp Pro Ser
    210                 215                 220

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

Gln Pro Gly Tyr Val Pro Pro Trp Asp Arg Glu Asn Leu Ser Val Lys
                245                 250                 255

Lys His Arg Arg Lys Arg Ala Ser Trp Ala Arg Ser Arg Gly Gly Ala
            260                 265                 270

Ile Asp Asp Asn Met Leu Leu Ala Val Val Arg Val Ala Asp Asp Trp
        275                 280                 285

Ala Leu Leu Asp Leu Arg Gly Leu Leu Arg Asn Thr Gln Tyr Arg Lys
    290                 295                 300

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

Val Thr Asn Asp Pro Thr Leu Ser Val Val Lys Lys Pro Gly Lys Pro
                325                 330                 335

Val Arg Tyr Thr Ala Thr Leu Ile Tyr Lys Gln Gly Val Val Pro Val
            340                 345                 350

Val Lys Ala Lys Val Val Lys Gly Ser Tyr Val Ser Lys Met Leu Asp
        355                 360                 365
```

```
Asp Thr Thr Glu Thr Phe Ser Leu Val Gly Val Asp Leu Gly Val Asn
    370                 375                 380

Asn Leu Ile Ala Ala Asn Ala Leu Arg Ile Arg Pro Gly Lys Cys Val
385                 390                 395                 400

Glu Arg Leu Gln Ala Phe Thr Leu Pro Glu Gln Thr Val Glu Asp Phe
                405                 410                 415

Phe Arg Phe Arg Lys Ala Tyr Asp Lys His Gln Glu Asn Leu Arg Leu
            420                 425                 430

Ala Ala Val Arg Ser Leu Thr Ala Glu Gln Gln Ala Glu Val Leu Ala
        435                 440                 445

Leu Asp Thr Phe Gly Pro Glu Gln Ala Lys Met Gln Val Cys Gly His
    450                 455                 460

Leu Gly Leu Ser Val Asp Glu Val Pro Trp Asp Lys Val Asn Ser Arg
465                 470                 475                 480

Ser Ser Ile Leu Ser Asp Leu Ala Lys Glu Arg Gly Val Asp Asp Thr
                485                 490                 495

Leu Tyr Met Phe Pro Phe Phe Lys Gly Lys Gly Lys Lys Arg Lys Thr
            500                 505                 510

Glu Ile Arg Lys Arg Trp Asp Val Asn Trp Ala Gln His Phe Arg Pro
        515                 520                 525

Gln Leu Thr Ser Glu Thr Arg Lys Ala Leu Asn Glu Ala Lys Trp Glu
    530                 535                 540

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

Glu Leu Ser Arg His Cys Val Asn Tyr Val Ile Arg Thr Ala Glu Lys
                565                 570                 575

Arg Ala Gln Cys Gly Lys Val Ile Val Ala Val Glu Asp Leu His His
            580                 585                 590
```

```
Ser Phe Arg Arg Gly Gly Lys Gly Ser Arg Lys Ser Gly Trp Gly Gly
        595                 600                 605

Phe Phe Ala Ala Lys Gln Glu Gly Arg Trp Leu Met Asp Ala Leu Phe
    610                 615                 620

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

Val Asp Pro Tyr Asn Thr Ser Arg Thr Cys Pro Glu Cys Gly His Cys
                645                 650                 655

Asp Lys Ala Asn Arg Asp Arg Val Asn Arg Glu Ala Phe Ile Cys Val
            660                 665                 670

Cys Cys Gly Tyr Arg Gly Asn Ala Asp Ile Asp Val Ala Ala Tyr Asn
        675                 680                 685

Ile Ala Met Val Ala Ile Thr Gly Val Ser Leu Arg Lys Ala Ala Arg
    690                 695                 700

Ala Ser Val Ala Ser Thr Pro Leu Glu Ser Leu Ala Ala Glu
705                 710                 715


<210> 306
<211> 708
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 306
Met Ser Lys Thr Lys Glu Leu Asn Asp Tyr Gln Glu Ala Leu Ala Arg
1               5                   10                  15

Arg Leu Pro Gly Val Arg His Gln Lys Ser Val Arg Arg Ala Ala Arg
            20                  25                  30

Leu Val Tyr Asp Arg Gln Gly Glu Asp Ala Met Val Ala Phe Leu Asp
        35                  40                  45

Gly Lys Glu Val Asp Glu Pro Tyr Thr Leu Gln Pro Pro Ala Lys Cys
    50                  55                  60
```

```
His Ile Leu Ala Val Ser Arg Pro Ile Glu Glu Trp Pro Ile Ala Arg
65                  70                  75                  80

Val Thr Met Ala Val Gln Glu His Val Tyr Ala Leu Pro Val His Glu
                85                  90                  95

Val Glu Lys Ser Arg Pro Glu Thr Thr Glu Gly Ser Arg Ser Ala Trp
            100                 105                 110

Phe Lys Asn Ser Gly Val Ser Asn His Gly Val Thr His Ala Gln Thr
        115                 120                 125

Leu Asn Ala Ile Leu Lys Asn Ala Tyr Asn Val Tyr Asn Gly Val Ile
    130                 135                 140

Lys Lys Val Glu Asn Arg Asn Ala Lys Lys Arg Asp Ser Leu Ala Ala
145                 150                 155                 160

Lys Asn Lys Ser Arg Glu Arg Lys Gly Leu Pro His Phe Lys Ala Asp
                165                 170                 175

Pro Pro Glu Leu Ala Thr Asp Glu Gln Gly Tyr Leu Leu Gln Pro Pro
            180                 185                 190

Ser Pro Asn Ser Ser Val Tyr Leu Val Gln Gln His Leu Arg Thr Pro
        195                 200                 205

Gln Ile Asp Leu Pro Ser Gly Tyr Thr Gly Pro Val Val Asp Pro Arg
    210                 215                 220

Ser Pro Ile Pro Ser Leu Ile Pro Ile Asp Arg Leu Ala Ile Pro Pro
225                 230                 235                 240

Gly Gln Pro Gly Tyr Val Pro Leu His Asp Arg Glu Lys Leu Thr Ser
                245                 250                 255

Asn Lys His Arg Arg Met Lys Leu Pro Lys Ser Leu Arg Ala Gln Gly
            260                 265                 270

Ala Leu Pro Val Cys Phe Arg Val Phe Asp Asp Trp Ala Val Val Asp
        275                 280                 285

Gly Arg Gly Leu Leu Arg His Ala Gln Tyr Arg Arg Leu Ala Pro Lys
```

```
    290                 295                 300

Asn Val Ser Ile Ala Glu Leu Leu Glu Leu Tyr Thr Gly Asp Pro Val
305                 310                 315                 320

Ile Asp Ile Lys Arg Asn Leu Met Thr Phe Arg Phe Ala Glu Ala Val
                325                 330                 335

Val Glu Val Thr Ala Arg Lys Ile Val Glu Lys Tyr His Asn Lys Tyr
            340                 345                 350

Leu Leu Lys Leu Thr Glu Pro Lys Gly Lys Pro Val Arg Glu Ile Gly
        355                 360                 365

Leu Val Ser Ile Asp Leu Asn Val Gln Arg Leu Ile Ala Leu Ala Ile
    370                 375                 380

Tyr Arg Val His Gln Thr Gly Glu Ser Gln Leu Ala Leu Ser Pro Cys
385                 390                 395                 400

Leu His Arg Glu Ile Leu Pro Ala Lys Gly Leu Gly Asp Phe Asp Lys
                405                 410                 415

Tyr Lys Ser Lys Phe Asn Gln Leu Thr Glu Glu Ile Leu Thr Ala Ala
            420                 425                 430

Val Gln Thr Leu Thr Ser Ala Gln Gln Glu Glu Tyr Gln Arg Tyr Val
        435                 440                 445

Glu Glu Ser Ser His Glu Ala Lys Ala Asp Leu Cys Leu Lys Tyr Ser
    450                 455                 460

Ile Thr Pro His Glu Leu Ala Trp Asp Lys Met Thr Ser Ser Thr Gln
465                 470                 475                 480

Tyr Ile Ser Arg Trp Leu Arg Asp His Gly Trp Asn Ala Ser Asp Phe
                485                 490                 495

Thr Gln Ile Thr Lys Gly Arg Lys Lys Val Glu Arg Leu Trp Ser Asp
            500                 505                 510

Ser Arg Trp Ala Gln Glu Leu Lys Pro Lys Leu Ser Asn Glu Thr Arg
        515                 520                 525
```

```
Arg Lys Leu Glu Asp Ala Lys His Asp Leu Gln Arg Ala Asn Pro Glu
    530                 535                 540

Trp Gln Arg Leu Ala Lys Arg Lys Gln Glu Tyr Ser Arg His Leu Ala
545                 550                 555                 560

Asn Thr Val Leu Ser Met Ala Arg Glu Tyr Thr Ala Cys Glu Thr Val
                565                 570                 575

Val Ile Ala Ile Glu Asn Leu Pro Met Lys Gly Gly Phe Val Asp Gly
            580                 585                 590

Asn Gly Ser Arg Glu Ser Gly Trp Asp Asn Phe Phe Thr His Lys Lys
        595                 600                 605

Glu Asn Arg Trp Met Ile Lys Asp Ile His Lys Ala Leu Ser Asp Leu
    610                 615                 620

Ala Pro Asn Arg Gly Val His Val Leu Glu Val Asn Pro Gln Tyr Thr
625                 630                 635                 640

Ser Gln Thr Cys Pro Glu Cys Gly His Arg Asp Lys Ala Asn Arg Asp
                645                 650                 655

Pro Ile Gln Arg Glu Arg Phe Cys Cys Thr His Cys Gly Ala Gln Arg
            660                 665                 670

His Ala Asp Leu Glu Val Ala Thr His Asn Ile Ala Met Val Ala Thr
        675                 680                 685

Thr Gly Lys Ser Leu Thr Gly Lys Ser Leu Ala Pro Gln Arg Leu Gln
    690                 695                 700

Glu Ala Ala Glu
705


<210> 307
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"
```

<400> 307
Val Leu Leu Ser Asp Arg Ile Gln Tyr Thr Asp Pro Ser Ala Pro Ile
1 5 10 15

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

Gly Tyr Val Pro Pro Phe Met Arg Lys Asn Leu Ser Thr Asn Lys His
35 40 45

Arg Arg Met Arg Leu Ser Arg Gly Gln Lys Glu Ala Cys Ala Leu Pro
50 55 60

Val Gly Leu Arg Leu Pro Asp Gly Lys Asp Gly Trp Asp Phe Ile Ile
65 70 75 80

Phe Asp Gly Arg Ala Leu Leu Arg Ala Cys Arg Arg Leu Arg Leu Glu
85 90 95

Val Thr Ser Met Asp Asp Val Leu Asp Lys Phe Thr Gly Asp Pro Arg
100 105 110

Ile Gln Leu Ser Pro Ala Gly Glu Thr Ile Val Thr Cys Met Leu Lys
115 120 125

Pro Gln His Thr Gly Val Ile Gln Gln Lys Leu Ile Thr Gly Lys Met
130 135 140

Lys Asp Arg Leu Val Gln Leu Thr Ala Glu Ala Pro Ile Ala Met Leu
145 150 155 160

Thr Val Asp Leu Gly Glu His Asn Leu Val Ala Cys Gly Ala Tyr Thr
165 170 175

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

Leu Leu Pro Glu Lys Val Leu Ala Asp Phe Glu Gly Tyr Arg Arg Asp
195 200 205

Ser Asp Glu His Ser Glu Thr Leu Arg His Glu Ala Leu Lys Ala Leu
210 215 220

```
Ser Lys Arg Gln Gln Arg Glu Val Leu Asp Met Leu Arg Thr Gly Ala
225                 230                 235                 240

Asp Gln Ala Arg Glu Ser Leu Cys Tyr Lys Tyr Gly Leu Asp Leu Gln
                245                 250                 255

Ala Leu Pro Trp Asp Lys Met Ser Ser Asn Ser Thr Phe Ile Ala Gln
            260                 265                 270

His Leu Met Ser Leu Gly Phe Gly Glu Ser Ala Thr His Val Arg Tyr
        275                 280                 285

Arg Pro Lys Arg Lys Ala Ser Glu Arg Thr Ile Leu Lys Tyr Asp Ser
    290                 295                 300

Arg Phe Ala Ala Glu Glu Lys Ile Lys Leu Thr Asp Glu Thr Arg Arg
305                 310                 315                 320

Ala Trp Asn Glu Ala Ile Trp Glu Cys Gln Arg Ala Ser Gln Glu Phe
                325                 330                 335

Arg Cys Leu Ser Val Arg Lys Leu Gln Leu Ala Arg Ala Ala Val Asn
            340                 345                 350

Trp Thr Leu Thr Gln Ala Lys Gln Arg Ser Arg Cys Pro Arg Val Val
        355                 360                 365

Val Val Val Glu Asp Leu Asn Val Arg Phe Met His Gly Gly Gly Lys
    370                 375                 380

Arg Gln Glu Gly Trp Ala Gly Phe Phe Lys Ala Arg Ser Glu Lys Arg
385                 390                 395                 400

Trp Phe Ile Gln Ala Leu His Lys Ala Tyr Thr Glu Leu Pro Thr Asn
                405                 410                 415

Arg Gly Ile His Val Met Glu Val Asn Pro Ala Arg Thr Ser Ile Thr
            420                 425                 430

Cys Thr Lys Cys Gly Tyr Cys Asp Pro Glu Asn Arg Tyr Gly Glu Asp
        435                 440                 445

Phe His Cys Arg Asn Pro Lys Cys Lys Val Arg Gly Gly His Val Ala
    450                 455                 460
```

```
Asn Ala Asp Leu Asp Ile Ala Thr Glu Asn Leu Ala Arg Val Ala Leu
465                 470                 475                 480


Ser Gly Pro Met Pro Lys Ala Pro Lys Leu Lys
                485                 490


<210> 308
<211> 848
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 308
Met Thr Pro Ser Phe Gly Tyr Gln Met Ile Ile Val Thr Pro Ile His
1               5                   10                  15


His Ala Ser Gly Ala Trp Ala Thr Leu Arg Leu Leu Phe Leu Asn Pro
            20                  25                  30


Lys Thr Ser Gly Val Met Leu Gly Met Thr Lys Thr Lys Ser Ala Phe
        35                  40                  45


Ala Leu Met Arg Glu Glu Val Phe Pro Gly Leu Leu Phe Lys Ser Ala
    50                  55                  60


Asp Leu Lys Met Ala Gly Arg Lys Phe Ala Lys Glu Gly Arg Glu Ala
65                  70                  75                  80


Ala Ile Glu Tyr Leu Arg Gly Lys Asp Glu Glu Arg Pro Ala Asn Phe
                85                  90                  95


Lys Pro Pro Ala Lys Gly Asp Ile Ile Ala Gln Ser Arg Pro Phe Asp
            100                 105                 110


Gln Trp Pro Ile Val Gln Val Ser Gln Ala Ile Gln Lys Tyr Ile Phe
        115                 120                 125


Gly Leu Thr Lys Ala Glu Phe Asp Ala Thr Lys Thr Leu Leu Tyr Gly
    130                 135                 140


Glu Gly Asn His Pro Thr Thr Glu Ser Arg Arg Arg Trp Phe Glu Ala
```

```
145                 150                 155                 160

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

Ile Phe Ser Ser Ala Leu Ala Arg Tyr Glu Gly Val Ile Gln Lys Val
            180                 185                 190

Glu Asn Arg Asn Glu Lys Arg Leu Lys Lys Leu Ser Glu Lys Asn Gln
        195                 200                 205

Arg Leu Val Glu Glu Gly His Ala Val Glu Ala Tyr Val Pro Glu Thr
    210                 215                 220

Ala Phe His Thr Leu Glu Ser Leu Lys Ala Leu Ser Glu Lys Ser Leu
225                 230                 235                 240

Val Pro Leu Asp Asp Leu Met Asp Lys Ile Asp Arg Leu Ala Gln Pro
                245                 250                 255

Pro Gly Ile Asn Pro Cys Leu Tyr Gly Tyr Gln Gln Val Ala Pro Tyr
            260                 265                 270

Ile Tyr Asp Pro Glu Asn Pro Arg Gly Val Val Leu Pro Asp Leu Tyr
        275                 280                 285

Leu Gly Tyr Cys Arg Lys Pro Asp Asp Pro Ile Thr Ala Cys Pro Asn
    290                 295                 300

Arg Leu Asp Ile Pro Lys Gly Gln Pro Gly Tyr Ile Pro Glu His Gln
305                 310                 315                 320

Arg Gly Gln Leu Lys Lys His Gly Arg Val Arg Arg Phe Arg Tyr Thr
                325                 330                 335

Asn Pro Gln Ala Lys Ala Arg Ala Lys Ala Gln Thr Ala Ile Leu Ala
            340                 345                 350

Val Leu Arg Ile Asp Glu Asp Trp Val Val Met Asp Leu Arg Gly Leu
        355                 360                 365

Leu Arg Asn Val Tyr Phe Arg Glu Val Ala Ala Pro Gly Glu Leu Thr
    370                 375                 380
```

```
Ala Arg Thr Leu Leu Asp Thr Phe Thr Gly Cys Pro Val Leu Asn Leu
385                 390                 395                 400

Arg Ser Asn Val Val Thr Phe Cys Tyr Asp Ile Glu Ser Lys Gly Ala
                405                 410                 415

Leu His Ala Glu Tyr Val Arg Lys Gly Trp Ala Thr Arg Asn Lys Leu
            420                 425                 430

Leu Asp Leu Thr Lys Asp Gly Gln Ser Val Ala Leu Leu Ser Val Asp
        435                 440                 445

Leu Gly Gln Arg His Pro Val Ala Val Met Ile Ser Arg Leu Lys Arg
    450                 455                 460

Asp Asp Lys Gly Asp Leu Ser Glu Lys Ser Ile Gln Val Val Ser Arg
465                 470                 475                 480

Thr Phe Ala Asp Gln Tyr Val Asp Lys Leu Lys Arg Tyr Arg Val Gln
                485                 490                 495

Tyr Asp Ala Leu Arg Lys Glu Ile Tyr Asp Ala Ala Leu Val Ser Leu
            500                 505                 510

Pro Pro Glu Gln Gln Ala Glu Ile Arg Ala Tyr Glu Ala Phe Ala Pro
        515                 520                 525

Gly Asp Ala Lys Ala Asn Val Leu Ser Val Met Phe Gln Gly Glu Val
    530                 535                 540

Ser Pro Asp Glu Leu Pro Trp Asp Lys Met Asn Thr Asn Thr His Tyr
545                 550                 555                 560

Ile Ser Asp Leu Tyr Leu Arg Arg Gly Gly Asp Pro Ser Arg Val Phe
                565                 570                 575

Phe Val Pro Gln Pro Ser Thr Pro Lys Lys Asn Ala Lys Lys Pro Pro
            580                 585                 590

Ala Pro Arg Lys Pro Val Lys Arg Thr Asp Glu Asn Val Ser His Met
        595                 600                 605

Pro Glu Phe Arg Pro His Leu Ser Asn Glu Thr Arg Glu Ala Phe Gln
```

```
    610                 615                 620

Lys Ala Lys Trp Thr Met Glu Arg Gly Asn Val Arg Tyr Ala Gln Leu
625                 630                 635                 640

Ser Arg Phe Leu Asn Gln Ile Val Arg Glu Ala Asn Asn Trp Leu Val
                645                 650                 655

Ser Glu Ala Lys Lys Leu Thr Gln Cys Gln Thr Val Val Trp Ala Ile
            660                 665                 670

Glu Asp Leu His Val Pro Phe Phe His Gly Lys Gly Lys Tyr His Glu
        675                 680                 685

Thr Trp Asp Gly Phe Phe Arg Gln Lys Lys Glu Asp Arg Trp Phe Val
    690                 695                 700

Asn Val Phe His Lys Ala Ile Ser Glu Arg Ala Pro Asn Lys Gly Glu
705                 710                 715                 720

Tyr Val Met Glu Val Ala Pro Tyr Arg Thr Ser Gln Arg Cys Pro Val
                725                 730                 735

Cys Gly Phe Val Asp Ala Asp Asn Arg His Gly Asp His Phe Lys Cys
            740                 745                 750

Leu Arg Cys Gly Val Glu Leu His Ala Asp Leu Glu Val Ala Thr Trp
        755                 760                 765

Asn Ile Ala Leu Val Ala Val Gln Gly His Gly Ile Ala Gly Pro Pro
    770                 775                 780

Arg Glu Gln Ser Cys Gly Gly Glu Thr Ala Gly Thr Ala Arg Lys Gly
785                 790                 795                 800

Lys Asn Ile Lys Lys Asn Lys Gly Leu Ala Asp Ala Val Thr Val Glu
                805                 810                 815

Ala Gln Asp Ser Glu Gly Gly Ser Lys Lys Asp Ala Gly Thr Ala Arg
            820                 825                 830

Asn Pro Val Tyr Ile Pro Ser Glu Ser Gln Val Asn Cys Pro Ala Pro
        835                 840                 845
```

<210> 309
<211> 781
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 309
Met Lys Pro Lys Thr Pro Lys Pro Pro Lys Thr Pro Val Ala Ala Leu
1 5 10 15

Ile Asp Lys His Phe Pro Gly Lys Arg Phe Arg Ala Ser Tyr Leu Lys
20 25 30

Ser Val Gly Lys Lys Leu Lys Asn Gln Gly Glu Asp Val Ala Val Arg
35 40 45

Phe Leu Thr Gly Lys Asp Glu Glu Arg Pro Pro Asn Phe Gln Pro Pro
50 55 60

Ala Lys Ser Asn Ile Val Ala Gln Ser Arg Pro Ile Glu Glu Trp Pro
65 70 75 80

Ile His Lys Val Ser Val Ala Val Gln Glu Tyr Val Tyr Gly Leu Thr
85 90 95

Val Ala Glu Lys Glu Ala Cys Ser Asp Ala Gly Glu Ser Ser Ser Ser
100 105 110

His Ala Ala Trp Phe Ala Lys Thr Gly Val Glu Asn Phe Gly Tyr Thr
115 120 125

Ser Val Gln Gly Leu Asn Lys Ile Phe Pro Pro Thr Phe Asn Arg Phe
130 135 140

Asp Gly Val Ile Lys Lys Val Glu Asn Arg Asn Glu Lys Lys Arg Gln
145 150 155 160

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

Asp Pro Pro Glu Ala Glu Val Lys Ala Thr Asp Asp Ala Gly Tyr Leu
180 185 190

```
Leu Gln Pro Pro Gly Ile Asn His Ser Val Tyr Gly Tyr Gln Ser Ile
        195                 200                 205

Thr Leu Cys Pro Tyr Thr Ala Glu Lys Phe Pro Thr Ile Lys Leu Pro
    210                 215                 220

Glu Glu Tyr Ala Gly Tyr His Ser Asn Pro Asp Ala Pro Ile Pro Ala
225                 230                 235                 240

Gly Val Pro Asp Arg Leu Ala Ile Pro Glu Gly Gln Pro Gly His Val
                245                 250                 255

Pro Glu Glu His Arg Ala Gly Leu Ser Thr Lys Lys His Arg Arg Val
            260                 265                 270

Arg Gln Trp Tyr Ala Met Ala Asn Trp Lys Pro Lys Pro Lys Arg Thr
        275                 280                 285

Ser Lys Pro Asp Tyr Asp Arg Leu Ala Lys Ala Arg Ala Gln Gly Ala
    290                 295                 300

Leu Leu Ile Val Ile Arg Ile Asp Glu Asp Trp Val Val Val Asp Ala
305                 310                 315                 320

Arg Gly Leu Leu Arg Asn Val Arg Trp Arg Ser Leu Gly Lys Arg Glu
                325                 330                 335

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

Asp Leu Lys Arg Gly Val Val Thr Phe Thr Tyr Ala Glu Gly Val Val
        355                 360                 365

Asn Val Cys Ser Arg Ser Thr Thr Lys Gly Lys Gln Thr Lys Val Leu
    370                 375                 380

Leu Asp Ala Met Thr Ala Pro Arg Asp Gly Lys Lys Arg Gln Ile Gly
385                 390                 395                 400

Met Val Ala Val Asp Leu Gly Gln Thr Asn Pro Ile Ala Ala Glu Tyr
                405                 410                 415
```

```
Ser Arg Val Gly Lys Asn Ala Ala Gly Thr Leu Glu Ala Thr Pro Leu
            420                 425                 430

Ser Arg Ser Thr Leu Pro Asp Glu Leu Leu Arg Glu Ile Ala Leu Tyr
        435                 440                 445

Arg Lys Ala His Asp Arg Leu Glu Ala Gln Leu Arg Glu Glu Ala Val
    450                 455                 460

Leu Lys Leu Thr Ala Glu Gln Gln Ala Glu Asn Ala Arg Tyr Val Glu
465                 470                 475                 480

Thr Ser Glu Glu Gly Ala Lys Leu Ala Leu Ala Asn Leu Gly Val Asp
                485                 490                 495

Thr Ser Thr Leu Pro Trp Asp Ala Met Thr Gly Trp Ser Thr Cys Ile
            500                 505                 510

Ser Asp His Leu Ile Asn His Gly Gly Asp Thr Ser Ala Val Phe Phe
        515                 520                 525

Gln Thr Ile Arg Lys Gly Thr Lys Lys Leu Glu Thr Ile Lys Arg Lys
    530                 535                 540

Asp Ser Ser Trp Ala Asp Ile Val Arg Pro Arg Leu Thr Lys Glu Thr
545                 550                 555                 560

Arg Glu Ala Leu Asn Asp Phe Leu Trp Glu Leu Lys Arg Ser His Glu
                565                 570                 575

Gly Tyr Glu Lys Leu Ser Lys Arg Leu Glu Glu Leu Ala Arg Arg Ala
            580                 585                 590

Val Asn His Val Val Gln Glu Val Lys Trp Leu Thr Gln Cys Gln Asp
        595                 600                 605

Ile Val Ile Val Ile Glu Asp Leu Asn Val Arg Asn Phe His Gly Gly
    610                 615                 620

Gly Lys Arg Gly Gly Gly Trp Ser Asn Phe Phe Thr Val Lys Lys Glu
625                 630                 635                 640

Asn Arg Trp Phe Met Gln Ala Leu His Lys Ala Phe Ser Asp Leu Ala
                645                 650                 655
```

```
Ala His Arg Gly Ile Pro Val Leu Glu Val Tyr Pro Ala Arg Thr Ser
            660                 665                 670

Ile Thr Cys Leu Gly Cys Gly His Cys Asp Pro Glu Asn Arg Asp Gly
        675                 680                 685

Glu Ala Phe Val Cys Gln Gln Cys Gly Ala Thr Phe His Ala Asp Leu
    690                 695                 700

Glu Val Ala Thr Arg Asn Ile Ala Arg Val Ala Leu Thr Gly Glu Ala
705                 710                 715                 720

Met Pro Lys Ala Pro Ala Arg Glu Gln Pro Gly Gly Ala Lys Lys Arg
                725                 730                 735

Gly Thr Ser Arg Arg Arg Lys Leu Thr Glu Val Ala Val Lys Ser Ala
            740                 745                 750

Glu Pro Thr Ile His Gln Ala Lys Asn Gln Gln Leu Asn Gly Thr Ser
        755                 760                 765

Arg Asp Pro Val Tyr Lys Gly Ser Glu Leu Pro Ala Leu
    770                 775                 780


<210> 310
<211> 767
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 310
Met Ser Glu Ile Thr Asp Leu Leu Lys Ala Asn Phe Lys Gly Lys Thr
1               5                   10                  15

Phe Lys Ser Ala Asp Met Arg Met Ala Gly Arg Ile Leu Lys Lys Ser
            20                  25                  30

Gly Ala Gln Ala Val Ile Lys Tyr Leu Ser Asp Lys Gly Ala Val Asp
        35                  40                  45

Pro Pro Asp Phe Arg Pro Pro Ala Lys Cys Asn Ile Ile Ala Gln Ser
```

```
    50                  55                  60

Arg Pro Phe Asp Glu Trp Pro Ile Cys Lys Ala Ser Met Ala Ile Gln
65                  70                  75                  80

Gln His Ile Tyr Gly Leu Thr Lys Asn Glu Phe Asp Glu Ser Ser Pro
                85                  90                  95

Gly Thr Ser Ser Ala Ser His Glu Gln Trp Phe Ala Lys Thr Gly Val
            100                 105                 110

Asp Thr His Gly Phe Thr His Val Gln Gly Leu Asn Leu Ile Phe Gln
        115                 120                 125

His Ala Lys Lys Arg Tyr Glu Gly Val Ile Lys Lys Val Glu Asn Tyr
    130                 135                 140

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

Lys Glu Gly Met Pro Leu Leu Glu Pro Arg Leu Arg Thr Ala Phe Gly
                165                 170                 175

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

Leu Tyr Gln Gln Thr Ser Pro Arg Pro Tyr Asp Lys Thr Lys His Pro
        195                 200                 205

Tyr Val His Ala Pro Phe Glu Leu Lys Glu Ile Thr Thr Ile Pro Thr
    210                 215                 220

Gln Asp Asp Arg Leu Lys Ile Pro Phe Gly Ala Pro Gly His Val Pro
225                 230                 235                 240

Glu Lys His Arg Ser Gln Leu Ser Met Ala Lys His Lys Arg Arg Arg
                245                 250                 255

Ala Trp Tyr Ala Leu Ser Gln Asn Lys Pro Arg Pro Pro Lys Asp Gly
            260                 265                 270

Ser Lys Gly Arg Arg Ser Val Arg Asp Leu Ala Asp Leu Lys Ala Ala
        275                 280                 285
```

```
Ser Leu Ala Asp Ala Ile Pro Leu Val Ser Arg Val Gly Phe Asp Trp
    290                 295                 300

Val Val Ile Asp Gly Arg Gly Leu Leu Arg Asn Leu Arg Trp Arg Lys
305                 310                 315                 320

Leu Ala His Glu Gly Met Thr Val Glu Glu Met Leu Gly Phe Phe Ser
                325                 330                 335

Gly Asp Pro Val Ile Asp Pro Arg Arg Asn Val Ala Thr Phe Ile Tyr
            340                 345                 350

Lys Ala Glu His Ala Thr Val Lys Ser Arg Lys Pro Ile Gly Gly Ala
        355                 360                 365

Lys Arg Ala Arg Glu Glu Leu Leu Lys Ala Thr Ala Ser Ser Asp Gly
    370                 375                 380

Val Ile Arg Gln Val Gly Leu Ile Ser Val Asp Leu Gly Gln Thr Asn
385                 390                 395                 400

Pro Val Ala Tyr Glu Ile Ser Arg Met His Gln Ala Asn Gly Glu Leu
                405                 410                 415

Val Ala Glu His Leu Glu Tyr Gly Leu Leu Asn Asp Glu Gln Val Asn
            420                 425                 430

Ser Ile Gln Arg Tyr Arg Ala Ala Trp Asp Ser Met Asn Glu Ser Phe
        435                 440                 445

Arg Gln Lys Ala Ile Glu Ser Leu Ser Met Glu Ala Gln Asp Glu Ile
    450                 455                 460

Met Gln Ala Ser Thr Gly Ala Ala Lys Arg Thr Arg Glu Ala Val Leu
465                 470                 475                 480

Thr Met Phe Gly Pro Asn Ala Thr Leu Pro Trp Ser Arg Met Ser Ser
                485                 490                 495

Asn Thr Thr Cys Ile Ser Asp Ala Leu Ile Glu Val Gly Lys Glu Glu
            500                 505                 510

Glu Thr Asn Phe Val Thr Ser Asn Gly Pro Arg Lys Arg Thr Asp Ala
```

```
        515                 520                 525

Gln Trp Ala Ala Tyr Leu Arg Pro Arg Val Asn Pro Glu Thr Arg Ala
    530                 535                 540

Leu Leu Asn Gln Ala Val Trp Asp Leu Met Lys Arg Ser Asp Glu Tyr
545                 550                 555                 560

Glu Arg Leu Ser Lys Arg Lys Leu Glu Met Ala Arg Gln Cys Val Asn
                565                 570                 575

Phe Val Val Ala Arg Ala Glu Lys Leu Thr Gln Cys Asn Asn Ile Gly
            580                 585                 590

Ile Val Leu Glu Asn Leu Val Val Arg Asn Phe His Gly Ser Gly Arg
        595                 600                 605

Arg Glu Ser Gly Trp Glu Gly Phe Phe Glu Pro Lys Arg Glu Asn Arg
    610                 615                 620

Trp Phe Met Gln Val Leu His Lys Ala Phe Ser Asp Leu Ala Gln His
625                 630                 635                 640

Arg Gly Val Met Val Phe Glu Val His Pro Ala Tyr Ser Ser Gln Thr
                645                 650                 655

Cys Pro Ala Cys Arg Tyr Val Asp Pro Lys Asn Arg Ser Ser Glu Asp
            660                 665                 670

Arg Glu Arg Phe Lys Cys Leu Lys Cys Gly Arg Ser Phe Asn Ala Asp
        675                 680                 685

Arg Glu Val Ala Thr Phe Asn Ile Arg Glu Ile Ala Arg Thr Gly Val
    690                 695                 700

Gly Leu Pro Lys Pro Asp Cys Glu Arg Ser Arg Gly Val Gln Thr Thr
705                 710                 715                 720

Gly Thr Ala Arg Asn Pro Gly Arg Ser Leu Lys Ser Asn Lys Asn Pro
                725                 730                 735

Ser Glu Pro Lys Arg Val Leu Gln Ser Lys Thr Arg Lys Lys Ile Thr
            740                 745                 750
```

Ser Thr Glu Thr Gln Asn Glu Pro Leu Ala Thr Asp Leu Lys Thr
        755   760   765

<210> 311
<211> 760
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 311
Met Thr Pro Lys Thr Glu Ser Pro Leu Ser Ala Leu Cys Lys Lys His
1   5   10   15

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

Ile Leu Lys Lys His Gly Glu Asp Ala Val Val Ala Phe Leu Ser Asp
        35   40   45

Lys Gln Glu Asp Glu Pro Ala Asn Phe Cys Pro Pro Ala Lys Val His
    50   55   60

Ile Leu Ala Gln Ser Arg Pro Phe Glu Asp Trp Pro Ile Asn Leu Ala
65   70   75   80

Ser Lys Ala Ile Gln Thr Tyr Val Tyr Gly Leu Thr Ala Asp Glu Arg
                85   90   95

Lys Thr Cys Glu Pro Gly Thr Ser Lys Glu Ser His Asp Arg Trp Phe
            100   105   110

Lys Glu Thr Gly Val Asp His His Gly Phe Thr Ser Val Gln Gly Leu
        115   120   125

Asn Leu Ile Phe Lys His Thr Leu Asn Arg Tyr Asp Gly Val Ile Lys
    130   135   140

Lys Val Glu Thr Arg Asn Glu Lys Arg Arg Ser Ser Val Val Arg Ile
145   150   155   160

Asn Glu Lys Lys Ala Ala Glu Gly Leu Pro Leu Ile Ala Ala Glu Ala
                165   170   175

```
Glu Glu Thr Ala Phe Gly Glu Asp Gly Arg Leu Leu Gln Pro Pro Gly
            180                 185                 190

Val Asn His Ser Ile Tyr Cys Phe Gln Gln Val Ser Pro Gln Pro Tyr
        195                 200                 205

Ser Ser Lys Lys His Pro Gln Val Val Leu Pro His Ala Val Gln Gly
    210                 215                 220

Val Asp Pro Asp Ala Pro Ile Pro Val Gly Arg Pro Asn Arg Leu Asp
225                 230                 235                 240

Ile Pro Lys Gly Gln Pro Gly Tyr Val Pro Glu Trp Gln Arg Pro His
                245                 250                 255

Leu Ser Met Lys Cys Lys Arg Val Arg Met Trp Tyr Ala Arg Ala Asn
            260                 265                 270

Trp Arg Arg Lys Pro Gly Arg Arg Ser Val Leu Asn Glu Ala Arg Leu
        275                 280                 285

Lys Glu Ala Ser Ala Lys Gly Ala Leu Pro Ile Val Leu Val Ile Gly
    290                 295                 300

Asp Asp Trp Leu Val Met Asp Ala Arg Gly Leu Leu Arg Ser Val Phe
305                 310                 315                 320

Trp Arg Arg Val Ala Lys Pro Gly Leu Ser Leu Ser Glu Leu Leu Asn
                325                 330                 335

Val Thr Pro Thr Gly Leu Phe Ser Gly Asp Pro Val Ile Asp Pro Lys
            340                 345                 350

Arg Gly Leu Val Thr Phe Thr Ser Lys Leu Gly Val Val Ala Val His
        355                 360                 365

Ser Arg Lys Pro Thr Arg Gly Lys Lys Ser Lys Asp Leu Leu Leu Lys
    370                 375                 380

Met Thr Lys Pro Thr Asp Asp Gly Met Pro Arg His Val Gly Met Val
385                 390                 395                 400
```

```
Ala Ile Asp Leu Gly Gln Thr Asn Pro Val Ala Ala Glu Tyr Ser Arg
                405                 410                 415

Val Val Gln Ser Asp Ala Gly Thr Leu Lys Gln Glu Pro Val Ser Arg
            420                 425                 430

Gly Val Leu Pro Asp Asp Leu Leu Lys Asp Val Ala Arg Tyr Arg Arg
        435                 440                 445

Ala Tyr Asp Leu Thr Glu Glu Ser Ile Arg Gln Glu Ala Ile Ala Leu
    450                 455                 460

Leu Ser Glu Gly His Arg Ala Glu Val Thr Lys Leu Asp Gln Thr Thr
465                 470                 475                 480

Ala Asn Glu Thr Lys Arg Leu Leu Val Asp Arg Gly Val Ser Glu Ser
                485                 490                 495

Leu Pro Trp Glu Lys Met Ser Ser Asn Thr Thr Tyr Ile Ser Asp Cys
            500                 505                 510

Leu Val Ala Leu Gly Lys Thr Asp Asp Val Phe Phe Val Pro Lys Ala
        515                 520                 525

Lys Lys Gly Lys Lys Glu Thr Gly Ile Ala Val Lys Arg Lys Asp His
    530                 535                 540

Gly Trp Ser Lys Leu Leu Arg Pro Arg Thr Ser Pro Glu Ala Arg Lys
545                 550                 555                 560

Ala Leu Asn Glu Asn Gln Trp Ala Val Lys Arg Ala Ser Pro Glu Tyr
                565                 570                 575

Glu Arg Leu Ser Arg Arg Lys Leu Glu Leu Gly Arg Arg Cys Val Asn
            580                 585                 590

His Ile Ile Gln Glu Thr Lys Arg Trp Thr Gln Cys Glu Asp Ile Val
        595                 600                 605

Val Val Leu Glu Asp Leu Asn Val Gly Phe Phe His Gly Ser Gly Lys
    610                 615                 620

Arg Pro Asp Gly Trp Asp Asn Phe Phe Val Ser Lys Arg Glu Asn Arg
625                 630                 635                 640
```

```
Trp Phe Ile Gln Val Leu His Lys Ala Phe Gly Asp Leu Ala Thr His
                645                 650                 655

Arg Gly Thr His Val Ile Glu Val His Pro Ala Arg Thr Ser Ile Thr
            660                 665                 670

Cys Ile Lys Cys Gly His Cys Asp Ala Gly Asn Arg Asp Gly Glu Ser
        675                 680                 685

Phe Val Cys Leu Ala Ser Ala Cys Gly Asp Arg Arg His Ala Asp Leu
    690                 695                 700

Glu Val Ala Thr Arg Asn Val Ala Arg Val Ala Ile Thr Gly Glu Arg
705                 710                 715                 720

Met Pro Pro Ser Glu Gln Ala Arg Asp Val Gln Lys Ala Gly Gly Ala
                725                 730                 735

Arg Lys Arg Lys Pro Ser Ala Arg Asn Val Lys Ser Ser Tyr Pro Ala
            740                 745                 750

Val Glu Pro Ala Pro Ala Ser Pro
        755                 760


<210> 312
<211> 752
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 312
Met Ser Asp Asn Lys Met Lys Lys Leu Ser Lys Glu Glu Lys Pro Leu
1               5                   10                  15

Thr Pro Leu Gln Ile Leu Ile Arg Lys Tyr Ile Asp Lys Ser Gln Tyr
            20                  25                  30

Pro Ser Gly Phe Lys Thr Thr Ile Ile Lys Gln Ala Gly Val Arg Ile
        35                  40                  45

Lys Ser Val Lys Ser Glu Gln Asp Glu Ile Asn Leu Ala Asn Trp Ile
```

```
    50                  55                  60

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

Ala Lys Cys Gln Ile Ile Ala Thr Ser Arg Ser Val Ala Asp Phe Asp
                85                  90                  95

Ile Val Lys Met Ser Asn Lys Val Gln Glu Ile Phe Phe Ala Ser Ser
            100                 105                 110

His Leu Asp Lys Asn Val Phe Asp Ile Gly Lys Ser Lys Ser Asp His
        115                 120                 125

Asp Ser Trp Phe Glu Arg Asn Asn Val Asp Arg Gly Ile Tyr Thr Tyr
    130                 135                 140

Ser Asn Val Gln Gly Met Asn Leu Ile Phe Ser Asn Thr Lys Asn Thr
145                 150                 155                 160

Tyr Leu Gly Val Ala Val Lys Ala Gln Asn Lys Phe Ser Ser Lys Met
                165                 170                 175

Lys Arg Ile Gln Asp Ile Asn Asn Phe Arg Ile Thr Asn His Gln Ser
            180                 185                 190

Pro Leu Pro Ile Pro Asp Glu Ile Lys Ile Tyr Asp Asp Ala Gly Phe
        195                 200                 205

Leu Leu Asn Pro Pro Gly Val Asn Pro Asn Ile Phe Gly Tyr Gln Ser
    210                 215                 220

Cys Leu Leu Lys Pro Leu Glu Asn Lys Glu Ile Ile Ser Lys Thr Ser
225                 230                 235                 240

Phe Pro Glu Tyr Ser Arg Leu Pro Ala Asp Met Ile Glu Val Asn Tyr
                245                 250                 255

Lys Ile Ser Asn Arg Leu Lys Phe Ser Asn Asp Gln Lys Gly Phe Ile
            260                 265                 270

Gln Phe Lys Asp Lys Leu Asn Leu Phe Lys Ile Asn Ser Gln Glu Leu
        275                 280                 285
```

```
Phe Ser Lys Arg Arg Arg Leu Ser Gly Gln Pro Ile Leu Leu Val Ala
    290                 295                 300

Ser Phe Gly Asp Asp Trp Val Val Leu Asp Gly Arg Gly Leu Leu Arg
305                 310                 315                 320

Gln Val Tyr Tyr Arg Gly Ile Ala Lys Pro Gly Ser Ile Thr Ile Ser
                325                 330                 335

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

Gly Val Val Ser Leu Gly Phe Lys Pro Gly Val Leu Ser Gln Glu Thr
        355                 360                 365

Leu Lys Thr Thr Ser Ala Arg Ile Phe Ala Glu Lys Leu Pro Asn Leu
    370                 375                 380

Val Leu Asn Asn Asn Val Gly Leu Met Ser Ile Asp Leu Gly Gln Thr
385                 390                 395                 400

Asn Pro Val Ser Tyr Arg Leu Ser Glu Ile Thr Ser Asn Met Ser Val
                405                 410                 415

Glu His Ile Cys Ser Asp Phe Leu Ser Gln Asp Gln Ile Ser Ser Ile
            420                 425                 430

Glu Lys Ala Lys Thr Ser Leu Asp Asn Leu Glu Glu Glu Ile Ala Ile
        435                 440                 445

Lys Ala Val Asp His Leu Ser Asp Glu Asp Lys Ile Asn Phe Ala Asn
    450                 455                 460

Phe Ser Lys Leu Asn Leu Pro Glu Asp Thr Arg Gln Ser Leu Phe Glu
465                 470                 475                 480

Lys Tyr Pro Glu Leu Ile Gly Ser Lys Leu Asp Phe Gly Ser Met Gly
                485                 490                 495

Ser Gly Thr Ser Tyr Ile Ala Asp Glu Leu Ile Lys Phe Glu Asn Lys
            500                 505                 510

Asp Ala Phe Tyr Pro Ser Gly Lys Lys Lys Phe Asp Leu Ser Phe Ser
```

```
        515                 520                 525

Arg Asp Leu Arg Lys Lys Leu Ser Asp Glu Thr Arg Lys Ser Tyr Asn
    530                 535                 540

Asp Ala Leu Phe Leu Glu Lys Arg Thr Asn Asp Lys Tyr Leu Lys Asn
545                 550                 555                 560

Ala Lys Arg Arg Lys Gln Ile Val Arg Thr Val Ala Asn Ser Leu Val
                565                 570                 575

Ser Lys Ile Glu Glu Leu Gly Leu Thr Pro Val Ile Asn Ile Glu Asn
            580                 585                 590

Leu Ala Met Ser Gly Gly Phe Phe Asp Gly Arg Gly Lys Arg Glu Lys
        595                 600                 605

Gly Trp Asp Asn Phe Phe Lys Val Lys Lys Glu Asn Arg Trp Val Met
    610                 615                 620

Lys Asp Phe His Lys Ala Phe Ser Glu Leu Ser Pro His His Gly Val
625                 630                 635                 640

Ile Val Ile Glu Ser Pro Pro Tyr Cys Thr Ser Val Thr Cys Thr Lys
                645                 650                 655

Cys Asn Phe Cys Asp Lys Lys Asn Arg Asn Gly His Lys Phe Thr Cys
            660                 665                 670

Gln Arg Cys Gly Leu Asp Ala Asn Ala Asp Leu Asp Ile Ala Thr Glu
        675                 680                 685

Asn Leu Glu Lys Val Ala Ile Ser Gly Lys Arg Met Pro Gly Ser Glu
    690                 695                 700

Arg Ser Ser Asp Glu Arg Lys Val Ala Val Ala Arg Lys Ala Lys Ser
705                 710                 715                 720

Pro Lys Gly Lys Ala Ile Lys Gly Val Lys Cys Thr Ile Thr Asp Glu
                725                 730                 735

Pro Ala Leu Leu Ser Ala Asn Ser Gln Asp Cys Ser Gln Ser Thr Ser
            740                 745                 750
```

<210> 313
<211> 747
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 313
Met Ala Leu Ser Leu Ala Glu Val Arg Glu Arg His Phe Lys Gly Leu
1 5 10 15

Arg Phe Arg Ser Ser Tyr Leu Lys Arg Ala Gly Lys Ile Leu Lys Lys
20 25 30

Glu Gly Glu Ala Ala Cys Val Ala Tyr Leu Thr Gly Lys Asp Glu Glu
35 40 45

Ser Pro Pro Asn Phe Lys Pro Pro Ala Lys Cys Asp Val Val Ala Gln
50 55 60

Ser Arg Pro Phe Glu Glu Trp Pro Ile Val Gln Ala Ser Val Ala Val
65 70 75 80

Gln Ser Tyr Val Tyr Gly Leu Thr Lys Glu Ala Phe Glu Ala Phe Asn
85 90 95

Pro Gly Thr Thr Lys Gln Ser His Glu Ala Cys Leu Ala Ala Thr Gly
100 105 110

Ile Asp Thr Cys Gly Tyr Ser Asn Val Gln Gly Leu Asn Leu Ile Phe
115 120 125

Arg Gln Ala Lys Asn Arg Tyr Glu Gly Val Ile Thr Lys Val Glu Asn
130 135 140

Arg Asn Lys Lys Ala Lys Lys Lys Leu Thr Arg Lys Asn Glu Trp Arg
145 150 155 160

Gln Lys Asn Gly His Ser Glu Leu Pro Glu Ala Pro Glu Glu Leu Thr
165 170 175

Phe Asn Asp Glu Gly Arg Leu Leu Gln Pro Pro Gly Ile Asn Pro Ser
180 185 190

```
Leu Tyr Thr Tyr Gln Gln Ile Ser Pro Thr Pro Trp Ser Pro Lys Asp
        195                 200                 205

Ser Ser Ile Leu Pro Pro Gln Tyr Ala Gly Tyr Glu Arg Asp Pro Asn
    210                 215                 220

Ala Pro Ile Pro Phe Gly Val Ala Lys Asp Arg Leu Thr Ile Ala Ser
225                 230                 235                 240

Gly Cys Pro Gly Tyr Ile Pro Glu Trp Met Arg Thr Ala Gly Glu Lys
                245                 250                 255

Thr Asn Pro Arg Thr Gln Lys Lys Phe Met His Pro Gly Leu Ser Thr
            260                 265                 270

Arg Lys Asn Lys Arg Met Arg Leu Pro Arg Ser Val Arg Ser Ala Pro
        275                 280                 285

Leu Gly Ala Leu Leu Val Thr Ile His Leu Gly Glu Asp Trp Leu Val
    290                 295                 300

Leu Asp Val Arg Gly Leu Leu Arg Asn Ala Arg Trp Arg Gly Val Ala
305                 310                 315                 320

Pro Lys Asp Ile Ser Thr Gln Gly Leu Leu Asn Leu Phe Thr Gly Asp
                325                 330                 335

Pro Val Ile Asp Thr Arg Arg Gly Val Val Thr Phe Thr Tyr Lys Pro
            340                 345                 350

Glu Thr Val Gly Ile His Ser Arg Thr Trp Leu Tyr Lys Gly Lys Gln
        355                 360                 365

Thr Lys Glu Val Leu Glu Lys Leu Thr Gln Asp Gln Thr Val Ala Leu
    370                 375                 380

Val Ala Ile Asp Leu Gly Gln Thr Asn Pro Val Ser Ala Ala Ala Ser
385                 390                 395                 400

Arg Val Ser Arg Ser Gly Glu Asn Leu Ser Ile Glu Thr Val Asp Arg
                405                 410                 415
```

```
Phe Phe Leu Pro Asp Glu Leu Ile Lys Glu Leu Arg Leu Tyr Arg Met
            420                 425                 430

Ala His Asp Arg Leu Glu Glu Arg Ile Arg Glu Glu Ser Thr Leu Ala
        435                 440                 445

Leu Thr Glu Ala Gln Gln Ala Glu Val Arg Ala Leu Glu His Val Val
    450                 455                 460

Arg Asp Asp Ala Lys Asn Lys Val Cys Ala Ala Phe Asn Leu Asp Ala
465                 470                 475                 480

Ala Ser Leu Pro Trp Asp Gln Met Thr Ser Asn Thr Thr Tyr Leu Ser
                485                 490                 495

Glu Ala Ile Leu Ala Gln Gly Val Ser Arg Asp Gln Val Phe Phe Thr
            500                 505                 510

Pro Asn Pro Lys Lys Gly Ser Lys Glu Pro Val Glu Val Met Arg Lys
        515                 520                 525

Asp Arg Ala Trp Val Tyr Ala Phe Lys Ala Lys Leu Ser Glu Glu Thr
    530                 535                 540

Arg Lys Ala Lys Asn Glu Ala Leu Trp Ala Leu Lys Arg Ala Ser Pro
545                 550                 555                 560

Asp Tyr Ala Arg Leu Ser Lys Arg Arg Glu Glu Leu Cys Arg Arg Ser
                565                 570                 575

Val Asn Met Val Ile Asn Arg Ala Lys Lys Arg Thr Gln Cys Gln Val
            580                 585                 590

Val Ile Pro Val Leu Glu Asp Leu Asn Ile Gly Phe Phe His Gly Ser
        595                 600                 605

Gly Lys Arg Leu Pro Gly Trp Asp Asn Phe Phe Val Ala Lys Lys Glu
    610                 615                 620

Asn Arg Trp Leu Met Asn Gly Leu His Lys Ser Phe Ser Asp Leu Ala
625                 630                 635                 640

Val His Arg Gly Phe Tyr Val Phe Glu Val Met Pro His Arg Thr Ser
                645                 650                 655
```

```
Ile Thr Cys Pro Ala Cys Gly His Cys Asp Ser Glu Asn Arg Asp Gly
            660                 665                 670

Glu Ala Phe Val Cys Leu Ser Cys Lys Arg Thr Tyr His Ala Asp Leu
        675                 680                 685

Asp Val Ala Thr His Asn Leu Thr Gln Val Ala Gly Thr Gly Leu Pro
    690                 695                 700

Met Pro Glu Arg Glu His Pro Gly Gly Thr Lys Lys Pro Gly Gly Ser
705                 710                 715                 720

Arg Lys Pro Glu Ser Pro Gln Thr His Ala Pro Ile Leu His Arg Thr
                725                 730                 735

Asp Tyr Ser Glu Ser Ala Asp Arg Leu Gly Ser
            740                 745


<210> 314
<211> 733
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      polypeptide"

<400> 314
Gln Ala Val Ile Lys Tyr Leu Ser Asp Lys Gly Ala Val Asp Pro Pro
1               5                   10                  15

Asp Phe Arg Pro Pro Ala Lys Cys Asn Ile Ile Ala Gln Ser Arg Pro
            20                  25                  30

Phe Asp Glu Trp Pro Ile Cys Lys Ala Ser Met Ala Ile Gln Gln His
        35                  40                  45

Ile Tyr Gly Leu Thr Lys Asn Glu Phe Asp Glu Ser Ser Pro Gly Thr
    50                  55                  60

Ser Ser Ala Ser His Glu Gln Trp Phe Ala Lys Thr Gly Val Asp Thr
65                  70                  75                  80

His Gly Phe Thr His Val Gln Gly Leu Asn Leu Ile Phe Gln His Ala
```

```
                85                  90                  95

Lys Lys Arg Tyr Glu Gly Val Ile Lys Lys Val Glu Asn Tyr Asn Glu
            100                 105                 110

Lys Glu Arg Lys Lys Phe Glu Gly Ile Asn Glu Arg Arg Ser Lys Glu
        115                 120                 125

Gly Met Pro Leu Leu Glu Pro Arg Leu Arg Thr Ala Phe Gly Asp Asp
    130                 135                 140

Gly Lys Phe Ala Glu Lys Pro Gly Val Asn Pro Ser Ile Tyr Leu Tyr
145                 150                 155                 160

Gln Gln Thr Ser Pro Arg Pro Tyr Asp Lys Thr Lys His Pro Tyr Val
                165                 170                 175

His Ala Pro Phe Glu Leu Lys Glu Ile Thr Thr Ile Pro Thr Gln Asp
            180                 185                 190

Asp Arg Leu Lys Ile Pro Phe Gly Ala Pro Gly His Val Pro Glu Lys
        195                 200                 205

His Arg Ser Gln Leu Ser Met Ala Lys His Lys Arg Arg Arg Ala Trp
    210                 215                 220

Tyr Ala Leu Ser Gln Asn Lys Pro Arg Pro Pro Lys Asp Gly Ser Lys
225                 230                 235                 240

Gly Arg Arg Ser Val Arg Asp Leu Ala Asp Leu Lys Ala Ala Ser Leu
                245                 250                 255

Ala Asp Ala Ile Pro Leu Val Ser Arg Val Gly Phe Asp Trp Val Val
            260                 265                 270

Ile Asp Gly Arg Gly Leu Leu Arg Asn Leu Arg Trp Arg Lys Leu Ala
        275                 280                 285

His Glu Gly Met Thr Val Glu Glu Met Leu Gly Phe Phe Ser Gly Asp
    290                 295                 300

Pro Val Ile Asp Pro Arg Arg Asn Val Ala Thr Phe Ile Tyr Lys Ala
305                 310                 315                 320
```

```
Glu His Ala Thr Val Lys Ser Arg Lys Pro Ile Gly Gly Ala Lys Arg
                325                 330                 335

Ala Arg Glu Glu Leu Leu Lys Ala Thr Ala Ser Ser Asp Gly Val Ile
            340                 345                 350

Arg Gln Val Gly Leu Ile Ser Val Asp Leu Gly Gln Thr Asn Pro Val
        355                 360                 365

Ala Tyr Glu Ile Ser Arg Met His Gln Ala Asn Gly Glu Leu Val Ala
    370                 375                 380

Glu His Leu Glu Tyr Gly Leu Leu Asn Asp Glu Gln Val Asn Ser Ile
385                 390                 395                 400

Gln Arg Tyr Arg Ala Ala Trp Asp Ser Met Asn Glu Ser Phe Arg Gln
                405                 410                 415

Lys Ala Ile Glu Ser Leu Ser Met Glu Ala Gln Asp Glu Ile Met Gln
            420                 425                 430

Ala Ser Thr Gly Ala Ala Lys Arg Thr Arg Glu Ala Val Leu Thr Met
        435                 440                 445

Phe Gly Pro Asn Ala Thr Leu Pro Trp Ser Arg Met Ser Ser Asn Thr
    450                 455                 460

Thr Cys Ile Ser Asp Ala Leu Ile Glu Val Gly Lys Glu Glu Glu Thr
465                 470                 475                 480

Asn Phe Val Thr Ser Asn Gly Pro Arg Lys Arg Thr Asp Ala Gln Trp
                485                 490                 495

Ala Ala Tyr Leu Arg Pro Arg Val Asn Pro Glu Thr Arg Ala Leu Leu
            500                 505                 510

Asn Gln Ala Val Trp Asp Leu Met Lys Arg Ser Asp Glu Tyr Glu Arg
        515                 520                 525

Leu Ser Lys Arg Lys Leu Glu Met Ala Arg Gln Cys Val Asn Phe Val
    530                 535                 540

Val Ala Arg Ala Glu Lys Leu Thr Gln Cys Asn Asn Ile Gly Ile Val
```

545 550 555 560

Leu Glu Asn Leu Val Val Arg Asn Phe His Gly Ser Gly Arg Arg Glu
565 570 575

Ser Gly Trp Glu Gly Phe Phe Glu Pro Lys Arg Glu Asn Arg Trp Phe
580 585 590

Met Gln Val Leu His Lys Ala Phe Ser Asp Leu Ala Gln His Arg Gly
595 600 605

Val Met Val Phe Glu Val His Pro Ala Tyr Ser Ser Gln Thr Cys Pro
610 615 620

Ala Cys Arg Tyr Val Asp Pro Lys Asn Arg Ser Ser Glu Asp Arg Glu
625 630 635 640

Arg Phe Lys Cys Leu Lys Cys Gly Arg Ser Phe Asn Ala Asp Arg Glu
645 650 655

Val Ala Thr Phe Asn Ile Arg Glu Ile Ala Arg Thr Gly Val Gly Leu
660 665 670

Pro Lys Pro Asp Cys Glu Arg Ser Arg Asp Val Gln Thr Pro Gly Thr
675 680 685

Ala Arg Lys Ser Gly Arg Ser Leu Lys Ser Gln Asp Asn Leu Ser Glu
690 695 700

Pro Lys Arg Val Leu Gln Ser Lys Thr Arg Lys Lys Ile Thr Ser Thr
705 710 715 720

Glu Thr Gln Asn Glu Pro Leu Ala Thr Asp Leu Lys Thr
725 730

<210> 315
<211> 702
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 315

```
Met Ile Lys Glu Gln Ser Glu Leu Ser Lys Leu Ile Glu Lys Tyr Tyr
1               5                  10                  15

Pro Gly Lys Lys Phe Tyr Ser Asn Asp Leu Lys Gln Ala Gly Lys His
            20                  25                  30

Leu Lys Lys Ser Glu His Leu Thr Ala Lys Glu Ser Glu Glu Leu Thr
        35                  40                  45

Val Glu Phe Leu Lys Ser Cys Lys Glu Lys Leu Tyr Asp Phe Arg Pro
    50                  55                  60

Pro Ala Lys Ala Leu Ile Ile Ser Thr Ser Arg Pro Phe Glu Glu Trp
65                  70                  75                  80

Pro Ile Tyr Lys Ala Ser Glu Ser Ile Gln Lys Tyr Ile Tyr Ser Leu
                85                  90                  95

Thr Lys Glu Glu Leu Glu Lys Tyr Asn Ile Ser Thr Asp Lys Thr Ser
            100                 105                 110

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

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

Asp Gly Val Leu Lys Lys Val Asn Asn Arg Asn Asn Lys Ile Leu Lys
145                 150                 155                 160

Lys Tyr Lys Arg Lys Ile Glu Glu Gly Ile Glu Ile Asp Ser Pro Glu
                165                 170                 175

Leu Glu Lys Ala Ile Asp Glu Ser Gly His Phe Ile Asn Pro Pro Gly
            180                 185                 190

Ile Asn Lys Asn Ile Tyr Cys Tyr Gln Gln Val Ser Pro Thr Ile Phe
        195                 200                 205

Asn Ser Phe Lys Glu Thr Lys Ile Ile Cys Pro Phe Asn Tyr Lys Arg
    210                 215                 220

Asn Pro Asn Asp Ile Ile Gln Lys Gly Val Ile Asp Arg Leu Ala Ile
225                 230                 235                 240
```

```
Pro Phe Gly Glu Pro Gly Tyr Ile Pro Asp His Gln Arg Asp Lys Val
                245                 250                 255

Asn Lys His Lys Lys Arg Ile Arg Lys Tyr Tyr Lys Asn Asn Glu Asn
            260                 265                 270

Lys Asn Lys Asp Ala Ile Leu Ala Lys Ile Asn Ile Gly Glu Asp Trp
        275                 280                 285

Val Leu Phe Asp Leu Arg Gly Leu Leu Arg Asn Ala Tyr Trp Arg Lys
    290                 295                 300

Leu Ile Pro Lys Gln Gly Ile Thr Pro Gln Gln Leu Leu Asp Met Phe
305                 310                 315                 320

Ser Gly Asp Pro Val Ile Asp Pro Ile Lys Asn Asn Ile Thr Phe Ile
                325                 330                 335

Tyr Lys Glu Ser Ile Ile Pro Ile His Ser Glu Ser Ile Ile Lys Thr
            340                 345                 350

Lys Lys Ser Lys Glu Leu Leu Glu Lys Leu Thr Lys Asp Glu Gln Ile
        355                 360                 365

Ala Leu Val Ser Ile Asp Leu Gly Gln Thr Asn Pro Val Ala Ala Arg
    370                 375                 380

Phe Ser Arg Leu Ser Ser Asp Leu Lys Pro Glu His Val Ser Ser Ser
385                 390                 395                 400

Phe Leu Pro Asp Glu Leu Lys Asn Glu Ile Cys Arg Tyr Arg Glu Lys
                405                 410                 415

Ser Asp Leu Leu Glu Ile Glu Ile Lys Asn Lys Ala Ile Lys Met Leu
            420                 425                 430

Ser Gln Glu Gln Gln Asp Glu Ile Lys Leu Val Asn Asp Ile Ser Ser
        435                 440                 445

Glu Glu Leu Lys Asn Ser Val Cys Lys Lys Tyr Asn Ile Asp Asn Ser
    450                 455                 460
```

```
Lys Ile Pro Trp Asp Lys Met Asn Gly Phe Thr Thr Phe Ile Ala Asp
465                 470                 475                 480

Glu Phe Ile Asn Asn Gly Gly Asp Lys Ser Leu Val Tyr Phe Thr Ala
                485                 490                 495

Lys Asp Lys Lys Ser Lys Lys Glu Lys Leu Val Lys Leu Ser Asp Lys
            500                 505                 510

Lys Ile Ala Asn Ser Phe Lys Pro Lys Ile Ser Lys Glu Thr Arg Glu
        515                 520                 525

Ile Leu Asn Lys Ile Thr Trp Asp Glu Lys Ile Ser Ser Asn Glu Tyr
    530                 535                 540

Lys Lys Leu Ser Lys Arg Lys Leu Glu Phe Ala Arg Arg Ala Thr Asn
545                 550                 555                 560

Tyr Leu Ile Asn Gln Ala Lys Lys Ala Thr Arg Leu Asn Asn Val Val
                565                 570                 575

Leu Val Val Glu Asp Leu Asn Ser Lys Phe Phe His Gly Ser Gly Lys
            580                 585                 590

Arg Glu Asp Gly Trp Asp Asn Phe Phe Ile Pro Lys Lys Glu Asn Arg
        595                 600                 605

Trp Phe Ile Gln Ala Leu His Lys Ser Leu Thr Asp Val Ser Ile His
    610                 615                 620

Arg Gly Ile Asn Val Ile Glu Val Arg Pro Glu Arg Thr Ser Ile Thr
625                 630                 635                 640

Cys Pro Lys Cys Gly Cys Cys Asp Lys Glu Asn Arg Lys Gly Glu Asp
                645                 650                 655

Phe Lys Cys Ile Lys Cys Asp Ser Val Tyr His Ala Asp Leu Glu Val
            660                 665                 670

Ala Thr Phe Asn Ile Glu Lys Val Ala Ile Thr Gly Glu Ser Met Pro
        675                 680                 685

Lys Pro Asp Cys Glu Arg Leu Gly Gly Glu Glu Ser Ile Gly
    690                 695                 700
```

<210> 316
<211> 661
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 316
Val Ala Phe Leu Asp Gly Lys Glu Val Asp Glu Pro Tyr Thr Leu Gln
1 5 10 15

Pro Pro Ala Lys Cys His Ile Leu Ala Val Ser Arg Pro Ile Glu Glu
20 25 30

Trp Pro Ile Ala Arg Val Thr Met Ala Val Gln Glu His Val Tyr Ala
35 40 45

Leu Pro Val His Glu Val Glu Lys Ser Arg Pro Glu Thr Thr Glu Gly
50 55 60

Ser Arg Ser Ala Trp Phe Lys Asn Ser Gly Val Ser Asn His Gly Val
65 70 75 80

Thr His Ala Gln Thr Leu Asn Ala Ile Leu Lys Asn Ala Tyr Asn Val
85 90 95

Tyr Asn Gly Val Ile Lys Lys Val Glu Asn Arg Asn Ala Lys Lys Arg
100 105 110

Asp Ser Leu Ala Ala Lys Asn Lys Ser Arg Glu Arg Lys Gly Leu Pro
115 120 125

His Phe Lys Ala Asp Pro Pro Glu Leu Ala Thr Asp Glu Gln Gly Tyr
130 135 140

Leu Leu Gln Pro Pro Ser Pro Asn Ser Ser Val Tyr Leu Val Gln Gln
145 150 155 160

His Leu Arg Thr Pro Gln Ile Asp Leu Pro Ser Gly Tyr Thr Gly Pro
165 170 175

Val Val Asp Pro Arg Ser Pro Ile Pro Ser Leu Ile Pro Ile Asp Arg

```
            180                 185                 190

Leu Ala Ile Pro Pro Gly Gln Pro Gly Tyr Val Pro Leu His Asp Arg
        195                 200                 205

Glu Lys Leu Thr Ser Asn Lys His Arg Arg Met Lys Leu Pro Lys Ser
    210                 215                 220

Leu Arg Ala Gln Gly Ala Leu Pro Val Cys Phe Arg Val Phe Asp Asp
225                 230                 235                 240

Trp Ala Val Val Asp Gly Arg Gly Leu Leu Arg His Ala Gln Tyr Arg
                245                 250                 255

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

Thr Gly Asp Pro Val Ile Asp Ile Lys Arg Asn Leu Met Thr Phe Arg
        275                 280                 285

Phe Ala Glu Ala Val Val Glu Val Thr Ala Arg Lys Ile Val Glu Lys
    290                 295                 300

Tyr His Asn Lys Tyr Leu Leu Lys Leu Thr Glu Pro Lys Gly Lys Pro
305                 310                 315                 320

Val Arg Glu Ile Gly Leu Val Ser Ile Asp Leu Asn Val Gln Arg Leu
                325                 330                 335

Ile Ala Leu Ala Ile Tyr Arg Val His Gln Thr Gly Glu Ser Gln Leu
            340                 345                 350

Ala Leu Ser Pro Cys Leu His Arg Glu Ile Leu Pro Ala Lys Gly Leu
        355                 360                 365

Gly Asp Phe Asp Lys Tyr Lys Ser Lys Phe Asn Gln Leu Thr Glu Glu
    370                 375                 380

Ile Leu Thr Ala Ala Val Gln Thr Leu Thr Ser Ala Gln Gln Glu Glu
385                 390                 395                 400

Tyr Gln Arg Tyr Val Glu Glu Ser Ser His Glu Ala Lys Ala Asp Leu
                405                 410                 415
```

```
Cys Leu Lys Tyr Ser Ile Thr Pro His Glu Leu Ala Trp Asp Lys Met
            420                 425                 430

Thr Ser Ser Thr Gln Tyr Ile Ser Arg Trp Leu Arg Asp His Gly Trp
        435                 440                 445

Asn Ala Ser Asp Phe Thr Gln Ile Thr Lys Gly Arg Lys Lys Val Glu
    450                 455                 460

Arg Leu Trp Ser Asp Ser Arg Trp Ala Gln Glu Leu Lys Pro Lys Leu
465                 470                 475                 480

Ser Asn Glu Thr Arg Arg Lys Leu Glu Asp Ala Lys His Asp Leu Gln
                485                 490                 495

Arg Ala Asn Pro Glu Trp Gln Arg Leu Ala Lys Arg Lys Gln Glu Tyr
            500                 505                 510

Ser Arg His Leu Ala Asn Thr Val Leu Ser Met Ala Arg Glu Tyr Thr
        515                 520                 525

Ala Cys Glu Thr Val Val Ile Ala Ile Glu Asn Leu Pro Met Lys Gly
    530                 535                 540

Gly Phe Val Asp Gly Asn Gly Ser Arg Glu Ser Gly Trp Asp Asn Phe
545                 550                 555                 560

Phe Thr His Lys Lys Glu Asn Arg Trp Met Ile Lys Asp Ile His Lys
                565                 570                 575

Ala Leu Ser Asp Leu Ala Pro Asn Arg Gly Val His Val Leu Glu Val
            580                 585                 590

Asn Pro Gln Tyr Thr Ser Gln Thr Cys Pro Glu Cys Gly His Arg Asp
        595                 600                 605

Lys Ala Asn Arg Asp Pro Ile Gln Arg Glu Arg Phe Cys Cys Thr His
    610                 615                 620

Cys Gly Ala Gln Arg His Ala Asp Leu Glu Val Ala Thr His Asn Ile
625                 630                 635                 640

Ala Met Val Ala Thr Thr Gly Lys Ser Leu Thr Gly Lys Ser Leu Ala
```

645 650 655

Pro Gln Arg Leu Gln
660

<210> 317
<211> 531
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 317
Leu Glu Ile Pro Glu Gly Glu Pro Gly His Val Pro Trp Phe Gln Arg
1 5 10 15

Met Asp Ile Pro Glu Gly Gln Ile Gly His Val Asn Lys Ile Gln Arg
20 25 30

Phe Asn Phe Val His Gly Lys Asn Ser Gly Lys Val Lys Phe Ser Asp
35 40 45

Lys Thr Gly Arg Val Lys Arg Tyr His His Ser Lys Tyr Lys Asp Ala
50 55 60

Thr Lys Pro Tyr Lys Phe Leu Glu Glu Ser Lys Lys Val Ser Ala Leu
65 70 75 80

Asp Ser Ile Leu Ala Ile Ile Thr Ile Gly Asp Asp Trp Val Val Phe
85 90 95

Asp Ile Arg Gly Leu Tyr Arg Asn Val Phe Tyr Arg Glu Leu Ala Gln
100 105 110

Lys Gly Leu Thr Ala Val Gln Leu Leu Asp Leu Phe Thr Gly Asp Pro
115 120 125

Val Ile Asp Pro Lys Lys Gly Ile Ile Thr Phe Ser Tyr Lys Glu Gly
130 135 140

Val Val Pro Val Phe Ser Gln Lys Ile Val Ser Arg Phe Lys Ser Arg
145 150 155 160

```
Asp Thr Leu Glu Lys Leu Thr Ser Gln Gly Pro Val Ala Leu Leu Ser
                165                 170                 175

Val Asp Leu Gly Gln Asn Glu Pro Val Ala Ala Arg Val Cys Ser Leu
            180                 185                 190

Lys Asn Ile Asn Asp Lys Ile Ala Leu Asp Asn Ser Cys Arg Ile Pro
        195                 200                 205

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

Asp Glu Leu Glu Ile Lys Ile Arg Leu Glu Ala Ile Asn Ser Leu Asp
225                 230                 235                 240

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

Arg Ala Lys Ala Ser Thr Val Asp Met Phe Asp Ile Asp Pro Asn Leu
            260                 265                 270

Ile Ser Trp Asp Ser Met Ser Asp Ala Arg Phe Ser Thr Gln Ile Ser
        275                 280                 285

Asp Leu Tyr Leu Lys Asn Gly Gly Asp Glu Ser Arg Val Tyr Phe Glu
    290                 295                 300

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

Val Arg Pro Lys Leu Ser Asp Ser Thr Arg Lys Asn Leu Asn Asp Ser
                325                 330                 335

Ile Trp Lys Leu Lys Arg Thr Ser Glu Glu Tyr Leu Lys Leu Ser Lys
            340                 345                 350

Arg Lys Leu Glu Leu Ser Arg Ala Val Val Asn Tyr Thr Ile Arg Gln
        355                 360                 365

Ser Lys Leu Leu Ser Gly Ile Asn Asp Ile Val Ile Ile Leu Glu Asp
    370                 375                 380

Leu Asp Val Lys Lys Lys Phe Asn Gly Arg Gly Ile Arg Asp Ile Gly
385                 390                 395                 400
```

```
Trp Asp Asn Phe Phe Ser Ser Arg Lys Glu Asn Arg Trp Phe Ile Pro
                405                 410                 415

Ala Phe His Lys Ser Phe Ser Glu Leu Ser Ser Asn Arg Gly Leu Cys
            420                 425                 430

Val Ile Glu Val Asn Pro Ala Trp Thr Ser Ala Thr Cys Pro Asp Cys
        435                 440                 445

Gly Phe Cys Ser Lys Glu Asn Arg Asp Gly Ile Asn Phe Thr Cys Arg
    450                 455                 460

Lys Cys Gly Val Ser Tyr His Ala Asp Ile Asp Val Ala Thr Leu Asn
465                 470                 475                 480

Ile Ala Arg Val Ala Val Leu Gly Lys Pro Met Ser Gly Pro Ala Asp
                485                 490                 495

Arg Glu Arg Leu Gly Gly Thr Lys Lys Pro Arg Val Ala Arg Ser Arg
            500                 505                 510

Lys Asp Met Lys Arg Lys Asp Ile Ser Asn Gly Thr Val Glu Val Met
        515                 520                 525

Val Thr Ala
    530
```

<210> 318
<211> 479
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 318

```
Ile Pro Ser Phe Gly Tyr Leu Asp Arg Leu Lys Ile Ala Lys Gly Gln
1               5                   10                  15

Pro Gly Tyr Ile Pro Glu Trp Gln Arg Glu Thr Ile Asn Pro Ser Lys
            20                  25                  30

Lys Val Arg Arg Tyr Trp Ala Thr Asn His Glu Lys Ile Arg Asn Ala
```

```
        35                  40                  45

Ile Pro Leu Val Val Phe Ile Gly Asp Asp Trp Val Ile Ile Asp Gly
    50                  55                  60

Arg Gly Leu Leu Arg Asp Ala Arg Arg Arg Lys Leu Ala Asp Lys Asn
65                  70                  75                  80

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

Asp Ser Thr Arg Gly Ile Ala Thr Leu Ser Tyr Val Glu Gly Val Val
            100                 105                 110

Pro Val Arg Ser Phe Ile Pro Ile Gly Glu Lys Lys Gly Arg Glu Tyr
        115                 120                 125

Leu Glu Lys Ser Thr Gln Lys Glu Ser Val Thr Leu Leu Ser Val Asp
    130                 135                 140

Ile Gly Gln Ile Asn Pro Val Ser Cys Gly Val Tyr Lys Val Ser Asn
145                 150                 155                 160

Gly Cys Ser Lys Ile Asp Phe Leu Asp Lys Phe Phe Leu Asp Lys Lys
                165                 170                 175

His Leu Asp Ala Ile Gln Lys Tyr Arg Thr Leu Gln Asp Ser Leu Glu
            180                 185                 190

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

Lys Glu Tyr Gln Asn Ile Asn Ser Gln Thr Ser Asn Asp Val Lys Lys
    210                 215                 220

Ser Leu Cys Thr Glu Tyr Asn Ile Asp Pro Glu Ala Ile Ser Trp Gln
225                 230                 235                 240

Asp Ile Thr Ala His Ser Thr Leu Ile Ser Asp Tyr Leu Ile Asp Asn
                245                 250                 255

Asn Ile Thr Asn Asp Val Tyr Arg Thr Val Asn Lys Ala Lys Tyr Lys
            260                 265                 270
```

```
Thr Asn Asp Phe Gly Trp Tyr Lys Lys Phe Ser Ala Lys Leu Ser Lys
        275                 280                 285

Glu Ala Arg Glu Ala Leu Asn Glu Lys Ile Trp Glu Leu Lys Ile Ala
    290                 295                 300

Ser Ser Lys Tyr Lys Lys Leu Ser Val Arg Lys Lys Glu Ile Ala Arg
305                 310                 315                 320

Thr Ile Ala Asn Asp Cys Val Lys Arg Ala Glu Thr Tyr Gly Asp Asn
                325                 330                 335

Val Val Val Ala Met Glu Ser Leu Thr Lys Asn Asn Lys Val Met Ser
            340                 345                 350

Gly Arg Gly Lys Arg Asp Pro Gly Trp His Asn Leu Gly Gln Ala Lys
        355                 360                 365

Val Glu Asn Arg Trp Phe Ile Gln Ala Ile Ser Ser Ala Phe Glu Asp
    370                 375                 380

Lys Ala Thr His His Gly Thr Pro Val Leu Lys Val Asn Pro Ala Tyr
385                 390                 395                 400

Thr Ser Gln Thr Cys Pro Ser Cys Gly His Cys Ser Lys Asp Asn Arg
                405                 410                 415

Ser Ser Lys Asp Arg Thr Ile Phe Val Cys Lys Ser Cys Gly Glu Lys
            420                 425                 430

Phe Asn Ala Asp Leu Asp Val Ala Thr Tyr Asn Ile Ala His Val Ala
        435                 440                 445

Phe Ser Gly Lys Lys Leu Ser Pro Pro Ser Glu Lys Ser Ser Ala Thr
    450                 455                 460

Lys Lys Pro Arg Ser Ala Arg Lys Ser Lys Lys Ser Arg Lys Ser
465                 470                 475
```

<210> 319
<211> 452
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 319
Ser Pro Ile Glu Lys Leu Leu Asn Gly Leu Leu Val Lys Ile Thr Phe
1 5 10 15

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

Gln Lys Gly Ile Ile His Lys Ser Tyr Phe Thr Asn Lys Ser Ser Leu
35 40 45

Val Asp Leu Ile Asp Leu Phe Thr Cys Asn Pro Ile Val Asn Tyr Lys
50 55 60

Asn Asn Val Val Thr Phe Cys Tyr Lys Glu Gly Val Val Asp Val Lys
65 70 75 80

Ser Phe Thr Pro Ile Lys Ser Gly Pro Lys Thr Gln Glu Asn Leu Ile
85 90 95

Lys Lys Leu Lys Tyr Ser Arg Phe Gln Asn Glu Lys Asp Ala Cys Val
100 105 110

Leu Gly Val Gly Val Asp Val Gly Val Thr Asn Pro Phe Ala Ile Asn
115 120 125

Gly Phe Lys Met Pro Val Asp Glu Ser Ser Glu Trp Val Met Leu Asn
130 135 140

Glu Pro Leu Phe Thr Ile Glu Thr Ser Gln Ala Phe Arg Glu Glu Ile
145 150 155 160

Met Ala Tyr Gln Gln Arg Thr Asp Glu Met Asn Asp Gln Phe Asn Gln
165 170 175

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

Leu Pro Glu Asp Ile Asn Glu Val Ala Lys Tyr Asn Leu Leu His Thr
195 200 205

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

Gln Phe Ile Ser Asp Tyr Leu Ile Gln Ile Gly Arg Gly Thr Glu Thr
225                 230                 235                 240

Glu Lys Thr Ile Thr Thr Lys Lys Gly Lys Glu Lys Ile Leu Thr Ile
                245                 250                 255

Arg Asp Val Asn Trp Phe Asn Thr Phe Lys Pro Lys Ile Ser Glu Glu
            260                 265                 270

Thr Gly Lys Ala Arg Thr Glu Ile Lys Arg Asp Leu Gln Lys Asn Ser
        275                 280                 285

Asp Gln Phe Gln Lys Leu Ala Lys Ser Arg Glu Gln Ser Cys Arg Thr
    290                 295                 300

Trp Val Asn Asn Val Thr Glu Glu Ala Lys Ile Lys Ser Gly Cys Pro
305                 310                 315                 320

Leu Ile Ile Phe Val Ile Glu Ala Leu Val Lys Asp Asn Arg Val Phe
                325                 330                 335

Ser Gly Lys Gly His Arg Ala Ile Gly Trp His Asn Phe Gly Lys Gln
            340                 345                 350

Lys Asn Glu Arg Arg Trp Trp Val Gln Ala Ile His Lys Ala Phe Gln
        355                 360                 365

Glu Gln Gly Val Asn His Gly Tyr Pro Val Ile Leu Cys Pro Pro Gln
    370                 375                 380

Tyr Thr Ser Gln Thr Cys Pro Lys Cys Asn His Val Asp Arg Asp Asn
385                 390                 395                 400

Arg Ser Gly Glu Lys Phe Lys Cys Leu Lys Tyr Gly Trp Ile Gly Asn
                405                 410                 415

Ala Asp Leu Asp Val Gly Ala Tyr Asn Ile Ala Arg Val Ala Ile Thr
            420                 425                 430

Gly Lys Ala Leu Ser Lys Pro Leu Glu Gln Lys Lys Ile Lys Lys Ala
        435                 440                 445
```

Lys Asn Lys Thr
450

<210> 320
<211> 425
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 320
Leu Leu Asp Asn Val Gln Lys Gly Ile Ile His Lys Ser Tyr Phe Thr
1 5 10 15

Asn Lys Ser Ser Leu Val Asp Leu Ile Asp Leu Phe Thr Cys Asn Pro
20 25 30

Ile Val Asn Tyr Lys Asn Asn Val Val Thr Phe Cys Tyr Lys Glu Gly
35 40 45

Val Val Asp Val Lys Ser Phe Thr Pro Ile Lys Ser Gly Pro Lys Thr
50 55 60

Gln Glu Asn Leu Ile Lys Lys Leu Lys Tyr Ser Arg Phe Gln Asn Glu
65 70 75 80

Lys Asp Ala Cys Val Leu Gly Val Gly Val Asp Val Gly Val Thr Asn
85 90 95

Pro Phe Ala Ile Asn Gly Phe Lys Met Pro Val Asp Glu Ser Ser Glu
100 105 110

Trp Val Met Leu Asn Glu Pro Leu Phe Thr Ile Glu Thr Ser Gln Ala
115 120 125

Phe Arg Glu Glu Ile Met Ala Tyr Gln Gln Arg Thr Asp Glu Met Asn
130 135 140

Asp Gln Phe Asn Gln Gln Ser Ile Asp Leu Leu Pro Pro Glu Tyr Lys
145 150 155 160

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

```
                165                 170                 175

Asn Leu Leu His Thr Leu Asn Ile Pro Asn Asn Phe Leu Trp Asp Lys
            180                 185                 190

Met Ser Asn Thr Thr Gln Phe Ile Ser Asp Tyr Leu Ile Gln Ile Gly
        195                 200                 205

Arg Gly Thr Glu Thr Glu Lys Thr Ile Thr Thr Lys Lys Gly Lys Glu
    210                 215                 220

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

Lys Ile Ser Glu Glu Thr Gly Lys Ala Arg Thr Glu Ile Lys Arg Asp
                245                 250                 255

Leu Gln Lys Asn Ser Asp Gln Phe Gln Lys Leu Ala Lys Ser Arg Glu
            260                 265                 270

Gln Ser Cys Arg Thr Trp Val Asn Asn Val Thr Glu Glu Ala Lys Ile
        275                 280                 285

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

Asp Asn Arg Val Phe Ser Gly Lys Gly His Arg Ala Ile Gly Trp His
305                 310                 315                 320

Asn Phe Gly Lys Gln Lys Asn Glu Arg Arg Trp Trp Val Gln Ala Ile
                325                 330                 335

His Lys Ala Phe Gln Glu Gln Gly Val Asn His Gly Tyr Pro Val Ile
            340                 345                 350

Leu Cys Pro Pro Gln Tyr Thr Ser Gln Thr Cys Pro Lys Cys Asn His
        355                 360                 365

Val Asp Arg Asp Asn Arg Ser Gly Glu Lys Phe Lys Cys Leu Lys Tyr
    370                 375                 380

Gly Trp Ile Gly Asn Ala Asp Leu Asp Val Gly Ala Tyr Asn Ile Ala
385                 390                 395                 400
```

Arg Val Ala Ile Thr Gly Lys Ala Leu Ser Lys Pro Leu Glu Gln Lys
405 410 415

Lys Ile Lys Lys Ala Lys Asn Lys Thr
420 425

<210> 321
<211> 735
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 321
Met Ile Lys Pro Thr Val Ser Gln Phe Leu Thr Pro Gly Phe Lys Leu
1 5 10 15

Ile Arg Asn His Ser Arg Thr Ala Gly Leu Lys Leu Lys Asn Glu Gly
20 25 30

Glu Glu Ala Cys Lys Lys Phe Val Arg Glu Asn Glu Ile Pro Lys Asp
35 40 45

Glu Cys Pro Asn Phe Gln Gly Gly Pro Ala Ile Ala Asn Ile Ile Ala
50 55 60

Lys Ser Arg Glu Phe Thr Glu Trp Glu Ile Tyr Gln Ser Ser Leu Ala
65 70 75 80

Ile Gln Glu Val Ile Phe Thr Leu Pro Lys Asp Lys Leu Pro Glu Pro
85 90 95

Ile Leu Lys Glu Glu Trp Arg Ala Gln Trp Leu Ser Glu His Gly Leu
100 105 110

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

Asn Ala Val Asn Thr Tyr Lys Gly Val Gln Val Lys Val Asp Asn Lys
130 135 140

Asn Lys Asn Asn Leu Ala Lys Ile Asn Arg Lys Asn Glu Ile Ala Lys
145 150 155 160

```
Leu Asn Gly Glu Gln Glu Ile Ser Phe Glu Glu Ile Lys Ala Phe Asp
                165                 170                 175

Asp Lys Gly Tyr Leu Leu Gln Lys Pro Ser Pro Asn Lys Ser Ile Tyr
            180                 185                 190

Cys Tyr Gln Ser Val Ser Pro Lys Pro Phe Ile Thr Ser Lys Tyr His
        195                 200                 205

Asn Val Asn Leu Pro Glu Glu Tyr Ile Gly Tyr Tyr Arg Lys Ser Asn
    210                 215                 220

Glu Pro Ile Val Ser Pro Tyr Gln Phe Asp Arg Leu Arg Ile Pro Ile
225                 230                 235                 240

Gly Glu Pro Gly Tyr Val Pro Lys Trp Gln Tyr Thr Phe Leu Ser Lys
                245                 250                 255

Lys Glu Asn Lys Arg Arg Lys Leu Ser Lys Arg Ile Lys Asn Val Ser
            260                 265                 270

Pro Ile Leu Gly Ile Ile Cys Ile Lys Lys Asp Trp Cys Val Phe Asp
        275                 280                 285

Met Arg Gly Leu Leu Arg Thr Asn His Trp Lys Lys Tyr His Lys Pro
    290                 295                 300

Thr Asp Ser Ile Asn Asp Leu Phe Asp Tyr Phe Thr Gly Asp Pro Val
305                 310                 315                 320

Ile Asp Thr Lys Ala Asn Val Val Arg Phe Arg Tyr Lys Met Glu Asn
                325                 330                 335

Gly Ile Val Asn Tyr Lys Pro Val Arg Glu Lys Lys Gly Lys Glu Leu
            340                 345                 350

Leu Glu Asn Ile Cys Asp Gln Asn Gly Ser Cys Lys Leu Ala Thr Val
        355                 360                 365

Asp Val Gly Gln Asn Asn Pro Val Ala Ile Gly Leu Phe Glu Leu Lys
    370                 375                 380
```

```
Lys Val Asn Gly Glu Leu Thr Lys Thr Leu Ile Ser Arg His Pro Thr
385                 390                 395                 400

Pro Ile Asp Phe Cys Asn Lys Ile Thr Ala Tyr Arg Glu Arg Tyr Asp
                405                 410                 415

Lys Leu Glu Ser Ser Ile Lys Leu Asp Ala Ile Lys Gln Leu Thr Ser
            420                 425                 430

Glu Gln Lys Ile Glu Val Asp Asn Tyr Asn Asn Asn Phe Thr Pro Gln
        435                 440                 445

Asn Thr Lys Gln Ile Val Cys Ser Lys Leu Asn Ile Asn Pro Asn Asp
    450                 455                 460

Leu Pro Trp Asp Lys Met Ile Ser Gly Thr His Phe Ile Ser Glu Lys
465                 470                 475                 480

Ala Gln Val Ser Asn Lys Ser Glu Ile Tyr Phe Thr Ser Thr Asp Lys
                485                 490                 495

Gly Lys Thr Lys Asp Val Met Lys Ser Asp Tyr Lys Trp Phe Gln Asp
            500                 505                 510

Tyr Lys Pro Lys Leu Ser Lys Glu Val Arg Asp Ala Leu Ser Asp Ile
        515                 520                 525

Glu Trp Arg Leu Arg Arg Glu Ser Leu Glu Phe Asn Lys Leu Ser Lys
    530                 535                 540

Ser Arg Glu Gln Asp Ala Arg Gln Leu Ala Asn Trp Ile Ser Ser Met
545                 550                 555                 560

Cys Asp Val Ile Gly Ile Glu Asn Leu Val Lys Lys Asn Asn Phe Phe
                565                 570                 575

Gly Gly Ser Gly Lys Arg Glu Pro Gly Trp Asp Asn Phe Tyr Lys Pro
            580                 585                 590

Lys Lys Glu Asn Arg Trp Trp Ile Asn Ala Ile His Lys Ala Leu Thr
        595                 600                 605

Glu Leu Ser Gln Asn Lys Gly Lys Arg Val Ile Leu Leu Pro Ala Met
    610                 615                 620
```

```
Arg Thr Ser Ile Thr Cys Pro Lys Cys Lys Tyr Cys Asp Ser Lys Asn
625                 630                 635                 640


Arg Asn Gly Glu Lys Phe Asn Cys Leu Lys Cys Gly Ile Glu Leu Asn
                645                 650                 655


Ala Asp Ile Asp Val Ala Thr Glu Asn Leu Ala Thr Val Ala Ile Thr
            660                 665                 670


Ala Gln Ser Met Pro Lys Pro Thr Cys Glu Arg Ser Gly Asp Ala Lys
        675                 680                 685


Lys Pro Val Arg Ala Arg Lys Ala Lys Ala Pro Glu Phe His Asp Lys
    690                 695                 700


Leu Ala Pro Ser Tyr Thr Val Val Leu Arg Glu Ala Val Lys Arg Pro
705                 710                 715                 720


Ala Ala Thr Lys Lys Ala Gly Gln Ala Lys Lys Lys Lys Glu Phe
                725                 730                 735


<210> 322
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      peptide"

<400> 322
Lys Arg Pro Ala Ala Thr Lys Lys Ala Gly Gln Ala Lys Lys Lys Lys
1               5                   10                  15


Glu Phe



<210> 323
<211> 41
<212> RNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
      oligonucleotide"
```

<400> 323
uaauuucuac uaaguguaga ucccccagcg cuucagcguu c
41

<210> 324
<211> 41
<212> RNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 324
uaauuucuac uaaguguaga uuugcuuucg ugguauucuu g
41

<210> 325
<211> 41
<212> RNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 325
uaauuucuac uaaguguaga ugugguauuc uugcuaguua c
41

<210> 326
<211> 41
<212> RNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 326
uaauuucuac uaaguguaga ucuccaagug ccucugcauu c
41

<210> 327
<211> 41
<212> RNA
<213> Artificial Sequence

<220>
<221> source

<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 327
uaauuucuac uaaguguaga ugcaauguug uuccuugagg a
41

<210> 328
<211> 41
<212> RNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 328
uaauuucuac uaaguguaga ucacauaccg cagacgguac a
41

<210> 329
<211> 41
<212> RNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 329
uaauuucuac uaaguguaga ugaccugcga gcggguucug a
41

<210> 330
<211> 41
<212> RNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 330
uaauuucuac uaaguguaga uaauuacuug ggugugaccc u
41

<210> 331
<211> 41
<212> RNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 331
uaauuucuac uaaguguaga uuuacauggc ucugguccga g
41

<210> 332
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<220>
<221> source
<223> /note="Description of Combined DNA/RNA Molecule: Synthetic
oligonucleotide"

<400> 332
uaauuucuac uaaguguaga uggcttccag ggaacaggcc t
41

<210> 333
<211> 931
<212> DNA
<213> Severe acute respiratory syndrome coronavirus 2

<400> 333
ccaaattggc tactaccgaa gagctaccag acgaattcgt ggtggtgacg gtaaaatgaa
60

agatctcagt ccaagatggt atttctacta cctaggaact gggccagaag ctggacttcc
120

ctatggtgct aacaaagacg gcatcatatg ggttgcaact gagggagcct tgaatacacc
180

aaaagatcac attggcaccc gcaatcctgc taacaatgct gcaatcgtgc tacaacttcc
240

tcaaggaaca acattgccaa aaggcttcta cgcagaaggg agcagaggcg gcagtcaagc
300

ctcttctcgt tcctcatcac gtagtcgcaa cagttcaaga aattcaactc caggcagcag
360

taggggaact tctcctgcta gaatggctgg caatggcggt gatgctgctc ttgctttgct
420

gctgcttgac agattgaacc agcttgagag caaaatgtct ggtaaaggcc aacaacaaca
480

aggccaaact gtcactaaga aatctgctgc tgaggcttct aagaagcctc ggcaaaaacg
540

tactgccact aaagcataca atgtaacaca agctttcggc agacgtggtc cagaacaaac
600

ccaaggaaat tttggggacc aggaactaat cagacaagga actgattaca aacattggcc
660

gcaaattgca caatttgccc ccagcgcttc agcgttcttc ggaatgtcgc gcattggcat
720

ggaagtcaca ccttcgggaa cgtggttgac ctacacaggt gccatcaaat tggatgacaa
780

agatccaaat ttcaaagatc aagtcatttt gctgaataag catattgacg catacaaaac
840

attcccacca acagagccta aaaaggacaa aaagaagaag gctgatgaaa ctcaagcctt
900

accgcagaga cagaagaaac agcaaactgt g
931

<210> 334
<211> 931
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
SARS-CoV N-gene sequence"

<400> 334
ccaaattggc tactaccgaa gagctacccg acgagttcgt ggtggtgacg gcaaaatgaa
60

agagctcagc cccagatggt acttctatta cctaggaact ggcccagaag cttcacttcc
120

ctacggcgct aacaaagaag gcatcgtatg ggttgcaact gagggagcct tgaatacacc
180

caaagaccac attggcaccc gcaatcctaa taacaatgct gccaccgtgc tacaacttcc
240

tcaaggaaca acattgccaa aaggcttcta cgcagaggga agcagaggcg gcagtcaagc
300

ctcttctcgc tcctcatcac gtagtcgcgg taattcaaga aattcaactc ctggcagcag
360

taggggaaat tctcctgctc gaatggctag cggaggtggt gaaactgccc tcgcgctatt
420

gctgctagac agattgaacc agcttgagag caaagtttct ggtaaaggcc aacaacaaca
480

aggccaaact gtcactaaga aatctgctgc tgaggcatct aaaaagcctc gccaaaaacg
540

tactgccaca aaacagtaca acgtcactca agcatttggg agacgtggtc cagaacaaac
600

ccaaggaaat ttcggggacc aagacctaat cagacaagga actgattaca aacattggcc
660

gcaaattgca caatttgctc caagtgcctc tgcattcttt ggaatgtcac gcattggcat
720

ggaagtcaca ccttcgggaa catggctgac ttatcatgga gccattaaat tggatgacaa
780

agatccacaa ttcaaagaca acgtcatact gctgaacaag cacattgacg catacaaaac
840

attcccacca acagagccta aaaaggacaa aaagaaaaag actgatgaag ctcagccttt
900

gccgcagaga caaaagaagc agcccactgt g
931

<210> 335
<211> 931
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
bat-SL-CoVZC45 N-gene sequence"

<400> 335
ccaaattggc tactaccgta gagctaccag acgaattcgt ggtggtgacg gtaaaatgaa
60

agagctcagc cccagatggt atttttacta tctaggaact ggaccagaag ctggacttcc
120

ctatggtgct aacaaagaag gcatcatatg ggttgcaact gagggagcct taaacacacc
180

gaaagaccac attggcaccc gcaatcctgc taacaatgct gcaatcgtgc tacaacttcc
240

tcaaggaaca acattgccaa aaggcttcta cgcagaaggg agcagaggcg gcagtcaagc
300

ttcttcacgc tcctcatcac gtagtcgcaa cagttcaaga aactcaactc caggcagcag
360

taggggaact tctcctgcta gaatggctgg caatggcggt gacactgctc ttgctttgct
420

gctgctagat aggttgaacc agcttgagaa caaagtatct ggcaaaggcc aacaacaaca
480

gggccaaact gtcactaaga aatctgctgc tgaggcatct aaaaagcctc gccaaaaacg
540

tactgctaca aaacagtaca acgtcactca agcatttggg agacgtggtc cagaacaaac
600

ccaaggaaat tttggggacc aagaattaat cagacaagga actgattaca aacattggcc
660

gcaaattgca caatttgctc caagtgcctc tgcattcttt ggaatgtcac gcattggcat
720

ggaagtcaca ccttcgggaa catggctgac ttatcatgga gccattaaat tggatgacaa
780

agatccacaa ttcaaagata acgtcatact gctgaataag cacattgacg catacaaaac
840

attcccacca acagagccta aaaaggacaa aaagaaaaag gctgatgaac ttcaggcttt
900

accgcagaga cagaagaaac aacaaactgt g
931

<210> 336
<211> 598
<212> DNA
<213> Severe acute respiratory syndrome coronavirus 2

<400> 336
actattacca gctgtactca actcaattga gtacagacac tggtgttgaa catgttacct
60

tcttcatcta caataaaatt gttgatgagc ctgaagaaca tgtccaaatt cacacaatcg
120

acggttcatc cggagttgtt aatccagtaa tggaaccaat ttatgatgaa ccgacgacga
180

ctactagcgt gcctttgtaa gcacaagctg atgagtacga acttatgtac tcattcgttt
240

cggaagagac aggtacgtta atagttaata gcgtacttct ttttcttgct ttcgtggtat
300

tcttgctagt tacactagcc atccttactg cgcttcgatt gtgtgcgtac tgctgcaata
360

ttgttaacgt gagtcttgta aaaccttctt tttacgttta ctctcgtgtt aaaaatctga
420

attcttctag agttcctgat cttctggtct aaacgaacta aatattatat tagtttttct
480

gtttggaact ttaattttag ccatggcaga ttccaacggt actattaccg ttgaagagct
540

taaaaagctc cttgaacaat ggaacctagt aataggtttc ctattcctta catggatt
598

<210> 337
<211> 595
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
SARS-CoV E-gene sequence"

<400> 337
tttactacca gcttgagtct acacaaatta ctacagacac tggtattgaa aatgctacat
60

tcttcatctt taacaagctt gttaaagacc caccgaatgt gcaaatacac acaatcgacg
120

gctcttcagg agttgctaat ccagcaatgg atccaattta tgatgagccg acgacgacta
180

ctagcgtgcc tttgtaagca caagaaagtg agtacgaact tatgtactca ttcgtttcgg
240

aagaaacagg tacgttaata gttaatagcg tacttctttt tcttgctttc gtggtattct
300

tgctagtcac actagccatc cttactgcgc ttcgattgtg tgcgtactgc tgcaatattg
360

ttaacgtgag tttagtaaaa ccaacggttt acgtctactc gcgtgttaaa aatctgaact
420

cttctgaagg agttcctgat cttctggtct aaacgaacta actattatta ttattctgtt
480

tggaacttta acattgctta tcatggcaga caacggtact attaccgttg aggagcttaa
540

acaactcctg gaacaatgga acctagtaat aggtttccta ttcctagcct ggatt
595

<210> 338
<211> 598
<212> DNA

<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
bat-SL-CoVZC45 E-gene sequence"

<400> 338
attactacca gctgtactca acacaagtga gtacagacac tggtgttgaa catgttactt
60

tcttcatcta caataaaatt gttgatgagc ctgaagaaca tgttcaaatt cacacaatcg
120

acggtacatc tggagttgtt aatccagcaa tggaaccaat ttatgatgaa ccgacgacga
180

ctactagcgt gcctttgtaa gcacaagctg atgagtacga acttatgtac tcattcgttt
240

cggaagagac aggtacgtta atagttaata gcgtacttct ttttcttgct tttgtggtat
300

tcttgctagt cacactagcc atccttactg cgcttcgatt gtgtgcgtac tgctgcaata
360

ttgttaacgt gagtcttgta aaaccttctt tttacgttta ctctcgtgtt aaaaatctga
420

attcttctag agttcctgat cttttggtct aaacgaacta aatattatat tagtctttct
480

gtttggaact ttaattttag ccatgtcagg tgacaacggt accattaccg ttgaagagct
540

taaaaagctc ttagaacaat ggaacctagt aataggattc ttgtttctta catggatt
598

<210> 339
<211> 850
<212> DNA
<213> Homo sapiens

<400> 339
actccgcagc ccgttcagga ccccggcgcg ggcagggcgc ccacgagctg gctggctgct
60

tgcacccaca tccttctttc tctgggacct ggggtcgcgg ttacttgggc tggccggcga
120

acccttgagt ggcctggcgg ggagcgggcc tcgcgcgcct ggagggccct gtggaacgaa
180

gagaggcaca cagcatggca gaaaaccgag agccccgcgg tgctgtggag gctgaactgg
240

atccagtgga atacaccctt aggaaaaggc ttcccagccg cctgccccgg agacccaatg
300

acatttatgt caacatgaag acggacttta aggcccagct ggcccgctgc cagaagctgc
360

tggacggagg ggcccggggt cagaacgcgt gctctgagat ctacattcac ggcttgggcc
420

tggccatcaa ccgcgccatc aacatcgcgc tgcagctgca ggcgggcagc ttcgggtcct
480

tgcaggtggc tgccaatacc tccaccgtgg agcttgttga tgagctggag ccagagaccg
540

acacacggga gccactgact cggatccgca acaactcagc catccacatc cgagtcttca
600

gggtcacacc caagtaattg aaaagacact cctccactta tcccctccgt gatatggctc
660

ttcgcatgct gagtactgga cctcggacca gagccatgta agaaaaggcc tgttccctgg
720

aagcccaaag gactctgcat tgagggtggg ggtaattgtc tcttggtggg cccagttagt
780

gggccttcct gagtgtgtgt atgcggtctg taactattgc catataaata aaaaatcctg
840

ttgcactagt
850

<210> 340
<211> 52
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 340
aattctaata cgactcacta tagggccaaa ttggctacta ccgaagagct ac
52

<210> 341
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 341
cacagtttgc tgtttcttct gtctctgcgg
30

<210> 342
<211> 54
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 342
aattctaata cgactcacta tagggctggt gttgaacatg ttaccttctt catc
54

<210> 343
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 343
cctattacta ggttccattg ttc
23

<210> 344
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 344
acaggtacgt taatagttaa tagcgt
26

<210> 345
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<221> source

<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 345
atattgcagc agtacgcaca ca
22

<210> 346
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 346
ttacaaacat tggccgcaaa
20

<210> 347
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 347
gcgcgacatt ccgaagaa
18

<210> 348
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 348
aacacaagct ttcggcag
18

<210> 349
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 349
gaaatttgga tctttgtcat cc
22

<210> 350
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 350
tgcggccaat gtttgtaatc agccaaggaa attttgggga c
41

<210> 351
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 351
cgcattggca tggaagtcac tttgatggca cctgtgtag
39

<210> 352
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 352
ttccttgtct gattagttc
19

<210> 353
<211> 18
<212> DNA

<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 353
accttcggga acgtggtt
18

<210> 354
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 354
ccgacgacga ctactagc
18

<210> 355
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 355
agagtaaacg taaaaagaag gtt
23

<210> 356
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 356
acctgtctct tccgaaacga atttgtaagc acaagctgat g
41

<210> 357

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

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 357
ctagccatcc ttactgcgct actcacgtta acaatattgc a
41

<210> 358
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 358
tcgattgtgt gcgtactgc
19

<210> 359
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 359
tgagtacata agttcgtac
19

<210> 360
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 360
ttgatgagct ggagcca
17

<210> 361
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 361
caccctcaat gcagagtc
18

<210> 362
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 362
gtgtgaccct gaagactcgg ttttagccac tgactcggat c
41

<210> 363
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 363
cctccgtgat atggctcttc gttttttttct tacatggctc tggtc
45

<210> 364
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 364

atgtggatgg ctgagttgtt
20

<210> 365
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 365
catgctgagt actggacctc
20

<210> 366
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 366
cacatccgag tcttcagg
18

<210> 367
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 367
ggcaatagtt acagaccgc
19

<210> 368
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic primer"

<400> 368
tccagtactc agcatgcgaa gcacccaagt aattgaaaag acac
44

<210> 369
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 369
ctggaagccc aaaggactct atacacacac tcaggaagg
39

<210> 370
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 370
cggaggggat aagtggagga
20

<210> 371
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 371
gcattgaggg tgggggt
17

<210> 372
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<221> source

<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 372
taattaatta attaattaat t
21

<210> 373
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 373
ttttttttt ttttttttt
20

<210> 374
<211> 20
<212> RNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 374
ggcuggccaa acugcugggu
20

<210> 375
<211> 990
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
Target nucleic acid sequence"

<400> 375
tggtccccgc cacccccac ccccactttg cagataaacc acatgcagga aggtcagcct
60

ggcaagtcca gtaagttcaa gcccaggtct caactgggca gcagagctcc tgctcttctt
120

tgtcctcata tacgagcacc tctggactta aaacttgagg aactggatgg agaaaagtta
180

atggtcagca gcgggttaca tcttctttca tgcgcctttc cattctttgg atcagtagtc
240

actaacgttc gccagccata agtcctcgac gtggagaggc tcagagcctg gcatgaacat
300

gaccctgaat tcggatgcag agcttcttcc catgatgatc tgtccctcac agcagggtct
360

tctctgtttc agggcatgaa ctacttggag gaccgtcgct tggtgcaccg cgacctggca
420

gccaggaacg tactggtgaa aacaccgcag catgtcaaga tcacagattt tgggctggcc
480

aaactgctgg gtgcggaaga gaaagaatac catgcagaag gaggcaaagt aaggaggtgg
540

ctttaggtca gccagcattt tcctgacacc agggaccagg ctgccttccc actagctgta
600

ttgtttaaca catgcagggg aggatgctct ccagacattc tgggtgagct cgcagcagct
660

gctgctggca gctgggtcca gccagggtct cctggtagtg tgagccagag ctgctttggg
720

aacagtactt gctgggacag tgaatgagga tgttatcccc aggtgatcat tagcaaatgt
780

taggtttcag tctctccctg caggatatat aagtcccctt caatagcgca attgggaaag
840

gtcacagctg ccttggtggt ccactgctgt caaggacacc taaggaacag gaaaggcccc
900

atgcggaccc gagctcccag ggctgtctgt ggctcgtggc tgggacaggc agcaatggag
960

tccttctctc ccttcactgg ctcggtttct
990

<210> 376
<211> 240
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
Target nucleic acid sequence"

<400> 376
taactctgaa aacatttcta gtcttgtaat caacatcagg gtaaaaatca tgtgttaata
60

caaaggtaca ggaacaaaga atttgttctt catggctctc tgtgtctgat ccaagaggcg
120

aggccagttt catttgagca ttaagtgtca agttctgcac gctatcatca tcaggggccg
180

aggcttctct ttgtttttaa ttaattgttt ttaactgtga gtttatatac acttgaagca
240

<210> 377
<211> 41
<212> RNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 377
uaauuucuac uaaguguaga uagcugcucg aauuggcuuu g
41

<210> 378
<211> 360
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
Target nucleic acid sequence"

<400> 378
agcagaagca gaggatttgt ttagtcactg gcaaacagga aaaaaaaatg gcggacaaca
60

acatgaccac aacacaaatt gaggtgggtc cgggagcaac caatgccacc ataaactttg
120

aagcaggaat tctggagtgc tatgaaaggc tttcatggca aagggccctt gactaccctg
180

gtcaagaccg cctaaacaga ctaaagagaa aattagagtc aagaataaag actcacaaca
240

aaagtgagcc tgaaagtaaa aggatgtctc ttgaagagag aaaagcaatt ggagtaaaaa
300

tgatgaaagt actcctattt atgaatccgt ctgctggaat tgaagggttt gagccatact
360

<210> 379
<211> 2026
<212> DNA

<213> Homo sapiens

<400> 379
ggagtattga atagttggga attggaaccc ctccaggggg aaccaaacat tgtcgttcag
60

aagaagacaa agagagattg aaatgaagct gttgatttca acacacaaat tctggtggta
120

gatgaaagca aagcaagtaa gtttctccga atccctagtc aactggaggt agagacggac
180

tgcgcaggtt aactacagct cccagcatgc ctgaggggcg ggctcagcgg ctgcgcagac
240

tggcgcgcgc ggacggtcat gggacttcag catggcggtg tttgcagatt tggacctgcg
300

agcgggttct gacctgaagg ctctgcgcgg acttgtggag acagccgctc accttggcta
360

ttcagttgtt gctatcaatc atatcgttga ctttaaggaa aagaaacagg aaattgaaaa
420

accagtagct gtttctgaac tcttcacaac tttgccaatt gtacagggaa aatcaagacc
480

aattaaaatt ttaactagat taacaattat tgtctcggat ccatctcact gcaatgtttt
540

gagagcaact tcttcaaggg cccggctcta tgatgttgtt gcagttttc caaagacaga
600

aaagcttttt catattgctt gcacacattt agatgtggat ttagtctgca taactgtaac
660

agagaaacta ccattttact tcaaaagacc tcctattaat gtggcgattg accgaggcct
720

ggcttttgaa cttgtctata gccctgctat caaagactcc acaatgagaa ggtatacaat
780

ttccagtgcc ctcaatttga tgcaaatctg caaaggaaag aatgtaatta tatctagtgc
840

tgcagaaagg cctttagaaa taagagggcc atatgacgtg gcaaatctag gcttgctgtt
900

tgggctctct gaaagtgacg ccaaggctgc ggtgtccacc aactgccgag cagcgcttct
960

ccatggagaa actagaaaaa ctgcttttgg aattatctct acagtgaaga aacctcggcc
1020

atcagaagga gatgaagatt gtcttccagc ttccaagaaa gccaagtgtg agggctgaaa
1080

agaatgcccc agtctctgtc agcactccct tcttcccttt tatagttcat cagccacaac
1140

aaaaataaaa cctttgtgtg atttactgtt ttcatttgga gctagaaatc aatagtctat
1200

aaaaacagtt ttacttgcaa tccattaaaa caacaaacga aacctagtga agcatctttt
1260

taaaaggctg ccagcttaat gaatttagat gtactttaag agagaaagac tggttatttc
1320

tcctttgtgt aagtgataaa caacagcaaa tatacttgaa taaaatgttt caggtatttt
1380

tgtttcattt tgtttttgag atagggtctt tgttgctcag gctggagtac agtggcataa
1440

tcacagctca ctgcaacctc aatcctgggc tcaagtgatc ctcccgcttc agcctctcaa
1500

gcagcgggaa ctacaggtgt gcactaccac acctggctat ttttttttt ttttttttt
1560

tcccttgtag agacatggtc tcactatgtt gctgaggctg gtctcaaact cctaggatca
1620

agccatcctc ccgctttggc ctcctaaagt gctgggatta catgagccac cacatgcagc
1680

cagatgtttg aatattttaa gagcttcttt cgaaagtttc ttgttcatac tcaaatagta
1740

gttattttga agatattcaa acttatattg aagaagtgac tttagttcct cttgttttaa
1800

gcttctttca tgtattcaaa tcagcatttt tttctaagaa attgctatag aatttgtgga
1860

aggagagagg atacacatgt aaaattacat ctggtctctt ccttcactgc ttcatgccta
1920

cgtaaggtct ttgaaatagg attccttact tttagttaga aacccctaaa acgctaatat
1980

tgattttcct gatagctgta ttaaaaatag caaagcatcg gactga
2026

<210> 380
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
primer"

<400> 380
tatatggtag aatcctgctt ctc
23

<210> 381
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<220>
<221> source
<223> /note="Description of Combined DNA/RNA Molecule: Synthetic
oligonucleotide"

<400> 381
tauugc
6

<210> 382
<211> 5
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 382
aaaaa
5

<210> 383
<211> 5
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 383
ccccc
5

<210> 384
<211> 5

<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 384
ggggg
5

<210> 385
<211> 5
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 385
ttttt
5

<210> 386
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 386
ttatta
6

<210> 387
<211> 10
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 387
attattatta
10

<210> 388
<211> 7
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 388
tttttt
7

<210> 389
<211> 11
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 389
ttttttttt t
11

<210> 390
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 390
ccggcagcca taacgccgtg aatacgttct gccgg
35

<210> 391
<211> 9
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 391
ttttatttt
9

<210> 392
<211> 12
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
oligonucleotide"

<400> 392
ttttattatt tt
12

<210> 393
<211> 372
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
Target nucleic acid sequence"

<400> 393
agcgaaagca ggtagatatt gaaagatgag tcttctaacc gaggtcgaaa cgtacgttct
60

ctctatcgtc ccgtcaggcc ccctcaaagc cgagatcgcg cagagacttg aagatgtctt
120

tgcagggaaa aacacagatc ttgaggctct catggaatgg ctaaagacaa gaccaatcct
180

gtcacctctg actaagggga ttttaggatt tgtgttcacg ctcaccgtgc ccagtgagcg
240

aggactgcag cgtagacgct ttgtccaaaa tgccctcaat gggaatgggg acccaaacaa
300

catggacaga gcagttaaac tgtacaggaa gcttaaaagg gaaataacgt tccatggggc
360

caaagaagtg gc
372

<210> 394
<211> 34
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:

Nucleic acid sequence comprising two PAM sites and a HERC2 SNP"

<400> 394
ccagtttcat ttgagcatta agtgtcaagt tctg
34

<210> 395
<211> 122
<212> DNA
<213> Severe acute respiratory syndrome coronavirus 2

<400> 395
gaccaggaac taatcagaca aggaactgat tacaaacatt ggccgcaaat tgcacaattt
60

gcccccagcg cttcagcgtt cttcggaatg tcgcgcattg gcatggaagt cacaccttcg
120

gg
122

<210> 396
<211> 122
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
bat-SL sequence"

<400> 396
gaccaagaat taatcagaca aggaactgat tacaaacatt ggccgcaaat tgcacaattt
60

gctccaagtg cctctgcatt ctttggaatg tcacgcattg gcatggaagt cacaccttcg
120

gg
122

<210> 397
<211> 122
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
bat-SL sequence"

<400> 397
gaccaagaat taatcagaca aggaactgat tacaaacatt ggccgcaaat tgcacaattt
60

gctccaagtg cctctgcatt ctttggaatg tctcgcattg gcatggaagt cacaccttcg
120

gg
122

<210> 398
<211> 122
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
SARS-CoV sequence"

<400> 398
gaccaagacc taatcagaca aggaactgat tacaaacatt ggccgcaaat tgcacaattt
60

gctccaagtg cctctgcatt ctttggaatg tcacgcattg gcatggaagt cacaccttcg
120

gg
122

<210> 399
<211> 133
<212> DNA
<213> Severe acute respiratory syndrome coronavirus 2

<400> 399
gatcacattg gcacccgcaa tcctgctaac aatgctgcaa tcgtgctaca acttcctcaa
60

ggaacaacat tgccaaaagg cttctacgca gaagggagca gaggcggcag tcaagcctct
120

tctcgttcct cat
133

<210> 400
<211> 133
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
bat-SL sequence"

<400> 400
gaccacattg gcacccgcaa tcctgctaac aatgctgcaa tcgtgctaca acttcctcaa
60

ggaacaacat tgccaaaagg cttctacgca gaagggagca gaggcggcag tcaagcttct
120

tcacgctcct cat
133

<210> 401
<211> 133
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
SARS-CoV sequence"

<400> 401
gaccacattg gcacccgcaa tcctaataac aatgctgcca ccgtgctaca acttcctcaa
60

ggaacaacat tgccaaaagg cttctacgca gagggaagca gaggcggcag tcaagcctct
120

tctcgctcct cat
133

<210> 402
<211> 119
<212> DNA
<213> Severe acute respiratory syndrome coronavirus 2

<400> 402
agagacaggt acgttaatag ttaatagcgt acttcttttt cttgctttcg tggtattctt
60

gctagttaca ctagccatcc ttactgcgct tcgattgtgt gcgtactgct gcaatattg
119

<210> 403
<211> 119
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
bat-SL sequence"

<400> 403
agagacaggt acgttaatag ttaatagcgt acttcttttt cttgcttttg tggtattctt
60

gctagtcaca ctagccatcc ttactgcgct tcgattgtgt gcgtactgct gcaatattg
119

<210> 404
<211> 119
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
SARS-CoV sequence"

<400> 404
agaaacaggt acgttaatag ttaatagcgt acttcttttt cttgctttcg tggtattctt
60

gctagtcaca ctagccatcc ttactgcgct tcgattgtgt gcgtactgct gcaatattg
119

<210> 405
<211> 34
<212> DNA
<213> Severe acute respiratory syndrome coronavirus 2

<400> 405
cacaatttgc ccccagcgct tcagcgttct tcgg
34

<210> 406
<211> 34
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
bat-SL-CoVZC45 sequence"

<400> 406
cacaatttgc tccaagtgcc tctgcattct ttgg
34

<210> 407
<211> 34
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
SARS-CoV sequence"

<400> 407
cacaatttgc tccaagtgcc tctgcattct ttgg
34

<210> 408
<211> 34
<212> DNA
<213> Severe acute respiratory syndrome coronavirus 2

<400> 408
agccttttgg caatgttgtt ccttgaggaa gttg
34

<210> 409
<211> 34
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
bat-SL-CoVZC45 sequence"

<400> 409
agccttttgg caatgttgtt ccttgaggaa gttg
34

<210> 410
<211> 34
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
SARS-CoV sequence"

<400> 410
agccttttgg caatgttgtt ccttgaggaa gttg
34

<210> 411
<211> 34
<212> DNA
<213> Severe acute respiratory syndrome coronavirus 2

<400> 411
ttctttttct tgctttcgtg gtattcttgc tagt
34

<210> 412
<211> 34
<212> DNA
<213> Unknown

<220>
<221> source

<223> /note="Description of Unknown:
bat-SL-CoVZC45 sequence"

<400> 412
ttctttttct tgcttttgtg gtattcttgc tagt
34

<210> 413
<211> 34
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
SARS-CoV sequence"

<400> 413
ttctttttct tgctttcgtg gtattcttgc tagt
34

<210> 414
<211> 34
<212> DNA
<213> Severe acute respiratory syndrome coronavirus 2

<400> 414
cttgctttcg tggtattctt gctagttaca ctag
34

<210> 415
<211> 34
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
bat-SL-CoVZC45 sequence"

<400> 415
cttgcttttg tggtattctt gctagtcaca ctag
34

<210> 416
<211> 34
<212> DNA
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown:
SARS-CoV sequence"

<400> 416
cttgctttcg tggtattctt gctagtcaca ctag
34