SEQUENCE LISTING

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<120> METHODS AND COMPOSITIONS FOR EDITING NUCLEOTIDE SEQUENCES

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<140> PCT/US2020/023713
<141> 2020-03-19

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<170> PatentIn version 3.5

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Asp Tyr Lys Asp Asp Asp Asp Lys
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Leu Lys Lys

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Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu
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Met Gly Ile Gln Gly Leu Ala Lys Leu Ile Ala Asp Val Ala Pro Ser
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Ala Ile Arg Glu Asn Asp Ile Lys Ser Tyr Phe Gly Arg Lys Val Ala
20 25 30

Ile Asp Ala Ser Met Ser Ile Tyr Gln Phe Leu Ile Ala Val Arg Gln
35 40 45

```
Gly Gly Asp Val Leu Gln Asn Glu Glu Gly Glu Thr Thr Ser His Leu
    50                  55                  60

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

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

Leu Ala Lys Arg Ser Glu Arg Arg Ala Glu Ala Glu Lys Gln Leu Gln
            100                 105                 110

Gln Ala Gln Ala Ala Gly Ala Glu Gln Glu Val Glu Lys Phe Thr Lys
        115                 120                 125

Arg Leu Val Lys Val Thr Lys Gln His Asn Asp Glu Cys Lys His Leu
    130                 135                 140

Leu Ser Leu Met Gly Ile Pro Tyr Leu Asp Ala Pro Ser Glu Ala Glu
145                 150                 155                 160

Ala Ser Cys Ala Ala Leu Val Lys Ala Gly Lys Val Tyr Ala Ala Ala
                165                 170                 175

Thr Glu Asp Met Asp Cys Leu Thr Phe Gly Ser Pro Val Leu Met Arg
            180                 185                 190

His Leu Thr Ala Ser Glu Ala Lys Lys Leu Pro Ile Gln Glu Phe His
        195                 200                 205

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

Asp Leu Cys Ile Leu Leu Gly Ser Asp Tyr Cys Glu Ser Ile Arg Gly
225                 230                 235                 240

Ile Gly Pro Lys Arg Ala Val Asp Leu Ile Gln Lys His Lys Ser Ile
                245                 250                 255
```

```
Glu Glu Ile Val Arg Arg Leu Asp Pro Asn Lys Tyr Pro Val Pro Glu
            260                 265                 270

Asn Trp Leu His Lys Glu Ala His Gln Leu Phe Leu Glu Pro Glu Val
        275                 280                 285

Leu Asp Pro Glu Ser Val Glu Leu Lys Trp Ser Glu Pro Asn Glu Glu
    290                 295                 300

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

Ile Arg Ser Gly Val Lys Arg Leu Ser Lys Ser Arg Gln Gly Ser Thr
                325                 330                 335

Gln Gly Arg Leu Asp Asp Phe Phe Lys Val Thr Gly Ser Leu Ser Ser
            340                 345                 350

Ala Lys Arg Lys Glu Pro Glu Pro Lys Gly Ser Thr Lys Lys Lys Ala
        355                 360                 365

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

Ala Ala Ala Lys Asp Gly Thr Leu Leu Ala Arg Pro Val Val Ser Trp
        35                  40                  45
```

```
Phe Asp Gln Gly Thr Arg Asp Val Ile Gly Leu Arg Ile Ala Gly Gly
    50                  55                  60

Ala Ile Val Trp Ala Thr Pro Asp His Lys Val Leu Thr Glu Tyr Gly
65                  70                  75                  80

Trp Arg Ala Ala Gly Glu Leu Arg Lys Gly Asp Arg Val Ala Gly Pro
                85                  90                  95

Gly Gly Ser Gly Asn Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met
            100                 105                 110

Val Ser Ala Leu Leu Asp Ala Glu Pro Pro Ile Leu Tyr Ser Glu Tyr
        115                 120                 125

Asp Pro Thr Ser Pro Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr
    130                 135                 140

Asn Leu Ala Asp Arg Glu Leu Val His Met Ile Asn Trp Ala Lys Arg
145                 150                 155                 160

Val Pro Gly Phe Val Asp Leu Thr Leu His Asp Gln Ala His Leu Leu
                165                 170                 175

Glu Cys Ala Trp Leu Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser
            180                 185                 190

Met Glu His Pro Gly Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp
        195                 200                 205

Arg Asn Gln Gly Lys Cys Val Glu Gly Met Val Glu Ile Phe Asp Met
    210                 215                 220

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

Glu Phe Val Cys Leu Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr
                245                 250                 255
```

```
Thr Phe Leu Ser Ser Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile
            260                 265                 270

His Arg Ala Leu Asp Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala
        275                 280                 285

Lys Ala Gly Leu Thr Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu
    290                 295                 300

Leu Leu Ile Leu Ser His Ile Arg His Met Ser Asn Lys Gly Met Glu
305                 310                 315                 320

His Leu Tyr Ser Met Lys Tyr Lys Asn Val Val Pro Leu Tyr Asp Leu
                325                 330                 335

Leu Leu Glu Met Leu Asp Ala His Arg Leu His Ala Gly Gly Ser Gly
            340                 345                 350

Ala Ser Arg Val Gln Ala Phe Ala Asp Ala Leu Asp Asp Lys Phe Leu
        355                 360                 365

His Asp Met Leu Ala Glu Glu Leu Arg Tyr Ser Val Ile Arg Glu Val
    370                 375                 380

Leu Pro Thr Arg Arg Ala Arg Thr Phe Asp Leu Glu Val Glu Glu Leu
385                 390                 395                 400

His Thr Leu Val Ala Glu Gly Val Val Val His Asn Cys
                405                 410
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1               5                   10                  15
```

```
His Arg Ile Glu Asp Val Val Asp Gly Arg Lys Pro Ile His Val Val
            20                  25                  30

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

Phe Asp Gln Gly Thr Arg Asp Val Ile Gly Leu Arg Ile Ala Gly Gly
    50                  55                  60

Ala Ile Val Trp Ala Thr Pro Asp His Lys Val Leu Thr Glu Tyr Gly
65                  70                  75                  80

Trp Arg Ala Ala Gly Glu Leu Arg Lys Gly Asp Arg Val Ala Gly Pro
                85                  90                  95

Gly Gly Ser Gly Asn Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met
            100                 105                 110

Val Ser Ala Leu Leu Asp Ala Glu Pro Pro Ile Leu Tyr Ser Glu Tyr
        115                 120                 125

Asp Pro Thr Ser Pro Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr
    130                 135                 140

Asn Leu Ala Asp Arg Glu Leu Val His Met Ile Asn Trp Ala Lys Arg
145                 150                 155                 160

Val Pro Gly Phe Val Asp Leu Thr Leu His Asp Gln Ala His Leu Leu
                165                 170                 175

Glu Cys Ala Trp Leu Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser
            180                 185                 190

Met Glu His Pro Gly Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp
        195                 200                 205

Arg Asn Gln Gly Lys Cys Val Glu Gly Met Val Glu Ile Phe Asp Met
    210                 215                 220
```

```
Leu Leu Ala Thr Ser Ser Arg Phe Arg Met Met Asn Leu Gln Gly Glu
225                 230                 235                 240

Glu Phe Val Cys Leu Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr
                245                 250                 255

Thr Phe Leu Ser Ser Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile
            260                 265                 270

His Arg Ala Leu Asp Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala
        275                 280                 285

Lys Ala Gly Leu Thr Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu
    290                 295                 300

Leu Leu Ile Leu Ser His Ile Arg His Met Ser Asn Lys Gly Met Glu
305                 310                 315                 320

His Leu Tyr Ser Met Lys Tyr Thr Asn Val Val Pro Leu Tyr Asp Leu
                325                 330                 335

Leu Leu Glu Met Leu Asp Ala His Arg Leu His Ala Gly Gly Ser Gly
            340                 345                 350

Ala Ser Arg Val Gln Ala Phe Ala Asp Ala Leu Asp Asp Lys Phe Leu
        355                 360                 365

His Asp Met Leu Ala Glu Glu Leu Arg Tyr Ser Val Ile Arg Glu Val
    370                 375                 380

Leu Pro Thr Arg Arg Ala Arg Thr Phe Asp Leu Glu Val Glu Glu Leu
385                 390                 395                 400

His Thr Leu Val Ala Glu Gly Val Val Val His Asn Cys
                405                 410
```

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Cys Leu Ala Glu Gly Thr Arg Ile Phe Asp Pro Val Thr Gly Thr Thr
1               5                  10                  15


His Arg Ile Glu Asp Val Val Asp Gly Arg Lys Pro Ile His Val Val
            20                  25                  30


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


Phe Asp Gln Gly Thr Arg Asp Val Ile Gly Leu Arg Ile Ala Gly Gly
    50                  55                  60


Ala Thr Val Trp Ala Thr Pro Asp His Lys Val Leu Thr Glu Tyr Gly
65                  70                  75                  80


Trp Arg Ala Ala Gly Glu Leu Arg Lys Gly Asp Arg Val Ala Gly Pro
                85                  90                  95


Gly Gly Ser Gly Asn Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met
            100                 105                 110


Val Ser Ala Leu Leu Asp Ala Glu Pro Pro Ile Pro Tyr Ser Glu Tyr
        115                 120                 125


Asp Pro Thr Ser Pro Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr
    130                 135                 140


Asn Leu Ala Asp Arg Glu Leu Val His Met Ile Asn Trp Ala Lys Arg
145                 150                 155                 160


Val Pro Gly Phe Val Asp Leu Thr Leu His Asp Gln Ala His Leu Leu
                165                 170                 175


Glu Cys Ala Trp Leu Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser
            180                 185                 190
```

```
Met Glu His Pro Gly Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp
        195                 200                 205

Arg Asn Gln Gly Lys Cys Val Glu Gly Met Val Glu Ile Phe Asp Met
    210                 215                 220

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

Glu Phe Val Cys Leu Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr
                245                 250                 255

Thr Phe Leu Ser Ser Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile
            260                 265                 270

His Arg Ala Leu Asp Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala
        275                 280                 285

Lys Ala Gly Leu Thr Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu
    290                 295                 300

Leu Leu Ile Leu Ser His Ile Arg His Met Ser Asn Lys Gly Met Glu
305                 310                 315                 320

His Leu Tyr Ser Met Lys Tyr Lys Asn Val Val Pro Leu Tyr Asp Leu
                325                 330                 335

Leu Leu Glu Met Leu Asp Ala His Arg Leu His Ala Gly Gly Ser Gly
            340                 345                 350

Ala Ser Arg Val Gln Ala Phe Ala Asp Ala Leu Asp Asp Lys Phe Leu
        355                 360                 365

His Asp Met Leu Ala Glu Gly Leu Arg Tyr Ser Val Ile Arg Glu Val
    370                 375                 380

Leu Pro Thr Arg Arg Ala Arg Thr Phe Asp Leu Glu Val Glu Glu Leu
385                 390                 395                 400

His Thr Leu Val Ala Glu Gly Val Val Val His Asn Cys
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Cys Leu Ala Glu Gly Thr Arg Ile Phe Asp Pro Val Thr Gly Thr Thr
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His Arg Ile Glu Asp Val Val Asp Gly Arg Lys Pro Ile His Val Val
20 25 30

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

Phe Asp Gln Gly Thr Arg Asp Val Ile Gly Leu Arg Ile Ala Gly Gly
50 55 60

Ala Thr Val Trp Ala Thr Pro Asp His Lys Val Leu Thr Glu Tyr Gly
65 70 75 80

Trp Arg Ala Ala Gly Glu Leu Arg Lys Gly Asp Arg Val Ala Gly Pro
85 90 95

Gly Gly Ser Gly Asn Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met
100 105 110

Val Ser Ala Leu Leu Asp Ala Glu Pro Pro Ile Leu Tyr Ser Glu Tyr
115 120 125

Asp Pro Thr Ser Pro Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr
130 135 140

Asn Leu Ala Asp Arg Glu Leu Val His Met Ile Asn Trp Ala Lys Arg
145 150 155 160

```
Val Pro Gly Phe Val Asp Leu Thr Leu His Asp Gln Ala His Leu Leu
                165                 170                 175

Glu Cys Ala Trp Leu Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser
            180                 185                 190

Met Glu His Pro Gly Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp
        195                 200                 205

Arg Asn Gln Gly Lys Cys Val Glu Gly Met Val Glu Ile Phe Asp Met
    210                 215                 220

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

Glu Phe Val Cys Leu Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr
                245                 250                 255

Thr Phe Leu Ser Ser Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile
            260                 265                 270

His Arg Ala Leu Asp Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala
        275                 280                 285

Lys Ala Gly Leu Thr Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu
    290                 295                 300

Leu Leu Ile Leu Ser His Ile Arg His Met Ser Asn Lys Gly Met Glu
305                 310                 315                 320

His Leu Tyr Ser Met Lys Tyr Lys Asn Val Val Pro Leu Tyr Asp Leu
                325                 330                 335

Leu Leu Glu Met Leu Asp Ala His Arg Leu His Ala Gly Gly Ser Gly
            340                 345                 350

Ala Ser Arg Val Gln Ala Phe Ala Asp Ala Leu Asp Asp Lys Phe Leu
        355                 360                 365

His Asp Met Leu Ala Glu Glu Leu Arg Tyr Ser Val Ile Arg Glu Val
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370 375 380

Leu Pro Thr Arg Arg Ala Arg Thr Phe Asp Leu Glu Val Glu Glu Leu
385 390 395 400

His Thr Leu Val Ala Glu Gly Val Val Val His Asn Cys
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Cys Leu Ala Glu Gly Thr Arg Ile Phe Asp Pro Val Thr Gly Thr Thr
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His Arg Ile Glu Asp Val Val Asp Gly Arg Lys Pro Ile His Val Val
20 25 30

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

Phe Asp Gln Gly Thr Arg Asp Val Ile Gly Leu Arg Ile Ala Gly Gly
50 55 60

Ala Thr Val Trp Ala Thr Pro Asp His Lys Val Leu Thr Glu Tyr Gly
65 70 75 80

Trp Arg Ala Ala Gly Glu Leu Arg Lys Gly Asp Arg Val Ala Gly Pro
85 90 95

Gly Gly Ser Gly Asn Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met
100 105 110

Val Ser Ala Leu Leu Asp Ala Glu Pro Pro Ile Pro Tyr Ser Glu Tyr
115 120 125

```
Asp Pro Thr Ser Pro Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr
    130                 135                 140

Asn Leu Ala Asp Arg Glu Leu Val His Met Ile Asn Trp Ala Lys Arg
145                 150                 155                 160

Val Pro Gly Phe Val Asp Leu Thr Leu His Asp Gln Ala His Leu Leu
                165                 170                 175

Glu Cys Ala Trp Leu Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser
            180                 185                 190

Met Glu His Pro Gly Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp
        195                 200                 205

Arg Asn Gln Gly Lys Cys Val Glu Gly Met Val Glu Ile Phe Asp Met
    210                 215                 220

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

Glu Phe Val Cys Leu Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr
                245                 250                 255

Thr Phe Leu Ser Ser Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile
            260                 265                 270

His Arg Ala Leu Asp Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala
        275                 280                 285

Lys Ala Gly Leu Thr Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu
    290                 295                 300

Leu Leu Ile Leu Ser His Ile Arg His Met Ser Asn Lys Gly Met Glu
305                 310                 315                 320

His Leu Tyr Ser Met Lys Tyr Lys Asn Val Val Pro Leu Tyr Asp Leu
                325                 330                 335

Leu Leu Glu Met Leu Asp Ala His Arg Leu His Ala Gly Gly Ser Gly
```

340 345 350

Ala Ser Arg Val Gln Ala Phe Ala Asp Ala Leu Asp Asp Lys Phe Leu
355 360 365

His Asp Met Leu Ala Glu Glu Leu Arg Tyr Ser Val Ile Arg Glu Val
370 375 380

Leu Pro Thr Arg Arg Ala Arg Thr Phe Asp Leu Glu Val Glu Glu Leu
385 390 395 400

His Thr Leu Val Ala Glu Gly Val Val Val His Asn Cys
405 410

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

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

Phe Asp Gln Gly Thr Arg Asp Val Ile Gly Leu Arg Ile Ala Gly Gly
50 55 60

Ala Thr Val Trp Ala Thr Pro Asp His Lys Val Leu Thr Glu Tyr Gly
65 70 75 80

Trp Arg Ala Ala Gly Glu Leu Arg Lys Gly Asp Arg Val Ala Gly Pro
85 90 95

```
Gly Gly Ser Gly Asn Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met
            100                 105                 110

Val Ser Ala Leu Leu Asp Ala Glu Pro Pro Ile Leu Tyr Ser Glu Tyr
        115                 120                 125

Asn Pro Thr Ser Pro Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr
    130                 135                 140

Asn Leu Ala Asp Arg Glu Leu Val His Met Ile Asn Trp Ala Lys Arg
145                 150                 155                 160

Val Pro Gly Phe Val Asp Leu Thr Leu His Asp Gln Ala His Leu Leu
                165                 170                 175

Glu Arg Ala Trp Leu Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser
            180                 185                 190

Met Glu His Pro Gly Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp
        195                 200                 205

Arg Asn Gln Gly Lys Cys Val Glu Gly Met Val Glu Ile Phe Asp Met
    210                 215                 220

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

Glu Phe Val Cys Leu Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr
                245                 250                 255

Thr Phe Leu Ser Ser Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile
            260                 265                 270

His Arg Ala Leu Asp Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala
        275                 280                 285

Lys Ala Gly Leu Thr Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu
    290                 295                 300

Leu Leu Ile Leu Ser His Ile Arg His Met Ser Asn Lys Gly Met Glu
```

305 310 315 320

His Leu Tyr Ser Met Lys Tyr Lys Asn Val Val Pro Leu Tyr Asp Leu
325 330 335

Leu Leu Glu Met Leu Asp Ala His Arg Leu His Ala Gly Gly Ser Gly
340 345 350

Ala Ser Arg Val Gln Ala Phe Ala Asp Ala Leu Asp Asp Lys Phe Leu
355 360 365

His Asp Met Leu Ala Glu Gly Leu Arg Tyr Ser Val Ile Arg Glu Val
370 375 380

Leu Pro Thr Arg Arg Ala Arg Thr Phe Asp Leu Glu Val Glu Glu Leu
385 390 395 400

His Thr Leu Val Ala Glu Gly Val Val Val His Asn Cys
405 410

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<400> 14

Cys Leu Ala Glu Gly Thr Arg Ile Phe Asp Pro Val Thr Gly Thr Thr
1 5 10 15

His Arg Ile Glu Asp Val Val Asp Gly Arg Lys Pro Ile His Val Val
20 25 30

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

Phe Asp Gln Gly Thr Arg Asp Val Ile Gly Leu Arg Ile Ala Gly Gly
50 55 60

```
Ala Ile Val Trp Ala Thr Pro Asp His Lys Val Leu Thr Glu Tyr Gly
65                  70                  75                  80

Trp Arg Ala Ala Gly Glu Leu Arg Lys Gly Asp Arg Val Ala Gly Pro
                85                  90                  95

Gly Gly Ser Gly Asn Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met
            100                 105                 110

Val Ser Ala Leu Leu Asp Ala Glu Pro Pro Ile Leu Tyr Ser Glu Tyr
        115                 120                 125

Asp Pro Thr Ser Pro Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr
    130                 135                 140

Asn Leu Ala Asp Arg Glu Leu Val His Met Ile Asn Trp Ala Lys Arg
145                 150                 155                 160

Val Pro Gly Phe Val Asp Leu Thr Leu His Asp Gln Ala His Leu Leu
                165                 170                 175

Glu Arg Ala Trp Leu Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser
            180                 185                 190

Met Glu His Pro Gly Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp
        195                 200                 205

Arg Asn Gln Gly Lys Cys Val Glu Gly Met Val Glu Ile Phe Asp Met
    210                 215                 220

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

Glu Phe Val Cys Leu Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr
                245                 250                 255

Thr Phe Leu Ser Ser Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile
            260                 265                 270

His Arg Ala Leu Asp Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala
```

```
        275                 280                 285

Lys Ala Gly Leu Thr Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu
    290                 295                 300

Leu Leu Ile Leu Ser His Ile Arg His Met Ser Asn Lys Gly Met Glu
305                 310                 315                 320

His Leu Tyr Ser Met Lys Tyr Lys Asn Val Val Pro Leu Tyr Asp Leu
                325                 330                 335

Leu Leu Glu Met Leu Asp Ala His Arg Leu His Ala Gly Gly Ser Gly
            340                 345                 350

Ala Ser Arg Val Gln Ala Phe Ala Asp Ala Leu Asp Asp Lys Phe Leu
        355                 360                 365

His Asp Met Leu Ala Glu Gly Leu Arg Tyr Ser Val Ile Arg Glu Val
    370                 375                 380

Leu Pro Thr Arg Arg Ala Arg Thr Phe Asp Leu Glu Val Glu Glu Leu
385                 390                 395                 400

His Thr Leu Val Ala Glu Gly Val Val Val His Asn Cys
                405                 410
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Cys Leu Ala Glu Gly Thr Arg Ile Phe Asp Pro Val Thr Gly Thr Thr
1               5                   10                  15

His Arg Ile Glu Asp Val Val Asp Gly Arg Lys Pro Ile His Val Val
            20                  25                  30
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```
Ala Val Ala Lys Asp Gly Thr Leu Leu Ala Arg Pro Val Val Ser Trp
        35                  40                  45

Phe Asp Gln Gly Thr Arg Asp Val Ile Gly Leu Arg Ile Ala Gly Gly
    50                  55                  60

Ala Thr Val Trp Ala Thr Pro Asp His Lys Val Leu Thr Glu Tyr Gly
65                  70                  75                  80

Trp Arg Ala Ala Gly Glu Leu Arg Lys Gly Asp Arg Val Ala Gly Pro
                85                  90                  95

Gly Gly Ser Gly Asn Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met
            100                 105                 110

Val Ser Ala Leu Leu Asp Ala Glu Pro Pro Ile Leu Tyr Ser Glu Tyr
        115                 120                 125

Asp Pro Thr Ser Pro Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr
    130                 135                 140

Asn Leu Ala Asp Arg Glu Leu Val His Met Ile Asn Trp Ala Lys Arg
145                 150                 155                 160

Val Pro Gly Phe Val Asp Leu Thr Leu His Asp Gln Ala His Leu Leu
                165                 170                 175

Glu Arg Ala Trp Leu Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser
            180                 185                 190

Met Glu His Pro Gly Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp
        195                 200                 205

Arg Asn Gln Gly Lys Cys Val Glu Gly Met Val Glu Ile Phe Asp Met
    210                 215                 220

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

Glu Phe Val Cys Leu Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr
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245 250 255

Thr Phe Leu Ser Ser Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile
260 265 270

His Arg Ala Leu Asp Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala
275 280 285

Lys Ala Gly Leu Thr Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu
290 295 300

Leu Leu Ile Leu Ser His Ile Arg His Met Ser Asn Lys Gly Met Glu
305 310 315 320

His Leu Tyr Ser Met Lys Tyr Lys Asn Val Val Pro Leu Tyr Asp Leu
325 330 335

Leu Leu Glu Met Leu Asp Ala His Arg Leu His Ala Gly Gly Ser Gly
340 345 350

Ala Ser Arg Val Gln Ala Phe Ala Asp Ala Leu Asp Asp Lys Phe Leu
355 360 365

His Asp Met Leu Ala Glu Glu Leu Arg Tyr Ser Val Ile Arg Glu Val
370 375 380

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp
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Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser
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Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys
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Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe
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Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser
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Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp
370 375 380

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

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
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Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe
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Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
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Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp
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Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu
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Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr
485 490 495

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

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

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Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln
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Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr
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Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp
                565                 570                 575

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

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

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

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

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

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

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

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

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

His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
                725                 730                 735
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Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
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Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln
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Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780

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

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

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

Leu Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys
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Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg
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Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
865                 870                 875                 880

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

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

Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
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Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
    930                 935                 940
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Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
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Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
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Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val
            980                 985                 990


Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
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Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
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Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
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Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
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Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
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Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
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Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
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Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
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Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
    1115                1120                1125


Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
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Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
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Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu
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Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                1210                1215

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

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

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

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

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

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

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

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

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

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

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

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

Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp
            260                 265                 270
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Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp
        275                 280                 285

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

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

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

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

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

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

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

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

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

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

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

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

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

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                485                 490                 495

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910
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Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
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Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser Thr
1325 1330 1335

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

Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp
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cattcgatta aaaagaatct tatcggtgcc ctcctattcg atagtggcga aacggcagag 180

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

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

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

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

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

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

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

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

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

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                165                 170                 175

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly
            580                 585                 590
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```
Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
        595                 600                 605

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                1210                1215
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```
Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
    1220                1225                1230

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

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

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

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

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

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

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

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

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

Gly Ser  Pro Lys Lys Lys Arg  Lys Val Ser Ser Asp  Tyr Lys Asp
    1370                1375                1380

His Asp  Gly Asp Tyr Lys Asp  His Asp Ile Asp Tyr  Lys Asp Asp
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Asp Asp  Lys Ala Ala Gly
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cacagtatca aaaaaaatct tataggggct cttttatttg acagtggaga gacagcggaa 180

gcgactcgtc tcaaacggac agctcgtaga aggtatacac gtcggaagaa tcgtatttgt 240

tatctacagg agatttttc aaatgagatg gcgaaagtag atgatagttt ctttcatcga 300

cttgaagagt ctttttggt ggaagaagac aagaagcatg aacgtcatcc tatttttgga 360

aatatagtag atgaagttgc ttatcatgag aaatatccaa ctatctatca tctgcgaaaa 420

aaattggtag attctactga taaagcggat ttgcgcttaa tctatttggc cttagcgcat 480

atgattaagt ttcgtggtca ttttttgatt gagggagatt taaatcctga taatagtgat 540

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attaacgcaa gtggagtaga tgctaaagcg attctttctg cacgattgag taaatcaaga 660

cgattagaaa atctcattgc tcagctcccc ggtgagaaga aaaatggctt atttgggaat 720

ctcattgctt tgtcattggg tttgacccct aattttaaat caaattttga tttggcagaa 780

gatgctaaat tacagctttc aaaagatact tacgatgatg atttagataa tttattggcg 840

caaattggag atcaatatgc tgatttgttt ttggcagcta agaatttatc agatgctatt 900

ttactttcag atatcctaag agtaaatact gaaataacta aggctcccct atcagcttca 960

atgattaaac gctacgatga acatcatcaa gacttgactc ttttaaaagc tttagttcga 1020

caacaacttc cagaaaagta taaagaaatc ttttttgatc aatcaaaaaa cggatatgca 1080

ggttatattg atgggggagc tagccaagaa gaattttata aatttatcaa accaatttta 1140

gaaaaaatgg atggtactga ggaattattg gtgaaactaa atcgtgaaga tttgctgcgc 1200

aagcaacgga cctttgacaa cggctctatt ccccatcaaa ttcacttggg tgagctgcat 1260

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gaaaaaatct tgacttttcg aattccttat tatgttggtc cattggcgcg tggcaatagt 1380

cgttttgcat ggatgactcg gaagtctgaa gaaacaatta ccccatggaa ttttgaagaa 1440

gttgtcgata aaggtgcttc agctcaatca tttattgaac gcatgacaaa ctttgataaa 1500

aatcttccaa atgaaaaagt actaccaaaa catagtttgc tttatgagta ttttacggtt 1560

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tcaggtgaac agaagaaagc cattgttgat ttactcttca aaacaaatcg aaaagtaacc 1680

gttaagcaat taaaagaaga ttatttcaaa aaaatagaat gttttgatag tgttgaaatt 1740

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attaaagata aagatttttt ggataatgaa gaaaatgaag atatcttaga ggatattgtt 1860

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cacctctttg atgataaggt gatgaaacag cttaaacgtc gccgttatac tggttgggga 1980

cgtttgtctc gaaaattgat taatggtatt agggataagc aatctggcaa aacaatatta 2040

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catgaacata ttgcaaattt agctggtagc cctgctatta aaaaaggtat tttacagact 2220

gtaaaagttg ttgatgaatt ggtcaaagta atggggcggc ataagccaga aaatatcgtt 2280

attgaaatgg cacgtgaaaa tcagacaact caaaagggcc agaaaaattc gcgagagcgt 2340

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gttgaaaata ctcaattgca aaatgaaaag ctctatctct attatctcca aaatggaaga 2460

gacatgtatg tggaccaaga attagatatt aatcgtttaa gtgattatga tgtcgatcac 2520

attgttccac aaagtttcct taaagacgat tcaatagaca ataaggtctt aacgcgttct 2580

gataaaaatc gtggtaaatc ggataacgtt ccaagtgaag aagtagtcaa aaagatgaaa 2640

aactattgga gacaacttct aaacgccaag ttaatcactc aacgtaagtt tgataattta 2700

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actaaatacg atgaaaatga taaacttatt cgagaggtta aagtgattac cttaaaatct 2880

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attttagcag atgccaattt agataaagtt cttagtgcat ataacaaaca tagagacaaa 3900

ccaatacgtg aacaagcaga aaatattatt catttattta cgttgacgaa tcttggagct 3960

cccgctgctt ttaaatattt tgatacaaca attgatcgta aacgatatac gtctacaaaa 4020

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gatttgagtc agctaggagg tgactga 4107

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1070                1075                1080
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Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1085                1090                1095

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

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

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

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

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

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

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

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

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

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

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

His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile Ser Glu  Phe Ser Lys
    1265                1270                1275
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Arg Val Ile Leu Ala Asp Ala Asn Leu Asp Lys Val Leu Ser Ala
1280 1285 1290

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

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

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

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

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

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<400> 26

Met Lys Glu Tyr His Ile Gly Leu Asp Ile Gly Thr Ser Ser Ile Gly
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Trp Ala Val Thr Asp Ser Gln Phe Lys Leu Met Arg Ile Lys Gly Lys
20 25 30

Thr Ala Ile Gly Val Arg Leu Phe Glu Glu Gly Lys Thr Ala Ala Glu
35 40 45

Arg Arg Thr Phe Arg Thr Thr Arg Arg Arg Leu Lys Arg Arg Lys Trp
50 55 60

Arg Leu His Tyr Leu Asp Glu Ile Phe Ala Pro His Leu Gln Glu Val
65 70 75 80

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

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

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

Asp Glu Leu Pro Val Glu Gln Arg Ala His Tyr Pro Val Met Asn Ile
    130                 135                 140

Tyr Lys Leu Arg Glu Ala Met Ile Asn Glu Asp Arg Gln Phe Asp Leu
145                 150                 155                 160

Arg Glu Val Tyr Leu Ala Val His His Ile Val Lys Tyr Arg Gly His
                165                 170                 175

Phe Leu Asn Asn Ala Ser Val Asp Lys Phe Lys Val Gly Arg Ile Asp
            180                 185                 190

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

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

Gly Gln Leu Leu Leu Asp Thr Lys Met Arg Lys Leu Asp Arg Gln Lys
225                 230                 235                 240

Ala Val Ala Lys Leu Leu Glu Val Lys Val Ala Asp Lys Glu Glu Thr
                245                 250                 255

Lys Arg Asn Lys Gln Ile Ala Thr Ala Met Ser Lys Leu Val Leu Gly
            260                 265                 270

Tyr Lys Ala Asp Phe Ala Thr Val Ala Met Ala Asn Gly Asn Glu Trp
        275                 280                 285

Lys Ile Asp Leu Ser Ser Glu Thr Ser Glu Asp Glu Ile Glu Lys Phe
    290                 295                 300
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Arg Glu Glu Leu Ser Asp Ala Gln Asn Asp Ile Leu Thr Glu Ile Thr
305                 310                 315                 320

Ser Leu Phe Ser Gln Ile Met Leu Asn Glu Ile Val Pro Asn Gly Met
                325                 330                 335

Ser Ile Ser Glu Ser Met Met Asp Arg Tyr Trp Thr His Glu Arg Gln
            340                 345                 350

Leu Ala Glu Val Lys Glu Tyr Leu Ala Thr Gln Pro Ala Ser Ala Arg
        355                 360                 365

Lys Glu Phe Asp Gln Val Tyr Asn Lys Tyr Ile Gly Gln Ala Pro Lys
    370                 375                 380

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

Lys Glu Asn Trp Lys Glu Ile Asp Glu Leu Leu Lys Ala Gly Asp Phe
                405                 410                 415

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

His Gln Gln Glu Leu Asp Arg Ile Ile Glu Lys Gln Ala Lys Tyr Tyr
        435                 440                 445

Pro Trp Leu Ala Thr Glu Asn Pro Ala Thr Gly Glu Arg Asp Arg His
    450                 455                 460

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

Tyr Val Gly Pro Leu Val Thr Pro Glu Val Gln Lys Ala Thr Ser Gly
                485                 490                 495

Ala Lys Phe Ala Trp Ala Lys Arg Lys Glu Asp Gly Glu Ile Thr Pro
            500                 505                 510
```

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Trp Asn Leu Trp Asp Lys Ile Asp Arg Ala Glu Ser Ala Glu Ala Phe
        515                 520                 525

Ile Lys Arg Met Thr Val Lys Asp Thr Tyr Leu Leu Asn Glu Asp Val
    530                 535                 540

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

Leu Asn Asn Val Arg Val Asn Gly Arg Arg Leu Ser Val Gly Ile Lys
                565                 570                 575

Gln Asp Ile Tyr Thr Glu Leu Phe Lys Lys Lys Lys Thr Val Lys Ala
            580                 585                 590

Ser Asp Val Ala Ser Leu Val Met Ala Lys Thr Arg Gly Val Asn Lys
        595                 600                 605

Pro Ser Val Glu Gly Leu Ser Asp Pro Lys Lys Phe Asn Ser Asn Leu
    610                 615                 620

Ala Thr Tyr Leu Asp Leu Lys Ser Ile Val Gly Asp Lys Val Asp Asp
625                 630                 635                 640

Asn Arg Tyr Gln Thr Asp Leu Glu Asn Ile Ile Glu Trp Arg Ser Val
                645                 650                 655

Phe Glu Asp Gly Glu Ile Phe Ala Asp Lys Leu Thr Glu Val Glu Trp
            660                 665                 670

Leu Thr Asp Glu Gln Arg Ser Ala Leu Val Lys Lys Arg Tyr Lys Gly
        675                 680                 685

Trp Gly Arg Leu Ser Lys Lys Leu Leu Thr Gly Ile Val Asp Glu Asn
    690                 695                 700

Gly Gln Arg Ile Ile Asp Leu Met Trp Asn Thr Asp Gln Asn Phe Lys
705                 710                 715                 720

Glu Ile Val Asp Gln Pro Val Phe Lys Glu Gln Ile Asp Gln Leu Asn
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               725                 730                 735

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

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

Trp Gln Val Val Arg Val Val Glu Asp Ile Val Lys Ala Val Gly Asn
    770                 775                 780

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

Gly Glu Ile Thr Arg Ser Arg Arg Thr Gln Leu Gln Lys Leu Phe Glu
                805                 810                 815

Asp Gln Ala His Glu Leu Val Lys Asp Thr Ser Leu Thr Glu Glu Leu
            820                 825                 830

Glu Lys Ala Pro Asp Leu Ser Asp Arg Tyr Tyr Phe Tyr Phe Thr Gln
        835                 840                 845

Gly Gly Lys Asp Met Tyr Thr Gly Asp Pro Ile Asn Phe Asp Glu Ile
    850                 855                 860

Ser Thr Lys Tyr Asp Ile Asp His Ile Leu Pro Gln Ser Phe Val Lys
865                 870                 875                 880

Asp Asn Ser Leu Asp Asn Arg Val Leu Thr Ser Arg Lys Glu Asn Asn
                885                 890                 895

Lys Lys Ser Asp Gln Val Pro Ala Lys Leu Tyr Ala Ala Lys Met Lys
            900                 905                 910

Pro Tyr Trp Asn Gln Leu Leu Lys Gln Gly Leu Ile Thr Gln Arg Lys
        915                 920                 925

Phe Glu Asn Leu Thr Lys Asp Val Asp Gln Asn Ile Lys Tyr Arg Ser
    930                 935                 940
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Leu Gly Phe Val Lys Arg Gln Leu Val Glu Thr Arg Gln Val Ile Lys
945                 950                 955                 960


Leu Thr Ala Asn Ile Leu Gly Ser Met Tyr Gln Glu Ala Gly Thr Glu
                965                 970                 975


Ile Ile Glu Thr Arg Ala Gly Leu Thr Lys Gln Leu Arg Glu Glu Phe
            980                 985                 990


Asp Leu Pro Lys Val Arg Glu Val  Asn Asp Tyr His His  Ala Val Asp
        995                 1000                1005


Ala Tyr  Leu Thr Thr Phe Ala  Gly Gln Tyr Leu Asn  Arg Arg Tyr
    1010                1015                1020


Pro Lys  Leu Arg Ser Phe Phe  Val Tyr Gly Glu Tyr  Met Lys Phe
    1025                1030                1035


Lys His  Gly Ser Asp Leu Lys  Leu Arg Asn Phe Asn  Phe Phe His
    1040                1045                1050


Glu Leu  Met Glu Gly Asp Lys  Ser Gln Gly Lys Val  Val Asp Gln
    1055                1060                1065


Gln Thr  Gly Glu Leu Ile Thr  Thr Arg Asp Glu Val  Ala Lys Ser
    1070                1075                1080


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


Val His  Asp Arg Ser Asp Gln  Leu Tyr Gly Ala Thr  Ile Val Thr
    1100                1105                1110


Ala Lys  Glu Ser Gly Lys Leu  Thr Ser Pro Ile Glu  Ile Lys Lys
    1115                1120                1125


Asn Arg  Leu Val Asp Leu Tyr  Gly Ala Tyr Thr Asn  Gly Thr Ser
    1130                1135                1140
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Ala Phe  Met Thr Ile Ile Lys  Phe Thr Gly Asn Lys  Pro Lys Tyr
    1145                1150                1155

Lys Val  Ile Gly Ile Pro Thr  Thr Ser Ala Ala Ser  Leu Lys Arg
    1160                1165                1170

Ala Gly  Lys Pro Gly Ser Glu  Ser Tyr Asn Gln Glu  Leu His Arg
    1175                1180                1185

Ile Ile  Lys Ser Asn Pro Lys  Val Lys Lys Gly Phe  Glu Ile Val
    1190                1195                1200

Val Pro  His Val Ser Tyr Gly  Gln Leu Ile Val Asp  Gly Asp Cys
    1205                1210                1215

Lys Phe  Thr Leu Ala Ser Pro  Thr Val Gln His Pro  Ala Thr Gln
    1220                1225                1230

Leu Val  Leu Ser Lys Lys Ser  Leu Glu Thr Ile Ser  Ser Gly Tyr
    1235                1240                1245

Lys Ile  Leu Lys Asp Lys Pro  Ala Ile Ala Asn Glu  Arg Leu Ile
    1250                1255                1260

Arg Val  Phe Asp Glu Val Val  Gly Gln Met Asn Arg  Tyr Phe Thr
    1265                1270                1275

Ile Phe  Asp Gln Arg Ser Asn  Arg Gln Lys Val Ala  Asp Ala Arg
    1280                1285                1290

Asp Lys  Phe Leu Ser Leu Pro  Thr Glu Ser Lys Tyr  Glu Gly Ala
    1295                1300                1305

Lys Lys  Val Gln Val Gly Lys  Thr Glu Val Ile Thr  Asn Leu Leu
    1310                1315                1320

Met Gly  Leu His Ala Asn Ala  Thr Gln Gly Asp Leu  Lys Val Leu
    1325                1330                1335
```

Gly Leu Ala Thr Phe Gly Phe Phe Gln Ser Thr Thr Gly Leu Ser
    1340   1345   1350

Leu Ser Glu Asp Thr Met Ile Val Tyr Gln Ser Pro Thr Gly Leu
    1355   1360   1365

Phe Glu Arg Arg Ile Cys Leu Lys Asp Ile
    1370   1375

<210> 27
<211> 1368
<212> PRT
<213> Staphylococcus aureus

<400> 27

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
```

```
    770                 775                 780

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

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

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

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

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

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

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

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

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

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

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

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

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

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


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


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


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


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


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


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


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


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


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


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


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


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

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

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

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

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

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

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

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

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

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

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

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

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

<210> 28
<211> 1053
<212> PRT
<213> Staphylococcus aureus

<400> 28

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

Val Gly Tyr Gly Ile Ile Asp Tyr Glu Thr Arg Asp Val Ile Asp Ala
            20                  25                  30

Gly Val Arg Leu Phe Lys Glu Ala Asn Val Glu Asn Asn Glu Gly Arg
        35                  40                  45

Arg Ser Lys Arg Gly Ala Arg Arg Leu Lys Arg Arg Arg Arg His Arg
    50                  55                  60

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

His Ser Glu Leu Ser Gly Ile Asn Pro Tyr Glu Ala Arg Val Lys Gly
                85                  90                  95

Leu Ser Gln Lys Leu Ser Glu Glu Glu Phe Ser Ala Ala Leu Leu His
            100                 105                 110

Leu Ala Lys Arg Arg Gly Val His Asn Val Asn Glu Val Glu Glu Asp
        115                 120                 125

Thr Gly Asn Glu Leu Ser Thr Lys Glu Gln Ile Ser Arg Asn Ser Lys
    130                 135                 140

Ala Leu Glu Glu Lys Tyr Val Ala Glu Leu Gln Leu Glu Arg Leu Lys
145                 150                 155                 160

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

Tyr Val Lys Glu Ala Lys Gln Leu Leu Lys Val Gln Lys Ala Tyr His
            180                 185                 190

Gln Leu Asp Gln Ser Phe Ile Asp Thr Tyr Ile Asp Leu Leu Glu Thr
        195                 200                 205
```

```
Arg Arg Thr Tyr Tyr Glu Gly Pro Gly Glu Gly Ser Pro Phe Gly Trp
    210                 215                 220

Lys Asp Ile Lys Glu Trp Tyr Glu Met Leu Met Gly His Cys Thr Tyr
225                 230                 235                 240

Phe Pro Glu Glu Leu Arg Ser Val Lys Tyr Ala Tyr Asn Ala Asp Leu
                245                 250                 255

Tyr Asn Ala Leu Asn Asp Leu Asn Asn Leu Val Ile Thr Arg Asp Glu
            260                 265                 270

Asn Glu Lys Leu Glu Tyr Tyr Glu Lys Phe Gln Ile Ile Glu Asn Val
        275                 280                 285

Phe Lys Gln Lys Lys Lys Pro Thr Leu Lys Gln Ile Ala Lys Glu Ile
    290                 295                 300

Leu Val Asn Glu Glu Asp Ile Lys Gly Tyr Arg Val Thr Ser Thr Gly
305                 310                 315                 320

Lys Pro Glu Phe Thr Asn Leu Lys Val Tyr His Asp Ile Lys Asp Ile
                325                 330                 335

Thr Ala Arg Lys Glu Ile Ile Glu Asn Ala Glu Leu Leu Asp Gln Ile
            340                 345                 350

Ala Lys Ile Leu Thr Ile Tyr Gln Ser Ser Glu Asp Ile Gln Glu Glu
        355                 360                 365

Leu Thr Asn Leu Asn Ser Glu Leu Thr Gln Glu Glu Ile Glu Gln Ile
    370                 375                 380

Ser Asn Leu Lys Gly Tyr Thr Gly Thr His Asn Leu Ser Leu Lys Ala
385                 390                 395                 400

Ile Asn Leu Ile Leu Asp Glu Leu Trp His Thr Asn Asp Asn Gln Ile
                405                 410                 415
```

```
Ala Ile Phe Asn Arg Leu Lys Leu Val Pro Lys Lys Val Asp Leu Ser
            420                 425                 430

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

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

Ile Ile Lys Lys Tyr Gly Leu Pro Asn Asp Ile Ile Ile Glu Leu Ala
465                 470                 475                 480

Arg Glu Lys Asn Ser Lys Asp Ala Gln Lys Met Ile Asn Glu Met Gln
                485                 490                 495

Lys Arg Asn Arg Gln Thr Asn Glu Arg Ile Glu Glu Ile Ile Arg Thr
            500                 505                 510

Thr Gly Lys Glu Asn Ala Lys Tyr Leu Ile Glu Lys Ile Lys Leu His
        515                 520                 525

Asp Met Gln Glu Gly Lys Cys Leu Tyr Ser Leu Glu Ala Ile Pro Leu
    530                 535                 540

Glu Asp Leu Leu Asn Asn Pro Phe Asn Tyr Glu Val Asp His Ile Ile
545                 550                 555                 560

Pro Arg Ser Val Ser Phe Asp Asn Ser Phe Asn Asn Lys Val Leu Val
                565                 570                 575

Lys Gln Glu Glu Asn Ser Lys Lys Gly Asn Arg Thr Pro Phe Gln Tyr
            580                 585                 590

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

Ile Leu Asn Leu Ala Lys Gly Lys Gly Arg Ile Ser Lys Thr Lys Lys
    610                 615                 620
```

```
Glu Tyr Leu Leu Glu Glu Arg Asp Ile Asn Arg Phe Ser Val Gln Lys
625                 630                 635                 640

Asp Phe Ile Asn Arg Asn Leu Val Asp Thr Arg Tyr Ala Thr Arg Gly
                645                 650                 655

Leu Met Asn Leu Leu Arg Ser Tyr Phe Arg Val Asn Asn Leu Asp Val
            660                 665                 670

Lys Val Lys Ser Ile Asn Gly Gly Phe Thr Ser Phe Leu Arg Arg Lys
        675                 680                 685

Trp Lys Phe Lys Lys Glu Arg Asn Lys Gly Tyr Lys His His Ala Glu
    690                 695                 700

Asp Ala Leu Ile Ile Ala Asn Ala Asp Phe Ile Phe Lys Glu Trp Lys
705                 710                 715                 720

Lys Leu Asp Lys Ala Lys Lys Val Met Glu Asn Gln Met Phe Glu Glu
                725                 730                 735

Lys Gln Ala Glu Ser Met Pro Glu Ile Glu Thr Glu Gln Glu Tyr Lys
            740                 745                 750

Glu Ile Phe Ile Thr Pro His Gln Ile Lys His Ile Lys Asp Phe Lys
        755                 760                 765

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

Ile Asn Asp Thr Leu Tyr Ser Thr Arg Lys Asp Asp Lys Gly Asn Thr
785                 790                 795                 800

Leu Ile Val Asn Asn Leu Asn Gly Leu Tyr Asp Lys Asp Asn Asp Lys
                805                 810                 815

Leu Lys Lys Leu Ile Asn Lys Ser Pro Glu Lys Leu Leu Met Tyr His
            820                 825                 830

His Asp Pro Gln Thr Tyr Gln Lys Leu Lys Leu Ile Met Glu Gln Tyr
```

```
        835                 840                 845

Gly Asp Glu Lys Asn Pro Leu Tyr Lys Tyr Tyr Glu Glu Thr Gly Asn
    850                 855                 860

Tyr Leu Thr Lys Tyr Ser Lys Lys Asp Asn Gly Pro Val Ile Lys Lys
865                 870                 875                 880

Ile Lys Tyr Tyr Gly Asn Lys Leu Asn Ala His Leu Asp Ile Thr Asp
                885                 890                 895

Asp Tyr Pro Asn Ser Arg Asn Lys Val Val Lys Leu Ser Leu Lys Pro
            900                 905                 910

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

Val Lys Asn Leu Asp Val Ile Lys Lys Glu Asn Tyr Tyr Glu Val Asn
    930                 935                 940

Ser Lys Cys Tyr Glu Glu Ala Lys Lys Leu Lys Lys Ile Ser Asn Gln
945                 950                 955                 960

Ala Glu Phe Ile Ala Ser Phe Tyr Lys Asn Asp Leu Ile Lys Ile Asn
                965                 970                 975

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

Ile Glu Val Asn Met Ile Asp Ile  Thr Tyr Arg Glu Tyr  Leu Glu Asn
        995                 1000                1005

Met Asn  Asp Lys Arg Pro Pro  His Ile Ile Lys Thr  Ile Ala Ser
    1010                1015                1020

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

Leu Tyr  Glu Val Lys Ser Lys  Lys His Pro Gln Ile  Ile Lys Lys
    1040                1045                1050
```

<210> 29
<211> 1409
<212> PRT
<213> Streptococcus thermophilus

<400> 29

Met Leu Phe Asn Lys Cys Ile Ile Ile Ser Ile Asn Leu Asp Phe Ser
1 5 10 15

Asn Lys Glu Lys Cys Met Thr Lys Pro Tyr Ser Ile Gly Leu Asp Ile
20 25 30

Gly Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Asn Tyr Lys Val
35 40 45

Pro Ser Lys Lys Met Lys Val Leu Gly Asn Thr Ser Lys Lys Tyr Ile
50 55 60

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

Glu Gly Arg Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg
85 90 95

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

Thr Leu Asp Asp Ala Phe Phe Gln Arg Leu Asp Asp Ser Phe Leu Val
115 120 125

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

Glu Glu Lys Val Tyr His Asp Glu Phe Pro Thr Ile Tyr His Leu Arg
145 150 155 160

Lys Tyr Leu Ala Asp Ser Thr Lys Lys Ala Asp Leu Arg Leu Val Tyr
165 170 175

```
Leu Ala Leu Ala His Met Ile Lys Tyr Arg Gly His Phe Leu Ile Glu
            180                 185                 190

Gly Glu Phe Asn Ser Lys Asn Asn Asp Ile Gln Lys Asn Phe Gln Asp
        195                 200                 205

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

Asn Ser Lys Gln Leu Glu Glu Ile Val Lys Asp Lys Ile Ser Lys Leu
225                 230                 235                 240

Glu Lys Lys Asp Arg Ile Leu Lys Leu Phe Pro Gly Glu Lys Asn Ser
                245                 250                 255

Gly Ile Phe Ser Glu Phe Leu Lys Leu Ile Val Gly Asn Gln Ala Asp
            260                 265                 270

Phe Arg Lys Cys Phe Asn Leu Asp Glu Lys Ala Ser Leu His Phe Ser
        275                 280                 285

Lys Glu Ser Tyr Asp Glu Asp Leu Glu Thr Leu Leu Gly Tyr Ile Gly
    290                 295                 300

Asp Asp Tyr Ser Asp Val Phe Leu Lys Ala Lys Lys Leu Tyr Asp Ala
305                 310                 315                 320

Ile Leu Leu Ser Gly Phe Leu Thr Val Thr Asp Asn Glu Thr Glu Ala
                325                 330                 335

Pro Leu Ser Ser Ala Met Ile Lys Arg Tyr Asn Glu His Lys Glu Asp
            340                 345                 350

Leu Ala Leu Leu Lys Glu Tyr Ile Arg Asn Ile Ser Leu Lys Thr Tyr
        355                 360                 365

Asn Glu Val Phe Lys Asp Asp Thr Lys Asn Gly Tyr Ala Gly Tyr Ile
    370                 375                 380

Asp Gly Lys Thr Asn Gln Glu Asp Phe Tyr Val Tyr Leu Lys Asn Leu
```

385 390 395 400

Leu Ala Glu Phe Glu Gly Ala Asp Tyr Phe Leu Glu Lys Ile Asp Arg
405 410 415

Glu Asp Phe Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro
420 425 430

Tyr Gln Ile His Leu Gln Glu Met Arg Ala Ile Leu Asp Lys Gln Ala
435 440 445

Lys Phe Tyr Pro Phe Leu Ala Lys Asn Lys Glu Arg Ile Glu Lys Ile
450 455 460

Leu Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn
465 470 475 480

Ser Asp Phe Ala Trp Ser Ile Arg Lys Arg Asn Glu Lys Ile Thr Pro
485 490 495

Trp Asn Phe Glu Asp Val Ile Asp Lys Glu Ser Ser Ala Glu Ala Phe
500 505 510

Ile Asn Arg Met Thr Ser Phe Asp Leu Tyr Leu Pro Glu Glu Lys Val
515 520 525

Leu Pro Lys His Ser Leu Leu Tyr Glu Thr Phe Asn Val Tyr Asn Glu
530 535 540

Leu Thr Lys Val Arg Phe Ile Ala Glu Ser Met Arg Asp Tyr Gln Phe
545 550 555 560

Leu Asp Ser Lys Gln Lys Lys Asp Ile Val Arg Leu Tyr Phe Lys Asp
565 570 575

Lys Arg Lys Val Thr Asp Lys Asp Ile Ile Glu Tyr Leu His Ala Ile
580 585 590

Tyr Gly Tyr Asp Gly Ile Glu Leu Lys Gly Ile Glu Lys Gln Phe Asn
595 600 605

```
Ser Ser Leu Ser Thr Tyr His Asp Leu Leu Asn Ile Ile Asn Asp Lys
    610                 615                 620

Glu Phe Leu Asp Asp Ser Ser Asn Glu Ala Ile Ile Glu Glu Ile Ile
625                 630                 635                 640

His Thr Leu Thr Ile Phe Glu Asp Arg Glu Met Ile Lys Gln Arg Leu
                645                 650                 655

Ser Lys Phe Glu Asn Ile Phe Asp Lys Ser Val Leu Lys Lys Leu Ser
            660                 665                 670

Arg Arg His Tyr Thr Gly Trp Gly Lys Leu Ser Ala Lys Leu Ile Asn
        675                 680                 685

Gly Ile Arg Asp Glu Lys Ser Gly Asn Thr Ile Leu Asp Tyr Leu Ile
    690                 695                 700

Asp Asp Gly Ile Ser Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp
705                 710                 715                 720

Ala Leu Ser Phe Lys Lys Lys Ile Gln Lys Ala Gln Ile Ile Gly Asp
                725                 730                 735

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

Pro Ala Ile Lys Lys Gly Ile Leu Gln Ser Ile Lys Ile Val Asp Glu
        755                 760                 765

Leu Val Lys Val Met Gly Gly Arg Lys Pro Glu Ser Ile Val Val Glu
    770                 775                 780

Met Ala Arg Glu Asn Gln Tyr Thr Asn Gln Gly Lys Ser Asn Ser Gln
785                 790                 795                 800

Gln Arg Leu Lys Arg Leu Glu Lys Ser Leu Lys Glu Leu Gly Ser Lys
                805                 810                 815
```

```
Ile Leu Lys Glu Asn Ile Pro Ala Lys Leu Ser Lys Ile Asp Asn Asn
            820                 825                 830

Ala Leu Gln Asn Asp Arg Leu Tyr Leu Tyr Tyr Leu Gln Asn Gly Lys
        835                 840                 845

Asp Met Tyr Thr Gly Asp Asp Leu Asp Ile Asp Arg Leu Ser Asn Tyr
    850                 855                 860

Asp Ile Asp His Ile Ile Pro Gln Ala Phe Leu Lys Asp Asn Ser Ile
865                 870                 875                 880

Asp Asn Lys Val Leu Val Ser Ser Ala Ser Asn Arg Gly Lys Ser Asp
                885                 890                 895

Asp Phe Pro Ser Leu Glu Val Val Lys Lys Arg Lys Thr Phe Trp Tyr
            900                 905                 910

Gln Leu Leu Lys Ser Lys Leu Ile Ser Gln Arg Lys Phe Asp Asn Leu
        915                 920                 925

Thr Lys Ala Glu Arg Gly Gly Leu Leu Pro Glu Asp Lys Ala Gly Phe
    930                 935                 940

Ile Gln Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys His Val Ala
945                 950                 955                 960

Arg Leu Leu Asp Glu Lys Phe Asn Asn Lys Lys Asp Glu Asn Asn Arg
                965                 970                 975

Ala Val Arg Thr Val Lys Ile Ile Thr Leu Lys Ser Thr Leu Val Ser
            980                 985                 990

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

Phe His  His Ala His Asp Ala  Tyr Leu Asn Ala Val  Ile Ala Ser
    1010                1015                1020
```

```
Ala Leu  Leu Lys Lys Tyr Pro  Lys Leu Glu Pro Glu  Phe Val Tyr
    1025                1030                1035

Gly Asp  Tyr Pro Lys Tyr Asn  Ser Phe Arg Glu Arg  Lys Ser Ala
    1040                1045                1050

Thr Glu  Lys Val Tyr Phe Tyr  Ser Asn Ile Met Asn  Ile Phe Lys
    1055                1060                1065

Lys Ser  Ile Ser Leu Ala Asp  Gly Arg Val Ile Glu  Arg Pro Leu
    1070                1075                1080

Ile Glu  Val Asn Glu Glu Thr  Gly Glu Ser Val Trp  Asn Lys Glu
    1085                1090                1095

Ser Asp  Leu Ala Thr Val Arg  Arg Val Leu Ser Tyr  Pro Gln Val
    1100                1105                1110

Asn Val  Val Lys Lys Val Glu  Glu Gln Asn His Gly  Leu Asp Arg
    1115                1120                1125

Gly Lys  Pro Lys Gly Leu Phe  Asn Ala Asn Leu Ser  Ser Lys Pro
    1130                1135                1140

Lys Pro  Asn Ser Asn Glu Asn  Leu Val Gly Ala Lys  Glu Tyr Leu
    1145                1150                1155

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

Ala Val  Leu Val Lys Gly Thr  Ile Glu Lys Gly Ala  Lys Lys Lys
    1175                1180                1185

Ile Thr  Asn Val Leu Glu Phe  Gln Gly Ile Ser Ile  Leu Asp Arg
    1190                1195                1200

Ile Asn  Tyr Arg Lys Asp Lys  Leu Asn Phe Leu Leu  Glu Lys Gly
    1205                1210                1215

Tyr Lys  Asp Ile Glu Leu Ile  Ile Glu Leu Pro Lys  Tyr Ser Leu
```

```
    1220                1225                1230

Phe Glu  Leu Ser Asp Gly Ser  Arg Arg Met Leu Ala  Ser Ile Leu
    1235                1240                1245

Ser Thr  Asn Asn Lys Arg Gly  Glu Ile His Lys Gly  Asn Gln Ile
    1250                1255                1260

Phe Leu  Ser Gln Lys Phe Val  Lys Leu Leu Tyr His  Ala Lys Arg
    1265                1270                1275

Ile Ser  Asn Thr Ile Asn Glu  Asn His Arg Lys Tyr  Val Glu Asn
    1280                1285                1290

His Lys  Lys Glu Phe Glu Glu  Leu Phe Tyr Tyr Ile  Leu Glu Phe
    1295                1300                1305

Asn Glu  Asn Tyr Val Gly Ala  Lys Lys Asn Gly Lys  Leu Leu Asn
    1310                1315                1320

Ser Ala  Phe Gln Ser Trp Gln  Asn His Ser Ile Asp  Glu Leu Cys
    1325                1330                1335

Ser Ser  Phe Ile Gly Pro Thr  Gly Ser Glu Arg Lys  Gly Leu Phe
    1340                1345                1350

Glu Leu  Thr Ser Arg Gly Ser  Ala Ala Asp Phe Glu  Phe Leu Gly
    1355                1360                1365

Val Lys  Ile Pro Arg Tyr Arg  Asp Tyr Thr Pro Ser  Ser Leu Leu
    1370                1375                1380

Lys Asp  Ala Thr Leu Ile His  Gln Ser Val Thr Gly  Leu Tyr Glu
    1385                1390                1395

Thr Arg  Ile Asp Leu Ala Lys  Leu Gly Glu Gly
    1400                1405
```

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<212> PRT
<213> Lactobacillus crispatus

<400> 30

Met Lys Ile Lys Asn Tyr Asn Leu Ala Leu Thr Pro Ser Thr Ser Ala
1 5 10 15

Val Gly His Val Glu Val Asp Asp Asp Leu Asn Ile Leu Glu Pro Val
20 25 30

His His Gln Lys Ala Ile Gly Val Ala Lys Phe Gly Glu Gly Glu Thr
35 40 45

Ala Glu Ala Arg Arg Leu Ala Arg Ser Ala Arg Arg Thr Thr Lys Arg
50 55 60

Arg Ala Asn Arg Ile Asn His Tyr Phe Asn Glu Ile Met Lys Pro Glu
65 70 75 80

Ile Asp Lys Val Asp Pro Leu Met Phe Asp Arg Ile Lys Gln Ala Gly
85 90 95

Leu Ser Pro Leu Asp Glu Arg Lys Glu Phe Arg Thr Val Ile Phe Asp
100 105 110

Arg Pro Asn Ile Ala Ser Tyr Tyr His Asn Gln Phe Pro Thr Ile Trp
115 120 125

His Leu Gln Lys Tyr Leu Met Ile Thr Asp Glu Lys Ala Asp Ile Arg
130 135 140

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

Phe Asn Thr Thr Pro Met Ser Gln Phe Lys Pro Gly Lys Leu Asn Leu
165 170 175

Lys Asp Asp Met Leu Ala Leu Asp Asp Tyr Asn Asp Leu Glu Gly Leu
180 185 190

```
Ser Phe Ala Val Ala Asn Ser Pro Glu Ile Glu Lys Val Ile Lys Asp
        195                 200                 205

Arg Ser Met His Lys Lys Glu Lys Ile Ala Glu Leu Lys Lys Leu Ile
    210                 215                 220

Val Asn Asp Val Pro Asp Lys Asp Leu Ala Lys Arg Asn Asn Lys Ile
225                 230                 235                 240

Ile Thr Gln Ile Val Asn Ala Ile Met Gly Asn Ser Phe His Leu Asn
                245                 250                 255

Phe Ile Phe Asp Met Asp Leu Asp Lys Leu Thr Ser Lys Ala Trp Ser
            260                 265                 270

Phe Lys Leu Asp Asp Pro Glu Leu Asp Thr Lys Phe Asp Ala Ile Ser
        275                 280                 285

Gly Ser Met Thr Asp Asn Gln Ile Gly Ile Phe Glu Thr Leu Gln Lys
    290                 295                 300

Ile Tyr Ser Ala Ile Ser Leu Leu Asp Ile Leu Asn Gly Ser Ser Asn
305                 310                 315                 320

Val Val Asp Ala Lys Asn Ala Leu Tyr Asp Lys His Lys Arg Asp Leu
                325                 330                 335

Asn Leu Tyr Phe Lys Phe Leu Asn Thr Leu Pro Asp Glu Ile Ala Lys
            340                 345                 350

Thr Leu Lys Ala Gly Tyr Thr Leu Tyr Ile Gly Asn Arg Lys Lys Asp
        355                 360                 365

Leu Leu Ala Ala Arg Lys Leu Leu Lys Val Asn Val Ala Lys Asn Phe
    370                 375                 380

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

Asp Lys Gln Gly Leu Gln Thr Arg Phe Ser Glu Lys Val Gly Glu Leu
```

```
                405                 410                 415

Val Ala Gln Asn Asn Phe Leu Pro Val Gln Arg Ser Ser Asp Asn Val
            420                 425                 430

Phe Ile Pro Tyr Gln Leu Asn Ala Ile Thr Phe Asn Lys Ile Leu Glu
        435                 440                 445

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

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

Thr Ile Pro Tyr Tyr Val Gly Pro Leu Val Thr Pro Glu Glu Gln Val
                485                 490                 495

Lys Ser Gly Ile Pro Lys Thr Ser Arg Phe Ala Trp Met Val Arg Lys
            500                 505                 510

Asp Asn Gly Ala Ile Thr Pro Trp Asn Phe Tyr Asp Lys Val Asp Ile
        515                 520                 525

Glu Ala Thr Ala Asp Lys Phe Ile Lys Arg Ser Ile Ala Lys Asp Ser
    530                 535                 540

Tyr Leu Leu Ser Glu Leu Val Leu Pro Lys His Ser Leu Leu Tyr Glu
545                 550                 555                 560

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

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

Lys Thr Asn Lys Val Asn Thr Ser Arg Ile Leu Lys Ala Leu Ala Lys
        595                 600                 605

His Asn Ile Pro Gly Ser Lys Ile Thr Gly Leu Ser Asn Pro Glu Glu
    610                 615                 620
```

```
Phe Thr Ser Ser Leu Gln Thr Tyr Asn Ala Trp Lys Lys Tyr Phe Pro
625                 630                 635                 640

Asn Gln Ile Asp Asn Phe Ala Tyr Gln Gln Asp Leu Glu Lys Met Ile
                645                 650                 655

Glu Trp Ser Thr Val Phe Glu Asp His Lys Ile Leu Ala Lys Lys Leu
            660                 665                 670

Asp Glu Ile Glu Trp Leu Asp Asp Asp Gln Lys Lys Phe Val Ala Asn
        675                 680                 685

Thr Arg Leu Arg Gly Trp Gly Arg Leu Ser Lys Arg Leu Leu Thr Gly
    690                 695                 700

Leu Lys Asp Asn Tyr Gly Lys Ser Ile Met Gln Arg Leu Glu Thr Thr
705                 710                 715                 720

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

Ile Asp Lys Ile Ser Gln Ala Ala Ala Lys Asn Gln Ser Leu Glu Asp
            740                 745                 750

Ile Leu Ala Asn Ser Tyr Thr Ser Pro Ser Asn Arg Lys Ala Ile Arg
        755                 760                 765

Lys Thr Met Ser Val Val Asp Glu Tyr Ile Lys Leu Asn His Gly Lys
    770                 775                 780

Glu Pro Asp Lys Ile Phe Leu Met Phe Gln Arg Ser Glu Gln Glu Lys
785                 790                 795                 800

Gly Lys Gln Thr Glu Ala Arg Ser Lys Gln Leu Asn Arg Ile Leu Ser
                805                 810                 815

Gln Leu Lys Ala Asp Lys Ser Ala Asn Lys Leu Phe Ser Lys Gln Leu
            820                 825                 830
```

```
Ala Asp Glu Phe Ser Asn Ala Ile Lys Lys Ser Lys Tyr Lys Leu Asn
        835                 840                 845

Asp Lys Gln Tyr Phe Tyr Phe Gln Gln Leu Gly Arg Asp Ala Leu Thr
    850                 855                 860

Gly Glu Val Ile Asp Tyr Asp Glu Leu Tyr Lys Tyr Thr Val Leu His
865                 870                 875                 880

Ile Ile Pro Arg Ser Lys Leu Thr Asp Asp Ser Gln Asn Asn Lys Val
                885                 890                 895

Leu Thr Lys Tyr Lys Ile Val Asp Gly Ser Val Ala Leu Lys Phe Gly
            900                 905                 910

Asn Ser Tyr Ser Asp Ala Leu Gly Met Pro Ile Lys Ala Phe Trp Thr
        915                 920                 925

Glu Leu Asn Arg Leu Lys Leu Ile Pro Lys Gly Lys Leu Leu Asn Leu
    930                 935                 940

Thr Thr Asp Phe Ser Thr Leu Asn Lys Tyr Gln Arg Asp Gly Tyr Ile
945                 950                 955                 960

Ala Arg Gln Leu Val Glu Thr Gln Gln Ile Val Lys Leu Leu Ala Thr
                965                 970                 975

Ile Met Gln Ser Arg Phe Lys His Thr Lys Ile Ile Glu Val Arg Asn
            980                 985                 990

Ser Gln Val Ala Asn Ile Arg Tyr  Gln Phe Asp Tyr Phe  Arg Ile Lys
        995                 1000                1005

Asn Leu  Asn Glu Tyr Tyr Arg  Gly Phe Asp Ala Tyr  Leu Ala Ala
    1010                1015                1020

Val Val  Gly Thr Tyr Leu Tyr  Lys Val Tyr Pro Lys  Ala Arg Arg
    1025                1030                1035
```

```
Leu Phe  Val Tyr Gly Gln Tyr  Leu Lys Pro Lys Lys  Thr Asn Gln
    1040                1045                1050

Glu Asn  Gln Asp Met His Leu  Asp Ser Glu Lys Lys  Ser Gln Gly
    1055                1060                1065

Phe Asn  Phe Leu Trp Asn Leu  Leu Tyr Gly Lys Gln  Asp Gln Ile
    1070                1075                1080

Phe Val  Asn Gly Thr Asp Val  Ile Ala Phe Asn Arg  Lys Asp Leu
    1085                1090                1095

Ile Thr  Lys Met Asn Thr Val  Tyr Asn Tyr Lys Ser  Gln Lys Ile
    1100                1105                1110

Ser Leu  Ala Ile Asp Tyr His  Asn Gly Ala Met Phe  Lys Ala Thr
    1115                1120                1125

Leu Phe  Pro Arg Asn Asp Arg  Asp Thr Ala Lys Thr  Arg Lys Leu
    1130                1135                1140

Ile Pro  Lys Lys Lys Asp Tyr  Asp Thr Asp Ile Tyr  Gly Gly Tyr
    1145                1150                1155

Thr Ser  Asn Val Asp Gly Tyr  Met Leu Leu Ala Glu  Ile Ile Lys
    1160                1165                1170

Arg Asp  Gly Asn Lys Gln Tyr  Gly Phe Tyr Gly Val  Pro Ser Arg
    1175                1180                1185

Leu Val  Ser Glu Leu Asp Thr  Leu Lys Lys Thr Arg  Tyr Thr Glu
    1190                1195                1200

Tyr Glu  Glu Lys Leu Lys Glu  Ile Ile Lys Pro Glu  Leu Gly Val
    1205                1210                1215

Asp Leu  Lys Lys Ile Lys Lys  Ile Lys Ile Leu Lys  Asn Lys Val
    1220                1225                1230

Pro Phe  Asn Gln Val Ile Ile  Asp Lys Gly Ser Lys  Phe Phe Ile
```

```
    1235                1240                1245

Thr Ser  Thr Ser Tyr Arg Trp  Asn Tyr Arg Gln Leu  Ile Leu Ser
    1250                1255                1260

Ala Glu  Ser Gln Gln Thr Leu  Met Asp Leu Val Val  Asp Pro Asp
    1265                1270                1275

Phe Ser  Asn His Lys Ala Arg  Lys Asp Ala Arg Lys  Asn Ala Asp
    1280                1285                1290

Glu Arg  Leu Ile Lys Val Tyr  Glu Glu Ile Leu Tyr  Gln Val Lys
    1295                1300                1305

Asn Tyr  Met Pro Met Phe Val  Glu Leu His Arg Cys  Tyr Glu Lys
    1310                1315                1320

Leu Val  Asp Ala Gln Lys Thr  Phe Lys Ser Leu Lys  Ile Ser Asp
    1325                1330                1335

Lys Ala  Met Val Leu Asn Gln  Ile Leu Ile Leu Leu  His Ser Asn
    1340                1345                1350

Ala Thr  Ser Pro Val Leu Glu  Lys Leu Gly Tyr His  Thr Arg Phe
    1355                1360                1365

Thr Leu  Gly Lys Lys His Asn  Leu Ile Ser Glu Asn  Ala Val Leu
    1370                1375                1380

Val Thr  Gln Ser Ile Thr Gly  Leu Lys Glu Asn His  Val Ser Ile
    1385                1390                1395

Lys Gln  Met Leu
    1400


<210>  31
<211>  1385
<212>  PRT
<213>  Pedicoccus damnosus

<400>  31
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```
Met Thr Asn Glu Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Ser Ser
1               5                  10                  15

Ile Gly Phe Ala Val Val Asn Asp Asn Asn Arg Val Ile Arg Val Lys
            20                  25                  30

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

Ala Asp Arg Arg Ser Phe Arg Thr Thr Arg Arg Ser Phe Arg Thr Thr
    50                  55                  60

Arg Arg Arg Leu Ser Arg Arg Arg Trp Arg Leu Lys Leu Leu Arg Glu
65                  70                  75                  80

Ile Phe Asp Ala Tyr Ile Thr Pro Val Asp Glu Ala Phe Phe Ile Arg
                85                  90                  95

Leu Lys Glu Ser Asn Leu Ser Pro Lys Asp Ser Lys Lys Gln Tyr Ser
            100                 105                 110

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

Tyr Pro Thr Ile Tyr His Leu Arg Asn Ala Leu Met Thr Glu His Arg
    130                 135                 140

Lys Phe Asp Val Arg Glu Ile Tyr Leu Ala Ile His His Ile Met Lys
145                 150                 155                 160

Phe Arg Gly His Phe Leu Asn Ala Thr Pro Ala Asn Asn Phe Lys Val
                165                 170                 175

Gly Arg Leu Asn Leu Glu Glu Lys Phe Glu Glu Leu Asn Asp Ile Tyr
            180                 185                 190

Gln Arg Val Phe Pro Asp Glu Ser Ile Glu Phe Arg Thr Asp Asn Leu
        195                 200                 205
```

```
Glu Gln Ile Lys Glu Val Leu Leu Asp Asn Lys Arg Ser Arg Ala Asp
    210                 215                 220

Arg Gln Arg Thr Leu Val Ser Asp Ile Tyr Gln Ser Ser Glu Asp Lys
225                 230                 235                 240

Asp Ile Glu Lys Arg Asn Lys Ala Val Ala Thr Glu Ile Leu Lys Ala
                245                 250                 255

Ser Leu Gly Asn Lys Ala Lys Leu Asn Val Ile Thr Asn Val Glu Val
            260                 265                 270

Asp Lys Glu Ala Ala Lys Glu Trp Ser Ile Thr Phe Asp Ser Glu Ser
        275                 280                 285

Ile Asp Asp Asp Leu Ala Lys Ile Glu Gly Gln Met Thr Asp Asp Gly
    290                 295                 300

His Glu Ile Ile Glu Val Leu Arg Ser Leu Tyr Ser Gly Ile Thr Leu
305                 310                 315                 320

Ser Ala Ile Val Pro Glu Asn His Thr Leu Ser Gln Ser Met Val Ala
                325                 330                 335

Lys Tyr Asp Leu His Lys Asp His Leu Lys Leu Phe Lys Lys Leu Ile
            340                 345                 350

Asn Gly Met Thr Asp Thr Lys Lys Ala Lys Asn Leu Arg Ala Ala Tyr
        355                 360                 365

Asp Gly Tyr Ile Asp Gly Val Lys Gly Lys Val Leu Pro Gln Glu Asp
    370                 375                 380

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

Glu Ile Gln Thr Tyr Ile Asp Gln Asp Ile Phe Met Pro Lys Gln Arg
                405                 410                 415

Thr Lys Ala Asn Gly Ser Ile Pro His Gln Leu Gln Gln Gln Glu Leu
```

```
            420                 425                 430

Asp Gln Ile Ile Glu Asn Gln Lys Ala Tyr Tyr Pro Trp Leu Ala Glu
        435                 440                 445

Leu Asn Pro Asn Pro Asp Lys Lys Arg Gln Gln Leu Ala Lys Tyr Lys
    450                 455                 460

Leu Asp Glu Leu Val Thr Phe Arg Val Pro Tyr Tyr Val Gly Pro Met
465                 470                 475                 480

Ile Thr Ala Lys Asp Gln Lys Asn Gln Ser Gly Ala Glu Phe Ala Trp
                485                 490                 495

Met Ile Arg Lys Glu Pro Gly Asn Ile Thr Pro Trp Asn Phe Asp Gln
            500                 505                 510

Lys Val Asp Arg Met Ala Thr Ala Asn Gln Phe Ile Lys Arg Met Thr
        515                 520                 525

Thr Thr Asp Thr Tyr Leu Leu Gly Glu Asp Val Leu Pro Ala Gln Ser
    530                 535                 540

Leu Leu Tyr Gln Lys Phe Glu Val Leu Asn Glu Leu Asn Lys Ile Arg
545                 550                 555                 560

Ile Asp His Lys Pro Ile Ser Ile Glu Gln Lys Gln Gln Ile Phe Asn
                565                 570                 575

Asp Leu Phe Lys Gln Phe Lys Asn Val Thr Ile Lys His Leu Gln Asp
            580                 585                 590

Tyr Leu Val Ser Gln Gly Gln Tyr Ser Lys Arg Pro Leu Ile Glu Gly
        595                 600                 605

Leu Ala Asp Glu Lys Arg Phe Asn Ser Ser Leu Ser Thr Tyr Ser Asp
    610                 615                 620

Leu Cys Gly Ile Phe Gly Ala Lys Leu Val Glu Glu Asn Asp Arg Gln
625                 630                 635                 640
```

```
Glu Asp Leu Glu Lys Ile Ile Glu Trp Ser Thr Ile Phe Glu Asp Lys
               645                 650                 655

Lys Ile Tyr Arg Ala Lys Leu Asn Asp Leu Thr Trp Leu Thr Asp Asp
            660                 665                 670

Gln Lys Glu Lys Leu Ala Thr Lys Arg Tyr Gln Gly Trp Gly Arg Leu
        675                 680                 685

Ser Arg Lys Leu Leu Val Gly Leu Lys Asn Ser Glu His Arg Asn Ile
    690                 695                 700

Met Asp Ile Leu Trp Ile Thr Asn Glu Asn Phe Met Gln Ile Gln Ala
705                 710                 715                 720

Glu Pro Asp Phe Ala Lys Leu Val Thr Asp Ala Asn Lys Gly Met Leu
               725                 730                 735

Glu Lys Thr Asp Ser Gln Asp Val Ile Asn Asp Leu Tyr Thr Ser Pro
            740                 745                 750

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

Gln Asn Ala Met His Gly Gln Ala Pro Ala Lys Ile His Val Glu Phe
    770                 775                 780

Ala Arg Gly Glu Glu Arg Asn Pro Arg Arg Ser Val Gln Arg Gln Arg
785                 790                 795                 800

Gln Val Glu Ala Ala Tyr Glu Lys Val Ser Asn Glu Leu Val Ser Ala
               805                 810                 815

Lys Val Arg Gln Glu Phe Lys Glu Ala Ile Asn Asn Lys Arg Asp Phe
            820                 825                 830

Lys Asp Arg Leu Phe Leu Tyr Phe Met Gln Gly Gly Ile Asp Ile Tyr
        835                 840                 845
```

```
Thr Gly Lys Gln Leu Asn Ile Asp Gln Leu Ser Ser Tyr Gln Ile Asp
    850                 855                 860

His Ile Leu Pro Gln Ala Phe Val Lys Asp Asp Ser Leu Thr Asn Arg
865                 870                 875                 880

Val Leu Thr Asn Glu Asn Gln Val Lys Ala Asp Ser Val Pro Ile Asp
                885                 890                 895

Ile Phe Gly Lys Lys Met Leu Ser Val Trp Gly Arg Met Lys Asp Gln
            900                 905                 910

Gly Leu Ile Ser Lys Gly Lys Tyr Arg Asn Leu Thr Met Asn Pro Glu
        915                 920                 925

Asn Ile Ser Ala His Thr Glu Asn Gly Phe Ile Asn Arg Gln Leu Val
    930                 935                 940

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

Tyr Gly Asp Ser Thr Gln Ile Ile Ser Val Lys Ala Asp Leu Ser His
                965                 970                 975

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

Tyr His His Ala Phe Asp Ala Tyr  Leu Ala Ala Phe Ile  Gly Asn Tyr
        995                 1000                1005

Leu Leu  Lys Arg Tyr Pro Lys  Leu Glu Ser Tyr Phe  Val Tyr Gly
    1010                1015                1020

Asp Phe  Lys Lys Phe Thr Gln  Lys Glu Thr Lys Met  Arg Arg Phe
    1025                1030                1035

Asn Phe  Ile Tyr Asp Leu Lys  His Cys Asp Gln Val  Val Asn Lys
    1040                1045                1050
```

```
Glu Thr  Gly Glu Ile Leu Trp  Thr Lys Asp Glu Asp  Ile Lys Tyr
    1055                1060                1065

Ile Arg  His Leu Phe Ala Tyr  Lys Lys Ile Leu Val  Ser His Glu
    1070                1075                1080

Val Arg  Glu Lys Arg Gly Ala  Leu Tyr Asn Gln Thr  Ile Tyr Lys
    1085                1090                1095

Ala Lys  Asp Asp Lys Gly Ser  Gly Gln Glu Ser Lys  Lys Leu Ile
    1100                1105                1110

Arg Ile  Lys Asp Asp Lys Glu  Thr Lys Ile Tyr Gly  Gly Tyr Ser
    1115                1120                1125

Gly Lys  Ser Leu Ala Tyr Met  Thr Ile Val Gln Ile  Thr Lys Lys
    1130                1135                1140

Asn Lys  Val Ser Tyr Arg Val  Ile Gly Ile Pro Thr  Leu Ala Leu
    1145                1150                1155

Ala Arg  Leu Asn Lys Leu Glu  Asn Asp Ser Thr Glu  Asn Asn Gly
    1160                1165                1170

Glu Leu  Tyr Lys Ile Ile Lys  Pro Gln Phe Thr His  Tyr Lys Val
    1175                1180                1185

Asp Lys  Lys Asn Gly Glu Ile  Ile Glu Thr Thr Asp  Asp Phe Lys
    1190                1195                1200

Ile Val  Val Ser Lys Val Arg  Phe Gln Gln Leu Ile  Asp Asp Ala
    1205                1210                1215

Gly Gln  Phe Phe Met Leu Ala  Ser Asp Thr Tyr Lys  Asn Asn Ala
    1220                1225                1230

Gln Gln  Leu Val Ile Ser Asn  Asn Ala Leu Lys Ala  Ile Asn Asn
    1235                1240                1245

Thr Asn  Ile Thr Asp Cys Pro  Arg Asp Asp Leu Glu  Arg Leu Asp
```

1250 1255 1260

Asn Leu Arg Leu Asp Ser Ala Phe Asp Glu Ile Val Lys Lys Met
1265 1270 1275

Asp Lys Tyr Phe Ser Ala Tyr Asp Ala Asn Asn Phe Arg Glu Lys
1280 1285 1290

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

Gln Trp Glu Asn Asn Lys Ile Thr Glu Leu Gly Lys Arg Thr Val
1310 1315 1320

Leu Thr Arg Ile Leu Gln Gly Leu His Ala Asn Ala Thr Thr Thr
1325 1330 1335

Asp Met Ser Ile Phe Lys Ile Lys Thr Pro Phe Gly Gln Leu Arg
1340 1345 1350

Gln Arg Ser Gly Ile Ser Leu Ser Glu Asn Ala Gln Leu Ile Tyr
1355 1360 1365

Gln Ser Pro Thr Gly Leu Phe Glu Arg Arg Val Gln Leu Asn Lys
1370 1375 1380

Ile Lys
1385

<210> 32
<211> 1367
<212> PRT
<213> Fusobaterium nucleatum

<400> 32

Met Lys Lys Gln Lys Phe Ser Asp Tyr Tyr Leu Gly Phe Asp Ile Gly
1 5 10 15

Thr Asn Ser Val Gly Trp Cys Val Thr Asp Leu Asp Tyr Asn Val Leu
20 25 30

```
Arg Phe Asn Lys Lys Asp Met Trp Gly Ser Arg Leu Phe Glu Glu Ala
        35                  40                  45

Lys Thr Ala Ala Glu Arg Arg Val Gln Arg Asn Ser Arg Arg Arg Leu
    50                  55                  60

Lys Arg Arg Lys Trp Arg Leu Asn Leu Leu Glu Glu Ile Phe Ser Asn
65                  70                  75                  80

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

Ser Leu Trp Leu Glu Asp Lys Ser Ser Lys Glu Lys Phe Thr Leu Phe
            100                 105                 110

Asn Asp Asp Asn Tyr Lys Asp Tyr Asp Phe Tyr Lys Gln Tyr Pro Thr
        115                 120                 125

Ile Phe His Leu Arg Asn Glu Leu Ile Lys Asn Pro Glu Lys Lys Asp
    130                 135                 140

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

His Phe Leu Phe Glu Gly Gln Asn Leu Lys Glu Ile Lys Asn Phe Glu
                165                 170                 175

Thr Leu Tyr Asn Asn Leu Ile Ala Phe Leu Glu Asp Asn Gly Ile Asn
            180                 185                 190

Lys Ile Ile Asp Lys Asn Asn Ile Glu Lys Leu Glu Lys Ile Val Cys
        195                 200                 205

Asp Ser Lys Lys Gly Leu Lys Asp Lys Glu Lys Glu Phe Lys Glu Ile
    210                 215                 220

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

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

Gly Glu Val Glu Lys Glu Lys Ile Ser Phe Arg Glu Gln Ile Tyr Glu
            260                 265                 270

Asp Asp Lys Pro Ile Tyr Tyr Ser Ile Leu Gly Glu Lys Ile Glu Leu
        275                 280                 285

Leu Asp Ile Ala Lys Thr Phe Tyr Asp Phe Met Val Leu Asn Asn Ile
    290                 295                 300

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

Glu His Lys Lys Asp Leu Lys Asn Leu Lys Tyr Ile Ile Arg Lys Tyr
                325                 330                 335

Asn Lys Gly Asn Tyr Asp Lys Leu Phe Lys Asp Lys Asn Glu Asn Asn
            340                 345                 350

Tyr Ser Ala Tyr Ile Gly Leu Asn Lys Glu Lys Ser Lys Lys Glu Val
        355                 360                 365

Ile Glu Lys Ser Arg Leu Lys Ile Asp Asp Leu Ile Lys Asn Ile Lys
    370                 375                 380

Gly Tyr Leu Pro Lys Val Glu Glu Ile Glu Glu Lys Asp Lys Ala Ile
385                 390                 395                 400

Phe Asn Lys Ile Leu Asn Lys Ile Glu Leu Lys Thr Ile Leu Pro Lys
                405                 410                 415

Gln Arg Ile Ser Asp Asn Gly Thr Leu Pro Tyr Gln Ile His Glu Ala
            420                 425                 430

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

Asn Tyr Glu Glu Asn Gly Ile Ile Thr Lys Asp Lys Leu Leu Met Thr
```

```
    450                 455                 460

Phe Lys Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Asn Ser Tyr His
465                 470                 475                 480

Lys Asp Lys Gly Gly Asn Ser Trp Ile Val Arg Lys Glu Glu Gly Lys
                485                 490                 495

Ile Leu Pro Trp Asn Phe Glu Gln Lys Val Asp Ile Glu Lys Ser Ala
            500                 505                 510

Glu Glu Phe Ile Lys Arg Met Thr Asn Lys Cys Thr Tyr Leu Asn Gly
        515                 520                 525

Glu Asp Val Ile Pro Lys Asp Thr Phe Leu Tyr Ser Glu Tyr Val Ile
    530                 535                 540

Leu Asn Glu Leu Asn Lys Val Gln Val Asn Asp Glu Phe Leu Asn Glu
545                 550                 555                 560

Glu Asn Lys Arg Lys Ile Ile Asp Glu Leu Phe Lys Glu Asn Lys Lys
                565                 570                 575

Val Ser Glu Lys Lys Phe Lys Glu Tyr Leu Leu Val Lys Gln Ile Val
            580                 585                 590

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

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

Leu Asp Ile Tyr Lys Glu Ile Ser Glu Lys Ser Ile Leu Trp Lys Cys
625                 630                 635                 640

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

Tyr Gly Asp Ile Leu Thr Lys Asp Glu Ile Lys Lys Ile Asn Thr Phe
            660                 665                 670
```

```
Lys Phe Asn Asn Trp Gly Arg Leu Ser Glu Lys Leu Leu Thr Gly Ile
        675                 680                 685

Glu Phe Ile Asn Leu Glu Thr Gly Glu Cys Tyr Ser Ser Val Met Asp
    690                 695                 700

Ala Leu Arg Arg Thr Asn Tyr Asn Leu Met Glu Leu Leu Ser Ser Lys
705                 710                 715                 720

Phe Thr Leu Gln Glu Ser Ile Asn Asn Glu Asn Lys Glu Met Asn Glu
                725                 730                 735

Ala Ser Tyr Arg Asp Leu Ile Glu Glu Ser Tyr Val Ser Pro Ser Leu
            740                 745                 750

Lys Arg Ala Ile Phe Gln Thr Leu Lys Ile Tyr Glu Glu Ile Arg Lys
        755                 760                 765

Ile Thr Gly Arg Val Pro Lys Lys Val Phe Ile Glu Met Ala Arg Gly
    770                 775                 780

Gly Asp Glu Ser Met Lys Asn Lys Lys Ile Pro Ala Arg Gln Glu Gln
785                 790                 795                 800

Leu Lys Lys Leu Tyr Asp Ser Cys Gly Asn Asp Ile Ala Asn Phe Ser
                805                 810                 815

Ile Asp Ile Lys Glu Met Lys Asn Ser Leu Ile Ser Tyr Asp Asn Asn
            820                 825                 830

Ser Leu Arg Gln Lys Lys Leu Tyr Leu Tyr Tyr Leu Gln Phe Gly Lys
        835                 840                 845

Cys Met Tyr Thr Gly Arg Glu Ile Asp Leu Asp Arg Leu Leu Gln Asn
    850                 855                 860

Asn Asp Thr Tyr Asp Ile Asp His Ile Tyr Pro Arg Ser Lys Val Ile
865                 870                 875                 880
```

```
Lys Asp Asp Ser Phe Asp Asn Leu Val Leu Val Leu Lys Asn Glu Asn
                885                 890                 895

Ala Glu Lys Ser Asn Glu Tyr Pro Val Lys Lys Glu Ile Gln Glu Lys
            900                 905                 910

Met Lys Ser Phe Trp Arg Phe Leu Lys Glu Lys Asn Phe Ile Ser Asp
        915                 920                 925

Glu Lys Tyr Lys Arg Leu Thr Gly Lys Asp Asp Phe Glu Leu Arg Gly
    930                 935                 940

Phe Met Ala Arg Gln Leu Val Asn Val Arg Gln Thr Thr Lys Glu Val
945                 950                 955                 960

Gly Lys Ile Leu Gln Gln Ile Glu Pro Glu Ile Lys Ile Val Tyr Ser
                965                 970                 975

Lys Ala Glu Ile Ala Ser Ser Phe Arg Glu Met Phe Asp Phe Ile Lys
            980                 985                 990

Val Arg Glu Leu Asn Asp Thr His  His Ala Lys Asp Ala  Tyr Leu Asn
        995                 1000                1005

Ile Val  Ala Gly Asn Val Tyr  Asn Thr Lys Phe Thr  Glu Lys Pro
    1010                1015                1020

Tyr Arg  Tyr Leu Gln Glu Ile  Lys Glu Asn Tyr Asp  Val Lys Lys
    1025                1030                1035

Ile Tyr  Asn Tyr Asp Ile Lys  Asn Ala Trp Asp Lys  Glu Asn Ser
    1040                1045                1050

Leu Glu  Ile Val Lys Lys Asn  Met Glu Lys Asn Thr  Val Asn Ile
    1055                1060                1065

Thr Arg  Phe Ile Lys Glu Lys  Lys Gly Gln Leu Phe  Asp Leu Asn
    1070                1075                1080
```

```
Pro Ile  Lys Lys Gly Glu Thr  Ser Asn Glu Ile Ile  Ser Ile Lys
    1085                1090                1095

Pro Lys  Val Tyr Asn Gly Lys  Asp Asp Lys Leu Asn  Glu Lys Tyr
    1100                1105                1110

Gly Tyr  Tyr Lys Ser Leu Asn  Pro Ala Tyr Phe Leu  Tyr Val Glu
    1115                1120                1125

His Lys  Glu Lys Asn Lys Arg  Ile Lys Ser Phe Glu  Arg Val Asn
    1130                1135                1140

Leu Val  Asp Val Asn Asn Ile  Lys Asp Glu Lys Ser  Leu Val Lys
    1145                1150                1155

Tyr Leu  Ile Glu Asn Lys Lys  Leu Val Glu Pro Arg  Val Ile Lys
    1160                1165                1170

Lys Val  Tyr Lys Arg Gln Val  Ile Leu Ile Asn Asp  Tyr Pro Tyr
    1175                1180                1185

Ser Ile  Val Thr Leu Asp Ser  Asn Lys Leu Met Asp  Phe Glu Asn
    1190                1195                1200

Leu Lys  Pro Leu Phe Leu Glu  Asn Lys Tyr Glu Lys  Ile Leu Lys
    1205                1210                1215

Asn Val  Ile Lys Phe Leu Glu  Asp Asn Gln Gly Lys  Ser Glu Glu
    1220                1225                1230

Asn Tyr  Lys Phe Ile Tyr Leu  Lys Lys Lys Asp Arg  Tyr Glu Lys
    1235                1240                1245

Asn Glu  Thr Leu Glu Ser Val  Lys Asp Arg Tyr Asn  Leu Glu Phe
    1250                1255                1260

Asn Glu  Met Tyr Asp Lys Phe  Leu Glu Lys Leu Asp  Ser Lys Asp
    1265                1270                1275

Tyr Lys  Asn Tyr Met Asn Asn  Lys Lys Tyr Gln Glu  Leu Leu Asp
```

1280 1285 1290

Val Lys Glu Lys Phe Ile Lys Leu Asn Leu Phe Asp Lys Ala Phe
1295 1300 1305

Thr Leu Lys Ser Phe Leu Asp Leu Phe Asn Arg Lys Thr Met Ala
1310 1315 1320

Asp Phe Ser Lys Val Gly Leu Thr Lys Tyr Leu Gly Lys Ile Gln
1325 1330 1335

Lys Ile Ser Ser Asn Val Leu Ser Lys Asn Glu Leu Tyr Leu Leu
1340 1345 1350

Glu Glu Ser Val Thr Gly Leu Phe Val Lys Lys Ile Lys Leu
1355 1360 1365

<210> 33
<211> 1286
<212> PRT
<213> Enterococcus cecorum

<400> 33

Arg Arg Lys Gln Arg Ile Gln Ile Leu Gln Glu Leu Leu Gly Glu Glu
1 5 10 15

Val Leu Lys Thr Asp Pro Gly Phe Phe His Arg Met Lys Glu Ser Arg
20 25 30

Tyr Val Val Glu Asp Lys Arg Thr Leu Asp Gly Lys Gln Val Glu Leu
35 40 45

Pro Tyr Ala Leu Phe Val Asp Lys Asp Tyr Thr Asp Lys Glu Tyr Tyr
50 55 60

Lys Gln Phe Pro Thr Ile Asn His Leu Ile Val Tyr Leu Met Thr Thr
65 70 75 80

Ser Asp Thr Pro Asp Ile Arg Leu Val Tyr Leu Ala Leu His Tyr Tyr
85 90 95

```
Met Lys Asn Arg Gly Asn Phe Leu His Ser Gly Asp Ile Asn Asn Val
            100                 105                 110

Lys Asp Ile Asn Asp Ile Leu Glu Gln Leu Asp Asn Val Leu Glu Thr
        115                 120                 125

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

Lys Asn Ile Tyr Asn Arg Asp Leu Gly Arg Gly Glu Arg Lys Lys Ala
145                 150                 155                 160

Phe Val Asn Thr Leu Gly Ala Lys Thr Lys Ala Glu Lys Ala Phe Cys
                165                 170                 175

Ser Leu Ile Ser Gly Gly Ser Thr Asn Leu Ala Glu Leu Phe Asp Asp
            180                 185                 190

Ser Ser Leu Lys Glu Ile Glu Thr Pro Lys Ile Glu Phe Ala Ser Ser
        195                 200                 205

Ser Leu Glu Asp Lys Ile Asp Gly Ile Gln Glu Ala Leu Glu Asp Arg
    210                 215                 220

Phe Ala Val Ile Glu Ala Ala Lys Arg Leu Tyr Asp Trp Lys Thr Leu
225                 230                 235                 240

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

Ser Tyr Gln Met His His Glu Gln Leu Leu Glu Leu Lys Ser Leu Val
            260                 265                 270

Lys Glu Tyr Leu Asp Arg Lys Val Phe Gln Glu Val Phe Val Ser Leu
        275                 280                 285

Asn Val Ala Asn Asn Tyr Pro Ala Tyr Ile Gly His Thr Lys Ile Asn
    290                 295                 300
```

```
Gly Lys Lys Lys Glu Leu Glu Val Lys Arg Thr Lys Arg Asn Asp Phe
305                 310                 315                 320

Tyr Ser Tyr Val Lys Lys Gln Val Ile Glu Pro Ile Lys Lys Lys Val
                325                 330                 335

Ser Asp Glu Ala Val Leu Thr Lys Leu Ser Glu Ile Glu Ser Leu Ile
            340                 345                 350

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

Ile Pro Tyr Gln Val Lys Leu Asn Glu Leu Thr Arg Ile Phe Asp Asn
    370                 375                 380

Leu Glu Asn Arg Ile Pro Val Leu Arg Glu Asn Arg Asp Lys Ile Ile
385                 390                 395                 400

Lys Thr Phe Lys Phe Arg Ile Pro Tyr Tyr Val Gly Ser Leu Asn Gly
                405                 410                 415

Val Val Lys Asn Gly Lys Cys Thr Asn Trp Met Val Arg Lys Glu Glu
            420                 425                 430

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

Ser Ala Glu Gln Phe Ile Arg Arg Met Thr Asn Lys Cys Thr Tyr Leu
    450                 455                 460

Val Asn Glu Asp Val Leu Pro Lys Tyr Ser Leu Leu Tyr Ser Lys Tyr
465                 470                 475                 480

Leu Val Leu Ser Glu Leu Asn Asn Leu Arg Ile Asp Gly Arg Pro Leu
                485                 490                 495

Asp Val Lys Ile Lys Gln Asp Ile Tyr Glu Asn Val Phe Lys Lys Asn
            500                 505                 510

Arg Lys Val Thr Leu Lys Lys Ile Lys Lys Tyr Leu Leu Lys Glu Gly
```

```
        515                 520                 525

Ile Ile Thr Asp Asp Asp Glu Leu Ser Gly Leu Ala Asp Asp Val Lys
    530                 535                 540

Ser Ser Leu Thr Ala Tyr Arg Asp Phe Lys Glu Lys Leu Gly His Leu
545                 550                 555                 560

Asp Leu Ser Glu Ala Gln Met Glu Asn Ile Ile Leu Asn Ile Thr Leu
                565                 570                 575

Phe Gly Asp Asp Lys Lys Leu Leu Lys Lys Arg Leu Ala Ala Leu Tyr
            580                 585                 590

Pro Phe Ile Asp Asp Lys Ser Leu Asn Arg Ile Ala Thr Leu Asn Tyr
        595                 600                 605

Arg Asp Trp Gly Arg Leu Ser Glu Arg Phe Leu Ser Gly Ile Thr Ser
    610                 615                 620

Val Asp Gln Glu Thr Gly Glu Leu Arg Thr Ile Ile Gln Cys Met Tyr
625                 630                 635                 640

Glu Thr Gln Ala Asn Leu Met Gln Leu Leu Ala Glu Pro Tyr His Phe
                645                 650                 655

Val Glu Ala Ile Glu Lys Glu Asn Pro Lys Val Asp Leu Glu Ser Ile
            660                 665                 670

Ser Tyr Arg Ile Val Asn Asp Leu Tyr Val Ser Pro Ala Val Lys Arg
        675                 680                 685

Gln Ile Trp Gln Thr Leu Leu Val Ile Lys Asp Ile Lys Gln Val Met
    690                 695                 700

Lys His Asp Pro Glu Arg Ile Phe Ile Glu Met Ala Arg Glu Lys Gln
705                 710                 715                 720

Glu Ser Lys Lys Thr Lys Ser Arg Lys Gln Val Leu Ser Glu Val Tyr
                725                 730                 735
```

```
Lys Lys Ala Lys Glu Tyr Glu His Leu Phe Glu Lys Leu Asn Ser Leu
            740                 745                 750

Thr Glu Glu Gln Leu Arg Ser Lys Lys Ile Tyr Leu Tyr Phe Thr Gln
        755                 760                 765

Leu Gly Lys Cys Met Tyr Ser Gly Glu Pro Ile Asp Phe Glu Asn Leu
    770                 775                 780

Val Ser Ala Asn Ser Asn Tyr Asp Ile Asp His Ile Tyr Pro Gln Ser
785                 790                 795                 800

Lys Thr Ile Asp Asp Ser Phe Asn Asn Ile Val Leu Val Lys Lys Ser
                805                 810                 815

Leu Asn Ala Tyr Lys Ser Asn His Tyr Pro Ile Asp Lys Asn Ile Arg
            820                 825                 830

Asp Asn Glu Lys Val Lys Thr Leu Trp Asn Thr Leu Val Ser Lys Gly
        835                 840                 845

Leu Ile Thr Lys Glu Lys Tyr Glu Arg Leu Ile Arg Ser Thr Pro Phe
    850                 855                 860

Ser Asp Glu Glu Leu Ala Gly Phe Ile Ala Arg Gln Leu Val Glu Thr
865                 870                 875                 880

Arg Gln Ser Thr Lys Ala Val Ala Glu Ile Leu Ser Asn Trp Phe Pro
                885                 890                 895

Glu Ser Glu Ile Val Tyr Ser Lys Ala Lys Asn Val Ser Asn Phe Arg
            900                 905                 910

Gln Asp Phe Glu Ile Leu Lys Val Arg Glu Leu Asn Asp Cys His His
        915                 920                 925

Ala His Asp Ala Tyr Leu Asn Ile Val Val Gly Asn Ala Tyr His Thr
    930                 935                 940
```

```
Lys Phe Thr Asn Ser Pro Tyr Arg Phe Ile Lys Asn Lys Ala Asn Gln
945                 950                 955                 960


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


Asn Gly Val Val Ala Trp Val Gly Gln Ser Glu Asn Asn Pro Gly Thr
            980                 985                 990


Ile Ala Thr Val Lys Lys Val Ile  Arg Arg Asn Thr Val  Leu Ile Ser
        995                 1000                1005


Arg Met  Val Lys Glu Val Asp  Gly Gln Leu Phe Asp  Leu Thr Leu
    1010                1015                1020


Met Lys  Lys Gly Lys Gly Gln  Val Pro Ile Lys Ser  Ser Asp Glu
    1025                1030                1035


Arg Leu  Thr Asp Ile Ser Lys  Tyr Gly Gly Tyr Asn  Lys Ala Thr
    1040                1045                1050


Gly Ala  Tyr Phe Thr Phe Val  Lys Ser Lys Lys Arg  Gly Lys Val
    1055                1060                1065


Val Arg  Ser Phe Glu Tyr Val  Pro Leu His Leu Ser  Lys Gln Phe
    1070                1075                1080


Glu Asn  Asn Asn Glu Leu Leu  Lys Glu Tyr Ile Glu  Lys Asp Arg
    1085                1090                1095


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


Ser Leu  Phe Arg Tyr Asn Gly  Ser Leu Val Arg Ile  Thr Gly Arg
    1115                1120                1125


Gly Asp  Thr Arg Leu Leu Leu  Val His Glu Gln Pro  Leu Tyr Val
    1130                1135                1140
```

Ser Asn Ser Phe Val Gln Gln Leu Lys Ser Val Ser Ser Tyr Lys
    1145   1150   1155

Leu Lys Lys Ser Glu Asn Asp Asn Ala Lys Leu Thr Lys Thr Ala
    1160   1165   1170

Thr Glu Lys Leu Ser Asn Ile Asp Glu Leu Tyr Asp Gly Leu Leu
    1175   1180   1185

Arg Lys Leu Asp Leu Pro Ile Tyr Ser Tyr Trp Phe Ser Ser Ile
    1190   1195   1200

Lys Glu Tyr Leu Val Glu Ser Arg Thr Lys Tyr Ile Lys Leu Ser
    1205   1210   1215

Ile Glu Glu Lys Ala Leu Val Ile Phe Glu Ile Leu His Leu Phe
    1220   1225   1230

Gln Ser Asp Ala Gln Val Pro Asn Leu Lys Ile Leu Gly Leu Ser
    1235   1240   1245

Thr Lys Pro Ser Arg Ile Arg Ile Gln Lys Asn Leu Lys Asp Thr
    1250   1255   1260

Asp Lys Met Ser Ile Ile His Gln Ser Pro Ser Gly Ile Phe Glu
    1265   1270   1275

His Glu Ile Glu Leu Thr Ser Leu
    1280   1285

<210> 34
<211> 1312
<212> PRT
<213> Anaerostipes hadrus

<400> 34

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

Trp Ala Val Thr Asn Pro Lys Tyr Glu Leu Glu Arg Ala Ser Arg Lys
            20   25   30

```
Asp Leu Trp Gly Val Arg Leu Phe Asp Lys Ala Glu Thr Ala Glu Asp
        35                  40                  45

Arg Arg Met Phe Arg Thr Asn Arg Arg Leu Asn Gln Arg Lys Lys Asn
    50                  55                  60

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

Asp Pro Asn Phe Phe Gln Gln Leu Asp Glu Ser Asn Phe Cys Glu Asp
                85                  90                  95

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

Phe Pro Thr Val Tyr His Leu Arg Lys Tyr Leu Met Glu Thr Lys Asp
        115                 120                 125

Lys Pro Asp Ile Arg Leu Val Tyr Leu Ala Phe Ser Lys Phe Met Lys
    130                 135                 140

Asn Arg Gly His Phe Leu Tyr Lys Gly Asn Leu Gly Glu Val Met Asp
145                 150                 155                 160

Phe Glu Asn Ser Met Lys Gly Phe Cys Glu Ser Leu Glu Lys Phe Asn
                165                 170                 175

Ile Asp Phe Pro Thr Leu Ser Asp Glu Gln Val Lys Glu Val Arg Asp
            180                 185                 190

Ile Leu Cys Asp His Lys Ile Ala Lys Thr Val Lys Lys Lys Asn Ile
        195                 200                 205

Ile Thr Ile Thr Lys Val Lys Ser Lys Thr Ala Lys Ala Trp Ile Gly
    210                 215                 220

Leu Phe Cys Gly Cys Ser Val Pro Val Lys Val Leu Phe Gln Asp Ile
225                 230                 235                 240
```

```
Asp Glu Glu Ile Val Thr Asp Pro Glu Lys Ile Ser Phe Glu Asp Ala
                245                 250                 255

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

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

Asn Glu Ile Leu Gly Asp His Gln Leu Leu Ser Asp Ala Met Ile Ala
    290                 295                 300

Glu Tyr Asn Lys His His Asp Asp Leu Lys Arg Leu Gln Lys Ile Ile
305                 310                 315                 320

Lys Gly Thr Gly Ser Arg Glu Leu Tyr Gln Asp Ile Phe Ile Asn Asp
                325                 330                 335

Val Ser Gly Asn Tyr Val Cys Tyr Val Gly His Ala Lys Thr Met Ser
            340                 345                 350

Ser Ala Asp Gln Lys Gln Phe Tyr Thr Phe Leu Lys Asn Arg Leu Lys
        355                 360                 365

Asn Val Asn Gly Ile Ser Ser Glu Asp Ala Glu Trp Ile Asp Thr Glu
    370                 375                 380

Ile Lys Asn Gly Thr Leu Leu Pro Lys Gln Thr Lys Arg Asp Asn Ser
385                 390                 395                 400

Val Ile Pro His Gln Leu Gln Leu Arg Glu Phe Glu Leu Ile Leu Asp
                405                 410                 415

Asn Met Gln Glu Met Tyr Pro Phe Leu Lys Glu Asn Arg Glu Lys Leu
            420                 425                 430

Leu Lys Ile Phe Asn Phe Val Ile Pro Tyr Tyr Val Gly Pro Leu Lys
        435                 440                 445
```

```
Gly Val Val Arg Lys Gly Glu Ser Thr Asn Trp Met Val Pro Lys Lys
    450                 455                 460

Asp Gly Val Ile His Pro Trp Asn Phe Asp Glu Met Val Asp Lys Glu
465                 470                 475                 480

Ala Ser Ala Glu Cys Phe Ile Ser Arg Met Thr Gly Asn Cys Ser Tyr
                485                 490                 495

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

Phe Glu Val Leu Asn Glu Leu Asn Pro Leu Lys Ile Asn Gly Glu Pro
        515                 520                 525

Ile Ser Val Glu Leu Lys Gln Arg Ile Tyr Glu Gln Leu Phe Leu Thr
    530                 535                 540

Gly Lys Lys Val Thr Lys Lys Ser Leu Thr Lys Tyr Leu Ile Lys Asn
545                 550                 555                 560

Gly Tyr Asp Lys Asp Ile Glu Leu Ser Gly Ile Asp Asn Glu Phe His
                565                 570                 575

Ser Asn Leu Lys Ser His Ile Asp Phe Glu Asp Tyr Asp Asn Leu Ser
            580                 585                 590

Asp Glu Glu Val Glu Gln Ile Ile Leu Arg Ile Thr Val Phe Glu Asp
        595                 600                 605

Lys Gln Leu Leu Lys Asp Tyr Leu Asn Arg Glu Phe Val Lys Leu Ser
    610                 615                 620

Glu Asp Glu Arg Lys Gln Ile Cys Ser Leu Ser Tyr Lys Gly Trp Gly
625                 630                 635                 640

Asn Leu Ser Glu Met Leu Leu Asn Gly Ile Thr Val Thr Asp Ser Asn
                645                 650                 655

Gly Val Glu Val Ser Val Met Asp Met Leu Trp Asn Thr Asn Leu Asn
```

660 665 670

Leu Met Gln Ile Leu Ser Lys Lys Tyr Gly Tyr Lys Ala Glu Ile Glu
675 680 685

His Tyr Asn Lys Glu His Glu Lys Thr Ile Tyr Asn Arg Glu Asp Leu
690 695 700

Met Asp Tyr Leu Asn Ile Pro Pro Ala Gln Arg Arg Lys Val Asn Gln
705 710 715 720

Leu Ile Thr Ile Val Lys Ser Leu Lys Lys Thr Tyr Gly Val Pro Asn
725 730 735

Lys Ile Phe Phe Lys Ile Ser Arg Glu His Gln Asp Asp Pro Lys Arg
740 745 750

Thr Ser Ser Arg Lys Glu Gln Leu Lys Tyr Leu Tyr Lys Ser Leu Lys
755 760 765

Ser Glu Asp Glu Lys His Leu Met Lys Glu Leu Asp Glu Leu Asn Asp
770 775 780

His Glu Leu Ser Asn Asp Lys Val Tyr Leu Tyr Phe Leu Gln Lys Gly
785 790 795 800

Arg Cys Ile Tyr Ser Gly Lys Lys Leu Asn Leu Ser Arg Leu Arg Lys
805 810 815

Ser Asn Tyr Gln Asn Asp Ile Asp Tyr Ile Tyr Pro Leu Ser Ala Val
820 825 830

Asn Asp Arg Ser Met Asn Asn Lys Val Leu Thr Gly Ile Gln Glu Asn
835 840 845

Arg Ala Asp Lys Tyr Thr Tyr Phe Pro Val Asp Ser Glu Ile Gln Lys
850 855 860

Lys Met Lys Gly Phe Trp Met Glu Leu Val Leu Gln Gly Phe Met Thr
865 870 875 880

```
Lys Glu Lys Tyr Phe Arg Leu Ser Arg Glu Asn Asp Phe Ser Lys Ser
               885                 890                 895

Glu Leu Val Ser Phe Ile Glu Arg Glu Ile Ser Asp Asn Gln Gln Ser
            900                 905                 910

Gly Arg Met Ile Ala Ser Val Leu Gln Tyr Tyr Phe Pro Glu Ser Lys
        915                 920                 925

Ile Val Phe Val Lys Glu Lys Leu Ile Ser Ser Phe Lys Arg Asp Phe
    930                 935                 940

His Leu Ile Ser Ser Tyr Gly His Asn His Leu Gln Ala Ala Lys Asp
945                 950                 955                 960

Ala Tyr Ile Thr Ile Val Val Gly Asn Val Tyr His Thr Lys Phe Thr
               965                 970                 975

Met Asp Pro Ala Ile Tyr Phe Lys Asn His Lys Arg Lys Asp Tyr Asp
            980                 985                 990

Leu Asn Arg Leu Phe Leu Glu Asn  Ile Ser Arg Asp Gly  Gln Ile Ala
        995                 1000                1005

Trp Glu  Ser Gly Pro Tyr Gly  Ser Ile Gln Thr Val  Arg Lys Glu
    1010                1015                1020

Tyr Ala  Gln Asn His Ile Ala  Val Thr Lys Arg Val  Val Glu Val
    1025                1030                1035

Lys Gly  Gly Leu Phe Lys Gln  Met Pro Leu Lys Lys  Gly His Gly
    1040                1045                1050

Glu Tyr  Pro Leu Lys Thr Asn  Asp Pro Arg Phe Gly  Asn Ile Ala
    1055                1060                1065

Gln Tyr  Gly Gly Tyr Thr Asn  Val Thr Gly Ser Tyr  Phe Val Leu
    1070                1075                1080
```

```
Val Glu  Ser Met Glu Lys Gly  Lys Lys Arg Ile Ser  Leu Glu Tyr
    1085                1090                1095

Val Pro  Val Tyr Leu His Glu  Arg Leu Glu Asp Asp  Pro Gly His
    1100                1105                1110

Lys Leu  Leu Lys Glu Tyr Leu  Val Asp His Arg Lys  Leu Asn His
    1115                1120                1125

Pro Lys  Ile Leu Leu Ala Lys  Val Arg Lys Asn Ser  Leu Leu Lys
    1130                1135                1140

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

Leu Ile  Leu Thr Asn Ala Val  Glu Leu Ile Met Asp  Asp Trp Gln
    1160                1165                1170

Thr Lys  Thr Ala Asn Lys Ile  Ser Gly Tyr Met Lys  Arg Arg Ala
    1175                1180                1185

Ile Asp  Lys Lys Ala Arg Val  Tyr Gln Asn Glu Phe  His Ile Gln
    1190                1195                1200

Glu Leu  Glu Gln Leu Tyr Asp  Phe Tyr Leu Asp Lys  Leu Lys Asn
    1205                1210                1215

Gly Val  Tyr Lys Asn Arg Lys  Asn Asn Gln Ala Glu  Leu Ile His
    1220                1225                1230

Asn Glu  Lys Glu Gln Phe Met  Glu Leu Lys Thr Glu  Asp Gln Cys
    1235                1240                1245

Val Leu  Leu Thr Glu Ile Lys  Lys Leu Phe Val Cys  Ser Pro Met
    1250                1255                1260

Gln Ala  Asp Leu Thr Leu Ile  Gly Gly Ser Lys His  Thr Gly Met
    1265                1270                1275
```

```
Ile Ala  Met Ser Ser Asn Val  Thr Lys Ala Asp Phe  Ala Val Ile
    1280                1285                1290


Ala Glu  Asp Pro Leu Gly Leu  Arg Asn Lys Val Ile  Tyr Ser His
    1295                1300                1305


Lys Gly  Glu Lys
    1310
```

<210> 35
<211> 1344
<212> PRT
<213> Kandleria vitulina

<400> 35

```
Met Ser Gln Asn Asn Asn Lys Ile Tyr Asn Ile Gly Leu Asp Ile Gly
1               5                   10                  15


Asp Ala Ser Val Gly Trp Ala Val Val Asp Glu His Tyr Asn Leu Leu
            20                  25                  30


Lys Arg His Gly Lys His Met Trp Gly Ser Arg Leu Phe Thr Gln Ala
        35                  40                  45


Asn Thr Ala Val Glu Arg Arg Ser Ser Arg Ser Thr Arg Arg Arg Tyr
    50                  55                  60


Asn Lys Arg Arg Glu Arg Ile Arg Leu Leu Arg Glu Ile Met Glu Asp
65                  70                  75                  80


Met Val Leu Asp Val Asp Pro Thr Phe Phe Ile Arg Leu Ala Asn Val
                85                  90                  95


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


His Ser Asn Tyr Asn Leu Phe Ile Asp Lys Asp Phe Asn Asp Lys Thr
        115                 120                 125


Tyr Tyr Asp Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys His Leu Cys
    130                 135                 140
```

```
Glu Ser Lys Glu Lys Glu Asp Pro Arg Leu Ile Tyr Leu Ala Leu His
145                 150                 155                 160

His Ile Val Lys Tyr Arg Gly Asn Phe Leu Tyr Glu Gly Gln Lys Phe
                165                 170                 175

Ser Met Asp Val Ser Asn Ile Glu Asp Lys Met Ile Asp Val Leu Arg
            180                 185                 190

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

Ile Asp Glu Val Leu Asn Val Leu Lys Glu Pro Leu Ser Lys Lys His
    210                 215                 220

Lys Ala Glu Lys Ala Phe Ala Leu Phe Asp Thr Thr Lys Asp Asn Lys
225                 230                 235                 240

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

Val Thr Lys Met Leu Lys Glu Ala Glu Leu His Asp Glu Asp Glu Lys
            260                 265                 270

Asp Ile Ser Phe Lys Phe Ser Asp Ala Thr Phe Asp Asp Ala Phe Val
        275                 280                 285

Glu Lys Gln Pro Leu Leu Gly Asp Cys Val Glu Phe Ile Asp Leu Leu
    290                 295                 300

His Asp Ile Tyr Ser Trp Val Glu Leu Gln Asn Ile Leu Gly Ser Ala
305                 310                 315                 320

His Thr Ser Glu Pro Ser Ile Ser Ala Ala Met Ile Gln Arg Tyr Glu
                325                 330                 335

Asp His Lys Asn Asp Leu Lys Leu Leu Lys Asp Val Ile Arg Lys Tyr
            340                 345                 350
```

```
Leu Pro Lys Lys Tyr Phe Glu Val Phe Arg Asp Glu Lys Ser Lys Lys
        355                 360                 365

Asn Asn Tyr Cys Asn Tyr Ile Asn His Pro Ser Lys Thr Pro Val Asp
    370                 375                 380

Glu Phe Tyr Lys Tyr Ile Lys Lys Leu Ile Glu Lys Ile Asp Asp Pro
385                 390                 395                 400

Asp Val Lys Thr Ile Leu Asn Lys Ile Glu Leu Glu Ser Phe Met Leu
                405                 410                 415

Lys Gln Asn Ser Arg Thr Asn Gly Ala Val Pro Tyr Gln Met Gln Leu
            420                 425                 430

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

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

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

Trp Ile Ile Lys Lys Glu Gly Lys Glu Asn Glu Arg Ile Leu Pro Trp
                485                 490                 495

Asn Ala Asn Glu Ile Val Asp Val Asp Lys Thr Ala Asp Glu Phe Ile
            500                 505                 510

Lys Arg Met Arg Asn Phe Cys Thr Tyr Phe Pro Asp Glu Pro Val Met
        515                 520                 525

Ala Lys Asn Ser Leu Thr Val Ser Lys Tyr Glu Val Leu Asn Glu Ile
    530                 535                 540

Asn Lys Leu Arg Ile Asn Asp His Leu Ile Lys Arg Asp Met Lys Asp
545                 550                 555                 560
```

```
Lys Met Leu His Thr Leu Phe Met Asp His Lys Ser Ile Ser Ala Asn
                565                 570                 575

Ala Met Lys Lys Trp Leu Val Lys Asn Gln Tyr Phe Ser Asn Thr Asp
            580                 585                 590

Asp Ile Lys Ile Glu Gly Phe Gln Lys Glu Asn Ala Cys Ser Thr Ser
        595                 600                 605

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

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

Glu Asp Lys Lys Ile Leu Arg Arg Arg Leu Lys Lys Glu Tyr Asp Leu
                645                 650                 655

Asp Glu Glu Lys Ile Lys Lys Ile Leu Lys Leu Lys Tyr Ser Gly Trp
            660                 665                 670

Ser Arg Leu Ser Lys Lys Leu Leu Ser Gly Ile Lys Thr Lys Tyr Lys
        675                 680                 685

Asp Ser Thr Arg Thr Pro Glu Thr Val Leu Glu Val Met Glu Arg Thr
    690                 695                 700

Asn Met Asn Leu Met Gln Val Ile Asn Asp Glu Lys Leu Gly Phe Lys
705                 710                 715                 720

Lys Thr Ile Asp Asp Ala Asn Ser Thr Ser Val Ser Gly Lys Phe Ser
                725                 730                 735

Tyr Ala Glu Val Gln Glu Leu Ala Gly Ser Pro Ala Ile Lys Arg Gly
            740                 745                 750

Ile Trp Gln Ala Leu Leu Ile Val Asp Glu Ile Lys Lys Ile Met Lys
        755                 760                 765

His Glu Pro Ala His Val Tyr Ile Glu Phe Ala Arg Asn Glu Asp Glu
```

```
    770                 775                 780

Lys Glu Arg Lys Asp Ser Phe Val Asn Gln Met Leu Lys Leu Tyr Lys
785                 790                 795                 800

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

Lys Gly Glu Asp Ala Lys Ser Lys Ile Arg Ser Glu Arg Leu Lys Leu
            820                 825                 830

Tyr Tyr Thr Gln Met Gly Lys Cys Met Tyr Thr Gly Lys Ser Leu Asp
        835                 840                 845

Ile Asp Arg Leu Asp Thr Tyr Gln Val Asp His Ile Val Pro Gln Ser
    850                 855                 860

Leu Leu Lys Asp Asp Ser Ile Asp Asn Lys Val Leu Val Leu Ser Ser
865                 870                 875                 880

Glu Asn Gln Arg Lys Leu Asp Asp Leu Val Ile Pro Ser Ser Ile Arg
                885                 890                 895

Asn Lys Met Tyr Gly Phe Trp Glu Lys Leu Phe Asn Asn Lys Ile Ile
            900                 905                 910

Ser Pro Lys Lys Phe Tyr Ser Leu Ile Lys Thr Glu Phe Asn Glu Lys
        915                 920                 925

Asp Gln Glu Arg Phe Ile Asn Arg Gln Ile Val Glu Thr Arg Gln Ile
    930                 935                 940

Thr Lys His Val Ala Gln Ile Ile Asp Asn His Tyr Glu Asn Thr Lys
945                 950                 955                 960

Val Val Thr Val Arg Ala Asp Leu Ser His Gln Phe Arg Glu Arg Tyr
                965                 970                 975

His Ile Tyr Lys Asn Arg Asp Ile Asn Asp Phe His His Ala His Asp
            980                 985                 990
```

```
Ala Tyr Ile Ala Thr Ile Leu Gly  Thr Tyr Ile Gly His  Arg Phe Glu
        995                 1000                1005


Ser Leu  Asp Ala Lys Tyr Ile  Tyr Gly Glu Tyr Lys  Arg Ile Phe
    1010                1015                1020


Arg Asn  Gln Lys Asn Lys Gly  Lys Glu Met Lys Lys  Asn Asn Asp
    1025                1030                1035


Gly Phe  Ile Leu Asn Ser Met  Arg Asn Ile Tyr Ala  Asp Lys Asp
    1040                1045                1050


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


Lys Cys  Phe Tyr Tyr Lys Asp  Cys Phe Val Thr Lys  Lys Leu Glu
    1070                1075                1080


Glu Asn  Asn Gly Thr Phe Phe  Asn Val Thr Val Leu  Pro Asn Asp
    1085                1090                1095


Thr Asn  Ser Asp Lys Asp Asn  Thr Leu Ala Thr Val  Pro Val Asn
    1100                1105                1110


Lys Tyr  Arg Ser Asn Val Asn  Lys Tyr Gly Gly Phe  Ser Gly Val
    1115                1120                1125


Asn Ser  Phe Ile Val Ala Ile  Lys Gly Lys Lys Lys  Lys Gly Lys
    1130                1135                1140


Lys Val  Ile Glu Val Asn Lys  Leu Thr Gly Ile Pro  Leu Met Tyr
    1145                1150                1155


Lys Asn  Ala Asp Glu Glu Ile  Lys Ile Asn Tyr Leu  Lys Gln Ala
    1160                1165                1170


Glu Asp  Leu Glu Glu Val Gln  Ile Gly Lys Glu Ile  Leu Lys Asn
    1175                1180                1185
```

Gln Leu Ile Glu Lys Asp Gly Gly Leu Tyr Tyr Ile Val Ala Pro
    1190   1195   1200

Thr Glu Ile Ile Asn Ala Lys Gln Leu Ile Leu Asn Glu Ser Gln
    1205   1210   1215

Thr Lys Leu Val Cys Glu Ile Tyr Lys Ala Met Lys Tyr Lys Asn
    1220   1225   1230

Tyr Asp Asn Leu Asp Ser Glu Lys Ile Ile Asp Leu Tyr Arg Leu
    1235   1240   1245

Leu Ile Asn Lys Met Glu Leu Tyr Tyr Pro Glu Tyr Arg Lys Gln
    1250   1255   1260

Leu Val Lys Lys Phe Glu Asp Arg Tyr Glu Gln Leu Lys Val Ile
    1265   1270   1275

Ser Ile Glu Glu Lys Cys Asn Ile Ile Lys Gln Ile Leu Ala Thr
    1280   1285   1290

Leu His Cys Asn Ser Ser Ile Gly Lys Ile Met Tyr Ser Asp Phe
    1295   1300   1305

Lys Ile Ser Thr Thr Ile Gly Arg Leu Asn Gly Arg Thr Ile Ser
    1310   1315   1320

Leu Asp Asp Ile Ser Phe Ile Ala Glu Ser Pro Thr Gly Met Tyr
    1325   1330   1335

Ser Lys Lys Tyr Lys Leu
    1340

<210> 36
<211> 1288
<212> PRT
<213> Enterococcus faecalis

<400> 36

Met Arg Leu Phe Glu Glu Gly His Thr Ala Glu Asp Arg Arg Leu Lys

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1               5                   10                  15

Arg Thr Ala Arg Arg Arg Ile Ser Arg Arg Arg Asn Arg Leu Arg Tyr
            20                  25                  30

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

Phe Ala Arg Leu Gln Glu Ser Phe Leu Val Pro Glu Asp Lys Lys Trp
    50                  55                  60

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

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

Ser Glu Gln Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Ile
            100                 105                 110

Val Lys Tyr Arg Gly His Phe Leu Ile Glu Gly Lys Leu Ser Thr Glu
        115                 120                 125

Asn Thr Ser Val Lys Asp Gln Phe Gln Gln Phe Met Val Ile Tyr Asn
    130                 135                 140

Gln Thr Phe Val Asn Gly Glu Ser Arg Leu Val Ser Ala Pro Leu Pro
145                 150                 155                 160

Glu Ser Val Leu Ile Glu Glu Glu Leu Thr Glu Lys Ala Ser Arg Thr
                165                 170                 175

Lys Lys Ser Glu Lys Val Leu Gln Gln Phe Pro Gln Glu Lys Ala Asn
            180                 185                 190

Gly Leu Phe Gly Gln Phe Leu Lys Leu Met Val Gly Asn Lys Ala Asp
        195                 200                 205

Phe Lys Lys Val Phe Gly Leu Glu Glu Glu Ala Lys Ile Thr Tyr Ala
    210                 215                 220
```

```
Ser Glu Ser Tyr Glu Glu Asp Leu Glu Gly Ile Leu Ala Lys Val Gly
225                 230                 235                 240

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

Val Glu Leu Ser Thr Ile Leu Ala Asp Ser Asp Lys Lys Ser His Ala
            260                 265                 270

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

Leu Lys Lys Phe Lys Arg Phe Ile Arg Glu Asn Cys Pro Asp Glu Tyr
    290                 295                 300

Asp Asn Leu Phe Lys Asn Glu Gln Lys Asp Gly Tyr Ala Gly Tyr Ile
305                 310                 315                 320

Ala His Ala Gly Lys Val Ser Gln Leu Lys Phe Tyr Gln Tyr Val Lys
                325                 330                 335

Lys Ile Ile Gln Asp Ile Ala Gly Ala Glu Tyr Phe Leu Glu Lys Ile
            340                 345                 350

Ala Gln Glu Asn Phe Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Val
        355                 360                 365

Ile Pro His Gln Ile His Leu Ala Glu Leu Gln Ala Ile Ile His Arg
    370                 375                 380

Gln Ala Ala Tyr Tyr Pro Phe Leu Lys Glu Asn Gln Glu Lys Ile Glu
385                 390                 395                 400

Gln Leu Val Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ser Lys
                405                 410                 415

Gly Asp Ala Ser Thr Phe Ala Trp Leu Lys Arg Gln Ser Glu Glu Pro
            420                 425                 430
```

```
Ile Arg Pro Trp Asn Leu Gln Glu Thr Val Asp Leu Asp Gln Ser Ala
        435                 440                 445

Thr Ala Phe Ile Glu Arg Met Thr Asn Phe Asp Thr Tyr Leu Pro Ser
    450                 455                 460

Glu Lys Val Leu Pro Lys His Ser Leu Leu Tyr Glu Lys Phe Met Val
465                 470                 475                 480

Phe Asn Glu Leu Thr Lys Ile Ser Tyr Thr Asp Asp Arg Gly Ile Lys
                485                 490                 495

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

Lys Thr Arg Arg Lys Val Lys Lys Lys Asp Ile Ile Gln Phe Tyr Arg
        515                 520                 525

Asn Glu Tyr Asn Thr Glu Ile Val Thr Leu Ser Gly Leu Glu Glu Asp
    530                 535                 540

Gln Phe Asn Ala Ser Phe Ser Thr Tyr Gln Asp Leu Leu Lys Cys Gly
545                 550                 555                 560

Leu Thr Arg Ala Glu Leu Asp His Pro Asp Asn Ala Glu Lys Leu Glu
                565                 570                 575

Asp Ile Ile Lys Ile Leu Thr Ile Phe Glu Asp Arg Gln Arg Ile Arg
            580                 585                 590

Thr Gln Leu Ser Thr Phe Lys Gly Gln Phe Ser Ala Glu Val Leu Lys
        595                 600                 605

Lys Leu Glu Arg Lys His Tyr Thr Gly Trp Gly Arg Leu Ser Lys Lys
    610                 615                 620

Leu Ile Asn Gly Ile Tyr Asp Lys Glu Ser Gly Lys Thr Ile Leu Asp
625                 630                 635                 640
```

```
Tyr Leu Val Lys Asp Asp Gly Val Ser Lys His Tyr Asn Arg Asn Phe
                645                 650                 655

Met Gln Leu Ile Asn Asp Ser Gln Leu Ser Phe Lys Asn Ala Ile Gln
            660                 665                 670

Lys Ala Gln Ser Ser Glu His Glu Glu Thr Leu Ser Glu Thr Val Asn
        675                 680                 685

Glu Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile Tyr Gln Ser Leu
    690                 695                 700

Lys Ile Val Asp Glu Leu Val Ala Ile Met Gly Tyr Ala Pro Lys Arg
705                 710                 715                 720

Ile Val Val Glu Met Ala Arg Glu Asn Gln Thr Thr Ser Thr Gly Lys
                725                 730                 735

Arg Arg Ser Ile Gln Arg Leu Lys Ile Val Glu Lys Ala Met Ala Glu
            740                 745                 750

Ile Gly Ser Asn Leu Leu Lys Glu Gln Pro Thr Thr Asn Glu Gln Leu
        755                 760                 765

Arg Asp Thr Arg Leu Phe Leu Tyr Tyr Met Gln Asn Gly Lys Asp Met
    770                 775                 780

Tyr Thr Gly Asp Glu Leu Ser Leu His Arg Leu Ser His Tyr Asp Ile
785                 790                 795                 800

Asp His Ile Ile Pro Gln Ser Phe Met Lys Asp Asp Ser Leu Asp Asn
                805                 810                 815

Leu Val Leu Val Gly Ser Thr Glu Asn Arg Gly Lys Ser Asp Asp Val
            820                 825                 830

Pro Ser Lys Glu Val Val Lys Asp Met Lys Ala Tyr Trp Glu Lys Leu
        835                 840                 845

Tyr Ala Ala Gly Leu Ile Ser Gln Arg Lys Phe Gln Arg Leu Thr Lys
```

```
    850                 855                 860

Gly Glu Gln Gly Gly Leu Thr Leu Glu Asp Lys Ala His Phe Ile Gln
865                 870                 875                 880

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

Leu Asp Gln Arg Tyr Asn Ala Lys Ser Lys Glu Lys Lys Val Gln Ile
            900                 905                 910

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

Leu Tyr Lys Val Arg Glu Val Asn Asp Tyr His His Gly Gln Asp Ala
    930                 935                 940

Tyr Leu Asn Cys Val Val Ala Thr Thr Leu Leu Lys Val Tyr Pro Asn
945                 950                 955                 960

Leu Ala Pro Glu Phe Val Tyr Gly Glu Tyr Pro Lys Phe Gln Thr Phe
                965                 970                 975

Lys Glu Asn Lys Ala Thr Ala Lys Ala Ile Ile Tyr Thr Asn Leu Leu
            980                 985                 990

Arg Phe Phe Thr Glu Asp Glu Pro  Arg Phe Thr Lys Asp  Gly Glu Ile
        995                 1000                1005

Leu Trp  Ser Asn Ser Tyr Leu  Lys Thr Ile Lys Lys  Glu Leu Asn
    1010                1015                1020

Tyr His  Gln Met Asn Ile Val  Lys Lys Val Glu Val  Gln Lys Gly
    1025                1030                1035

Gly Phe  Ser Lys Glu Ser Ile  Lys Pro Lys Gly Pro  Ser Asn Lys
    1040                1045                1050

Leu Ile  Pro Val Lys Asn Gly  Leu Asp Pro Gln Lys  Tyr Gly Gly
    1055                1060                1065
```

```
Phe Asp  Ser Pro Val Val Ala  Tyr Thr Val Leu Phe  Thr His Glu
    1070                1075                1080

Lys Gly  Lys Lys Pro Leu Ile  Lys Gln Glu Ile Leu  Gly Ile Thr
    1085                1090                1095

Ile Met  Glu Lys Thr Arg Phe  Glu Gln Asn Pro Ile  Leu Phe Leu
    1100                1105                1110

Glu Glu  Lys Gly Phe Leu Arg  Pro Arg Val Leu Met  Lys Leu Pro
    1115                1120                1125

Lys Tyr  Thr Leu Tyr Glu Phe  Pro Glu Gly Arg Arg  Arg Leu Leu
    1130                1135                1140

Ala Ser  Ala Lys Glu Ala Gln  Lys Gly Asn Gln Met  Val Leu Pro
    1145                1150                1155

Glu His  Leu Leu Thr Leu Leu  Tyr His Ala Lys Gln  Cys Leu Leu
    1160                1165                1170

Pro Asn  Gln Ser Glu Ser Leu  Ala Tyr Val Glu Gln  His Gln Pro
    1175                1180                1185

Glu Phe  Gln Glu Ile Leu Glu  Arg Val Val Asp Phe  Ala Glu Val
    1190                1195                1200

His Thr  Leu Ala Lys Ser Lys  Val Gln Gln Ile Val  Lys Leu Phe
    1205                1210                1215

Glu Ala  Asn Gln Thr Ala Asp  Val Lys Glu Ile Ala  Ala Ser Phe
    1220                1225                1230

Ile Gln  Leu Met Gln Phe Asn  Ala Met Gly Ala Pro  Ser Thr Phe
    1235                1240                1245

Lys Phe  Phe Gln Lys Asp Ile  Glu Arg Ala Arg Tyr  Thr Ser Ile
    1250                1255                1260
```

Lys Glu Ile Phe Asp Ala Thr Ile Ile Tyr Gln Ser Pro Thr Gly
    1265   1270   1275

Leu Tyr Glu Thr Arg Arg Lys Val Val Asp
    1280   1285

<210> 37
<211> 1052
<212> PRT
<213> Staphylococcus aureus

<400> 37

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

Tyr Gly Ile Ile Asp Tyr Glu Thr Arg Asp Val Ile Asp Ala Gly Val
            20   25   30

Arg Leu Phe Lys Glu Ala Asn Val Glu Asn Asn Glu Gly Arg Arg Ser
        35   40   45

Lys Arg Gly Ala Arg Arg Leu Lys Arg Arg Arg Arg His Arg Ile Gln
    50   55   60

Arg Val Lys Lys Leu Leu Phe Asp Tyr Asn Leu Leu Thr Asp His Ser
65   70   75   80

Glu Leu Ser Gly Ile Asn Pro Tyr Glu Ala Arg Val Lys Gly Leu Ser
                85   90   95

Gln Lys Leu Ser Glu Glu Glu Phe Ser Ala Ala Leu Leu His Leu Ala
            100   105   110

Lys Arg Arg Gly Val His Asn Val Asn Glu Val Glu Glu Asp Thr Gly
        115   120   125

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

Glu Glu Lys Tyr Val Ala Glu Leu Gln Leu Glu Arg Leu Lys Lys Asp

```
145                 150                 155                 160

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

Lys Glu Ala Lys Gln Leu Leu Lys Val Gln Lys Ala Tyr His Gln Leu
            180                 185                 190

Asp Gln Ser Phe Ile Asp Thr Tyr Ile Asp Leu Leu Glu Thr Arg Arg
        195                 200                 205

Thr Tyr Tyr Glu Gly Pro Gly Glu Gly Ser Pro Phe Gly Trp Lys Asp
    210                 215                 220

Ile Lys Glu Trp Tyr Glu Met Leu Met Gly His Cys Thr Tyr Phe Pro
225                 230                 235                 240

Glu Glu Leu Arg Ser Val Lys Tyr Ala Tyr Asn Ala Asp Leu Tyr Asn
                245                 250                 255

Ala Leu Asn Asp Leu Asn Asn Leu Val Ile Thr Arg Asp Glu Asn Glu
            260                 265                 270

Lys Leu Glu Tyr Tyr Glu Lys Phe Gln Ile Ile Glu Asn Val Phe Lys
        275                 280                 285

Gln Lys Lys Lys Pro Thr Leu Lys Gln Ile Ala Lys Glu Ile Leu Val
    290                 295                 300

Asn Glu Glu Asp Ile Lys Gly Tyr Arg Val Thr Ser Thr Gly Lys Pro
305                 310                 315                 320

Glu Phe Thr Asn Leu Lys Val Tyr His Asp Ile Lys Asp Ile Thr Ala
                325                 330                 335

Arg Lys Glu Ile Ile Glu Asn Ala Glu Leu Leu Asp Gln Ile Ala Lys
            340                 345                 350

Ile Leu Thr Ile Tyr Gln Ser Ser Glu Asp Ile Gln Glu Glu Leu Thr
        355                 360                 365
```

```
Asn Leu Asn Ser Glu Leu Thr Gln Glu Glu Ile Glu Gln Ile Ser Asn
    370                 375                 380

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

Leu Ile Leu Asp Glu Leu Trp His Thr Asn Asp Asn Gln Ile Ala Ile
                405                 410                 415

Phe Asn Arg Leu Lys Leu Val Pro Lys Lys Val Asp Leu Ser Gln Gln
            420                 425                 430

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

Val Lys Arg Ser Phe Ile Gln Ser Ile Lys Val Ile Asn Ala Ile Ile
    450                 455                 460

Lys Lys Tyr Gly Leu Pro Asn Asp Ile Ile Ile Glu Leu Ala Arg Glu
465                 470                 475                 480

Lys Asn Ser Lys Asp Ala Gln Lys Met Ile Asn Glu Met Gln Lys Arg
                485                 490                 495

Asn Arg Gln Thr Asn Glu Arg Ile Glu Glu Ile Ile Arg Thr Thr Gly
            500                 505                 510

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

Gln Glu Gly Lys Cys Leu Tyr Ser Leu Glu Ala Ile Pro Leu Glu Asp
    530                 535                 540

Leu Leu Asn Asn Pro Phe Asn Tyr Glu Val Asp His Ile Ile Pro Arg
545                 550                 555                 560

Ser Val Ser Phe Asp Asn Ser Phe Asn Asn Lys Val Leu Val Lys Gln
                565                 570                 575
```

```
Glu Glu Asn Ser Lys Lys Gly Asn Arg Thr Pro Phe Gln Tyr Leu Ser
            580                 585                 590

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

Asn Leu Ala Lys Gly Lys Gly Arg Ile Ser Lys Thr Lys Lys Glu Tyr
    610                 615                 620

Leu Leu Glu Glu Arg Asp Ile Asn Arg Phe Ser Val Gln Lys Asp Phe
625                 630                 635                 640

Ile Asn Arg Asn Leu Val Asp Thr Arg Tyr Ala Thr Arg Gly Leu Met
                645                 650                 655

Asn Leu Leu Arg Ser Tyr Phe Arg Val Asn Asn Leu Asp Val Lys Val
            660                 665                 670

Lys Ser Ile Asn Gly Gly Phe Thr Ser Phe Leu Arg Arg Lys Trp Lys
        675                 680                 685

Phe Lys Lys Glu Arg Asn Lys Gly Tyr Lys His His Ala Glu Asp Ala
    690                 695                 700

Leu Ile Ile Ala Asn Ala Asp Phe Ile Phe Lys Glu Trp Lys Lys Leu
705                 710                 715                 720

Asp Lys Ala Lys Lys Val Met Glu Asn Gln Met Phe Glu Glu Lys Gln
                725                 730                 735

Ala Glu Ser Met Pro Glu Ile Glu Thr Glu Gln Glu Tyr Lys Glu Ile
            740                 745                 750

Phe Ile Thr Pro His Gln Ile Lys His Ile Lys Asp Phe Lys Asp Tyr
        755                 760                 765

Lys Tyr Ser His Arg Val Asp Lys Lys Pro Asn Arg Glu Leu Ile Asn
    770                 775                 780
```

```
Asp Thr Leu Tyr Ser Thr Arg Lys Asp Asp Lys Gly Asn Thr Leu Ile
785                 790                 795                 800

Val Asn Asn Leu Asn Gly Leu Tyr Asp Lys Asp Asn Asp Lys Leu Lys
                805                 810                 815

Lys Leu Ile Asn Lys Ser Pro Glu Lys Leu Leu Met Tyr His His Asp
            820                 825                 830

Pro Gln Thr Tyr Gln Lys Leu Lys Leu Ile Met Glu Gln Tyr Gly Asp
        835                 840                 845

Glu Lys Asn Pro Leu Tyr Lys Tyr Tyr Glu Glu Thr Gly Asn Tyr Leu
    850                 855                 860

Thr Lys Tyr Ser Lys Lys Asp Asn Gly Pro Val Ile Lys Lys Ile Lys
865                 870                 875                 880

Tyr Tyr Gly Asn Lys Leu Asn Ala His Leu Asp Ile Thr Asp Asp Tyr
                885                 890                 895

Pro Asn Ser Arg Asn Lys Val Val Lys Leu Ser Leu Lys Pro Tyr Arg
            900                 905                 910

Phe Asp Val Tyr Leu Asp Asn Gly Val Tyr Lys Phe Val Thr Val Lys
        915                 920                 925

Asn Leu Asp Val Ile Lys Lys Glu Asn Tyr Tyr Glu Val Asn Ser Lys
    930                 935                 940

Cys Tyr Glu Glu Ala Lys Lys Leu Lys Lys Ile Ser Asn Gln Ala Glu
945                 950                 955                 960

Phe Ile Ala Ser Phe Tyr Asn Asn Asp Leu Ile Lys Ile Asn Gly Glu
                965                 970                 975

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

Val Asn Met Ile Asp Ile Thr Tyr  Arg Glu Tyr Leu Glu  Asn Met Asn
```

995 1000 1005

Asp Lys Arg Pro Pro Arg Ile Ile Lys Thr Ile Ala Ser Lys Thr
1010 1015 1020

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

Glu Val Lys Ser Lys Lys His Pro Gln Ile Ile Lys Lys Gly
1040 1045 1050

<210> 38
<211> 1082
<212> PRT
<213> Geobacillus thermodenitrificans

<400> 38

Met Lys Tyr Lys Ile Gly Leu Asp Ile Gly Ile Thr Ser Ile Gly Trp
1 5 10 15

Ala Val Ile Asn Leu Asp Ile Pro Arg Ile Glu Asp Leu Gly Val Arg
20 25 30

Ile Phe Asp Arg Ala Glu Asn Pro Lys Thr Gly Glu Ser Leu Ala Leu
35 40 45

Pro Arg Arg Leu Ala Arg Ser Ala Arg Arg Arg Leu Arg Arg Arg Lys
50 55 60

His Arg Leu Glu Arg Ile Arg Arg Leu Phe Val Arg Glu Gly Ile Leu
65 70 75 80

Thr Lys Glu Glu Leu Asn Lys Leu Phe Glu Lys Lys His Glu Ile Asp
85 90 95

Val Trp Gln Leu Arg Val Glu Ala Leu Asp Arg Lys Leu Asn Asn Asp
100 105 110

Glu Leu Ala Arg Ile Leu Leu His Leu Ala Lys Arg Arg Gly Phe Arg
115 120 125

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Ser Asn Arg Lys Ser Glu Arg Thr Asn Lys Glu Asn Ser Thr Met Leu
    130                 135                 140

Lys His Ile Glu Glu Asn Gln Ser Ile Leu Ser Ser Tyr Arg Thr Val
145                 150                 155                 160

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

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

Glu Ile Lys Leu Ile Phe Ala Lys Gln Arg Glu Tyr Gly Asn Ile Val
        195                 200                 205

Cys Thr Glu Ala Phe Glu His Glu Tyr Ile Ser Ile Trp Ala Ser Gln
    210                 215                 220

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

Thr Phe Glu Pro Lys Glu Lys Arg Ala Pro Lys Ala Thr Tyr Thr Phe
                245                 250                 255

Gln Ser Phe Thr Val Trp Glu His Ile Asn Lys Leu Arg Leu Val Ser
            260                 265                 270

Pro Gly Gly Ile Arg Ala Leu Thr Asp Asp Glu Arg Arg Leu Ile Tyr
        275                 280                 285

Lys Gln Ala Phe His Lys Asn Lys Ile Thr Phe His Asp Val Arg Thr
    290                 295                 300

Leu Leu Asn Leu Pro Asp Asp Thr Arg Phe Lys Gly Leu Leu Tyr Asp
305                 310                 315                 320

Arg Asn Thr Thr Leu Lys Glu Asn Glu Lys Val Arg Phe Leu Glu Leu
                325                 330                 335
```

```
Gly Ala Tyr His Lys Ile Arg Lys Ala Ile Asp Ser Val Tyr Gly Lys
            340                 345                 350

Gly Ala Ala Lys Ser Phe Arg Pro Ile Asp Phe Asp Thr Phe Gly Tyr
        355                 360                 365

Ala Leu Thr Met Phe Lys Asp Asp Thr Asp Ile Arg Ser Tyr Leu Arg
    370                 375                 380

Asn Glu Tyr Glu Gln Asn Gly Lys Arg Met Glu Asn Leu Ala Asp Lys
385                 390                 395                 400

Val Tyr Asp Glu Glu Leu Ile Glu Glu Leu Leu Asn Leu Ser Phe Ser
                405                 410                 415

Lys Phe Gly His Leu Ser Leu Lys Ala Leu Arg Asn Ile Leu Pro Tyr
            420                 425                 430

Met Glu Gln Gly Glu Val Tyr Ser Thr Ala Cys Glu Arg Ala Gly Tyr
        435                 440                 445

Thr Phe Thr Gly Pro Lys Lys Lys Gln Lys Thr Val Leu Leu Pro Asn
    450                 455                 460

Ile Pro Pro Ile Ala Asn Pro Val Val Met Arg Ala Leu Thr Gln Ala
465                 470                 475                 480

Arg Lys Val Val Asn Ala Ile Ile Lys Lys Tyr Gly Ser Pro Val Ser
                485                 490                 495

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

Arg Lys Met Gln Lys Glu Gln Glu Gly Asn Arg Lys Lys Asn Glu Thr
        515                 520                 525

Ala Ile Arg Gln Leu Val Glu Tyr Gly Leu Thr Leu Asn Pro Thr Gly
    530                 535                 540

Leu Asp Ile Val Lys Phe Lys Leu Trp Ser Glu Gln Asn Gly Lys Cys
```

545 550 555 560

Ala Tyr Ser Leu Gln Pro Ile Glu Ile Glu Arg Leu Leu Glu Pro Gly
565 570 575

Tyr Thr Glu Val Asp His Val Ile Pro Tyr Ser Arg Ser Leu Asp Asp
580 585 590

Ser Tyr Thr Asn Lys Val Leu Val Leu Thr Lys Glu Asn Arg Glu Lys
595 600 605

Gly Asn Arg Thr Pro Ala Glu Tyr Leu Gly Leu Gly Ser Glu Arg Trp
610 615 620

Gln Gln Phe Glu Thr Phe Val Leu Thr Asn Lys Gln Phe Ser Lys Lys
625 630 635 640

Lys Arg Asp Arg Leu Leu Arg Leu His Tyr Asp Glu Asn Glu Glu Asn
645 650 655

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

Leu Ala Asn Phe Ile Arg Glu His Leu Lys Phe Ala Asp Ser Asp Asp
675 680 685

Lys Gln Lys Val Tyr Thr Val Asn Gly Arg Ile Thr Ala His Leu Arg
690 695 700

Ser Arg Trp Asn Phe Asn Lys Asn Arg Glu Glu Ser Asn Leu His His
705 710 715 720

Ala Val Asp Ala Ala Ile Val Ala Cys Thr Thr Pro Ser Asp Ile Ala
725 730 735

Arg Val Thr Ala Phe Tyr Gln Arg Arg Glu Gln Asn Lys Glu Leu Ser
740 745 750

Lys Lys Thr Asp Pro Gln Phe Pro Gln Pro Trp Pro His Phe Ala Asp
755 760 765

```
Glu Leu Gln Ala Arg Leu Ser Lys Asn Pro Lys Glu Ser Ile Lys Ala
    770                 775                 780

Leu Asn Leu Gly Asn Tyr Asp Asn Glu Lys Leu Glu Ser Leu Gln Pro
785                 790                 795                 800

Val Phe Val Ser Arg Met Pro Lys Arg Ser Ile Thr Gly Ala Ala His
                805                 810                 815

Gln Glu Thr Leu Arg Arg Tyr Ile Gly Ile Asp Glu Arg Ser Gly Lys
            820                 825                 830

Ile Gln Thr Val Val Lys Lys Lys Leu Ser Glu Ile Gln Leu Asp Lys
        835                 840                 845

Thr Gly His Phe Pro Met Tyr Gly Lys Glu Ser Asp Pro Arg Thr Tyr
    850                 855                 860

Glu Ala Ile Arg Gln Arg Leu Leu Glu His Asn Asn Asp Pro Lys Lys
865                 870                 875                 880

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

Pro Ile Ile Arg Thr Ile Lys Ile Ile Asp Thr Thr Asn Gln Val Ile
            900                 905                 910

Pro Leu Asn Asp Gly Lys Thr Val Ala Tyr Asn Ser Asn Ile Val Arg
        915                 920                 925

Val Asp Val Phe Glu Lys Asp Gly Lys Tyr Tyr Cys Val Pro Ile Tyr
    930                 935                 940

Thr Ile Asp Met Met Lys Gly Ile Leu Pro Asn Lys Ala Ile Glu Pro
945                 950                 955                 960

Asn Lys Pro Tyr Ser Glu Trp Lys Glu Met Thr Glu Asp Tyr Thr Phe
                965                 970                 975
```

Arg Phe Ser Leu Tyr Pro Asn Asp Leu Ile Arg Ile Glu Phe Pro Arg
980 985 990

Glu Lys Thr Ile Lys Thr Ala Val Gly Glu Glu Ile Lys Ile Lys Asp
995 1000 1005

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

Ser Leu Val Ser His Asp Asn Asn Phe Ser Leu Arg Ser Ile Gly
1025 1030 1035

Ser Arg Thr Leu Lys Arg Phe Glu Lys Tyr Gln Val Asp Val Leu
1040 1045 1050

Gly Asn Ile Tyr Lys Val Arg Gly Glu Lys Arg Val Gly Val Ala
1055 1060 1065

Ser Ser Ser His Ser Lys Ala Gly Glu Thr Ile Arg Pro Leu
1070 1075 1080

<210> 39
<211> 1375
<212> PRT
<213> S. canis

<400> 39

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

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

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

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

Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Arg

```
65                  70                  75                  80

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

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

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

His Arg Asn Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Ala Asp
    130                 135                 140

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

Ile Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Lys Leu Asn Ala
                165                 170                 175

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

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

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

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

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

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

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

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

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

Met Val Lys Arg Tyr Asp Glu His His Gln Asp Leu Ala Leu Leu Lys
                325                 330                 335

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

Asp Asp Thr Lys Asn Gly Tyr Ala Gly Tyr Val Gly Ile Gly Ile Lys
        355                 360                 365

His Arg Lys Arg Thr Thr Lys Leu Ala Thr Gln Glu Glu Phe Tyr Lys
    370                 375                 380

Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly Ala Glu Glu Leu Leu
385                 390                 395                 400

Ala Lys Leu Asn Arg Asp Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp
                405                 410                 415

Asn Gly Ser Ile Pro His Gln Ile His Leu Lys Glu Leu His Ala Ile
            420                 425                 430

Leu Arg Arg Gln Glu Glu Phe Tyr Pro Phe Leu Lys Glu Asn Arg Glu
        435                 440                 445

Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro
    450                 455                 460

Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Leu Thr Arg Lys Ser Glu
465                 470                 475                 480

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

```
Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn Phe Asp Glu Gln Leu
            500                 505                 510

Pro Asn Lys Lys Val Leu Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe
        515                 520                 525

Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr Val Thr Glu Arg Met
    530                 535                 540

Arg Lys Pro Glu Phe Leu Ser Gly Glu Gln Lys Lys Ala Ile Val Asp
545                 550                 555                 560

Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val Lys Gln Leu Lys Glu
                565                 570                 575

Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser Val Glu Ile Ile Gly
            580                 585                 590

Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr Tyr His Asp Leu Leu
        595                 600                 605

Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp
    610                 615                 620

Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu
625                 630                 635                 640

Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His Leu Phe Asp Asp Lys
                645                 650                 655

Val Met Lys Gln Leu Lys Arg Arg His Tyr Thr Gly Trp Gly Arg Leu
            660                 665                 670

Ser Arg Lys Met Ile Asn Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr
        675                 680                 685

Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ser Asn Arg Asn Phe Met
    690                 695                 700
```

```
Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys Glu Glu Ile Glu Lys
705                 710                 715                 720


Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His Glu Gln Ile Ala Asp
                725                 730                 735


Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile Leu Gln Thr Val Lys
            740                 745                 750


Ile Val Asp Glu Leu Val Lys Val Met Gly His Lys Pro Glu Asn Ile
        755                 760                 765


Val Ile Glu Met Ala Arg Glu Asn Gln Thr Thr Thr Lys Gly Leu Gln
    770                 775                 780


Gln Ser Arg Glu Arg Lys Lys Arg Ile Glu Glu Gly Ile Lys Glu Leu
785                 790                 795                 800


Glu Ser Gln Ile Leu Lys Glu Asn Pro Val Glu Asn Thr Gln Leu Gln
                805                 810                 815


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


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


His Ile Val Pro Gln Ser Phe Ile Lys Asp Asp Ser Ile Asp Asn Lys
    850                 855                 860


Val Leu Thr Arg Ser Val Glu Asn Arg Gly Lys Ser Asp Asn Val Pro
865                 870                 875                 880


Ser Glu Glu Val Val Lys Lys Met Lys Asn Tyr Trp Arg Gln Leu Leu
                885                 890                 895


Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe Asp Asn Leu Thr Lys Ala
            900                 905                 910


Glu Arg Gly Gly Leu Ser Glu Ala Asp Lys Ala Gly Phe Ile Lys Arg
```

```
        915                 920                 925

Gln Leu Val Glu Thr Arg Gln Ile Thr Lys His Val Ala Arg Ile Leu
    930                 935                 940

Asp Ser Arg Met Asn Thr Lys Arg Asp Lys Asn Asp Lys Pro Ile Arg
945                 950                 955                 960

Glu Val Lys Val Ile Thr Leu Lys Ser Lys Leu Val Ser Asp Phe Arg
                965                 970                 975

Lys Asp Phe Gln Leu Tyr Lys Val Arg Asp Ile Asn Asn Tyr His His
            980                 985                 990

Ala His Asp Ala Tyr Leu Asn Ala  Val Val Gly Thr Ala  Leu Ile Lys
        995                 1000                1005

Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val Tyr Gly  Asp Tyr Lys
    1010                1015                1020

Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys Ser Glu  Gln Glu Ile
    1025                1030                1035

Gly Lys  Ala Thr Ala Lys Arg  Phe Phe Tyr Ser Asn  Ile Met Asn
    1040                1045                1050

Phe Phe  Lys Thr Glu Val Lys  Leu Ala Asn Gly Glu  Ile Arg Lys
    1055                1060                1065

Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr Gly Glu  Val Val Trp
    1070                1075                1080

Asn Lys  Glu Lys Asp Phe Ala  Thr Val Arg Lys Val  Leu Ala Met
    1085                1090                1095

Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu Val Gln  Thr Gly Gly
    1100                1105                1110

Phe Ser  Lys Glu Ser Ile Leu  Ser Lys Arg Glu Ser  Ala Lys Leu
    1115                1120                1125
```

```
Ile Pro  Arg Lys Lys Gly Trp  Asp Thr Arg Lys Tyr  Gly Gly Phe
    1130                1135                1140

Gly Ser  Pro Thr Val Ala Tyr  Ser Ile Leu Val Val  Ala Lys Val
    1145                1150                1155

Glu Lys  Gly Lys Ala Lys Lys  Leu Lys Ser Val Lys  Val Leu Val
    1160                1165                1170

Gly Ile  Thr Ile Met Glu Lys  Gly Ser Tyr Glu Lys  Asp Pro Ile
    1175                1180                1185

Gly Phe  Leu Glu Ala Lys Gly  Tyr Lys Asp Ile Lys  Lys Glu Leu
    1190                1195                1200

Ile Phe  Lys Leu Pro Lys Tyr  Ser Leu Phe Glu Leu  Glu Asn Gly
    1205                1210                1215

Arg Arg  Arg Met Leu Ala Ser  Ala Thr Glu Leu Gln  Lys Ala Asn
    1220                1225                1230

Glu Leu  Val Leu Pro Gln His  Leu Val Arg Leu Leu  Tyr Tyr Thr
    1235                1240                1245

Gln Asn  Ile Ser Ala Thr Thr  Gly Ser Asn Asn Leu  Gly Tyr Ile
    1250                1255                1260

Glu Gln  His Arg Glu Glu Phe  Lys Glu Ile Phe Glu  Lys Ile Ile
    1265                1270                1275

Asp Phe  Ser Glu Lys Tyr Ile  Leu Lys Asn Lys Val  Asn Ser Asn
    1280                1285                1290

Leu Lys  Ser Ser Phe Asp Glu  Gln Phe Ala Val Ser  Asp Ser Ile
    1295                1300                1305

Leu Leu  Ser Asn Ser Phe Val  Ser Leu Leu Lys Tyr  Thr Ser Phe
    1310                1315                1320
```

Gly Ala Ser Gly Gly Phe Thr Phe Leu Asp Leu Asp Val Lys Gln
    1325   1330   1335

Gly Arg Leu Arg Tyr Gln Thr Val Thr Glu Val Leu Asp Ala Thr
    1340   1345   1350

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

Leu Ser Gln Leu Gly Gly Asp
    1370   1375

<210> 40
<211> 1368
<212> PRT
<213> Streptococcus pyogenes

<220>
<221> SITE
<222> (10)..(10)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> SITE
<222> (840)..(840)
<223> Xaa can be any naturally occurring amino acid

<400> 40

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

705 710 715 720

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

<210> 41
<211> 1368
<212> PRT
<213> Streptococcus pyogenes

<400> 41

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
```

```
    770                 775                 780

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

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

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

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

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

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

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

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

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

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

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

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

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

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


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


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


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


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


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


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


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


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


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


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


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


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

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

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

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

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

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

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

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

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

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

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

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

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

<210> 42
<211> 1368
<212> PRT
<213> Streptococcus pyogenes

<220>
<221> SITE
<222> (10)..(10)
<223> Xaa can be any naturally occurring amino acid

<400> 42

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg
```

385 390 395 400

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
```

```
    1220                1225                1230

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

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

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

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

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

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

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

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

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


<210>  43
<211>  1368
<212>  PRT
<213>  Streptococcus pyogenes


<220>
<221>  SITE
<222>  (762)..(762)
<223>  Xaa can be any naturally occurring amino acid

<400>  43

Met Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val
```

```
1               5                   10                  15

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
            740                 745                 750

Arg His Lys Pro Glu Asn Ile Val Ile Xaa Met Ala Arg Glu Asn Gln
        755                 760                 765

Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780

Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
785                 790                 795                 800

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu
                805                 810                 815

Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg
            820                 825                 830

Leu Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys
        835                 840                 845

Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg
```

```
    850                 855                 860

Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
865                 870                 875                 880

Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys
                885                 890                 895

Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
            900                 905                 910

Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
        915                 920                 925

Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
    930                 935                 940

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
945                 950                 955                 960

Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
                965                 970                 975

Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val
            980                 985                 990

Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
        995                 1000                1005

Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
    1010                1015                1020

Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
    1025                1030                1035

Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
    1040                1045                1050

Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
    1055                1060                1065
```

```
Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1070                1075                1080

Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1085                1090                1095

Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
    1100                1105                1110

Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
    1115                1120                1125

Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
    1130                1135                1140

Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
    1145                1150                1155

Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser
    1160                1165                1170

Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys
    1175                1180                1185

Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu
    1190                1195                1200

Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                1210                1215

Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
    1220                1225                1230

Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu Lys Leu  Lys Gly Ser
    1235                1240                1245

Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe Val Glu  Gln His Lys
    1250                1255                1260
```

```
His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile Ser Glu  Phe Ser Lys
    1265                1270                1275


Arg Val  Ile Leu Ala Asp Ala  Asn Leu Asp Lys Val  Leu Ser Ala
    1280                1285                1290


Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg Glu Gln  Ala Glu Asn
    1295                1300                1305


Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu Gly Ala  Pro Ala Ala
    1310                1315                1320


Phe Lys  Tyr Phe Asp Thr Thr  Ile Asp Arg Lys Arg  Tyr Thr Ser
    1325                1330                1335


Thr Lys  Glu Val Leu Asp Ala  Thr Leu Ile His Gln  Ser Ile Thr
    1340                1345                1350


Gly Leu  Tyr Glu Thr Arg Ile  Asp Leu Ser Gln Leu  Gly Gly Asp
    1355                1360                1365


<210>  44
<211>  1368
<212>  PRT
<213>  Streptococcus pyogenes


<220>
<221>  SITE
<222>  (983)..(983)
<223>  Xaa can be any naturally occurring amino acid

<400>  44

Met Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val
1               5                   10                  15


Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe
            20                  25                  30


Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile
        35                  40                  45
```

```
Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu
    50                  55                  60

Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys
65                  70                  75                  80

Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser
                85                  90                  95

Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys
            100                 105                 110

His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr
        115                 120                 125

His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp
    130                 135                 140

Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His
145                 150                 155                 160

Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro
                165                 170                 175

Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr
            180                 185                 190

Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala
        195                 200                 205

Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn
    210                 215                 220

Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn
225                 230                 235                 240

Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe
                245                 250                 255
```

```
Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp
            260                 265                 270

Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp
        275                 280                 285

Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp
    290                 295                 300

Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser
305                 310                 315                 320

Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys
                325                 330                 335

Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe
            340                 345                 350

Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser
        355                 360                 365

Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp
    370                 375                 380

Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg
385                 390                 395                 400

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
                405                 410                 415

Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe
            420                 425                 430

Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
        435                 440                 445

Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp
    450                 455                 460

Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu
```

```
465                 470                 475                 480

Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr
                485                 490                 495

Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser
            500                 505                 510

Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys
        515                 520                 525

Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln
    530                 535                 540

Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr
545                 550                 555                 560

Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp
                565                 570                 575

Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly
            580                 585                 590

Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
        595                 600                 605

Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr
    610                 615                 620

Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala
625                 630                 635                 640

His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr
                645                 650                 655

Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp
            660                 665                 670

Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe
        675                 680                 685
```

```
Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe
    690                 695                 700

Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu
705                 710                 715                 720

His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
                725                 730                 735

Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
            740                 745                 750

Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln
        755                 760                 765

Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780

Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
785                 790                 795                 800

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu
                805                 810                 815

Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg
            820                 825                 830

Leu Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys
        835                 840                 845

Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg
    850                 855                 860

Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
865                 870                 875                 880

Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys
                885                 890                 895
```

```
Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
            900                 905                 910

Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
        915                 920                 925

Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
    930                 935                 940

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
945                 950                 955                 960

Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
                965                 970                 975

Glu Ile Asn Asn Tyr His Xaa Ala His Asp Ala Tyr Leu Asn Ala Val
            980                 985                 990

Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
        995                 1000                1005

Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
    1010                1015                1020

Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
    1025                1030                1035

Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
    1040                1045                1050

Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
    1055                1060                1065

Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1070                1075                1080

Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1085                1090                1095
```

```
Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
    1100                1105                1110

Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
    1115                1120                1125

Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
    1130                1135                1140

Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
    1145                1150                1155

Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser
    1160                1165                1170

Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys
    1175                1180                1185

Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu
    1190                1195                1200

Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                1210                1215

Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
    1220                1225                1230

Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu Lys Leu  Lys Gly Ser
    1235                1240                1245

Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe Val Glu  Gln His Lys
    1250                1255                1260

His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile Ser Glu  Phe Ser Lys
    1265                1270                1275

Arg Val  Ile Leu Ala Asp Ala  Asn Leu Asp Lys Val  Leu Ser Ala
    1280                1285                1290

Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg Glu Gln  Ala Glu Asn
```

1295 1300 1305

Ile Ile His Leu Phe Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala
1310 1315 1320

Phe Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser
1325 1330 1335

Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His Gln Ser Ile Thr
1340 1345 1350

Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp
1355 1360 1365

<210> 45
<211> 1368
<212> PRT
<213> Streptococcus pyogenes

<220>
<221> SITE
<222> (986)..(986)
<223> Xaa can be any naturally occurring amino acid

<400> 45

Met Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val
1 5 10 15

Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe
20 25 30

Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile
35 40 45

Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu
50 55 60

Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys
65 70 75 80

Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser

```
                85                  90                  95

Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys
            100                 105                 110

His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr
        115                 120                 125

His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp
    130                 135                 140

Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His
145                 150                 155                 160

Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro
                165                 170                 175

Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr
            180                 185                 190

Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala
        195                 200                 205

Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn
    210                 215                 220

Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn
225                 230                 235                 240

Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe
                245                 250                 255

Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp
            260                 265                 270

Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp
        275                 280                 285

Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp
    290                 295                 300
```

```
Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser
305                 310                 315                 320

Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys
                325                 330                 335

Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe
            340                 345                 350

Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser
        355                 360                 365

Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp
    370                 375                 380

Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg
385                 390                 395                 400

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
                405                 410                 415

Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe
            420                 425                 430

Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
        435                 440                 445

Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp
    450                 455                 460

Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu
465                 470                 475                 480

Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr
                485                 490                 495

Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser
            500                 505                 510
```

```
Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys
        515                 520                 525

Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln
    530                 535                 540

Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr
545                 550                 555                 560

Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp
                565                 570                 575

Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly
            580                 585                 590

Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
        595                 600                 605

Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr
    610                 615                 620

Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala
625                 630                 635                 640

His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr
                645                 650                 655

Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp
            660                 665                 670

Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe
        675                 680                 685

Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe
    690                 695                 700

Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu
705                 710                 715                 720
```

```
His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
               725                 730                 735

Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
            740                 745                 750

Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln
        755                 760                 765

Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780

Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
785                 790                 795                 800

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu
               805                 810                 815

Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg
            820                 825                 830

Leu Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys
        835                 840                 845

Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg
    850                 855                 860

Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
865                 870                 875                 880

Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys
               885                 890                 895

Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
            900                 905                 910

Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
        915                 920                 925

Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
```

```
    930                 935                 940

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
945                 950                 955                 960

Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
                965                 970                 975

Glu Ile Asn Asn Tyr His His Ala His Xaa Ala Tyr Leu Asn Ala Val
            980                 985                 990

Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
        995                 1000                1005

Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
    1010                1015                1020

Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
    1025                1030                1035

Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
    1040                1045                1050

Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
    1055                1060                1065

Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1070                1075                1080

Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1085                1090                1095

Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
    1100                1105                1110

Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
    1115                1120                1125

Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
    1130                1135                1140
```

```
Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
    1145                1150                1155

Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser
    1160                1165                1170

Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys
    1175                1180                1185

Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu
    1190                1195                1200

Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                1210                1215

Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
    1220                1225                1230

Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu Lys Leu  Lys Gly Ser
    1235                1240                1245

Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe Val Glu  Gln His Lys
    1250                1255                1260

His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile Ser Glu  Phe Ser Lys
    1265                1270                1275

Arg Val  Ile Leu Ala Asp Ala  Asn Leu Asp Lys Val  Leu Ser Ala
    1280                1285                1290

Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg Glu Gln  Ala Glu Asn
    1295                1300                1305

Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu Gly Ala  Pro Ala Ala
    1310                1315                1320

Phe Lys  Tyr Phe Asp Thr Thr  Ile Asp Arg Lys Arg  Tyr Thr Ser
    1325                1330                1335
```

```
Thr Lys  Glu Val Leu Asp Ala  Thr Leu Ile His Gln  Ser Ile Thr
    1340                1345                1350


Gly Leu  Tyr Glu Thr Arg Ile  Asp Leu Ser Gln Leu  Gly Gly Asp
    1355                1360                1365


<210>  46
<211>  1368
<212>  PRT
<213>  Streptococcus pyogenes

<400>  46

Met Asp Lys Lys Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val
1               5                   10                  15


Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe
            20                  25                  30


Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile
        35                  40                  45


Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu
    50                  55                  60


Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys
65                  70                  75                  80


Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser
                85                  90                  95


Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys
            100                 105                 110


His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr
        115                 120                 125


His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp
    130                 135                 140


Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His
```

145 150 155 160

Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro
165 170 175

Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr
180 185 190

Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala
195 200 205

Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn
210 215 220

Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn
225 230 235 240

Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe
245 250 255

Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp
260 265 270

Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp
275 280 285

Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp
290 295 300

Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser
305 310 315 320

Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys
325 330 335

Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe
340 345 350

Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser
355 360 365

```
Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp
    370                 375                 380

Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg
385                 390                 395                 400

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
                405                 410                 415

Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe
            420                 425                 430

Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
        435                 440                 445

Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp
    450                 455                 460

Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu
465                 470                 475                 480

Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr
                485                 490                 495

Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser
            500                 505                 510

Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys
        515                 520                 525

Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln
    530                 535                 540

Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr
545                 550                 555                 560

Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp
                565                 570                 575
```

```
Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly
            580                 585                 590

Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
        595                 600                 605

Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr
    610                 615                 620

Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala
625                 630                 635                 640

His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr
                645                 650                 655

Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp
            660                 665                 670

Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe
        675                 680                 685

Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe
    690                 695                 700

Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu
705                 710                 715                 720

His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
                725                 730                 735

Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
            740                 745                 750

Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln
        755                 760                 765

Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780
```

```
Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
785                 790                 795                 800


Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu
                805                 810                 815


Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg
            820                 825                 830


Leu Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys
        835                 840                 845


Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg
    850                 855                 860


Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
865                 870                 875                 880


Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys
                885                 890                 895


Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
            900                 905                 910


Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
        915                 920                 925


Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
    930                 935                 940


Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
945                 950                 955                 960


Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
                965                 970                 975


Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val
            980                 985                 990


Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
```

995 1000 1005

Val Tyr Gly Asp Tyr Lys Val Tyr Asp Val Arg Lys Met Ile Ala
1010 1015 1020

Lys Ser Glu Gln Glu Ile Gly Lys Ala Thr Ala Lys Tyr Phe Phe
1025 1030 1035

Tyr Ser Asn Ile Met Asn Phe Phe Lys Thr Glu Ile Thr Leu Ala
1040 1045 1050

Asn Gly Glu Ile Arg Lys Arg Pro Leu Ile Glu Thr Asn Gly Glu
1055 1060 1065

Thr Gly Glu Ile Val Trp Asp Lys Gly Arg Asp Phe Ala Thr Val
1070 1075 1080

Arg Lys Val Leu Ser Met Pro Gln Val Asn Ile Val Lys Lys Thr
1085 1090 1095

Glu Val Gln Thr Gly Gly Phe Ser Lys Glu Ser Ile Leu Pro Lys
1100 1105 1110

Arg Asn Ser Asp Lys Leu Ile Ala Arg Lys Lys Asp Trp Asp Pro
1115 1120 1125

Lys Lys Tyr Gly Gly Phe Asp Ser Pro Thr Val Ala Tyr Ser Val
1130 1135 1140

Leu Val Val Ala Lys Val Glu Lys Gly Lys Ser Lys Lys Leu Lys
1145 1150 1155

Ser Val Lys Glu Leu Leu Gly Ile Thr Ile Met Glu Arg Ser Ser
1160 1165 1170

Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala Lys Gly Tyr Lys
1175 1180 1185

Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro Lys Tyr Ser Leu
1190 1195 1200

```
Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                 1210                 1215

Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
    1220                 1225                 1230

Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu Lys Leu  Lys Gly Ser
    1235                 1240                 1245

Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe Val Glu  Gln His Lys
    1250                 1255                 1260

His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile Ser Glu  Phe Ser Lys
    1265                 1270                 1275

Arg Val  Ile Leu Ala Asp Ala  Asn Leu Asp Lys Val  Leu Ser Ala
    1280                 1285                 1290

Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg Glu Gln  Ala Glu Asn
    1295                 1300                 1305

Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu Gly Ala  Pro Ala Ala
    1310                 1315                 1320

Phe Lys  Tyr Phe Asp Thr Thr  Ile Asp Arg Lys Arg  Tyr Thr Ser
    1325                 1330                 1335

Thr Lys  Glu Val Leu Asp Ala  Thr Leu Ile His Gln  Ser Ile Thr
    1340                 1345                 1350

Gly Leu  Tyr Glu Thr Arg Ile  Asp Leu Ser Gln Leu  Gly Gly Asp
    1355                 1360                 1365


<210>  47
<211>  1368
<212>  PRT
<213>  Streptococcus pyogenes

<400>  47
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```
Met Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val
1               5                   10                  15

Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe
            20                  25                  30

Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile
        35                  40                  45

Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu
    50                  55                  60

Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys
65                  70                  75                  80

Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser
                85                  90                  95

Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys
            100                 105                 110

His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr
        115                 120                 125

His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp
    130                 135                 140

Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His
145                 150                 155                 160

Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro
                165                 170                 175

Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr
            180                 185                 190

Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala
        195                 200                 205

Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn
```

```
    210                 215                 220

Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn
225                 230                 235                 240

Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe
                245                 250                 255

Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp
            260                 265                 270

Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp
        275                 280                 285

Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp
    290                 295                 300

Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser
305                 310                 315                 320

Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys
                325                 330                 335

Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe
            340                 345                 350

Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser
        355                 360                 365

Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp
    370                 375                 380

Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg
385                 390                 395                 400

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
                405                 410                 415

Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe
            420                 425                 430
```

```
Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
        435                 440                 445

Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp
    450                 455                 460

Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu
465                 470                 475                 480

Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr
                485                 490                 495

Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser
            500                 505                 510

Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys
        515                 520                 525

Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln
    530                 535                 540

Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr
545                 550                 555                 560

Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp
                565                 570                 575

Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly
            580                 585                 590

Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
        595                 600                 605

Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr
    610                 615                 620

Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala
625                 630                 635                 640
```

```
His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr
                645                 650                 655

Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp
            660                 665                 670

Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe
        675                 680                 685

Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe
    690                 695                 700

Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu
705                 710                 715                 720

His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
                725                 730                 735

Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
            740                 745                 750

Arg His Lys Pro Glu Asn Ile Val Ile Ala Met Ala Arg Glu Asn Gln
        755                 760                 765

Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780

Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
785                 790                 795                 800

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu
                805                 810                 815

Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg
            820                 825                 830

Leu Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys
        835                 840                 845
```

```
Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg
    850                 855                 860

Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
865                 870                 875                 880

Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys
                885                 890                 895

Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
            900                 905                 910

Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
        915                 920                 925

Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
    930                 935                 940

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
945                 950                 955                 960

Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
                965                 970                 975

Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val
            980                 985                 990

Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
        995                 1000                1005

Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
    1010                1015                1020

Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
    1025                1030                1035

Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
    1040                1045                1050

Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
```

```
    1055                1060                1065

Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1070                1075                1080

Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1085                1090                1095

Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
    1100                1105                1110

Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
    1115                1120                1125

Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
    1130                1135                1140

Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
    1145                1150                1155

Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser
    1160                1165                1170

Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys
    1175                1180                1185

Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu
    1190                1195                1200

Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                1210                1215

Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
    1220                1225                1230

Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu Lys Leu  Lys Gly Ser
    1235                1240                1245

Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe Val Glu  Gln His Lys
    1250                1255                1260
```

```
His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile Ser Glu  Phe Ser Lys
    1265                1270                1275


Arg Val  Ile Leu Ala Asp Ala  Asn Leu Asp Lys Val  Leu Ser Ala
    1280                1285                1290


Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg Glu Gln  Ala Glu Asn
    1295                1300                1305


Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu Gly Ala  Pro Ala Ala
    1310                1315                1320


Phe Lys  Tyr Phe Asp Thr Thr  Ile Asp Arg Lys Arg  Tyr Thr Ser
    1325                1330                1335


Thr Lys  Glu Val Leu Asp Ala  Thr Leu Ile His Gln  Ser Ile Thr
    1340                1345                1350


Gly Leu  Tyr Glu Thr Arg Ile  Asp Leu Ser Gln Leu  Gly Gly Asp
    1355                1360                1365


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<213>  Streptococcus pyogenes

<400>  48

Met Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val
1               5                   10                  15


Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe
            20                  25                  30


Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile
        35                  40                  45


Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu
    50                  55                  60
```

```
Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys
65                  70                  75                  80

Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser
                85                  90                  95

Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys
            100                 105                 110

His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr
        115                 120                 125

His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp
    130                 135                 140

Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His
145                 150                 155                 160

Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro
                165                 170                 175

Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr
            180                 185                 190

Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala
        195                 200                 205

Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn
    210                 215                 220

Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn
225                 230                 235                 240

Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe
                245                 250                 255

Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp
            260                 265                 270

Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp
```

```
        275                 280                 285

Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp
    290                 295                 300

Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser
305                 310                 315                 320

Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys
                325                 330                 335

Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe
            340                 345                 350

Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser
        355                 360                 365

Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp
    370                 375                 380

Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg
385                 390                 395                 400

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
                405                 410                 415

Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe
            420                 425                 430

Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
        435                 440                 445

Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp
    450                 455                 460

Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu
465                 470                 475                 480

Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr
                485                 490                 495
```

```
Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser
            500                 505                 510

Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys
        515                 520                 525

Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln
    530                 535                 540

Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr
545                 550                 555                 560

Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp
                565                 570                 575

Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly
            580                 585                 590

Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
        595                 600                 605

Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr
    610                 615                 620

Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala
625                 630                 635                 640

His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr
                645                 650                 655

Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp
            660                 665                 670

Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe
        675                 680                 685

Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe
    690                 695                 700
```

```
Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu
705                 710                 715                 720

His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
                725                 730                 735

Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
            740                 745                 750

Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln
        755                 760                 765

Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780

Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
785                 790                 795                 800

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu
                805                 810                 815

Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg
            820                 825                 830

Leu Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys
        835                 840                 845

Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg
    850                 855                 860

Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
865                 870                 875                 880

Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys
                885                 890                 895

Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
            900                 905                 910
```

```
Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
        915                 920                 925


Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
    930                 935                 940


Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
945                 950                 955                 960


Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
                965                 970                 975


Glu Ile Asn Asn Tyr His Ala Ala His Asp Ala Tyr Leu Asn Ala Val
            980                 985                 990


Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
        995                 1000                1005


Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
    1010                1015                1020


Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
    1025                1030                1035


Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
    1040                1045                1050


Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
    1055                1060                1065


Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1070                1075                1080


Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1085                1090                1095


Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
    1100                1105                1110


Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
```

```
    1115                1120                1125

Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
    1130                1135                1140

Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
    1145                1150                1155

Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser
    1160                1165                1170

Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys
    1175                1180                1185

Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu
    1190                1195                1200

Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                1210                1215

Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
    1220                1225                1230

Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu Lys Leu  Lys Gly Ser
    1235                1240                1245

Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe Val Glu  Gln His Lys
    1250                1255                1260

His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile Ser Glu  Phe Ser Lys
    1265                1270                1275

Arg Val  Ile Leu Ala Asp Ala  Asn Leu Asp Lys Val  Leu Ser Ala
    1280                1285                1290

Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg Glu Gln  Ala Glu Asn
    1295                1300                1305

Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu Gly Ala  Pro Ala Ala
    1310                1315                1320
```

Phe Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser
    1325   1330   1335

Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His Gln Ser Ile Thr
    1340   1345   1350

Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp
    1355   1360   1365

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<212> PRT
<213> Streptococcus pyogenes

<400> 49

Met Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val
1   5   10   15

Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe
            20   25   30

Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile
        35   40   45

Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu
    50   55   60

Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys
65   70   75   80

Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser
                85   90   95

Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys
            100   105   110

His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr
        115   120   125

```
His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp
    130                 135                 140

Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His
145                 150                 155                 160

Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro
                165                 170                 175

Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr
            180                 185                 190

Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala
        195                 200                 205

Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn
    210                 215                 220

Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn
225                 230                 235                 240

Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe
                245                 250                 255

Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp
            260                 265                 270

Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp
        275                 280                 285

Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp
    290                 295                 300

Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser
305                 310                 315                 320

Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys
                325                 330                 335

Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe
```

```
            340                 345                 350

Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser
        355                 360                 365

Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp
    370                 375                 380

Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg
385                 390                 395                 400

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
                405                 410                 415

Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe
            420                 425                 430

Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
        435                 440                 445

Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp
    450                 455                 460

Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu
465                 470                 475                 480

Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr
                485                 490                 495

Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser
            500                 505                 510

Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys
        515                 520                 525

Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln
    530                 535                 540

Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr
545                 550                 555                 560
```

```
Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp
                565                 570                 575

Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly
            580                 585                 590

Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
        595                 600                 605

Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr
    610                 615                 620

Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala
625                 630                 635                 640

His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr
                645                 650                 655

Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp
            660                 665                 670

Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe
        675                 680                 685

Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe
    690                 695                 700

Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu
705                 710                 715                 720

His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
                725                 730                 735

Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
            740                 745                 750

Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln
        755                 760                 765
```

```
Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780

Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
785                 790                 795                 800

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu
                805                 810                 815

Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg
            820                 825                 830

Leu Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys
        835                 840                 845

Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg
    850                 855                 860

Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
865                 870                 875                 880

Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys
                885                 890                 895

Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
            900                 905                 910

Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
        915                 920                 925

Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
    930                 935                 940

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
945                 950                 955                 960

Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
                965                 970                 975
```

```
Glu Ile Asn Asn Tyr His His Ala His Ala Ala Tyr Leu Asn Ala Val
            980                 985                 990

Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
        995                1000                1005

Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
    1010                1015                1020

Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
    1025                1030                1035

Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
    1040                1045                1050

Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
    1055                1060                1065

Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1070                1075                1080

Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1085                1090                1095

Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
    1100                1105                1110

Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
    1115                1120                1125

Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
    1130                1135                1140

Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
    1145                1150                1155

Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser
    1160                1165                1170

Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys
```

1175 1180 1185

Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro Lys Tyr Ser Leu
1190 1195 1200

Phe Glu Leu Glu Asn Gly Arg Lys Arg Met Leu Ala Ser Ala Gly
1205 1210 1215

Glu Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro Ser Lys Tyr Val
1220 1225 1230

Asn Phe Leu Tyr Leu Ala Ser His Tyr Glu Lys Leu Lys Gly Ser
1235 1240 1245

Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val Glu Gln His Lys
1250 1255 1260

His Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser Glu Phe Ser Lys
1265 1270 1275

Arg Val Ile Leu Ala Asp Ala Asn Leu Asp Lys Val Leu Ser Ala
1280 1285 1290

Tyr Asn Lys His Arg Asp Lys Pro Ile Arg Glu Gln Ala Glu Asn
1295 1300 1305

Ile Ile His Leu Phe Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala
1310 1315 1320

Phe Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser
1325 1330 1335

Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His Gln Ser Ile Thr
1340 1345 1350

Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp
1355 1360 1365

<210> 50
<211> 1368

<212> PRT
<213> Streptococcus pyogenes

<220>
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<222> (840)..(840)
<223> Xaa can be any naturally occurring amino acid

<400> 50

Met Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val
1 5 10 15

Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe
20 25 30

Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile
35 40 45

Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu
50 55 60

Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys
65 70 75 80

Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser
85 90 95

Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys
100 105 110

His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr
115 120 125

His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp
130 135 140

Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His
145 150 155 160

Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro
165 170 175

```
Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr
            180                 185                 190

Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala
        195                 200                 205

Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn
    210                 215                 220

Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn
225                 230                 235                 240

Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe
                245                 250                 255

Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp
            260                 265                 270

Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp
        275                 280                 285

Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp
    290                 295                 300

Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser
305                 310                 315                 320

Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys
                325                 330                 335

Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe
            340                 345                 350

Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser
        355                 360                 365

Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp
    370                 375                 380
```

```
Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg
385                 390                 395                 400

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
                405                 410                 415

Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe
            420                 425                 430

Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
        435                 440                 445

Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp
    450                 455                 460

Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu
465                 470                 475                 480

Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr
                485                 490                 495

Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser
            500                 505                 510

Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys
        515                 520                 525

Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln
    530                 535                 540

Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr
545                 550                 555                 560

Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp
                565                 570                 575

Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly
            580                 585                 590
```

```
Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
        595                 600                 605

Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr
    610                 615                 620

Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala
625                 630                 635                 640

His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr
                645                 650                 655

Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp
            660                 665                 670

Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe
        675                 680                 685

Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe
    690                 695                 700

Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu
705                 710                 715                 720

His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
                725                 730                 735

Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
            740                 745                 750

Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln
        755                 760                 765

Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780

Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
785                 790                 795                 800

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu
```

```
                805                 810                 815

Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg
            820                 825                 830

Leu Ser Asp Tyr Asp Val Asp Xaa Ile Val Pro Gln Ser Phe Leu Lys
        835                 840                 845

Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg
    850                 855                 860

Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
865                 870                 875                 880

Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys
                885                 890                 895

Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
            900                 905                 910

Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
        915                 920                 925

Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
    930                 935                 940

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
945                 950                 955                 960

Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
                965                 970                 975

Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val
            980                 985                 990

Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
        995                 1000                1005

Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
    1010                1015                1020
```

```
Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
    1025                1030                1035

Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
    1040                1045                1050

Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
    1055                1060                1065

Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1070                1075                1080

Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1085                1090                1095

Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
    1100                1105                1110

Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
    1115                1120                1125

Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
    1130                1135                1140

Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
    1145                1150                1155

Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser
    1160                1165                1170

Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys
    1175                1180                1185

Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu
    1190                1195                1200

Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                1210                1215
```

Glu Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro Ser Lys Tyr Val
1220 1225 1230

Asn Phe Leu Tyr Leu Ala Ser His Tyr Glu Lys Leu Lys Gly Ser
1235 1240 1245

Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val Glu Gln His Lys
1250 1255 1260

His Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser Glu Phe Ser Lys
1265 1270 1275

Arg Val Ile Leu Ala Asp Ala Asn Leu Asp Lys Val Leu Ser Ala
1280 1285 1290

Tyr Asn Lys His Arg Asp Lys Pro Ile Arg Glu Gln Ala Glu Asn
1295 1300 1305

Ile Ile His Leu Phe Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala
1310 1315 1320

Phe Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser
1325 1330 1335

Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His Gln Ser Ile Thr
1340 1345 1350

Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp
1355 1360 1365

<210> 51
<211> 1368
<212> PRT
<213> Streptococcus pyogenes

<400> 51

Met Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val
1 5 10 15

Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe

```
            20                  25                  30

Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile
        35                  40                  45

Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu
    50                  55                  60

Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys
65                  70                  75                  80

Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser
                85                  90                  95

Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys
            100                 105                 110

His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr
        115                 120                 125

His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp
    130                 135                 140

Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His
145                 150                 155                 160

Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro
                165                 170                 175

Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr
            180                 185                 190

Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala
        195                 200                 205

Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn
    210                 215                 220

Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn
225                 230                 235                 240
```

```
Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe
                245                 250                 255

Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp
            260                 265                 270

Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp
        275                 280                 285

Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp
    290                 295                 300

Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser
305                 310                 315                 320

Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys
                325                 330                 335

Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe
            340                 345                 350

Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser
        355                 360                 365

Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp
    370                 375                 380

Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg
385                 390                 395                 400

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
                405                 410                 415

Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe
            420                 425                 430

Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
        435                 440                 445
```

```
Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp
    450                 455                 460

Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu
465                 470                 475                 480

Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr
                485                 490                 495

Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser
            500                 505                 510

Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys
        515                 520                 525

Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln
    530                 535                 540

Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr
545                 550                 555                 560

Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp
                565                 570                 575

Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly
            580                 585                 590

Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
        595                 600                 605

Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr
    610                 615                 620

Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala
625                 630                 635                 640

His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr
                645                 650                 655
```

```
Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp
            660                 665                 670

Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe
        675                 680                 685

Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe
    690                 695                 700

Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu
705                 710                 715                 720

His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
                725                 730                 735

Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
            740                 745                 750

Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln
        755                 760                 765

Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780

Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
785                 790                 795                 800

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu
                805                 810                 815

Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg
            820                 825                 830

Leu Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe Leu Lys
        835                 840                 845

Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg
    850                 855                 860

Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
```

```
865                 870                 875                 880

Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys
                885                 890                 895

Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
            900                 905                 910

Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
        915                 920                 925

Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
    930                 935                 940

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
945                 950                 955                 960

Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
                965                 970                 975

Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val
            980                 985                 990

Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
        995                 1000                1005

Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
    1010                1015                1020

Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
    1025                1030                1035

Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
    1040                1045                1050

Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
    1055                1060                1065

Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1070                1075                1080
```

```
Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1085                1090                1095

Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
    1100                1105                1110

Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
    1115                1120                1125

Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
    1130                1135                1140

Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
    1145                1150                1155

Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser
    1160                1165                1170

Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys
    1175                1180                1185

Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu
    1190                1195                1200

Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                1210                1215

Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
    1220                1225                1230

Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu Lys Leu  Lys Gly Ser
    1235                1240                1245

Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe Val Glu  Gln His Lys
    1250                1255                1260

His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile Ser Glu  Phe Ser Lys
    1265                1270                1275
```

```
Arg Val  Ile Leu Ala Asp Ala  Asn Leu Asp Lys Val  Leu Ser Ala
    1280                1285                1290


Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg Glu Gln  Ala Glu Asn
    1295                1300                1305


Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu Gly Ala  Pro Ala Ala
    1310                1315                1320


Phe Lys  Tyr Phe Asp Thr Thr  Ile Asp Arg Lys Arg  Tyr Thr Ser
    1325                1330                1335


Thr Lys  Glu Val Leu Asp Ala  Thr Leu Ile His Gln  Ser Ile Thr
    1340                1345                1350


Gly Leu  Tyr Glu Thr Arg Ile  Asp Leu Ser Gln Leu  Gly Gly Asp
    1355                1360                1365


<210>  52
<211>  1368
<212>  PRT
<213>  Streptococcus pyogenes


<220>
<221>  SITE
<222>  (864)..(864)
<223>  Xaa can be any naturally occurring amino acid

<400>  52

Met Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val
1               5                   10                  15


Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe
            20                  25                  30


Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile
        35                  40                  45


Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu
    50                  55                  60
```

```
Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys
65                  70                  75                  80

Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser
                85                  90                  95

Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys
            100                 105                 110

His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr
        115                 120                 125

His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp
    130                 135                 140

Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His
145                 150                 155                 160

Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro
                165                 170                 175

Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr
            180                 185                 190

Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala
        195                 200                 205

Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn
    210                 215                 220

Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn
225                 230                 235                 240

Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe
                245                 250                 255

Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp
            260                 265                 270
```

```
Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp
        275                 280                 285

Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp
    290                 295                 300

Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser
305                 310                 315                 320

Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys
                325                 330                 335

Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe
            340                 345                 350

Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser
        355                 360                 365

Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp
    370                 375                 380

Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg
385                 390                 395                 400

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
                405                 410                 415

Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe
            420                 425                 430

Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
        435                 440                 445

Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp
    450                 455                 460

Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu
465                 470                 475                 480

Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr
```

485 490 495

Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser
500 505 510

Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys
515 520 525

Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln
530 535 540

Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr
545 550 555 560

Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp
565 570 575

Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly
580 585 590

Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
595 600 605

Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr
610 615 620

Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala
625 630 635 640

His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr
645 650 655

Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp
660 665 670

Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe
675 680 685

Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe
690 695 700

```
Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu
705                 710                 715                 720

His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
                725                 730                 735

Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
            740                 745                 750

Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln
        755                 760                 765

Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780

Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
785                 790                 795                 800

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu
                805                 810                 815

Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg
            820                 825                 830

Leu Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys
        835                 840                 845

Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Xaa
    850                 855                 860

Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
865                 870                 875                 880

Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys
                885                 890                 895

Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
            900                 905                 910
```

```
Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
        915                 920                 925

Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
    930                 935                 940

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
945                 950                 955                 960

Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
                965                 970                 975

Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val
            980                 985                 990

Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
        995                 1000                1005

Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
    1010                1015                1020

Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
    1025                1030                1035

Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
    1040                1045                1050

Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
    1055                1060                1065

Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1070                1075                1080

Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1085                1090                1095

Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
    1100                1105                1110
```

```
Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
    1115                1120                1125

Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
    1130                1135                1140

Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
    1145                1150                1155

Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser
    1160                1165                1170

Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys
    1175                1180                1185

Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu
    1190                1195                1200

Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                1210                1215

Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
    1220                1225                1230

Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu Lys Leu  Lys Gly Ser
    1235                1240                1245

Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe Val Glu  Gln His Lys
    1250                1255                1260

His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile Ser Glu  Phe Ser Lys
    1265                1270                1275

Arg Val  Ile Leu Ala Asp Ala  Asn Leu Asp Lys Val  Leu Ser Ala
    1280                1285                1290

Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg Glu Gln  Ala Glu Asn
    1295                1300                1305

Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu Gly Ala  Pro Ala Ala
```

1310 1315 1320

Phe Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser
1325 1330 1335

Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His Gln Ser Ile Thr
1340 1345 1350

Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp
1355 1360 1365

<210> 53
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<212> PRT
<213> Streptococcus pyogenes

<400> 53

Met Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val
1 5 10 15

Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe
20 25 30

Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile
35 40 45

Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu
50 55 60

Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys
65 70 75 80

Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser
85 90 95

Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys
100 105 110

His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr
115 120 125

```
His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp
    130                 135                 140

Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His
145                 150                 155                 160

Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro
                165                 170                 175

Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr
            180                 185                 190

Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala
        195                 200                 205

Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn
    210                 215                 220

Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn
225                 230                 235                 240

Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe
                245                 250                 255

Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp
            260                 265                 270

Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp
        275                 280                 285

Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp
    290                 295                 300

Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser
305                 310                 315                 320

Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys
                325                 330                 335
```

```
Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe
            340                 345                 350

Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser
        355                 360                 365

Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp
    370                 375                 380

Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg
385                 390                 395                 400

Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu
                405                 410                 415

Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe
            420                 425                 430

Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile
        435                 440                 445

Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp
    450                 455                 460

Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu
465                 470                 475                 480

Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr
                485                 490                 495

Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser
            500                 505                 510

Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys
        515                 520                 525

Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln
    530                 535                 540

Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr
```

```
545                 550                 555                 560

Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp
                565                 570                 575

Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly
            580                 585                 590

Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp
        595                 600                 605

Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr
    610                 615                 620

Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala
625                 630                 635                 640

His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr
                645                 650                 655

Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp
            660                 665                 670

Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe
        675                 680                 685

Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe
    690                 695                 700

Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu
705                 710                 715                 720

His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly
                725                 730                 735

Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
            740                 745                 750

Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln
        755                 760                 765
```

```
Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile
    770                 775                 780

Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro
785                 790                 795                 800

Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu
                805                 810                 815

Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg
            820                 825                 830

Leu Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys
        835                 840                 845

Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Ala
    850                 855                 860

Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys
865                 870                 875                 880

Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys
                885                 890                 895

Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp
            900                 905                 910

Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr
        915                 920                 925

Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp
    930                 935                 940

Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser
945                 950                 955                 960

Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg
                965                 970                 975
```

```
Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val
            980                 985                 990

Val Gly Thr Ala Leu Ile Lys Lys  Tyr Pro Lys Leu Glu  Ser Glu Phe
        995                 1000                1005

Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val Arg Lys  Met Ile Ala
    1010                1015                1020

Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr Ala Lys  Tyr Phe Phe
    1025                1030                1035

Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr Glu Ile  Thr Leu Ala
    1040                1045                1050

Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile Glu Thr  Asn Gly Glu
    1055                1060                1065

Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg Asp Phe  Ala Thr Val
    1070                1075                1080

Arg Lys  Val Leu Ser Met Pro  Gln Val Asn Ile Val  Lys Lys Thr
    1085                1090                1095

Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu Ser Ile  Leu Pro Lys
    1100                1105                1110

Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys Lys Asp  Trp Asp Pro
    1115                1120                1125

Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr Val Ala  Tyr Ser Val
    1130                1135                1140

Leu Val  Val Ala Lys Val Glu  Lys Gly Lys Ser Lys  Lys Leu Lys
    1145                1150                1155

Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile Met Glu  Arg Ser Ser
    1160                1165                1170
```

```
Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu Ala Lys  Gly Tyr Lys
    1175                1180                1185

Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu Pro Lys  Tyr Ser Leu
    1190                1195                1200

Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met Leu Ala  Ser Ala Gly
    1205                1210                1215

Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu Pro Ser  Lys Tyr Val
    1220                1225                1230

Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu Lys Leu  Lys Gly Ser
    1235                1240                1245

Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe Val Glu  Gln His Lys
    1250                1255                1260

His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile Ser Glu  Phe Ser Lys
    1265                1270                1275

Arg Val  Ile Leu Ala Asp Ala  Asn Leu Asp Lys Val  Leu Ser Ala
    1280                1285                1290

Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg Glu Gln  Ala Glu Asn
    1295                1300                1305

Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu Gly Ala  Pro Ala Ala
    1310                1315                1320

Phe Lys  Tyr Phe Asp Thr Thr  Ile Asp Arg Lys Arg  Tyr Thr Ser
    1325                1330                1335

Thr Lys  Glu Val Leu Asp Ala  Thr Leu Ile His Gln  Ser Ile Thr
    1340                1345                1350

Gly Leu  Tyr Glu Thr Arg Ile  Asp Leu Ser Gln Leu  Gly Gly Asp
    1355                1360                1365
```

<210> 54

<211> 1367
<212> PRT
<213> Streptococcus pyogenes

<220>
<221> SITE
<222> (839)..(839)
<223> Xaa can be any naturally occurring amino acid

<400> 54

Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val Gly
1 5 10 15

Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
20 25 30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
35 40 45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
50 55 60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65 70 75 80

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe
85 90 95

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
100 105 110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
115 120 125

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
130 135 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145 150 155 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp

```
                165                 170                 175

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380
```

```
Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590
```

```
Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
        755                 760                 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800
```

```
Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815

Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp Xaa Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975

Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990

Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005

Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
```

```
    1010                1015                1020

Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035

Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
    1040                1045                1050

Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065

Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
    1070                1075                1080

Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095

Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110

Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125

Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140

Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155

Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170

Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                1210                1215
```

```
Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230


Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245


Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260


Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275


Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290


Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305


Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                1315                1320


Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Arg Tyr  Thr Ser Thr
    1325                1330                1335


Lys Glu  Val Leu Asp Ala Thr  Leu Ile His Gln Ser  Ile Thr Gly
    1340                1345                1350


Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln Leu Gly  Gly Asp
    1355                1360                1365


<210>  55
<211>  1367
<212>  PRT
<213>  Streptococcus pyogenes

<400>  55

Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val Gly
1               5                  10                  15
```

```
Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
            20                  25                  30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
        35                  40                  45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
    50                  55                  60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65                  70                  75                  80

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe
                85                  90                  95

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
            100                 105                 110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
        115                 120                 125

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
    130                 135                 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145                 150                 155                 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
                165                 170                 175

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
```

225 230 235 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
245 250 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
260 265 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
275 280 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
290 295 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305 310 315 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
325 330 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
340 345 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
355 360 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
370 375 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385 390 395 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
405 410 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
420 425 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
435 440 445

```
Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655
```

```
Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
        755                 760                 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815

Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860
```

```
Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880


Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895


Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910


Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925


His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940


Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960


Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975


Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990


Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005


Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020


Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035


Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
    1040                1045                1050


Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065


Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
```

```
    1070                1075                1080

Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095

Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110

Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125

Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140

Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155

Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170

Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                1210                1215

Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230

Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245

Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260

Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275
```

Val Ile Leu Ala Asp Ala Asn Leu Asp Lys Val Leu Ser Ala Tyr
1280 1285 1290

Asn Lys His Arg Asp Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile
1295 1300 1305

Ile His Leu Phe Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala Phe
1310 1315 1320

Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser Thr
1325 1330 1335

Lys Glu Val Leu Asp Ala Thr Leu Ile His Gln Ser Ile Thr Gly
1340 1345 1350

Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp
1355 1360 1365

<210> 56
<211> 1367
<212> PRT
<213> Streptococcus pyogenes

<220>
<221> SITE
<222> (863)..(863)
<223> Xaa can be any naturally occurring amino acid

<400> 56

Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val Gly
1 5 10 15

Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
20 25 30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
35 40 45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
50 55 60

```
Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65                  70                  75                  80

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe
                85                  90                  95

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
            100                 105                 110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
        115                 120                 125

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
    130                 135                 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145                 150                 155                 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
                165                 170                 175

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270
```

```
Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480
```

```
Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
```

```
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
        755                 760                 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815

Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Xaa Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910
```

```
Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975

Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990

Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005

Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020

Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035

Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
    1040                1045                1050

Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065

Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
    1070                1075                1080

Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095

Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110
```

```
Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125

Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140

Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155

Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170

Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                1210                1215

Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230

Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245

Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260

Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275

Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290

Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305
```

Ile His Leu Phe Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala Phe
    1310   1315   1320

Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser Thr
    1325   1330   1335

Lys Glu Val Leu Asp Ala Thr Leu Ile His Gln Ser Ile Thr Gly
    1340   1345   1350

Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp
    1355   1360   1365

<210> 57
<211> 1367
<212> PRT
<213> Streptococcus pyogenes

<400> 57

Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val Gly
1   5   10   15

Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
            20   25   30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
        35   40   45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
    50   55   60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65   70   75   80

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe
                85   90   95

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
            100   105   110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
        115   120   125

```
Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
    130                 135                 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145                 150                 155                 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
                165                 170                 175

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335
```

```
Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540
```

```
Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
```

```
        755                 760                 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815

Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Ala Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975
```

```
Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990


Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005


Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020


Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035


Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
    1040                1045                1050


Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065


Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
    1070                1075                1080


Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095


Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110


Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125


Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140


Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155


Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170
```

```
Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                1210                1215

Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230

Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245

Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260

Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275

Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290

Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305

Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                1315                1320

Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Arg Tyr  Thr Ser Thr
    1325                1330                1335

Lys Glu  Val Leu Asp Ala Thr  Leu Ile His Gln Ser  Ile Thr Gly
    1340                1345                1350

Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln Leu Gly  Gly Asp
    1355                1360                1365
```

<210> 58
<211> 1053
<212> PRT
<213> Staphylococcus aureus

<400> 58

Met Gly Lys Arg Asn Tyr Ile Leu Gly Leu Asp Ile Gly Ile Thr Ser
1 5 10 15

Val Gly Tyr Gly Ile Ile Asp Tyr Glu Thr Arg Asp Val Ile Asp Ala
20 25 30

Gly Val Arg Leu Phe Lys Glu Ala Asn Val Glu Asn Asn Glu Gly Arg
35 40 45

Arg Ser Lys Arg Gly Ala Arg Arg Leu Lys Arg Arg Arg Arg His Arg
50 55 60

Ile Gln Arg Val Lys Lys Leu Leu Phe Asp Tyr Asn Leu Leu Thr Asp
65 70 75 80

His Ser Glu Leu Ser Gly Ile Asn Pro Tyr Glu Ala Arg Val Lys Gly
85 90 95

Leu Ser Gln Lys Leu Ser Glu Glu Glu Phe Ser Ala Ala Leu Leu His
100 105 110

Leu Ala Lys Arg Arg Gly Val His Asn Val Asn Glu Val Glu Glu Asp
115 120 125

Thr Gly Asn Glu Leu Ser Thr Lys Glu Gln Ile Ser Arg Asn Ser Lys
130 135 140

Ala Leu Glu Glu Lys Tyr Val Ala Glu Leu Gln Leu Glu Arg Leu Lys
145 150 155 160

Lys Asp Gly Glu Val Arg Gly Ser Ile Asn Arg Phe Lys Thr Ser Asp
165 170 175

Tyr Val Lys Glu Ala Lys Gln Leu Leu Lys Val Gln Lys Ala Tyr His
180 185 190

```
Gln Leu Asp Gln Ser Phe Ile Asp Thr Tyr Ile Asp Leu Leu Glu Thr
        195                 200                 205

Arg Arg Thr Tyr Tyr Glu Gly Pro Gly Glu Gly Ser Pro Phe Gly Trp
    210                 215                 220

Lys Asp Ile Lys Glu Trp Tyr Glu Met Leu Met Gly His Cys Thr Tyr
225                 230                 235                 240

Phe Pro Glu Glu Leu Arg Ser Val Lys Tyr Ala Tyr Asn Ala Asp Leu
                245                 250                 255

Tyr Asn Ala Leu Asn Asp Leu Asn Asn Leu Val Ile Thr Arg Asp Glu
            260                 265                 270

Asn Glu Lys Leu Glu Tyr Tyr Glu Lys Phe Gln Ile Ile Glu Asn Val
        275                 280                 285

Phe Lys Gln Lys Lys Lys Pro Thr Leu Lys Gln Ile Ala Lys Glu Ile
    290                 295                 300

Leu Val Asn Glu Glu Asp Ile Lys Gly Tyr Arg Val Thr Ser Thr Gly
305                 310                 315                 320

Lys Pro Glu Phe Thr Asn Leu Lys Val Tyr His Asp Ile Lys Asp Ile
                325                 330                 335

Thr Ala Arg Lys Glu Ile Ile Glu Asn Ala Glu Leu Leu Asp Gln Ile
            340                 345                 350

Ala Lys Ile Leu Thr Ile Tyr Gln Ser Ser Glu Asp Ile Gln Glu Glu
        355                 360                 365

Leu Thr Asn Leu Asn Ser Glu Leu Thr Gln Glu Glu Ile Glu Gln Ile
    370                 375                 380

Ser Asn Leu Lys Gly Tyr Thr Gly Thr His Asn Leu Ser Leu Lys Ala
385                 390                 395                 400
```

```
Ile Asn Leu Ile Leu Asp Glu Leu Trp His Thr Asn Asp Asn Gln Ile
                405                 410                 415

Ala Ile Phe Asn Arg Leu Lys Leu Val Pro Lys Lys Val Asp Leu Ser
            420                 425                 430

Gln Gln Lys Glu Ile Pro Thr Thr Leu Val Asp Asp Phe Ile Leu Ser
        435                 440                 445

Pro Val Val Lys Arg Ser Phe Ile Gln Ser Ile Lys Val Ile Asn Ala
    450                 455                 460

Ile Ile Lys Lys Tyr Gly Leu Pro Asn Asp Ile Ile Ile Glu Leu Ala
465                 470                 475                 480

Arg Glu Lys Asn Ser Lys Asp Ala Gln Lys Met Ile Asn Glu Met Gln
                485                 490                 495

Lys Arg Asn Arg Gln Thr Asn Glu Arg Ile Glu Glu Ile Ile Arg Thr
            500                 505                 510

Thr Gly Lys Glu Asn Ala Lys Tyr Leu Ile Glu Lys Ile Lys Leu His
        515                 520                 525

Asp Met Gln Glu Gly Lys Cys Leu Tyr Ser Leu Glu Ala Ile Pro Leu
    530                 535                 540

Glu Asp Leu Leu Asn Asn Pro Phe Asn Tyr Glu Val Asp His Ile Ile
545                 550                 555                 560

Pro Arg Ser Val Ser Phe Asp Asn Ser Phe Asn Asn Lys Val Leu Val
                565                 570                 575

Lys Gln Glu Glu Asn Ser Lys Lys Gly Asn Arg Thr Pro Phe Gln Tyr
            580                 585                 590

Leu Ser Ser Ser Asp Ser Lys Ile Ser Tyr Glu Thr Phe Lys Lys His
        595                 600                 605
```

```
Ile Leu Asn Leu Ala Lys Gly Lys Gly Arg Ile Ser Lys Thr Lys Lys
    610                 615                 620

Glu Tyr Leu Leu Glu Glu Arg Asp Ile Asn Arg Phe Ser Val Gln Lys
625                 630                 635                 640

Asp Phe Ile Asn Arg Asn Leu Val Asp Thr Arg Tyr Ala Thr Arg Gly
                645                 650                 655

Leu Met Asn Leu Leu Arg Ser Tyr Phe Arg Val Asn Asn Leu Asp Val
            660                 665                 670

Lys Val Lys Ser Ile Asn Gly Gly Phe Thr Ser Phe Leu Arg Arg Lys
        675                 680                 685

Trp Lys Phe Lys Lys Glu Arg Asn Lys Gly Tyr Lys His His Ala Glu
    690                 695                 700

Asp Ala Leu Ile Ile Ala Asn Ala Asp Phe Ile Phe Lys Glu Trp Lys
705                 710                 715                 720

Lys Leu Asp Lys Ala Lys Lys Val Met Glu Asn Gln Met Phe Glu Glu
                725                 730                 735

Lys Gln Ala Glu Ser Met Pro Glu Ile Glu Thr Glu Gln Glu Tyr Lys
            740                 745                 750

Glu Ile Phe Ile Thr Pro His Gln Ile Lys His Ile Lys Asp Phe Lys
        755                 760                 765

Asp Tyr Lys Tyr Ser His Arg Val Asp Lys Lys Pro Asn Arg Lys Leu
    770                 775                 780

Ile Asn Asp Thr Leu Tyr Ser Thr Arg Lys Asp Asp Lys Gly Asn Thr
785                 790                 795                 800

Leu Ile Val Asn Asn Leu Asn Gly Leu Tyr Asp Lys Asp Asn Asp Lys
                805                 810                 815

Leu Lys Lys Leu Ile Asn Lys Ser Pro Glu Lys Leu Leu Met Tyr His
```

```
            820                 825                 830

His Asp Pro Gln Thr Tyr Gln Lys Leu Lys Leu Ile Met Glu Gln Tyr
        835                 840                 845

Gly Asp Glu Lys Asn Pro Leu Tyr Lys Tyr Tyr Glu Glu Thr Gly Asn
    850                 855                 860

Tyr Leu Thr Lys Tyr Ser Lys Lys Asp Asn Gly Pro Val Ile Lys Lys
865                 870                 875                 880

Ile Lys Tyr Tyr Gly Asn Lys Leu Asn Ala His Leu Asp Ile Thr Asp
                885                 890                 895

Asp Tyr Pro Asn Ser Arg Asn Lys Val Val Lys Leu Ser Leu Lys Pro
            900                 905                 910

Tyr Arg Phe Asp Val Tyr Leu Asp Asn Gly Val Tyr Lys Phe Val Thr
        915                 920                 925

Val Lys Asn Leu Asp Val Ile Lys Lys Glu Asn Tyr Tyr Glu Val Asn
    930                 935                 940

Ser Lys Cys Tyr Glu Glu Ala Lys Lys Leu Lys Lys Ile Ser Asn Gln
945                 950                 955                 960

Ala Glu Phe Ile Ala Ser Phe Tyr Lys Asn Asp Leu Ile Lys Ile Asn
                965                 970                 975

Gly Glu Leu Tyr Arg Val Ile Gly Val Asn Asn Asp Leu Leu Asn Arg
            980                 985                 990

Ile Glu Val Asn Met Ile Asp Ile  Thr Tyr Arg Glu Tyr  Leu Glu Asn
        995                 1000                1005

Met Asn  Asp Lys Arg Pro Pro  His Ile Ile Lys Thr  Ile Ala Ser
    1010                1015                1020

Lys Thr  Gln Ser Ile Lys Lys  Tyr Ser Thr Asp Ile  Leu Gly Asn
    1025                1030                1035
```

Leu Tyr Glu Val Lys Ser Lys Lys His Pro Gln Ile Ile Lys Lys
1040 1045 1050

<210> 59
<211> 1082
<212> PRT
<213> N. meningitidis

<400> 59

Met Ala Ala Phe Lys Pro Asn Ser Ile Asn Tyr Ile Leu Gly Leu Asp
1 5 10 15

Ile Gly Ile Ala Ser Val Gly Trp Ala Met Val Glu Ile Asp Glu Glu
20 25 30

Glu Asn Pro Ile Arg Leu Ile Asp Leu Gly Val Arg Val Phe Glu Arg
35 40 45

Ala Glu Val Pro Lys Thr Gly Asp Ser Leu Ala Met Ala Arg Arg Leu
50 55 60

Ala Arg Ser Val Arg Arg Leu Thr Arg Arg Arg Ala His Arg Leu Leu
65 70 75 80

Arg Thr Arg Arg Leu Leu Lys Arg Glu Gly Val Leu Gln Ala Ala Asn
85 90 95

Phe Asp Glu Asn Gly Leu Ile Lys Ser Leu Pro Asn Thr Pro Trp Gln
100 105 110

Leu Arg Ala Ala Ala Leu Asp Arg Lys Leu Thr Pro Leu Glu Trp Ser
115 120 125

Ala Val Leu Leu His Leu Ile Lys His Arg Gly Tyr Leu Ser Gln Arg
130 135 140

Lys Asn Glu Gly Glu Thr Ala Asp Lys Glu Leu Gly Ala Leu Leu Lys
145 150 155 160

```
Gly Val Ala Gly Asn Ala His Ala Leu Gln Thr Gly Asp Phe Arg Thr
                165                 170                 175

Pro Ala Glu Leu Ala Leu Asn Lys Phe Glu Lys Glu Ser Gly His Ile
            180                 185                 190

Arg Asn Gln Arg Ser Asp Tyr Ser His Thr Phe Ser Arg Lys Asp Leu
        195                 200                 205

Gln Ala Glu Leu Ile Leu Leu Phe Glu Lys Gln Lys Glu Phe Gly Asn
    210                 215                 220

Pro His Val Ser Gly Gly Leu Lys Glu Gly Ile Glu Thr Leu Leu Met
225                 230                 235                 240

Thr Gln Arg Pro Ala Leu Ser Gly Asp Ala Val Gln Lys Met Leu Gly
                245                 250                 255

His Cys Thr Phe Glu Pro Ala Glu Pro Lys Ala Ala Lys Asn Thr Tyr
            260                 265                 270

Thr Ala Glu Arg Phe Ile Trp Leu Thr Lys Leu Asn Asn Leu Arg Ile
        275                 280                 285

Leu Glu Gln Gly Ser Glu Arg Pro Leu Thr Asp Thr Glu Arg Ala Thr
    290                 295                 300

Leu Met Asp Glu Pro Tyr Arg Lys Ser Lys Leu Thr Tyr Ala Gln Ala
305                 310                 315                 320

Arg Lys Leu Leu Gly Leu Glu Asp Thr Ala Phe Phe Lys Gly Leu Arg
                325                 330                 335

Tyr Gly Lys Asp Asn Ala Glu Ala Ser Thr Leu Met Glu Met Lys Ala
            340                 345                 350

Tyr His Ala Ile Ser Arg Ala Leu Glu Lys Glu Gly Leu Lys Asp Lys
        355                 360                 365

Lys Ser Pro Leu Asn Leu Ser Pro Glu Leu Gln Asp Glu Ile Gly Thr
```

```
    370                 375                 380

Ala Phe Ser Leu Phe Lys Thr Asp Glu Asp Ile Thr Gly Arg Leu Lys
385                 390                 395                 400

Asp Arg Ile Gln Pro Glu Ile Leu Glu Ala Leu Leu Lys His Ile Ser
                405                 410                 415

Phe Asp Lys Phe Val Gln Ile Ser Leu Lys Ala Leu Arg Arg Ile Val
            420                 425                 430

Pro Leu Met Glu Gln Gly Lys Arg Tyr Asp Glu Ala Cys Ala Glu Ile
        435                 440                 445

Tyr Gly Asp His Tyr Gly Lys Lys Asn Thr Glu Glu Lys Ile Tyr Leu
    450                 455                 460

Pro Pro Ile Pro Ala Asp Glu Ile Arg Asn Pro Val Val Leu Arg Ala
465                 470                 475                 480

Leu Ser Gln Ala Arg Lys Val Ile Asn Gly Val Val Arg Arg Tyr Gly
                485                 490                 495

Ser Pro Ala Arg Ile His Ile Glu Thr Ala Arg Glu Val Gly Lys Ser
            500                 505                 510

Phe Lys Asp Arg Lys Glu Ile Glu Lys Arg Gln Glu Glu Asn Arg Lys
        515                 520                 525

Asp Arg Glu Lys Ala Ala Ala Lys Phe Arg Glu Tyr Phe Pro Asn Phe
    530                 535                 540

Val Gly Glu Pro Lys Ser Lys Asp Ile Leu Lys Leu Arg Leu Tyr Glu
545                 550                 555                 560

Gln Gln His Gly Lys Cys Leu Tyr Ser Gly Lys Glu Ile Asn Leu Gly
                565                 570                 575

Arg Leu Asn Glu Lys Gly Tyr Val Glu Ile Asp Ala Ala Leu Pro Phe
            580                 585                 590
```

```
Ser Arg Thr Trp Asp Asp Ser Phe Asn Asn Lys Val Leu Val Leu Gly
        595                 600                 605

Ser Glu Asn Gln Asn Lys Gly Asn Gln Thr Pro Tyr Glu Tyr Phe Asn
    610                 615                 620

Gly Lys Asp Asn Ser Arg Glu Trp Gln Glu Phe Lys Ala Arg Val Glu
625                 630                 635                 640

Thr Ser Arg Phe Pro Arg Ser Lys Lys Gln Arg Ile Leu Leu Gln Lys
                645                 650                 655

Phe Asp Glu Asp Gly Phe Lys Glu Arg Asn Leu Asn Asp Thr Arg Tyr
            660                 665                 670

Val Asn Arg Phe Leu Cys Gln Phe Val Ala Asp Arg Met Arg Leu Thr
        675                 680                 685

Gly Lys Gly Lys Lys Arg Val Phe Ala Ser Asn Gly Gln Ile Thr Asn
    690                 695                 700

Leu Leu Arg Gly Phe Trp Gly Leu Arg Lys Val Arg Ala Glu Asn Asp
705                 710                 715                 720

Arg His His Ala Leu Asp Ala Val Val Val Ala Cys Ser Thr Val Ala
                725                 730                 735

Met Gln Gln Lys Ile Thr Arg Phe Val Arg Tyr Lys Glu Met Asn Ala
            740                 745                 750

Phe Asp Gly Lys Thr Ile Asp Lys Glu Thr Gly Glu Val Leu His Gln
        755                 760                 765

Lys Thr His Phe Pro Gln Pro Trp Glu Phe Phe Ala Gln Glu Val Met
    770                 775                 780

Ile Arg Val Phe Gly Lys Pro Asp Gly Lys Pro Glu Phe Glu Glu Ala
785                 790                 795                 800
```

```
Asp Thr Leu Glu Lys Leu Arg Thr Leu Leu Ala Glu Lys Leu Ser Ser
                805                 810                 815

Arg Pro Glu Ala Val His Glu Tyr Val Thr Pro Leu Phe Val Ser Arg
            820                 825                 830

Ala Pro Asn Arg Lys Met Ser Gly Gln Gly His Met Glu Thr Val Lys
        835                 840                 845

Ser Ala Lys Arg Leu Asp Glu Gly Val Ser Val Leu Arg Val Pro Leu
    850                 855                 860

Thr Gln Leu Lys Leu Lys Asp Leu Glu Lys Met Val Asn Arg Glu Arg
865                 870                 875                 880

Glu Pro Lys Leu Tyr Glu Ala Leu Lys Ala Arg Leu Glu Ala His Lys
                885                 890                 895

Asp Asp Pro Ala Lys Ala Phe Ala Glu Pro Phe Tyr Lys Tyr Asp Lys
            900                 905                 910

Ala Gly Asn Arg Thr Gln Gln Val Lys Ala Val Arg Val Glu Gln Val
        915                 920                 925

Gln Lys Thr Gly Val Trp Val Arg Asn His Asn Gly Ile Ala Asp Asn
    930                 935                 940

Ala Thr Met Val Arg Val Asp Val Phe Glu Lys Gly Asp Lys Tyr Tyr
945                 950                 955                 960

Leu Val Pro Ile Tyr Ser Trp Gln Val Ala Lys Gly Ile Leu Pro Asp
                965                 970                 975

Arg Ala Val Val Gln Gly Lys Asp Glu Glu Asp Trp Gln Leu Ile Asp
            980                 985                 990

Asp Ser Phe Asn Phe Lys Phe Ser  Leu His Pro Asn Asp  Leu Val Glu
        995                 1000                1005
```

Val Ile Thr Lys Lys Ala Arg Met Phe Gly Tyr Phe Ala Ser Cys
    1010   1015   1020

His Arg Gly Thr Gly Asn Ile Asn Ile Arg Ile His Asp Leu Asp
    1025   1030   1035

His Lys Ile Gly Lys Asn Gly Ile Leu Glu Gly Ile Gly Val Lys
    1040   1045   1050

Thr Ala Leu Ser Phe Gln Lys Tyr Gln Ile Asp Glu Leu Gly Lys
    1055   1060   1065

Glu Ile Arg Pro Cys Arg Leu Lys Lys Arg Pro Pro Val Arg
    1070   1075   1080

<210> 60
<211> 984
<212> PRT
<213> C. jejuni

<400> 60

Met Ala Arg Ile Leu Ala Phe Asp Ile Gly Ile Ser Ser Ile Gly Trp
1   5   10   15

Ala Phe Ser Glu Asn Asp Glu Leu Lys Asp Cys Gly Val Arg Ile Phe
            20   25   30

Thr Lys Val Glu Asn Pro Lys Thr Gly Glu Ser Leu Ala Leu Pro Arg
        35   40   45

Arg Leu Ala Arg Ser Ala Arg Lys Arg Leu Ala Arg Arg Lys Ala Arg
    50   55   60

Leu Asn His Leu Lys His Leu Ile Ala Asn Glu Phe Lys Leu Asn Tyr
65   70   75   80

Glu Asp Tyr Gln Ser Phe Asp Glu Ser Leu Ala Lys Ala Tyr Lys Gly
                85   90   95

Ser Leu Ile Ser Pro Tyr Glu Leu Arg Phe Arg Ala Leu Asn Glu Leu
            100   105   110

```
Leu Ser Lys Gln Asp Phe Ala Arg Val Ile Leu His Ile Ala Lys Arg
        115                 120                 125

Arg Gly Tyr Asp Asp Ile Lys Asn Ser Asp Asp Lys Glu Lys Gly Ala
    130                 135                 140

Ile Leu Lys Ala Ile Lys Gln Asn Glu Glu Lys Leu Ala Asn Tyr Gln
145                 150                 155                 160

Ser Val Gly Glu Tyr Leu Tyr Lys Glu Tyr Phe Gln Lys Phe Lys Glu
                165                 170                 175

Asn Ser Lys Glu Phe Thr Asn Val Arg Asn Lys Lys Glu Ser Tyr Glu
            180                 185                 190

Arg Cys Ile Ala Gln Ser Phe Leu Lys Asp Glu Leu Lys Leu Ile Phe
        195                 200                 205

Lys Lys Gln Arg Glu Phe Gly Phe Ser Phe Ser Lys Lys Phe Glu Glu
    210                 215                 220

Glu Val Leu Ser Val Ala Phe Tyr Lys Arg Ala Leu Lys Asp Phe Ser
225                 230                 235                 240

His Leu Val Gly Asn Cys Ser Phe Phe Thr Asp Glu Lys Arg Ala Pro
                245                 250                 255

Lys Asn Ser Pro Leu Ala Phe Met Phe Val Ala Leu Thr Arg Ile Ile
            260                 265                 270

Asn Leu Leu Asn Asn Leu Lys Asn Thr Glu Gly Ile Leu Tyr Thr Lys
        275                 280                 285

Asp Asp Leu Asn Ala Leu Leu Asn Glu Val Leu Lys Asn Gly Thr Leu
    290                 295                 300

Thr Tyr Lys Gln Thr Lys Lys Leu Leu Gly Leu Ser Asp Asp Tyr Glu
305                 310                 315                 320
```

```
Phe Lys Gly Glu Lys Gly Thr Tyr Phe Ile Glu Phe Lys Lys Tyr Lys
                325                 330                 335

Glu Phe Ile Lys Ala Leu Gly Glu His Asn Leu Ser Gln Asp Asp Leu
            340                 345                 350

Asn Glu Ile Ala Lys Asp Ile Thr Leu Ile Lys Asp Glu Ile Lys Leu
        355                 360                 365

Lys Lys Ala Leu Ala Lys Tyr Asp Leu Asn Gln Asn Gln Ile Asp Ser
    370                 375                 380

Leu Ser Lys Leu Glu Phe Lys Asp His Leu Asn Ile Ser Phe Lys Ala
385                 390                 395                 400

Leu Lys Leu Val Thr Pro Leu Met Leu Glu Gly Lys Lys Tyr Asp Glu
                405                 410                 415

Ala Cys Asn Glu Leu Asn Leu Lys Val Ala Ile Asn Glu Asp Lys Lys
            420                 425                 430

Asp Phe Leu Pro Ala Phe Asn Glu Thr Tyr Tyr Lys Asp Glu Val Thr
        435                 440                 445

Asn Pro Val Val Leu Arg Ala Ile Lys Glu Tyr Arg Lys Val Leu Asn
    450                 455                 460

Ala Leu Leu Lys Lys Tyr Gly Lys Val His Lys Ile Asn Ile Glu Leu
465                 470                 475                 480

Ala Arg Glu Val Gly Lys Asn His Ser Gln Arg Ala Lys Ile Glu Lys
                485                 490                 495

Glu Gln Asn Glu Asn Tyr Lys Ala Lys Lys Asp Ala Glu Leu Glu Cys
            500                 505                 510

Glu Lys Leu Gly Leu Lys Ile Asn Ser Lys Asn Ile Leu Lys Leu Arg
        515                 520                 525
```

```
Leu Phe Lys Glu Gln Lys Glu Phe Cys Ala Tyr Ser Gly Glu Lys Ile
    530                 535                 540

Lys Ile Ser Asp Leu Gln Asp Glu Lys Met Leu Glu Ile Asp His Ile
545                 550                 555                 560

Tyr Pro Tyr Ser Arg Ser Phe Asp Asp Ser Tyr Met Asn Lys Val Leu
                565                 570                 575

Val Phe Thr Lys Gln Asn Gln Glu Lys Leu Asn Gln Thr Pro Phe Glu
            580                 585                 590

Ala Phe Gly Asn Asp Ser Ala Lys Trp Gln Lys Ile Glu Val Leu Ala
        595                 600                 605

Lys Asn Leu Pro Thr Lys Lys Gln Lys Arg Ile Leu Asp Lys Asn Tyr
    610                 615                 620

Lys Asp Lys Glu Gln Lys Asn Phe Lys Asp Arg Asn Leu Asn Asp Thr
625                 630                 635                 640

Arg Tyr Ile Ala Arg Leu Val Leu Asn Tyr Thr Lys Asp Tyr Leu Asp
                645                 650                 655

Phe Leu Pro Leu Ser Asp Asp Glu Asn Thr Lys Leu Asn Asp Thr Gln
            660                 665                 670

Lys Gly Ser Lys Val His Val Glu Ala Lys Ser Gly Met Leu Thr Ser
        675                 680                 685

Ala Leu Arg His Thr Trp Gly Phe Ser Ala Lys Asp Arg Asn Asn His
    690                 695                 700

Leu His His Ala Ile Asp Ala Val Ile Ile Ala Tyr Ala Asn Asn Ser
705                 710                 715                 720

Ile Val Lys Ala Phe Ser Asp Phe Lys Lys Glu Gln Glu Ser Asn Ser
                725                 730                 735

Ala Glu Leu Tyr Ala Lys Lys Ile Ser Glu Leu Asp Tyr Lys Asn Lys
```

```
            740                 745                 750

Arg Lys Phe Phe Glu Pro Phe Ser Gly Phe Arg Gln Lys Val Leu Asp
        755                 760                 765

Lys Ile Asp Glu Ile Phe Val Ser Lys Pro Glu Arg Lys Lys Pro Ser
    770                 775                 780

Gly Ala Leu His Glu Glu Thr Phe Arg Lys Glu Glu Glu Phe Tyr Gln
785                 790                 795                 800

Ser Tyr Gly Gly Lys Glu Gly Val Leu Lys Ala Leu Glu Leu Gly Lys
                805                 810                 815

Ile Arg Lys Val Asn Gly Lys Ile Val Lys Asn Gly Asp Met Phe Arg
            820                 825                 830

Val Asp Ile Phe Lys His Lys Lys Thr Asn Lys Phe Tyr Ala Val Pro
        835                 840                 845

Ile Tyr Thr Met Asp Phe Ala Leu Lys Val Leu Pro Asn Lys Ala Val
    850                 855                 860

Ala Arg Ser Lys Lys Gly Glu Ile Lys Asp Trp Ile Leu Met Asp Glu
865                 870                 875                 880

Asn Tyr Glu Phe Cys Phe Ser Leu Tyr Lys Asp Ser Leu Ile Leu Ile
                885                 890                 895

Gln Thr Lys Asp Met Gln Glu Pro Glu Phe Val Tyr Tyr Asn Ala Phe
            900                 905                 910

Thr Ser Ser Thr Val Ser Leu Ile Val Ser Lys His Asp Asn Lys Phe
        915                 920                 925

Glu Thr Leu Ser Lys Asn Gln Lys Ile Leu Phe Lys Asn Ala Asn Glu
    930                 935                 940

Lys Glu Val Ile Ala Lys Ser Ile Gly Ile Gln Asn Leu Lys Val Phe
945                 950                 955                 960
```

```
Glu Lys Tyr Ile Val Ser Ala Leu Gly Glu Val Thr Lys Ala Glu Phe
                965                 970                 975


Arg Gln Arg Glu Asp Phe Lys Lys
            980
```

<210> 61
<211> 1087
<212> PRT
<213> G. stearothermophilus

<400> 61

```
Met Arg Tyr Lys Ile Gly Leu Asp Ile Gly Ile Thr Ser Val Gly Trp
1               5                   10                  15


Ala Val Met Asn Leu Asp Ile Pro Arg Ile Glu Asp Leu Gly Val Arg
            20                  25                  30


Ile Phe Asp Arg Ala Glu Asn Pro Gln Thr Gly Glu Ser Leu Ala Leu
        35                  40                  45


Pro Arg Arg Leu Ala Arg Ser Ala Arg Arg Arg Leu Arg Arg Arg Lys
    50                  55                  60


His Arg Leu Glu Arg Ile Arg Arg Leu Val Ile Arg Glu Gly Ile Leu
65                  70                  75                  80


Thr Lys Glu Glu Leu Asp Lys Leu Phe Glu Glu Lys His Glu Ile Asp
                85                  90                  95


Val Trp Gln Leu Arg Val Glu Ala Leu Asp Arg Lys Leu Asn Asn Asp
            100                 105                 110


Glu Leu Ala Arg Val Leu Leu His Leu Ala Lys Arg Arg Gly Phe Lys
        115                 120                 125


Ser Asn Arg Lys Ser Glu Arg Ser Asn Lys Glu Asn Ser Thr Met Leu
    130                 135                 140
```

```
Lys His Ile Glu Glu Asn Arg Ala Ile Leu Ser Ser Tyr Arg Thr Val
145                 150                 155                 160

Gly Glu Met Ile Val Lys Asp Pro Lys Phe Ala Leu His Lys Arg Asn
                165                 170                 175

Lys Gly Glu Asn Tyr Thr Asn Thr Ile Ala Arg Asp Asp Leu Glu Arg
            180                 185                 190

Glu Ile Arg Leu Ile Phe Ser Lys Gln Arg Glu Phe Gly Asn Met Ser
        195                 200                 205

Cys Thr Glu Glu Phe Glu Asn Glu Tyr Ile Thr Ile Trp Ala Ser Gln
    210                 215                 220

Arg Pro Val Ala Ser Lys Asp Asp Ile Glu Lys Lys Val Gly Phe Cys
225                 230                 235                 240

Thr Phe Glu Pro Lys Glu Lys Arg Ala Pro Lys Ala Thr Tyr Thr Phe
                245                 250                 255

Gln Ser Phe Ile Ala Trp Glu His Ile Asn Lys Leu Arg Leu Ile Ser
            260                 265                 270

Pro Ser Gly Ala Arg Gly Leu Thr Asp Glu Glu Arg Arg Leu Leu Tyr
        275                 280                 285

Glu Gln Ala Phe Gln Lys Asn Lys Ile Thr Tyr His Asp Ile Arg Thr
    290                 295                 300

Leu Leu His Leu Pro Asp Asp Thr Tyr Phe Lys Gly Ile Val Tyr Asp
305                 310                 315                 320

Arg Gly Glu Ser Arg Lys Gln Asn Glu Asn Ile Arg Phe Leu Glu Leu
                325                 330                 335

Asp Ala Tyr His Gln Ile Arg Lys Ala Val Asp Lys Val Tyr Gly Lys
            340                 345                 350

Gly Lys Ser Ser Ser Phe Leu Pro Ile Asp Phe Asp Thr Phe Gly Tyr
```

```
        355                 360                 365

Ala Leu Thr Leu Phe Lys Asp Asp Ala Asp Ile His Ser Tyr Leu Arg
    370                 375                 380

Asn Glu Tyr Glu Gln Asn Gly Lys Arg Met Pro Asn Leu Ala Asn Lys
385                 390                 395                 400

Val Tyr Asp Asn Glu Leu Ile Glu Glu Leu Leu Asn Leu Ser Phe Thr
                405                 410                 415

Lys Phe Gly His Leu Ser Leu Lys Ala Leu Arg Ser Ile Leu Pro Tyr
            420                 425                 430

Met Glu Gln Gly Glu Val Tyr Ser Ser Ala Cys Glu Arg Ala Gly Tyr
        435                 440                 445

Thr Phe Thr Gly Pro Lys Lys Lys Gln Lys Thr Met Leu Leu Pro Asn
    450                 455                 460

Ile Pro Pro Ile Ala Asn Pro Val Val Met Arg Ala Leu Thr Gln Ala
465                 470                 475                 480

Arg Lys Val Val Asn Ala Ile Ile Lys Lys Tyr Gly Ser Pro Val Ser
                485                 490                 495

Ile His Ile Glu Leu Ala Arg Asp Leu Ser Gln Thr Phe Asp Glu Arg
            500                 505                 510

Arg Lys Thr Lys Lys Glu Gln Asp Glu Asn Arg Lys Lys Asn Glu Thr
        515                 520                 525

Ala Ile Arg Gln Leu Met Glu Tyr Gly Leu Thr Leu Asn Pro Thr Gly
    530                 535                 540

His Asp Ile Val Lys Phe Lys Leu Trp Ser Glu Gln Asn Gly Arg Cys
545                 550                 555                 560

Ala Tyr Ser Leu Gln Pro Ile Glu Ile Glu Arg Leu Leu Glu Pro Gly
                565                 570                 575
```

```
Tyr Val Glu Val Asp His Val Ile Pro Tyr Ser Arg Ser Leu Asp Asp
            580                 585                 590

Ser Tyr Thr Asn Lys Val Leu Val Leu Thr Arg Glu Asn Arg Glu Lys
        595                 600                 605

Gly Asn Arg Ile Pro Ala Glu Tyr Leu Gly Val Gly Thr Glu Arg Trp
    610                 615                 620

Gln Gln Phe Glu Thr Phe Val Leu Thr Asn Lys Gln Phe Ser Lys Lys
625                 630                 635                 640

Lys Arg Asp Arg Leu Leu Arg Leu His Tyr Asp Glu Asn Glu Glu Thr
                645                 650                 655

Glu Phe Lys Asn Arg Asn Leu Asn Asp Thr Arg Tyr Ile Ser Arg Phe
            660                 665                 670

Phe Ala Asn Phe Ile Arg Glu His Leu Lys Phe Ala Glu Ser Asp Asp
        675                 680                 685

Lys Gln Lys Val Tyr Thr Val Asn Gly Arg Val Thr Ala His Leu Arg
    690                 695                 700

Ser Arg Trp Glu Phe Asn Lys Asn Arg Glu Glu Ser Asp Leu His His
705                 710                 715                 720

Ala Val Asp Ala Val Ile Val Ala Cys Thr Thr Pro Ser Asp Ile Ala
                725                 730                 735

Lys Val Thr Ala Phe Tyr Gln Arg Arg Glu Gln Asn Lys Glu Leu Ala
            740                 745                 750

Lys Lys Thr Glu Pro His Phe Pro Gln Pro Trp Pro His Phe Ala Asp
        755                 760                 765

Glu Leu Arg Ala Arg Leu Ser Lys His Pro Lys Glu Ser Ile Lys Ala
    770                 775                 780
```

```
Leu Asn Leu Gly Asn Tyr Asp Asp Gln Lys Leu Glu Ser Leu Gln Pro
785                 790                 795                 800

Val Phe Val Ser Arg Met Pro Lys Arg Ser Val Thr Gly Ala Ala His
                805                 810                 815

Gln Glu Thr Leu Arg Arg Tyr Val Gly Ile Asp Glu Arg Ser Gly Lys
            820                 825                 830

Ile Gln Thr Val Val Lys Thr Lys Leu Ser Glu Ile Lys Leu Asp Ala
        835                 840                 845

Ser Gly His Phe Pro Met Tyr Gly Lys Glu Ser Asp Pro Arg Thr Tyr
    850                 855                 860

Glu Ala Ile Arg Gln Arg Leu Leu Glu His Asn Asn Asp Pro Lys Lys
865                 870                 875                 880

Ala Phe Gln Glu Pro Leu Tyr Lys Pro Lys Lys Asn Gly Glu Pro Gly
                885                 890                 895

Pro Val Ile Arg Thr Val Lys Ile Ile Asp Thr Lys Asn Gln Val Ile
            900                 905                 910

Pro Leu Asn Asp Gly Lys Thr Val Ala Tyr Asn Ser Asn Ile Val Arg
        915                 920                 925

Val Asp Val Phe Glu Lys Asp Gly Lys Tyr Tyr Cys Val Pro Val Tyr
    930                 935                 940

Thr Met Asp Ile Met Lys Gly Ile Leu Pro Asn Lys Ala Ile Glu Pro
945                 950                 955                 960

Asn Lys Pro Tyr Ser Glu Trp Lys Glu Met Thr Glu Asp Tyr Thr Phe
                965                 970                 975

Arg Phe Ser Leu Tyr Pro Asn Asp Leu Ile Arg Ile Glu Leu Pro Arg
            980                 985                 990
```

Glu Lys Thr Val Lys Thr Ala Ala Gly Glu Glu Ile Asn Val Lys Asp
        995   1000   1005

Val Phe Val Tyr Tyr Lys Thr Ile Asp Ser Ala Asn Gly Gly Leu
    1010   1015   1020

Glu Leu Ile Ser His Asp His Arg Phe Ser Leu Arg Gly Val Gly
    1025   1030   1035

Ser Arg Thr Leu Lys Arg Phe Glu Lys Tyr Gln Val Asp Val Leu
    1040   1045   1050

Gly Asn Ile Tyr Lys Val Arg Gly Glu Lys Arg Val Gly Leu Ala
    1055   1060   1065

Ser Ser Ala His Ser Lys Pro Gly Lys Thr Ile Arg Pro Leu Gln
    1070   1075   1080

Ser Thr Arg Asp
    1085

<210> 62
<211> 1228
<212> PRT
<213> Unknown

<220>
<223> L. bacterium

<400> 62

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
```

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                485                 490                 495

Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr
            500                 505                 510

Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro
        515                 520                 525

Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala
    530                 535                 540

Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys
545                 550                 555                 560

Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly
                565                 570                 575

Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met
            580                 585                 590

Leu Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro
        595                 600                 605

Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly
    610                 615                 620

Asp Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys
625                 630                 635                 640

Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn
                645                 650                 655

Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu
            660                 665                 670

Val Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys
        675                 680                 685

Glu Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile
    690                 695                 700
```

```
Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His
705                 710                 715                 720

Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile
                725                 730                 735

Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys
            740                 745                 750

Lys Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys
        755                 760                 765

Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr
    770                 775                 780

Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile
785                 790                 795                 800

Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val
                805                 810                 815

Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Asp
            820                 825                 830

Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly
        835                 840                 845

Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn
    850                 855                 860

Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu
865                 870                 875                 880

Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile
                885                 890                 895

Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys
            900                 905                 910
```

```
Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu Asn
        915                 920                 925

Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val Tyr Gln
    930                 935                 940

Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val Asp Lys
945                 950                 955                 960

Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly Tyr Gln Ile
                965                 970                 975

Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser Thr Gln Asn Gly Phe
            980                 985                 990

Ile Phe Tyr Ile Pro Ala Trp Leu  Thr Ser Lys Ile Asp  Pro Ser Thr
        995                 1000                1005

Gly Phe  Val Asn Leu Leu Lys  Thr Lys Tyr Thr Ser  Ile Ala Asp
    1010                1015                1020

Ser Lys  Lys Phe Ile Ser Ser  Phe Asp Arg Ile Met  Tyr Val Pro
    1025                1030                1035

Glu Glu  Asp Leu Phe Glu Phe  Ala Leu Asp Tyr Lys  Asn Phe Ser
    1040                1045                1050

Arg Thr  Asp Ala Asp Tyr Ile  Lys Lys Trp Lys Leu  Tyr Ser Tyr
    1055                1060                1065

Gly Asn  Arg Ile Arg Ile Phe  Arg Asn Pro Lys Lys  Asn Asn Val
    1070                1075                1080

Phe Asp  Trp Glu Glu Val Cys  Leu Thr Ser Ala Tyr  Lys Glu Leu
    1085                1090                1095

Phe Asn  Lys Tyr Gly Ile Asn  Tyr Gln Gln Gly Asp  Ile Arg Ala
    1100                1105                1110
```

```
Leu Leu  Cys Glu Gln Ser Asp  Lys Ala Phe Tyr Ser  Ser Phe Met
    1115                1120                1125


Ala Leu  Met Ser Leu Met Leu  Gln Met Arg Asn Ser  Ile Thr Gly
    1130                1135                1140


Arg Thr  Asp Val Asp Phe Leu  Ile Ser Pro Val Lys  Asn Ser Asp
    1145                1150                1155


Gly Ile  Phe Tyr Asp Ser Arg  Asn Tyr Glu Ala Gln  Glu Asn Ala
    1160                1165                1170


Ile Leu  Pro Lys Asn Ala Asp  Ala Asn Gly Ala Tyr  Asn Ile Ala
    1175                1180                1185


Arg Lys  Val Leu Trp Ala Ile  Gly Gln Phe Lys Lys  Ala Glu Asp
    1190                1195                1200


Glu Lys  Leu Asp Lys Val Lys  Ile Ala Ile Ser Asn  Lys Glu Trp
    1205                1210                1215


Leu Glu  Tyr Ala Gln Thr Ser  Val Lys His
    1220                1225


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<212>  PRT
<213>  B. hisashii

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Met Ala Thr Arg Ser Phe Ile Leu Lys Ile Glu Pro Asn Glu Glu Val
1               5                  10                  15


Lys Lys Gly Leu Trp Lys Thr His Glu Val Leu Asn His Gly Ile Ala
            20                  25                  30


Tyr Tyr Met Asn Ile Leu Lys Leu Ile Arg Gln Glu Ala Ile Tyr Glu
        35                  40                  45


His His Glu Gln Asp Pro Lys Asn Pro Lys Lys Val Ser Lys Ala Glu
    50                  55                  60
```

```
Ile Gln Ala Glu Leu Trp Asp Phe Val Leu Lys Met Gln Lys Cys Asn
65                  70                  75                  80

Ser Phe Thr His Glu Val Asp Lys Asp Glu Val Phe Asn Ile Leu Arg
                85                  90                  95

Glu Leu Tyr Glu Glu Leu Val Pro Ser Ser Val Glu Lys Lys Gly Glu
            100                 105                 110

Ala Asn Gln Leu Ser Asn Lys Phe Leu Tyr Pro Leu Val Asp Pro Asn
        115                 120                 125

Ser Gln Ser Gly Lys Gly Thr Ala Ser Ser Gly Arg Lys Pro Arg Trp
    130                 135                 140

Tyr Asn Leu Lys Ile Ala Gly Asp Pro Ser Trp Glu Glu Glu Lys Lys
145                 150                 155                 160

Lys Trp Glu Glu Asp Lys Lys Lys Asp Pro Leu Ala Lys Ile Leu Gly
                165                 170                 175

Lys Leu Ala Glu Tyr Gly Leu Ile Pro Leu Phe Ile Pro Tyr Thr Asp
            180                 185                 190

Ser Asn Glu Pro Ile Val Lys Glu Ile Lys Trp Met Glu Lys Ser Arg
        195                 200                 205

Asn Gln Ser Val Arg Arg Leu Asp Lys Asp Met Phe Ile Gln Ala Leu
    210                 215                 220

Glu Arg Phe Leu Ser Trp Glu Ser Trp Asn Leu Lys Val Lys Glu Glu
225                 230                 235                 240

Tyr Glu Lys Val Glu Lys Glu Tyr Lys Thr Leu Glu Glu Arg Ile Lys
                245                 250                 255

Glu Asp Ile Gln Ala Leu Lys Ala Leu Glu Gln Tyr Glu Lys Glu Arg
            260                 265                 270
```

```
Gln Glu Gln Leu Leu Arg Asp Thr Leu Asn Thr Asn Glu Tyr Arg Leu
        275                 280                 285

Ser Lys Arg Gly Leu Arg Gly Trp Arg Glu Ile Ile Gln Lys Trp Leu
    290                 295                 300

Lys Met Asp Glu Asn Glu Pro Ser Glu Lys Tyr Leu Glu Val Phe Lys
305                 310                 315                 320

Asp Tyr Gln Arg Lys His Pro Arg Glu Ala Gly Asp Tyr Ser Val Tyr
                325                 330                 335

Glu Phe Leu Ser Lys Lys Glu Asn His Phe Ile Trp Arg Asn His Pro
            340                 345                 350

Glu Tyr Pro Tyr Leu Tyr Ala Thr Phe Cys Glu Ile Asp Lys Lys Lys
        355                 360                 365

Lys Asp Ala Lys Gln Gln Ala Thr Phe Thr Leu Ala Asp Pro Ile Asn
    370                 375                 380

His Pro Leu Trp Val Arg Phe Glu Glu Arg Ser Gly Ser Asn Leu Asn
385                 390                 395                 400

Lys Tyr Arg Ile Leu Thr Glu Gln Leu His Thr Glu Lys Leu Lys Lys
                405                 410                 415

Lys Leu Thr Val Gln Leu Asp Arg Leu Ile Tyr Pro Thr Glu Ser Gly
            420                 425                 430

Gly Trp Glu Glu Lys Gly Lys Val Asp Ile Val Leu Leu Pro Ser Arg
        435                 440                 445

Gln Phe Tyr Asn Gln Ile Phe Leu Asp Ile Glu Glu Lys Gly Lys His
    450                 455                 460

Ala Phe Thr Tyr Lys Asp Glu Ser Ile Lys Phe Pro Leu Lys Gly Thr
465                 470                 475                 480
```

```
Leu Gly Gly Ala Arg Val Gln Phe Asp Arg Asp His Leu Arg Arg Tyr
                485                 490                 495

Pro His Lys Val Glu Ser Gly Asn Val Gly Arg Ile Tyr Phe Asn Met
            500                 505                 510

Thr Val Asn Ile Glu Pro Thr Glu Ser Pro Val Ser Lys Ser Leu Lys
        515                 520                 525

Ile His Arg Asp Asp Phe Pro Lys Val Val Asn Phe Lys Pro Lys Glu
    530                 535                 540

Leu Thr Glu Trp Ile Lys Asp Ser Lys Gly Lys Lys Leu Lys Ser Gly
545                 550                 555                 560

Ile Glu Ser Leu Glu Ile Gly Leu Arg Val Met Ser Ile Asp Leu Gly
                565                 570                 575

Gln Arg Gln Ala Ala Ala Ala Ser Ile Phe Glu Val Val Asp Gln Lys
            580                 585                 590

Pro Asp Ile Glu Gly Lys Leu Phe Phe Pro Ile Lys Gly Thr Glu Leu
        595                 600                 605

Tyr Ala Val His Arg Ala Ser Phe Asn Ile Lys Leu Pro Gly Glu Thr
    610                 615                 620

Leu Val Lys Ser Arg Glu Val Leu Arg Lys Ala Arg Glu Asp Asn Leu
625                 630                 635                 640

Lys Leu Met Asn Gln Lys Leu Asn Phe Leu Arg Asn Val Leu His Phe
                645                 650                 655

Gln Gln Phe Glu Asp Ile Thr Glu Arg Glu Lys Arg Val Thr Lys Trp
            660                 665                 670

Ile Ser Arg Gln Glu Asn Ser Asp Val Pro Leu Val Tyr Gln Asp Glu
        675                 680                 685

Leu Ile Gln Ile Arg Glu Leu Met Tyr Lys Pro Tyr Lys Asp Trp Val
```

```
    690                 695                 700

Ala Phe Leu Lys Gln Leu His Lys Arg Leu Glu Val Glu Ile Gly Lys
705                 710                 715                 720

Glu Val Lys His Trp Arg Lys Ser Leu Ser Asp Gly Arg Lys Gly Leu
                725                 730                 735

Tyr Gly Ile Ser Leu Lys Asn Ile Asp Glu Ile Asp Arg Thr Arg Lys
            740                 745                 750

Phe Leu Leu Arg Trp Ser Leu Arg Pro Thr Glu Pro Gly Glu Val Arg
        755                 760                 765

Arg Leu Glu Pro Gly Gln Arg Phe Ala Ile Asp Gln Leu Asn His Leu
    770                 775                 780

Asn Ala Leu Lys Glu Asp Arg Leu Lys Lys Met Ala Asn Thr Ile Ile
785                 790                 795                 800

Met His Ala Leu Gly Tyr Cys Tyr Asp Val Arg Lys Lys Lys Trp Gln
                805                 810                 815

Ala Lys Asn Pro Ala Cys Gln Ile Ile Leu Phe Glu Asp Leu Ser Asn
            820                 825                 830

Tyr Asn Pro Tyr Glu Glu Arg Ser Arg Phe Glu Asn Ser Lys Leu Met
        835                 840                 845

Lys Trp Ser Arg Arg Glu Ile Pro Arg Gln Val Ala Leu Gln Gly Glu
    850                 855                 860

Ile Tyr Gly Leu Gln Val Gly Glu Val Gly Ala Gln Phe Ser Ser Arg
865                 870                 875                 880

Phe His Ala Lys Thr Gly Ser Pro Gly Ile Arg Cys Ser Val Val Thr
                885                 890                 895

Lys Glu Lys Leu Gln Asp Asn Arg Phe Phe Lys Asn Leu Gln Arg Glu
            900                 905                 910
```

```
Gly Arg Leu Thr Leu Asp Lys Ile Ala Val Leu Lys Glu Gly Asp Leu
        915                 920                 925

Tyr Pro Asp Lys Gly Gly Glu Lys Phe Ile Ser Leu Ser Lys Asp Arg
    930                 935                 940

Lys Cys Val Thr Thr His Ala Asp Ile Asn Ala Ala Gln Asn Leu Gln
945                 950                 955                 960

Lys Arg Phe Trp Thr Arg Thr His Gly Phe Tyr Lys Val Tyr Cys Lys
                965                 970                 975

Ala Tyr Gln Val Asp Gly Gln Thr Val Tyr Ile Pro Glu Ser Lys Asp
            980                 985                 990

Gln Lys Gln Lys Ile Ile Glu Glu  Phe Gly Glu Gly Tyr  Phe Ile Leu
        995                 1000                1005

Lys Asp  Gly Val Tyr Glu Trp  Val Asn Ala Gly Lys  Leu Lys Ile
    1010                1015                1020

Lys Lys  Gly Ser Ser Lys Gln  Ser Ser Ser Glu Leu  Val Asp Ser
    1025                1030                1035

Asp Ile  Leu Lys Asp Ser Phe  Asp Leu Ala Ser Glu  Leu Lys Gly
    1040                1045                1050

Glu Lys  Leu Met Leu Tyr Arg  Asp Pro Ser Gly Asn  Val Phe Pro
    1055                1060                1065

Ser Asp  Lys Trp Met Ala Ala  Gly Val Phe Phe Gly  Lys Leu Glu
    1070                1075                1080

Arg Ile  Leu Ile Ser Lys Leu  Thr Asn Gln Tyr Ser  Ile Ser Thr
    1085                1090                1095

Ile Glu  Asp Asp Ser Ser Lys  Gln Ser Met
    1100                1105
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Met Thr Gln Phe Glu Gly Phe Thr Asn Leu Tyr Gln Val Ser Lys Thr
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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

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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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

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  Ala 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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<223> Lachnospiraceae bacterium GAM79

<400> 66

Met Asn Tyr Lys Thr Gly Leu Glu Asp Phe Ile Gly Lys Glu Ser Leu
1   5   10   15

Ser Lys Thr Leu Arg Asn Ala Leu Ile Pro Thr Glu Ser Thr Lys Ile
            20   25   30

His Met Glu Glu Met Gly Val Ile Arg Asp Asp Glu Leu Arg Ala Glu
        35   40   45

Lys Gln Gln Glu Leu Lys Glu Ile Met Asp Asp Tyr Tyr Arg Thr Phe
    50   55   60

Ile Glu Glu Lys Leu Gly Gln Ile Gln Gly Ile Gln Trp Asn Ser Leu
65   70   75   80

Phe Gln Lys Met Glu Glu Thr Met Glu Asp Ile Ser Val Arg Lys Asp
                85   90   95

Leu Asp Lys Ile Gln Asn Glu Lys Arg Lys Glu Ile Cys Cys Tyr Phe
            100   105   110

Thr Ser Asp Lys Arg Phe Lys Asp Leu Phe Asn Ala Lys Leu Ile Thr
        115   120   125

Asp Ile Leu Pro Asn Phe Ile Lys Asp Asn Lys Glu Tyr Thr Glu Glu
    130   135   140

Glu Lys Ala Glu Lys Glu Gln Thr Arg Val Leu Phe Gln Arg Phe Ala
145   150   155   160

Thr Ala Phe Thr Asn Tyr Phe Asn Gln Arg Arg Asn Asn Phe Ser Glu
                165   170   175

Asp Asn Ile Ser Thr Ala Ile Ser Phe Arg Ile Val Asn Glu Asn Ser
            180   185   190

```
Glu Ile His Leu Gln Asn Met Arg Ala Phe Gln Arg Ile Glu Gln Gln
        195                 200                 205

Tyr Pro Glu Glu Val Cys Gly Met Glu Glu Glu Tyr Lys Asp Met Leu
    210                 215                 220

Gln Glu Trp Gln Met Lys His Ile Tyr Ser Val Asp Phe Tyr Asp Arg
225                 230                 235                 240

Glu Leu Thr Gln Pro Gly Ile Glu Tyr Tyr Asn Gly Ile Cys Gly Lys
                245                 250                 255

Ile Asn Glu His Met Asn Gln Phe Cys Gln Lys Asn Arg Ile Asn Lys
            260                 265                 270

Asn Asp Phe Arg Met Lys Lys Leu His Lys Gln Ile Leu Cys Lys Lys
        275                 280                 285

Ser Ser Tyr Tyr Glu Ile Pro Phe Arg Phe Glu Ser Asp Gln Glu Val
    290                 295                 300

Tyr Asp Ala Leu Asn Glu Phe Ile Lys Thr Met Lys Lys Lys Glu Ile
305                 310                 315                 320

Ile Arg Arg Cys Val His Leu Gly Gln Glu Cys Asp Asp Tyr Asp Leu
                325                 330                 335

Gly Lys Ile Tyr Ile Ser Ser Asn Lys Tyr Glu Gln Ile Ser Asn Ala
            340                 345                 350

Leu Tyr Gly Ser Trp Asp Thr Ile Arg Lys Cys Ile Lys Glu Glu Tyr
        355                 360                 365

Met Asp Ala Leu Pro Gly Lys Gly Glu Lys Lys Glu Glu Lys Ala Glu
    370                 375                 380

Ala Ala Ala Lys Lys Glu Glu Tyr Arg Ser Ile Ala Asp Ile Asp Lys
385                 390                 395                 400
```

```
Ile Ile Ser Leu Tyr Gly Ser Glu Met Asp Arg Thr Ile Ser Ala Lys
                405                 410                 415

Lys Cys Ile Thr Glu Ile Cys Asp Met Ala Gly Gln Ile Ser Ile Asp
            420                 425                 430

Pro Leu Val Cys Asn Ser Asp Ile Lys Leu Leu Gln Asn Lys Glu Lys
        435                 440                 445

Thr Thr Glu Ile Lys Thr Ile Leu Asp Ser Phe Leu His Val Tyr Gln
    450                 455                 460

Trp Gly Gln Thr Phe Ile Val Ser Asp Ile Ile Glu Lys Asp Ser Tyr
465                 470                 475                 480

Phe Tyr Ser Glu Leu Glu Asp Val Leu Glu Asp Phe Glu Gly Ile Thr
                485                 490                 495

Thr Leu Tyr Asn His Val Arg Ser Tyr Val Thr Gln Lys Pro Tyr Ser
            500                 505                 510

Thr Val Lys Phe Lys Leu His Phe Gly Ser Pro Thr Leu Ala Asn Gly
        515                 520                 525

Trp Ser Gln Ser Lys Glu Tyr Asp Asn Asn Ala Ile Leu Leu Met Arg
    530                 535                 540

Asp Gln Lys Phe Tyr Leu Gly Ile Phe Asn Val Arg Asn Lys Pro Asp
545                 550                 555                 560

Lys Gln Ile Ile Lys Gly His Glu Lys Glu Glu Lys Gly Asp Tyr Lys
                565                 570                 575

Lys Met Ile Tyr Asn Leu Leu Pro Gly Pro Ser Lys Met Leu Pro Lys
            580                 585                 590

Val Phe Ile Thr Ser Arg Ser Gly Gln Glu Thr Tyr Lys Pro Ser Lys
        595                 600                 605

His Ile Leu Asp Gly Tyr Asn Glu Lys Arg His Ile Lys Ser Ser Pro
```

610 615 620

Lys Phe Asp Leu Gly Tyr Cys Trp Asp Leu Ile Asp Tyr Tyr Lys Glu
625 630 635 640

Cys Ile His Lys His Pro Asp Trp Lys Asn Tyr Asp Phe His Phe Ser
645 650 655

Asp Thr Lys Asp Tyr Glu Asp Ile Ser Gly Phe Tyr Arg Glu Val Glu
660 665 670

Met Gln Gly Tyr Gln Ile Lys Trp Thr Tyr Ile Ser Ala Asp Glu Ile
675 680 685

Gln Lys Leu Asp Glu Lys Gly Gln Ile Phe Leu Phe Gln Ile Tyr Asn
690 695 700

Lys Asp Phe Ser Val His Ser Thr Gly Lys Asp Asn Leu His Thr Met
705 710 715 720

Tyr Leu Lys Asn Leu Phe Ser Glu Glu Asn Leu Lys Asp Ile Val Leu
725 730 735

Lys Leu Asn Gly Glu Ala Glu Leu Phe Phe Arg Lys Ala Ser Ile Lys
740 745 750

Thr Pro Ile Val His Lys Lys Gly Ser Val Leu Val Asn Arg Ser Tyr
755 760 765

Thr Gln Thr Val Gly Asn Lys Glu Ile Arg Val Ser Ile Pro Glu Glu
770 775 780

Tyr Tyr Thr Glu Ile Tyr Asn Tyr Leu Asn His Ile Gly Lys Gly Lys
785 790 795 800

Leu Ser Ser Glu Ala Gln Arg Tyr Leu Asp Glu Gly Lys Ile Lys Ser
805 810 815

Phe Thr Ala Thr Lys Asp Ile Val Lys Asn Tyr Arg Tyr Cys Cys Asp
820 825 830

```
His Tyr Phe Leu His Leu Pro Ile Thr Ile Asn Phe Lys Ala Lys Ser
        835                 840                 845

Asp Val Ala Val Asn Glu Arg Thr Leu Ala Tyr Ile Ala Lys Lys Glu
    850                 855                 860

Asp Ile His Ile Ile Gly Ile Asp Arg Gly Glu Arg Asn Leu Leu Tyr
865                 870                 875                 880

Ile Ser Val Val Asp Val His Gly Asn Ile Arg Glu Gln Arg Ser Phe
                885                 890                 895

Asn Ile Val Asn Gly Tyr Asp Tyr Gln Gln Lys Leu Lys Asp Arg Glu
            900                 905                 910

Lys Ser Arg Asp Ala Ala Arg Lys Asn Trp Glu Glu Ile Glu Lys Ile
        915                 920                 925

Lys Glu Leu Lys Glu Gly Tyr Leu Ser Met Val Ile His Tyr Ile Ala
    930                 935                 940

Gln Leu Val Val Lys Tyr Asn Ala Val Val Ala Met Glu Asp Leu Asn
945                 950                 955                 960

Tyr Gly Phe Lys Thr Gly Arg Phe Lys Val Glu Arg Gln Val Tyr Gln
                965                 970                 975

Lys Phe Glu Thr Met Leu Ile Glu Lys Leu His Tyr Leu Val Phe Lys
            980                 985                 990

Asp Arg Glu Val Cys Glu Glu Gly  Gly Val Leu Arg Gly  Tyr Gln Leu
        995                 1000                1005

Thr Tyr  Ile Pro Glu Ser Leu  Lys Lys Val Gly Lys  Gln Cys Gly
    1010                1015                1020

Phe Ile  Phe Tyr Val Pro Ala  Gly Tyr Thr Ser Lys  Ile Asp Pro
    1025                1030                1035
```

```
Thr Thr  Gly Phe Val Asn Leu  Phe Ser Phe Lys Asn  Leu Thr Asn
    1040                1045                1050

Arg Glu  Ser Arg Gln Asp Phe  Val Gly Lys Phe Asp  Glu Ile Arg
    1055                1060                1065

Tyr Asp  Arg Asp Lys Lys Met  Phe Glu Phe Ser Phe  Asp Tyr Asn
    1070                1075                1080

Asn Tyr  Ile Lys Lys Gly Thr  Ile Leu Ala Ser Thr  Lys Trp Lys
    1085                1090                1095

Val Tyr  Thr Asn Gly Thr Arg  Leu Lys Arg Ile Val  Val Asn Gly
    1100                1105                1110

Lys Tyr  Thr Ser Gln Ser Met  Glu Val Glu Leu Thr  Asp Ala Met
    1115                1120                1125

Glu Lys  Met Leu Gln Arg Ala  Gly Ile Glu Tyr His  Asp Gly Lys
    1130                1135                1140

Asp Leu  Lys Gly Gln Ile Val  Glu Lys Gly Ile Glu  Ala Glu Ile
    1145                1150                1155

Ile Asp  Ile Phe Arg Leu Thr  Val Gln Met Arg Asn  Ser Arg Ser
    1160                1165                1170

Glu Ser  Glu Asp Arg Glu Tyr  Asp Arg Leu Ile Ser  Pro Val Leu
    1175                1180                1185

Asn Asp  Lys Gly Glu Phe Phe  Asp Thr Ala Thr Ala  Asp Lys Thr
    1190                1195                1200

Leu Pro  Gln Asp Ala Asp Ala  Asn Gly Ala Tyr Cys  Ile Ala Leu
    1205                1210                1215

Lys Gly  Leu Tyr Glu Val Lys  Gln Ile Lys Glu Asn  Trp Lys Glu
    1220                1225                1230
```

Asn Glu Gln Phe Pro Arg Asn Lys Leu Val Gln Asp Asn Lys Thr
    1235   1240   1245

Trp Phe Asp Phe Met Gln Lys Lys Arg Tyr Leu
    1250   1255

<210> 67
<211> 1306
<212> PRT
<213> Prevotella copri

<400> 67

Met Ala Lys Asn Phe Glu Asp Phe Lys Arg Leu Tyr Ser Leu Ser Lys
1   5   10   15

Thr Leu Arg Phe Glu Ala Lys Pro Ile Gly Ala Thr Leu Asp Asn Ile
            20   25   30

Val Lys Ser Gly Leu Leu Asp Glu Asp Glu His Arg Ala Ala Ser Tyr
        35   40   45

Val Lys Val Lys Lys Leu Ile Asp Glu Tyr His Lys Val Phe Ile Asp
    50   55   60

Arg Val Leu Asp Asp Gly Cys Leu Pro Leu Glu Asn Lys Gly Asn Asn
65   70   75   80

Asn Ser Leu Ala Glu Tyr Tyr Glu Ser Tyr Val Ser Arg Ala Gln Asp
                85   90   95

Glu Asp Ala Lys Lys Lys Phe Lys Glu Ile Gln Gln Asn Leu Arg Ser
            100   105   110

Val Ile Ala Lys Lys Leu Thr Glu Asp Lys Ala Tyr Ala Asn Leu Phe
        115   120   125

Gly Asn Lys Leu Ile Glu Ser Tyr Lys Asp Lys Glu Asp Lys Lys Lys
    130   135   140

Ile Ile Asp Ser Asp Leu Ile Gln Phe Ile Asn Thr Ala Glu Ser Thr
145   150   155   160

```
Gln Leu Asp Ser Met Ser Gln Asp Glu Ala Lys Glu Leu Val Lys Glu
                165                 170                 175

Phe Trp Gly Phe Val Thr Tyr Phe Tyr Gly Phe Phe Asp Asn Arg Lys
            180                 185                 190

Asn Met Tyr Thr Ala Glu Glu Lys Ser Thr Gly Ile Ala Tyr Arg Leu
        195                 200                 205

Val Asn Glu Asn Leu Pro Lys Phe Ile Asp Asn Ile Glu Ala Phe Asn
    210                 215                 220

Arg Ala Ile Thr Arg Pro Glu Ile Gln Glu Asn Met Gly Val Leu Tyr
225                 230                 235                 240

Ser Asp Phe Ser Glu Tyr Leu Asn Val Glu Ser Ile Gln Glu Met Phe
                245                 250                 255

Gln Leu Asp Tyr Tyr Asn Met Leu Leu Thr Gln Lys Gln Ile Asp Val
            260                 265                 270

Tyr Asn Ala Ile Ile Gly Gly Lys Thr Asp Asp Glu His Asp Val Lys
        275                 280                 285

Ile Lys Gly Ile Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Gln His Lys
    290                 295                 300

Asp Asp Lys Leu Pro Lys Leu Lys Ala Leu Phe Lys Gln Ile Leu Ser
305                 310                 315                 320

Asp Arg Asn Ala Ile Ser Trp Leu Pro Glu Glu Phe Asn Ser Asp Gln
                325                 330                 335

Glu Val Leu Asn Ala Ile Lys Asp Cys Tyr Glu Arg Leu Ala Glu Asn
            340                 345                 350

Val Leu Gly Asp Lys Val Leu Lys Ser Leu Leu Gly Ser Leu Ala Asp
        355                 360                 365
```

```
Tyr Ser Leu Asp Gly Ile Phe Ile Arg Asn Asp Leu Gln Leu Thr Asp
    370                 375                 380

Ile Ser Gln Lys Met Phe Gly Asn Trp Gly Val Ile Gln Asn Ala Ile
385                 390                 395                 400

Met Gln Asn Ile Lys Arg Val Ala Pro Ala Arg Lys His Lys Glu Ser
                405                 410                 415

Glu Glu Asp Tyr Glu Lys Arg Ile Ala Gly Ile Phe Lys Lys Ala Asp
            420                 425                 430

Ser Phe Ser Ile Ser Tyr Ile Asn Asp Cys Leu Asn Glu Ala Asp Pro
        435                 440                 445

Asn Asn Ala Tyr Phe Val Glu Asn Tyr Phe Ala Thr Phe Gly Ala Val
    450                 455                 460

Asn Thr Pro Thr Met Gln Arg Glu Asn Leu Phe Ala Leu Val Gln Asn
465                 470                 475                 480

Ala Tyr Thr Glu Val Ala Ala Leu Leu His Ser Asp Tyr Pro Thr Val
                485                 490                 495

Lys His Leu Ala Gln Asp Lys Ala Asn Val Ser Lys Ile Lys Ala Leu
            500                 505                 510

Leu Asp Ala Ile Lys Ser Leu Gln His Phe Val Lys Pro Leu Leu Gly
        515                 520                 525

Lys Gly Asp Glu Ser Asp Lys Asp Glu Arg Phe Tyr Gly Glu Leu Ala
    530                 535                 540

Ser Leu Trp Ala Glu Leu Asp Thr Val Thr Pro Leu Tyr Asn Met Ile
545                 550                 555                 560

Arg Asn Tyr Met Thr Arg Lys Pro Tyr Ser Gln Lys Lys Ile Lys Leu
                565                 570                 575
```

```
Asn Phe Glu Asn Pro Gln Leu Leu Gly Gly Trp Asp Ala Asn Lys Glu
            580                 585                 590

Lys Asp Tyr Ala Thr Ile Ile Leu Arg Arg Asn Gly Leu Tyr Tyr Leu
        595                 600                 605

Ala Ile Met Asp Lys Asp Ser Arg Lys Leu Leu Gly Lys Ala Met Pro
    610                 615                 620

Ser Asp Gly Glu Cys Tyr Glu Lys Met Val Tyr Lys Phe Phe Lys Asp
625                 630                 635                 640

Val Thr Thr Met Ile Pro Lys Cys Ser Thr Gln Leu Lys Asp Val Gln
                645                 650                 655

Ala Tyr Phe Lys Val Asn Thr Asp Asp Tyr Val Leu Asn Ser Lys Ala
            660                 665                 670

Phe Asn Lys Pro Leu Thr Ile Thr Lys Glu Val Phe Asp Leu Asn Asn
        675                 680                 685

Val Leu Tyr Gly Lys Tyr Lys Lys Phe Gln Lys Gly Tyr Leu Thr Ala
    690                 695                 700

Thr Gly Asp Asn Val Gly Tyr Thr His Ala Val Asn Val Trp Ile Lys
705                 710                 715                 720

Phe Cys Met Asp Phe Leu Asn Ser Tyr Asp Ser Thr Cys Ile Tyr Asp
                725                 730                 735

Phe Ser Ser Leu Lys Pro Glu Ser Tyr Leu Ser Leu Asp Ala Phe Tyr
            740                 745                 750

Gln Asp Ala Asn Leu Leu Leu Tyr Lys Leu Ser Phe Ala Arg Ala Ser
        755                 760                 765

Val Ser Tyr Ile Asn Gln Leu Val Glu Glu Gly Lys Met Tyr Leu Phe
    770                 775                 780

Gln Ile Tyr Asn Lys Asp Phe Ser Glu Tyr Ser Lys Gly Thr Pro Asn
```

785 790 795 800

Met His Thr Leu Tyr Trp Lys Ala Leu Phe Asp Glu Arg Asn Leu Ala
805 810 815

Asp Val Val Tyr Lys Leu Asn Gly Gln Ala Glu Met Phe Tyr Arg Lys
820 825 830

Lys Ser Ile Glu Asn Thr His Pro Thr His Pro Ala Asn His Pro Ile
835 840 845

Leu Asn Lys Asn Lys Asp Asn Lys Lys Lys Glu Ser Leu Phe Asp Tyr
850 855 860

Asp Leu Ile Lys Asp Arg Arg Tyr Thr Val Asp Lys Phe Met Phe His
865 870 875 880

Val Pro Ile Thr Met Asn Phe Lys Ser Val Gly Ser Glu Asn Ile Asn
885 890 895

Gln Asp Val Lys Ala Tyr Leu Arg His Ala Asp Asp Met His Ile Ile
900 905 910

Gly Ile Asp Arg Gly Glu Arg His Leu Leu Tyr Leu Val Val Ile Asp
915 920 925

Leu Gln Gly Asn Ile Lys Glu Gln Tyr Ser Leu Asn Glu Ile Val Asn
930 935 940

Glu Tyr Asn Gly Asn Thr Tyr His Thr Asn Tyr His Asp Leu Leu Asp
945 950 955 960

Val Arg Glu Glu Glu Arg Leu Lys Ala Arg Gln Ser Trp Gln Thr Ile
965 970 975

Glu Asn Ile Lys Glu Leu Lys Glu Gly Tyr Leu Ser Gln Val Ile His
980 985 990

Lys Ile Thr Gln Leu Met Val Arg Tyr His Ala Ile Val Val Leu Glu
995 1000 1005

```
Asp Leu  Ser Lys Gly Phe Met  Arg Ser Arg Gln Lys  Val Glu Lys
    1010                1015                1020

Gln Val  Tyr Gln Lys Phe Glu  Lys Met Leu Ile Asp  Lys Leu Asn
    1025                1030                1035

Tyr Leu  Val Asp Lys Lys Thr  Asp Val Ser Thr Pro  Gly Gly Leu
    1040                1045                1050

Leu Asn  Ala Tyr Gln Leu Thr  Cys Lys Ser Asp Ser  Ser Gln Lys
    1055                1060                1065

Leu Gly  Lys Gln Ser Gly Phe  Leu Phe Tyr Ile Pro  Ala Trp Asn
    1070                1075                1080

Thr Ser  Lys Ile Asp Pro Val  Thr Gly Phe Val Asn  Leu Leu Asp
    1085                1090                1095

Thr His  Ser Leu Asn Ser Lys  Glu Lys Ile Lys Ala  Phe Phe Ser
    1100                1105                1110

Lys Phe  Asp Ala Ile Arg Tyr  Asn Lys Asp Lys Lys  Trp Phe Glu
    1115                1120                1125

Phe Asn  Leu Asp Tyr Asp Lys  Phe Gly Lys Lys Ala  Glu Asp Thr
    1130                1135                1140

Arg Thr  Lys Trp Thr Leu Cys  Thr Arg Gly Met Arg  Ile Asp Thr
    1145                1150                1155

Phe Arg  Asn Lys Glu Lys Asn  Ser Gln Trp Asp Asn  Gln Glu Val
    1160                1165                1170

Asp Leu  Thr Thr Glu Met Lys  Ser Leu Leu Glu His  Tyr Tyr Ile
    1175                1180                1185

Asp Ile  His Gly Asn Leu Lys  Asp Ala Ile Ser Ala  Gln Thr Asp
    1190                1195                1200
```

Lys Ala Phe Phe Thr Gly Leu Leu His Ile Leu Lys Leu Thr Leu
    1205   1210   1215

Gln Met Arg Asn Ser Ile Thr Gly Thr Glu Thr Asp Tyr Leu Val
    1220   1225   1230

Ser Pro Val Ala Asp Glu Asn Gly Ile Phe Tyr Asp Ser Arg Ser
    1235   1240   1245

Cys Gly Asn Gln Leu Pro Glu Asn Ala Asp Ala Asn Gly Ala Tyr
    1250   1255   1260

Asn Ile Ala Arg Lys Gly Leu Met Leu Ile Glu Gln Ile Lys Asn
    1265   1270   1275

Ala Glu Asp Leu Asn Asn Val Lys Phe Asp Ile Ser Asn Lys Ala
    1280   1285   1290

Trp Leu Asn Phe Ala Gln Gln Lys Pro Tyr Lys Asn Gly
    1295   1300   1305

<210> 68
<211> 1142
<212> PRT
<213> Eubacterium rectale

<400> 68

Met Phe Ser Ala Lys Leu Ile Ser Asp Ile Leu Pro Glu Phe Val Ile
1   5   10   15

His Asn Asn Asn Tyr Ser Ala Ser Glu Lys Glu Glu Lys Thr Gln Val
            20   25   30

Ile Lys Leu Phe Ser Arg Phe Ala Thr Ser Phe Lys Asp Tyr Phe Lys
        35   40   45

Asn Arg Ala Asn Cys Phe Ser Ala Asn Asp Ile Ser Ser Ser Ser Cys
    50   55   60

His Arg Ile Val Asn Asp Asn Ala Glu Ile Phe Phe Ser Asn Ala Leu

```
65                  70                  75                  80

Val Tyr Arg Arg Ile Val Lys Asn Leu Ser Asn Asp Asp Ile Asn Lys
                85                  90                  95

Ile Ser Gly Asp Met Lys Asp Ser Leu Lys Glu Met Ser Leu Glu Glu
            100                 105                 110

Ile Tyr Ser Tyr Glu Lys Tyr Gly Glu Phe Ile Thr Gln Glu Gly Ile
        115                 120                 125

Ser Phe Tyr Asn Asp Ile Cys Gly Lys Val Asn Leu Phe Met Asn Leu
    130                 135                 140

Tyr Cys Gln Lys Asn Lys Glu Asn Lys Asn Leu Tyr Lys Leu Arg Lys
145                 150                 155                 160

Leu His Lys Gln Ile Leu Cys Ile Ala Asp Thr Ser Tyr Glu Val Pro
                165                 170                 175

Tyr Lys Phe Glu Ser Asp Glu Glu Val Tyr Gln Ser Val Asn Gly Phe
            180                 185                 190

Leu Asp Asn Ile Ser Ser Lys His Ile Val Glu Arg Leu Arg Lys Ile
        195                 200                 205

Gly Glu Asn Tyr Asn Gly Tyr Asn Leu Asp Lys Ile Tyr Ile Val Ser
    210                 215                 220

Lys Phe Tyr Glu Ser Val Ser Gln Lys Thr Tyr Arg Asp Trp Glu Thr
225                 230                 235                 240

Ile Asn Thr Ala Leu Glu Ile His Tyr Asn Asn Ile Leu Pro Gly Asn
                245                 250                 255

Gly Lys Ser Lys Ala Asp Lys Val Lys Lys Ala Val Lys Asn Asp Leu
            260                 265                 270

Gln Lys Ser Ile Thr Glu Ile Asn Glu Leu Val Ser Asn Tyr Lys Leu
        275                 280                 285
```

```
Cys Pro Asp Asp Asn Ile Lys Ala Glu Thr Tyr Ile His Glu Ile Ser
    290                 295                 300

His Ile Leu Asn Asn Phe Glu Ala Gln Glu Leu Lys Tyr Asn Pro Glu
305                 310                 315                 320

Ile His Leu Val Glu Ser Glu Leu Lys Ala Ser Glu Leu Lys Asn Val
                325                 330                 335

Leu Asp Val Ile Met Asn Ala Phe His Trp Cys Ser Val Phe Met Thr
            340                 345                 350

Glu Glu Leu Val Asp Lys Asp Asn Asn Phe Tyr Ala Glu Leu Glu Glu
        355                 360                 365

Ile Tyr Asp Glu Ile Tyr Pro Val Ile Ser Leu Tyr Asn Leu Val Arg
    370                 375                 380

Asn Tyr Val Thr Gln Lys Pro Tyr Ser Thr Lys Lys Ile Lys Leu Asn
385                 390                 395                 400

Phe Gly Ile Pro Thr Leu Ala Asp Gly Trp Ser Lys Ser Lys Glu Tyr
                405                 410                 415

Ser Asn Asn Ala Ile Ile Leu Met Arg Asp Asn Leu Tyr Tyr Leu Gly
            420                 425                 430

Ile Phe Asn Ala Lys Asn Lys Pro Asp Lys Lys Ile Ile Glu Gly Asn
        435                 440                 445

Thr Ser Glu Asn Lys Gly Asp Tyr Lys Lys Met Ile Tyr Asn Leu Leu
    450                 455                 460

Pro Gly Pro Asn Lys Met Ile Pro Lys Val Phe Leu Ser Ser Lys Thr
465                 470                 475                 480

Gly Val Glu Thr Tyr Lys Pro Ser Ala Tyr Ile Leu Glu Gly Tyr Lys
                485                 490                 495
```

```
Gln Asn Lys His Leu Lys Ser Ser Lys Asp Phe Asp Ile Thr Phe Cys
            500                 505                 510

His Asp Leu Ile Asp Tyr Phe Lys Asn Cys Ile Ala Ile His Pro Glu
        515                 520                 525

Trp Lys Asn Phe Gly Phe Asp Phe Ser Asp Thr Ser Thr Tyr Glu Asp
    530                 535                 540

Ile Ser Gly Phe Tyr Arg Glu Val Glu Leu Gln Gly Tyr Lys Ile Asp
545                 550                 555                 560

Trp Thr Tyr Ile Ser Glu Lys Asp Ile Asp Leu Leu Gln Glu Lys Gly
                565                 570                 575

Gln Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ser Lys Lys Ser
            580                 585                 590

Ser Gly Asn Asp Asn Leu His Thr Met Tyr Leu Lys Asn Leu Phe Ser
        595                 600                 605

Glu Glu Asn Leu Lys Asp Ile Val Leu Lys Leu Asn Gly Glu Ala Glu
    610                 615                 620

Ile Phe Phe Arg Lys Ser Ser Ile Lys Asn Pro Ile Ile His Lys Lys
625                 630                 635                 640

Gly Ser Ile Leu Val Asn Arg Thr Tyr Glu Ala Glu Glu Lys Asp Gln
                645                 650                 655

Phe Gly Asn Ile Gln Ile Val Arg Lys Thr Ile Pro Glu Asn Ile Tyr
            660                 665                 670

Gln Glu Leu Tyr Lys Tyr Phe Asn Asp Lys Ser Asp Lys Glu Leu Ser
        675                 680                 685

Asp Glu Ala Ala Lys Leu Lys Asn Val Val Gly His His Glu Ala Ala
    690                 695                 700
```

```
Thr Asn Ile Val Lys Asp Tyr Arg Tyr Thr Tyr Asp Lys Tyr Phe Leu
705                 710                 715                 720

His Met Pro Ile Thr Ile Asn Phe Lys Ala Asn Lys Thr Ser Phe Ile
                725                 730                 735

Asn Asp Arg Ile Leu Gln Tyr Ile Ala Lys Glu Lys Asp Leu His Val
            740                 745                 750

Ile Gly Ile Asp Arg Gly Glu Arg Asn Leu Ile Tyr Val Ser Val Ile
        755                 760                 765

Asp Thr Cys Gly Asn Ile Val Glu Gln Lys Ser Phe Asn Ile Val Asn
    770                 775                 780

Gly Tyr Asp Tyr Gln Ile Lys Leu Lys Gln Gln Glu Gly Ala Arg Gln
785                 790                 795                 800

Ile Ala Arg Lys Glu Trp Lys Glu Ile Gly Lys Ile Lys Glu Ile Lys
                805                 810                 815

Glu Gly Tyr Leu Ser Leu Val Ile His Glu Ile Ser Lys Met Val Ile
            820                 825                 830

Lys Tyr Asn Ala Ile Ile Ala Met Glu Asp Leu Ser Tyr Gly Phe Lys
        835                 840                 845

Lys Gly Arg Phe Lys Val Glu Arg Gln Val Tyr Gln Lys Phe Glu Thr
    850                 855                 860

Met Leu Ile Asn Lys Leu Asn Tyr Leu Val Phe Lys Asp Ile Ser Ile
865                 870                 875                 880

Thr Glu Asn Gly Gly Leu Leu Lys Gly Tyr Gln Leu Thr Tyr Ile Pro
                885                 890                 895

Asp Lys Leu Lys Asn Val Gly His Gln Cys Gly Cys Ile Phe Tyr Val
            900                 905                 910

Pro Ala Ala Tyr Thr Ser Lys Ile Asp Pro Thr Thr Gly Phe Val Asn
```

```
        915                 920                 925

Ile Phe Lys Phe Lys Asp Leu Thr Val Asp Ala Lys Arg Glu Phe Ile
    930                 935                 940

Lys Lys Phe Asp Ser Ile Arg Tyr Asp Ser Asp Lys Asn Leu Phe Cys
945                 950                 955                 960

Phe Thr Phe Asp Tyr Asn Asn Phe Ile Thr Gln Asn Thr Val Met Ser
                965                 970                 975

Lys Ser Ser Trp Ser Val Tyr Thr Tyr Gly Val Arg Ile Lys Arg Arg
            980                 985                 990

Phe Val Asn Gly Arg Phe Ser Asn  Glu Ser Asp Thr Ile  Asp Ile Thr
        995                 1000                1005

Lys Asp  Met Glu Lys Thr Leu  Glu Met Thr Asp Ile  Asn Trp Arg
    1010                1015                1020

Asp Gly  His Asp Leu Arg Gln  Asp Ile Ile Asp Tyr  Glu Ile Val
    1025                1030                1035

Gln His  Ile Phe Glu Ile Phe  Lys Leu Thr Val Gln  Met Arg Asn
    1040                1045                1050

Ser Leu  Ser Glu Leu Glu Asp  Arg Asp Tyr Asp Arg  Leu Ile Ser
    1055                1060                1065

Pro Val  Leu Asn Glu Asn Asn  Ile Phe Tyr Asp Ser  Ala Lys Ala
    1070                1075                1080

Gly Asp  Ala Leu Pro Lys Asp  Ala Asp Ala Asn Gly  Ala Tyr Cys
    1085                1090                1095

Ile Ala  Leu Lys Gly Leu Tyr  Glu Ile Lys Gln Ile  Thr Glu Asn
    1100                1105                1110

Trp Lys  Glu Asp Gly Lys Phe  Ser Arg Asp Lys Leu  Lys Ile Ser
    1115                1120                1125
```

Asn Lys Asp Trp Phe Asp Phe Ile Gln Asn Lys Arg Tyr Leu
    1130   1135   1140

<210> 69
<211> 1259
<212> PRT
<213> Unknown

<220>
<223> Acidaminococcus sp.

<400> 69

Met Asn Tyr Lys Thr Gly Leu Glu Asp Phe Ile Gly Lys Glu Ser Leu
1   5   10   15

Ser Lys Thr Leu Arg Asn Ala Leu Ile Pro Thr Glu Ser Thr Lys Ile
            20   25   30

His Met Glu Glu Met Gly Val Ile Arg Asp Asp Glu Leu Arg Ala Glu
        35   40   45

Lys Gln Gln Glu Leu Lys Glu Ile Met Asp Asp Tyr Tyr Arg Ala Phe
    50   55   60

Ile Glu Glu Lys Leu Gly Gln Ile Gln Gly Ile Gln Trp Asn Ser Leu
65   70   75   80

Phe Gln Lys Met Glu Glu Thr Met Glu Asp Ile Ser Val Arg Lys Asp
                85   90   95

Leu Asp Lys Ile Gln Asn Glu Lys Arg Lys Glu Ile Cys Cys Tyr Phe
            100   105   110

Thr Ser Asp Lys Arg Phe Lys Asp Leu Phe Asn Ala Lys Leu Ile Thr
        115   120   125

Asp Ile Leu Pro Asn Phe Ile Lys Asp Asn Lys Glu Tyr Thr Glu Glu
    130   135   140

Glu Lys Ala Glu Lys Glu Gln Thr Arg Val Leu Phe Gln Arg Phe Ala

```
145                 150                 155                 160

Thr Ala Phe Thr Asn Tyr Phe Asn Gln Arg Arg Asn Asn Phe Ser Glu
                165                 170                 175

Asp Asn Ile Ser Thr Ala Ile Ser Phe Arg Ile Val Asn Glu Asn Ser
            180                 185                 190

Glu Ile His Leu Gln Asn Met Arg Ala Phe Gln Arg Ile Glu Gln Gln
        195                 200                 205

Tyr Pro Glu Glu Val Cys Gly Met Glu Glu Glu Tyr Lys Asp Met Leu
    210                 215                 220

Gln Glu Trp Gln Met Lys His Ile Tyr Leu Val Asp Phe Tyr Asp Arg
225                 230                 235                 240

Val Leu Thr Gln Pro Gly Ile Glu Tyr Tyr Asn Gly Ile Cys Gly Lys
                245                 250                 255

Ile Asn Glu His Met Asn Gln Phe Cys Gln Lys Asn Arg Ile Asn Lys
            260                 265                 270

Asn Asp Phe Arg Met Lys Lys Leu His Lys Gln Ile Leu Cys Lys Lys
        275                 280                 285

Ser Ser Tyr Tyr Glu Ile Pro Phe Arg Phe Glu Ser Asp Gln Glu Val
    290                 295                 300

Tyr Asp Ala Leu Asn Glu Phe Ile Lys Thr Met Lys Glu Lys Glu Ile
305                 310                 315                 320

Ile Cys Arg Cys Val His Leu Gly Gln Lys Cys Asp Asp Tyr Asp Leu
                325                 330                 335

Gly Lys Ile Tyr Ile Ser Ser Asn Lys Tyr Glu Gln Ile Ser Asn Ala
            340                 345                 350

Leu Tyr Gly Ser Trp Asp Thr Ile Arg Lys Cys Ile Lys Glu Glu Tyr
        355                 360                 365
```

```
Met Asp Ala Leu Pro Gly Lys Gly Glu Lys Lys Glu Glu Lys Ala Glu
    370                 375                 380

Ala Ala Ala Lys Lys Glu Glu Tyr Arg Ser Ile Ala Asp Ile Asp Lys
385                 390                 395                 400

Ile Ile Ser Leu Tyr Gly Ser Glu Met Asp Arg Thr Ile Ser Ala Lys
                405                 410                 415

Lys Cys Ile Thr Glu Ile Cys Asp Met Ala Gly Gln Ile Ser Thr Asp
            420                 425                 430

Pro Leu Val Cys Asn Ser Asp Ile Lys Leu Leu Gln Asn Lys Glu Lys
        435                 440                 445

Thr Thr Glu Ile Lys Thr Ile Leu Asp Ser Phe Leu His Val Tyr Gln
    450                 455                 460

Trp Gly Gln Thr Phe Ile Val Ser Asp Ile Ile Glu Lys Asp Ser Tyr
465                 470                 475                 480

Phe Tyr Ser Glu Leu Glu Asp Val Leu Glu Asp Phe Glu Gly Ile Thr
                485                 490                 495

Thr Leu Tyr Asn His Val Arg Ser Tyr Val Thr Gln Lys Pro Tyr Ser
            500                 505                 510

Thr Val Lys Phe Lys Leu His Phe Gly Ser Pro Thr Leu Ala Asn Gly
        515                 520                 525

Trp Ser Gln Ser Lys Glu Tyr Asp Asn Asn Ala Ile Leu Leu Met Arg
    530                 535                 540

Asp Gln Lys Phe Tyr Leu Gly Ile Phe Asn Val Arg Asn Lys Pro Asp
545                 550                 555                 560

Lys Gln Ile Ile Lys Gly His Glu Lys Glu Glu Lys Gly Asp Tyr Lys
                565                 570                 575
```

```
Lys Met Ile Tyr Asn Leu Leu Pro Gly Pro Ser Lys Met Leu Pro Lys
            580                 585                 590

Val Phe Ile Thr Ser Arg Ser Gly Gln Glu Thr Tyr Lys Pro Ser Lys
        595                 600                 605

His Ile Leu Asp Gly Tyr Asn Glu Lys Arg His Ile Lys Ser Ser Pro
    610                 615                 620

Lys Phe Asp Leu Gly Tyr Cys Trp Asp Leu Ile Asp Tyr Tyr Lys Glu
625                 630                 635                 640

Cys Ile His Lys His Pro Asp Trp Lys Asn Tyr Asp Phe His Phe Ser
                645                 650                 655

Asp Thr Lys Asp Tyr Glu Asp Ile Ser Gly Phe Tyr Arg Glu Val Glu
            660                 665                 670

Met Gln Gly Tyr Gln Ile Lys Trp Thr Tyr Ile Ser Ala Asp Glu Ile
        675                 680                 685

Gln Lys Leu Asp Glu Lys Gly Gln Ile Phe Leu Phe Gln Ile Tyr Asn
    690                 695                 700

Lys Asp Phe Ser Val His Ser Thr Gly Lys Asp Asn Leu His Thr Met
705                 710                 715                 720

Tyr Leu Lys Asn Leu Phe Ser Glu Glu Asn Leu Lys Asp Ile Val Leu
                725                 730                 735

Lys Leu Asn Gly Glu Ala Glu Leu Phe Phe Arg Lys Ala Ser Ile Lys
            740                 745                 750

Thr Pro Val Val His Lys Lys Gly Ser Val Leu Val Asn Arg Ser Tyr
        755                 760                 765

Thr Gln Thr Val Gly Asp Lys Glu Ile Arg Val Ser Ile Pro Glu Glu
    770                 775                 780
```

```
Tyr Tyr Thr Glu Ile Tyr Asn Tyr Leu Asn His Ile Gly Arg Gly Lys
785                 790                 795                 800


Leu Ser Thr Glu Ala Gln Arg Tyr Leu Glu Glu Arg Lys Ile Lys Ser
                805                 810                 815


Phe Thr Ala Thr Lys Asp Ile Val Lys Asn Tyr Arg Tyr Cys Cys Asp
            820                 825                 830


His Tyr Phe Leu His Leu Pro Ile Thr Ile Asn Phe Lys Ala Lys Ser
        835                 840                 845


Asp Ile Ala Val Asn Glu Arg Thr Leu Ala Tyr Ile Ala Lys Lys Glu
    850                 855                 860


Asp Ile His Ile Ile Gly Ile Asp Arg Gly Glu Arg Asn Leu Leu Tyr
865                 870                 875                 880


Ile Ser Val Val Asp Val His Gly Asn Ile Arg Glu Gln Arg Ser Phe
                885                 890                 895


Asn Ile Val Asn Gly Tyr Asp Tyr Gln Gln Lys Leu Lys Asp Arg Glu
            900                 905                 910


Lys Ser Arg Asp Ala Ala Arg Lys Asn Trp Glu Glu Ile Glu Lys Ile
        915                 920                 925


Lys Glu Leu Lys Glu Gly Tyr Leu Ser Met Val Ile His Tyr Ile Ala
    930                 935                 940


Gln Leu Val Val Lys Tyr Asn Ala Val Val Ala Met Glu Asp Leu Asn
945                 950                 955                 960


Tyr Gly Phe Lys Thr Gly Arg Phe Lys Val Glu Arg Gln Val Tyr Gln
                965                 970                 975


Lys Phe Glu Thr Met Leu Ile Glu Lys Leu His Tyr Leu Val Phe Lys
            980                 985                 990


Asp Arg Glu Val Cys Glu Glu Gly  Gly Val Leu Arg Gly  Tyr Gln Leu
```

995 1000 1005

Thr Tyr Ile Pro Glu Ser Leu Lys Lys Val Gly Lys Gln Cys Gly
1010 1015 1020

Phe Ile Phe Tyr Val Pro Ala Gly Tyr Thr Ser Lys Ile Asp Pro
1025 1030 1035

Thr Thr Gly Phe Val Asn Leu Phe Ser Phe Lys Asn Leu Thr Asn
1040 1045 1050

Arg Glu Ser Arg Gln Asp Phe Val Gly Lys Phe Asp Glu Ile Arg
1055 1060 1065

Tyr Asp Arg Asp Lys Lys Met Phe Glu Phe Ser Phe Asp Tyr Asn
1070 1075 1080

Asn Tyr Ile Lys Lys Gly Thr Met Leu Ala Ser Thr Lys Trp Lys
1085 1090 1095

Val Tyr Thr Asn Gly Thr Arg Leu Lys Arg Ile Val Val Asn Gly
1100 1105 1110

Lys Tyr Thr Ser Gln Ser Met Glu Val Glu Leu Thr Asp Ala Met
1115 1120 1125

Glu Lys Met Leu Gln Arg Ala Gly Ile Glu Tyr His Asp Gly Lys
1130 1135 1140

Asp Leu Lys Gly Gln Ile Val Glu Lys Gly Ile Glu Ala Glu Ile
1145 1150 1155

Ile Asp Ile Phe Arg Leu Thr Val Gln Met Arg Asn Ser Arg Ser
1160 1165 1170

Glu Ser Glu Asp Arg Glu Tyr Asp Arg Leu Ile Ser Pro Val Leu
1175 1180 1185

Asn Asp Lys Gly Glu Phe Phe Asp Thr Ala Thr Ala Asp Lys Thr
1190 1195 1200

```
Leu Pro  Gln Asp Ala Asp Ala  Asn Gly Ala Tyr Cys  Ile Ala Leu
    1205                 1210                 1215


Lys Gly  Leu Tyr Glu Val Lys  Gln Ile Lys Glu Asn  Trp Lys Glu
    1220                 1225                 1230


Asn Glu  Gln Phe Pro Arg Asn  Lys Leu Val Gln Asp  Asn Lys Thr
    1235                 1240                 1245


Trp Phe  Asp Phe Met Gln Lys  Lys Arg Tyr Leu
    1250                 1255
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<210> 70
<211> 1108
<212> PRT
<213> Bacillus hisashii

<400> 70

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Met Ala Thr Arg Ser Phe Ile Leu Lys Ile Glu Pro Asn Glu Glu Val
1               5                   10                  15


Lys Lys Gly Leu Trp Lys Thr His Glu Val Leu Asn His Gly Ile Ala
            20                  25                  30


Tyr Tyr Met Asn Ile Leu Lys Leu Ile Arg Gln Glu Ala Ile Tyr Glu
        35                  40                  45


His His Glu Gln Asp Pro Lys Asn Pro Lys Lys Val Ser Lys Ala Glu
    50                  55                  60


Ile Gln Ala Glu Leu Trp Asp Phe Val Leu Lys Met Gln Lys Cys Asn
65                  70                  75                  80


Ser Phe Thr His Glu Val Asp Lys Asp Glu Val Phe Asn Ile Leu Arg
                85                  90                  95


Glu Leu Tyr Glu Glu Leu Val Pro Ser Ser Val Glu Lys Lys Gly Glu
            100                 105                 110
```

```
Ala Asn Gln Leu Ser Asn Lys Phe Leu Tyr Pro Leu Val Asp Pro Asn
        115                 120                 125

Ser Gln Ser Gly Lys Gly Thr Ala Ser Ser Gly Arg Lys Pro Arg Trp
    130                 135                 140

Tyr Asn Leu Lys Ile Ala Gly Asp Pro Ser Trp Glu Glu Glu Lys Lys
145                 150                 155                 160

Lys Trp Glu Glu Asp Lys Lys Lys Asp Pro Leu Ala Lys Ile Leu Gly
                165                 170                 175

Lys Leu Ala Glu Tyr Gly Leu Ile Pro Leu Phe Ile Pro Tyr Thr Asp
            180                 185                 190

Ser Asn Glu Pro Ile Val Lys Glu Ile Lys Trp Met Glu Lys Ser Arg
        195                 200                 205

Asn Gln Ser Val Arg Arg Leu Asp Lys Asp Met Phe Ile Gln Ala Leu
    210                 215                 220

Glu Arg Phe Leu Ser Trp Glu Ser Trp Asn Leu Lys Val Lys Glu Glu
225                 230                 235                 240

Tyr Glu Lys Val Glu Lys Glu Tyr Lys Thr Leu Glu Glu Arg Ile Lys
                245                 250                 255

Glu Asp Ile Gln Ala Leu Lys Ala Leu Glu Gln Tyr Glu Lys Glu Arg
            260                 265                 270

Gln Glu Gln Leu Leu Arg Asp Thr Leu Asn Thr Asn Glu Tyr Arg Leu
        275                 280                 285

Ser Lys Arg Gly Leu Arg Gly Trp Arg Glu Ile Ile Gln Lys Trp Leu
    290                 295                 300

Lys Met Asp Glu Asn Glu Pro Ser Glu Lys Tyr Leu Glu Val Phe Lys
305                 310                 315                 320

Asp Tyr Gln Arg Lys His Pro Arg Glu Ala Gly Asp Tyr Ser Val Tyr
```

```
                325                 330                 335

Glu Phe Leu Ser Lys Lys Glu Asn His Phe Ile Trp Arg Asn His Pro
            340                 345                 350

Glu Tyr Pro Tyr Leu Tyr Ala Thr Phe Cys Glu Ile Asp Lys Lys Lys
        355                 360                 365

Lys Asp Ala Lys Gln Gln Ala Thr Phe Thr Leu Ala Asp Pro Ile Asn
    370                 375                 380

His Pro Leu Trp Val Arg Phe Glu Glu Arg Ser Gly Ser Asn Leu Asn
385                 390                 395                 400

Lys Tyr Arg Ile Leu Thr Glu Gln Leu His Thr Glu Lys Leu Lys Lys
                405                 410                 415

Lys Leu Thr Val Gln Leu Asp Arg Leu Ile Tyr Pro Thr Glu Ser Gly
            420                 425                 430

Gly Trp Glu Glu Lys Gly Lys Val Asp Ile Val Leu Leu Pro Ser Arg
        435                 440                 445

Gln Phe Tyr Asn Gln Ile Phe Leu Asp Ile Glu Glu Lys Gly Lys His
    450                 455                 460

Ala Phe Thr Tyr Lys Asp Glu Ser Ile Lys Phe Pro Leu Lys Gly Thr
465                 470                 475                 480

Leu Gly Gly Ala Arg Val Gln Phe Asp Arg Asp His Leu Arg Arg Tyr
                485                 490                 495

Pro His Lys Val Glu Ser Gly Asn Val Gly Arg Ile Tyr Phe Asn Met
            500                 505                 510

Thr Val Asn Ile Glu Pro Thr Glu Ser Pro Val Ser Lys Ser Leu Lys
        515                 520                 525

Ile His Arg Asp Asp Phe Pro Lys Val Val Asn Phe Lys Pro Lys Glu
    530                 535                 540
```

```
Leu Thr Glu Trp Ile Lys Asp Ser Lys Gly Lys Lys Leu Lys Ser Gly
545                 550                 555                 560

Ile Glu Ser Leu Glu Ile Gly Leu Arg Val Met Ser Ile Asp Leu Gly
                565                 570                 575

Gln Arg Gln Ala Ala Ala Ala Ser Ile Phe Glu Val Val Asp Gln Lys
            580                 585                 590

Pro Asp Ile Glu Gly Lys Leu Phe Phe Pro Ile Lys Gly Thr Glu Leu
        595                 600                 605

Tyr Ala Val His Arg Ala Ser Phe Asn Ile Lys Leu Pro Gly Glu Thr
    610                 615                 620

Leu Val Lys Ser Arg Glu Val Leu Arg Lys Ala Arg Glu Asp Asn Leu
625                 630                 635                 640

Lys Leu Met Asn Gln Lys Leu Asn Phe Leu Arg Asn Val Leu His Phe
                645                 650                 655

Gln Gln Phe Glu Asp Ile Thr Glu Arg Glu Lys Arg Val Thr Lys Trp
            660                 665                 670

Ile Ser Arg Gln Glu Asn Ser Asp Val Pro Leu Val Tyr Gln Asp Glu
        675                 680                 685

Leu Ile Gln Ile Arg Glu Leu Met Tyr Lys Pro Tyr Lys Asp Trp Val
    690                 695                 700

Ala Phe Leu Lys Gln Leu His Lys Arg Leu Glu Val Glu Ile Gly Lys
705                 710                 715                 720

Glu Val Lys His Trp Arg Lys Ser Leu Ser Asp Gly Arg Lys Gly Leu
                725                 730                 735

Tyr Gly Ile Ser Leu Lys Asn Ile Asp Glu Ile Asp Arg Thr Arg Lys
            740                 745                 750
```

```
Phe Leu Leu Arg Trp Ser Leu Arg Pro Thr Glu Pro Gly Glu Val Arg
        755                 760                 765

Arg Leu Glu Pro Gly Gln Arg Phe Ala Ile Asp Gln Leu Asn His Leu
    770                 775                 780

Asn Ala Leu Lys Glu Asp Arg Leu Lys Lys Met Ala Asn Thr Ile Ile
785                 790                 795                 800

Met His Ala Leu Gly Tyr Cys Tyr Asp Val Arg Lys Lys Lys Trp Gln
                805                 810                 815

Ala Lys Asn Pro Ala Cys Gln Ile Ile Leu Phe Glu Asp Leu Ser Asn
            820                 825                 830

Tyr Asn Pro Tyr Glu Glu Arg Ser Arg Phe Glu Asn Ser Lys Leu Met
        835                 840                 845

Lys Trp Ser Arg Arg Glu Ile Pro Arg Gln Val Ala Leu Gln Gly Glu
    850                 855                 860

Ile Tyr Gly Leu Gln Val Gly Glu Val Gly Ala Gln Phe Ser Ser Arg
865                 870                 875                 880

Phe His Ala Lys Thr Gly Ser Pro Gly Ile Arg Cys Ser Val Val Thr
                885                 890                 895

Lys Glu Lys Leu Gln Asp Asn Arg Phe Phe Lys Asn Leu Gln Arg Glu
            900                 905                 910

Gly Arg Leu Thr Leu Asp Lys Ile Ala Val Leu Lys Glu Gly Asp Leu
        915                 920                 925

Tyr Pro Asp Lys Gly Gly Glu Lys Phe Ile Ser Leu Ser Lys Asp Arg
    930                 935                 940

Lys Cys Val Thr Thr His Ala Asp Ile Asn Ala Ala Gln Asn Leu Gln
945                 950                 955                 960
```

Lys Arg Phe Trp Thr Arg Thr His Gly Phe Tyr Lys Val Tyr Cys Lys
965 970 975

Ala Tyr Gln Val Asp Gly Gln Thr Val Tyr Ile Pro Glu Ser Lys Asp
980 985 990

Gln Lys Gln Lys Ile Ile Glu Glu Phe Gly Glu Gly Tyr Phe Ile Leu
995 1000 1005

Lys Asp Gly Val Tyr Glu Trp Val Asn Ala Gly Lys Leu Lys Ile
1010 1015 1020

Lys Lys Gly Ser Ser Lys Gln Ser Ser Ser Glu Leu Val Asp Ser
1025 1030 1035

Asp Ile Leu Lys Asp Ser Phe Asp Leu Ala Ser Glu Leu Lys Gly
1040 1045 1050

Glu Lys Leu Met Leu Tyr Arg Asp Pro Ser Gly Asn Val Phe Pro
1055 1060 1065

Ser Asp Lys Trp Met Ala Ala Gly Val Phe Phe Gly Lys Leu Glu
1070 1075 1080

Arg Ile Leu Ile Ser Lys Leu Thr Asn Gln Tyr Ser Ile Ser Thr
1085 1090 1095

Ile Glu Asp Asp Ser Ser Lys Gln Ser Met
1100 1105

<210> 71
<211> 1465
<212> PRT
<213> Thermomonas hydrothermalis

<400> 71

Met Ser Glu Lys Thr Thr Gln Arg Ala Tyr Thr Leu Arg Leu Asn Arg
1 5 10 15

Ala Ser Gly Glu Cys Ala Val Cys Gln Asn Asn Ser Cys Asp Cys Trp
20 25 30

```
His Asp Ala Leu Trp Ala Thr His Lys Ala Val Asn Arg Gly Ala Lys
        35                  40                  45

Ala Phe Gly Asp Trp Leu Leu Thr Leu Arg Gly Gly Leu Cys His Thr
    50                  55                  60

Leu Val Glu Met Glu Val Pro Ala Lys Gly Asn Asn Pro Pro Gln Arg
65                  70                  75                  80

Pro Thr Asp Gln Glu Arg Arg Asp Arg Arg Val Leu Leu Ala Leu Ser
                85                  90                  95

Trp Leu Ser Val Glu Asp Glu His Gly Ala Pro Lys Glu Phe Ile Val
            100                 105                 110

Ala Thr Gly Arg Asp Ser Ala Asp Asp Arg Ala Lys Lys Val Glu Glu
        115                 120                 125

Lys Leu Arg Glu Ile Leu Glu Lys Arg Asp Phe Gln Glu His Glu Ile
    130                 135                 140

Asp Ala Trp Leu Gln Asp Cys Gly Pro Ser Leu Lys Ala His Ile Arg
145                 150                 155                 160

Glu Asp Ala Val Trp Val Asn Arg Arg Ala Leu Phe Asp Ala Ala Val
                165                 170                 175

Glu Arg Ile Lys Thr Leu Thr Trp Glu Glu Ala Trp Asp Phe Leu Glu
            180                 185                 190

Pro Phe Phe Gly Thr Gln Tyr Phe Ala Gly Ile Gly Asp Gly Lys Asp
        195                 200                 205

Lys Asp Asp Ala Glu Gly Pro Ala Arg Gln Gly Glu Lys Ala Lys Asp
    210                 215                 220

Leu Val Gln Lys Ala Gly Gln Trp Leu Ser Ala Arg Phe Gly Ile Gly
225                 230                 235                 240
```

```
Thr Gly Ala Asp Phe Met Ser Met Ala Glu Ala Tyr Glu Lys Ile Ala
                245                 250                 255

Lys Trp Ala Ser Gln Ala Gln Asn Gly Asp Asn Gly Lys Ala Thr Ile
            260                 265                 270

Glu Lys Leu Ala Cys Ala Leu Arg Pro Ser Glu Pro Pro Thr Leu Asp
        275                 280                 285

Thr Val Leu Lys Cys Ile Ser Gly Pro Gly His Lys Ser Ala Thr Arg
    290                 295                 300

Glu Tyr Leu Lys Thr Leu Asp Lys Lys Ser Thr Val Thr Gln Glu Asp
305                 310                 315                 320

Leu Asn Gln Leu Arg Lys Leu Ala Asp Glu Asp Ala Arg Asn Cys Arg
                325                 330                 335

Lys Lys Val Gly Lys Lys Gly Lys Lys Pro Trp Ala Asp Glu Val Leu
            340                 345                 350

Lys Asp Val Glu Asn Ser Cys Glu Leu Thr Tyr Leu Gln Asp Asn Ser
        355                 360                 365

Pro Ala Arg His Arg Glu Phe Ser Val Met Leu Asp His Ala Ala Arg
    370                 375                 380

Arg Val Ser Met Ala His Ser Trp Ile Lys Lys Ala Glu Gln Arg Arg
385                 390                 395                 400

Arg Gln Phe Glu Ser Asp Ala Gln Lys Leu Lys Asn Leu Gln Glu Arg
                405                 410                 415

Ala Pro Ser Ala Val Glu Trp Leu Asp Arg Phe Cys Glu Ser Arg Ser
            420                 425                 430

Met Thr Thr Gly Ala Asn Thr Gly Ser Gly Tyr Arg Ile Arg Lys Arg
        435                 440                 445
```

```
Ala Ile Glu Gly Trp Ser Tyr Val Val Gln Ala Trp Ala Glu Ala Ser
    450                 455                 460

Cys Asp Thr Glu Asp Lys Arg Ile Ala Ala Ala Arg Lys Val Gln Ala
465                 470                 475                 480

Asp Pro Glu Ile Glu Lys Phe Gly Asp Ile Gln Leu Phe Glu Ala Leu
                485                 490                 495

Ala Ala Asp Glu Ala Ile Cys Val Trp Arg Asp Gln Glu Gly Thr Gln
            500                 505                 510

Asn Pro Ser Ile Leu Ile Asp Tyr Val Thr Gly Lys Thr Ala Glu His
        515                 520                 525

Asn Gln Lys Arg Phe Lys Val Pro Ala Tyr Arg His Pro Asp Glu Leu
    530                 535                 540

Arg His Pro Val Phe Cys Asp Phe Gly Asn Ser Arg Trp Ser Ile Gln
545                 550                 555                 560

Phe Ala Ile His Lys Glu Ile Arg Asp Arg Asp Lys Gly Ala Lys Gln
                565                 570                 575

Asp Thr Arg Gln Leu Gln Asn Arg His Gly Leu Lys Met Arg Leu Trp
            580                 585                 590

Asn Gly Arg Ser Met Thr Asp Val Asn Leu His Trp Ser Ser Lys Arg
        595                 600                 605

Leu Thr Ala Asp Leu Ala Leu Asp Gln Asn Pro Asn Pro Asn Pro Thr
    610                 615                 620

Glu Val Thr Arg Ala Asp Arg Leu Gly Arg Ala Ala Ser Ser Ala Phe
625                 630                 635                 640

Asp His Val Lys Ile Lys Asn Val Phe Asn Glu Lys Glu Trp Asn Gly
                645                 650                 655

Arg Leu Gln Ala Pro Arg Ala Glu Leu Asp Arg Ile Ala Lys Leu Glu
```

660 665 670

Glu Gln Gly Lys Thr Glu Gln Ala Glu Lys Leu Arg Lys Arg Leu Arg
675 680 685

Trp Tyr Val Ser Phe Ser Pro Cys Leu Ser Pro Ser Gly Pro Phe Ile
690 695 700

Val Tyr Ala Gly Gln His Asn Ile Gln Pro Lys Arg Ser Gly Gln Tyr
705 710 715 720

Ala Pro His Ala Gln Ala Asn Lys Gly Arg Ala Arg Leu Ala Gln Leu
725 730 735

Ile Leu Ser Arg Leu Pro Asp Leu Arg Ile Leu Ser Val Asp Leu Gly
740 745 750

His Arg Phe Ala Ala Ala Cys Ala Val Trp Glu Thr Leu Ser Ser Asp
755 760 765

Ala Phe Arg Arg Glu Ile Gln Gly Leu Asn Val Leu Ala Gly Gly Ser
770 775 780

Gly Glu Gly Asp Leu Phe Leu His Val Glu Met Thr Gly Asp Asp Gly
785 790 795 800

Lys Arg Arg Thr Val Val Tyr Arg Arg Ile Gly Pro Asp Gln Leu Leu
805 810 815

Asp Asn Thr Pro His Pro Ala Pro Trp Ala Arg Leu Asp Arg Gln Phe
820 825 830

Leu Ile Lys Leu Gln Gly Glu Asp Glu Gly Val Arg Glu Ala Ser Asn
835 840 845

Glu Glu Leu Trp Thr Val His Lys Leu Glu Val Glu Val Gly Arg Thr
850 855 860

Val Pro Leu Ile Asp Arg Met Val Arg Ser Gly Phe Gly Lys Thr Glu
865 870 875 880

```
Lys Gln Lys Glu Arg Leu Lys Lys Leu Arg Glu Leu Gly Trp Ile Ser
                885                 890                 895

Ala Met Pro Asn Glu Pro Ser Ala Glu Thr Asp Glu Lys Glu Gly Glu
            900                 905                 910

Ile Arg Ser Ile Ser Arg Ser Val Asp Glu Leu Met Ser Ser Ala Leu
        915                 920                 925

Gly Thr Leu Arg Leu Ala Leu Lys Arg His Gly Asn Arg Ala Arg Ile
    930                 935                 940

Ala Phe Ala Met Thr Ala Asp Tyr Lys Pro Met Pro Gly Gly Gln Lys
945                 950                 955                 960

Tyr Tyr Phe His Glu Ala Lys Glu Ala Ser Lys Asn Asp Asp Glu Thr
                965                 970                 975

Lys Arg Arg Asp Asn Gln Ile Glu Phe Leu Gln Asp Ala Leu Ser Leu
            980                 985                 990

Trp His Asp Leu Phe Ser Ser Pro  Asp Trp Glu Asp Asn  Glu Ala Lys
        995                 1000                1005

Lys Leu  Trp Gln Asn His Ile  Ala Thr Leu Pro Asn  Tyr Gln Thr
    1010                1015                1020

Pro Glu  Glu Ile Ser Ala Glu  Leu Lys Arg Val Glu  Arg Asn Lys
    1025                1030                1035

Lys Arg  Lys Glu Asn Arg Asp  Lys Leu Arg Thr Ala  Ala Lys Ala
    1040                1045                1050

Leu Ala  Glu Asn Asp Gln Leu  Arg Gln His Leu His  Asp Thr Trp
    1055                1060                1065

Lys Glu  Arg Trp Glu Ser Asp  Asp Gln Gln Trp Lys  Glu Arg Leu
    1070                1075                1080
```

```
Arg Ser  Leu Lys Asp Trp Ile  Phe Pro Arg Gly Lys  Ala Glu Asp
    1085                1090                1095

Asn Pro  Ser Ile Arg His Val  Gly Gly Leu Ser Ile  Thr Arg Ile
    1100                1105                1110

Asn Thr  Ile Ser Gly Leu Tyr  Gln Ile Leu Lys Ala  Phe Lys Met
    1115                1120                1125

Arg Pro  Glu Pro Asp Asp Leu  Arg Lys Asn Ile Pro  Gln Lys Gly
    1130                1135                1140

Asp Asp  Glu Leu Glu Asn Phe  Asn Arg Arg Leu Leu  Glu Ala Arg
    1145                1150                1155

Asp Arg  Leu Arg Glu Gln Arg  Val Lys Gln Leu Ala  Ser Arg Ile
    1160                1165                1170

Ile Glu  Ala Ala Leu Gly Val  Gly Arg Ile Lys Ile  Pro Lys Asn
    1175                1180                1185

Gly Lys  Leu Pro Lys Arg Pro  Arg Thr Thr Val Asp  Thr Pro Cys
    1190                1195                1200

His Ala  Val Val Ile Glu Ser  Leu Lys Thr Tyr Arg  Pro Asp Asp
    1205                1210                1215

Leu Arg  Thr Arg Arg Glu Asn  Arg Gln Leu Met Gln  Trp Ser Ser
    1220                1225                1230

Ala Lys  Val Arg Lys Tyr Leu  Lys Glu Gly Cys Glu  Leu Tyr Gly
    1235                1240                1245

Leu His  Phe Leu Glu Val Pro  Ala Asn Tyr Thr Ser  Arg Gln Cys
    1250                1255                1260

Ser Arg  Thr Gly Leu Pro Gly  Ile Arg Cys Asp Asp  Val Pro Thr
    1265                1270                1275
```

```
Gly Asp  Phe Leu Lys Ala Pro  Trp Trp Arg Arg Ala  Ile Asn Thr
    1280                1285                1290

Ala Arg  Glu Lys Asn Gly Gly  Asp Ala Lys Asp Arg  Phe Leu Val
    1295                1300                1305

Asp Leu  Tyr Asp His Leu Asn  Asn Leu Gln Ser Lys  Gly Glu Ala
    1310                1315                1320

Leu Pro  Ala Thr Val Arg Val  Pro Arg Gln Gly Gly  Asn Leu Phe
    1325                1330                1335

Ile Ala  Gly Ala Gln Leu Asp  Asp Thr Asn Lys Glu  Arg Arg Ala
    1340                1345                1350

Ile Gln  Ala Asp Leu Asn Ala  Ala Ala Asn Ile Gly  Leu Arg Ala
    1355                1360                1365

Leu Leu  Asp Pro Asp Trp Arg  Gly Arg Trp Trp Tyr  Val Pro Cys
    1370                1375                1380

Lys Asp  Gly Thr Ser Glu Pro  Ala Leu Asp Arg Ile  Glu Gly Ser
    1385                1390                1395

Thr Ala  Phe Asn Asp Val Arg  Ser Leu Pro Thr Gly  Asp Asn Ser
    1400                1405                1410

Ser Arg  Arg Ala Pro Arg Glu  Ile Glu Asn Leu Trp  Arg Asp Pro
    1415                1420                1425

Ser Gly  Asp Ser Leu Glu Ser  Gly Thr Trp Ser Pro  Thr Arg Ala
    1430                1435                1440

Tyr Trp  Asp Thr Val Gln Ser  Arg Val Ile Glu Leu  Leu Arg Arg
    1445                1450                1455

His Ala  Gly Leu Pro Thr Ser
    1460                1465
```

<210> 72

<211> 1090
<212> PRT
<213> Laceyella sacchari

<400> 72

Met Ser Ile Arg Ser Phe Lys Leu Lys Leu Lys Thr Lys Ser Gly Val
1 5 10 15

Asn Ala Glu Gln Leu Arg Arg Gly Leu Trp Arg Thr His Gln Leu Ile
20 25 30

Asn Asp Gly Ile Ala Tyr Tyr Met Asn Trp Leu Val Leu Leu Arg Gln
35 40 45

Glu Asp Leu Phe Ile Arg Asn Lys Glu Thr Asn Glu Ile Glu Lys Arg
50 55 60

Ser Lys Glu Glu Ile Gln Ala Val Leu Leu Glu Arg Val His Lys Gln
65 70 75 80

Gln Gln Arg Asn Gln Trp Ser Gly Glu Val Asp Glu Gln Thr Leu Leu
85 90 95

Gln Ala Leu Arg Gln Leu Tyr Glu Glu Ile Val Pro Ser Val Ile Gly
100 105 110

Lys Ser Gly Asn Ala Ser Leu Lys Ala Arg Phe Phe Leu Gly Pro Leu
115 120 125

Val Asp Pro Asn Asn Lys Thr Thr Lys Asp Val Ser Lys Ser Gly Pro
130 135 140

Thr Pro Lys Trp Lys Lys Met Lys Asp Ala Gly Asp Pro Asn Trp Val
145 150 155 160

Gln Glu Tyr Glu Lys Tyr Met Ala Glu Arg Gln Thr Leu Val Arg Leu
165 170 175

Glu Glu Met Gly Leu Ile Pro Leu Phe Pro Met Tyr Thr Asp Glu Val
180 185 190

```
Gly Asp Ile His Trp Leu Pro Gln Ala Ser Gly Tyr Thr Arg Thr Trp
        195                 200                 205

Asp Arg Asp Met Phe Gln Gln Ala Ile Glu Arg Leu Leu Ser Trp Glu
    210                 215                 220

Ser Trp Asn Arg Arg Val Arg Glu Arg Arg Ala Gln Phe Glu Lys Lys
225                 230                 235                 240

Thr His Asp Phe Ala Ser Arg Phe Ser Glu Ser Asp Val Gln Trp Met
                245                 250                 255

Asn Lys Leu Arg Glu Tyr Glu Ala Gln Gln Glu Lys Ser Leu Glu Glu
            260                 265                 270

Asn Ala Phe Ala Pro Asn Glu Pro Tyr Ala Leu Thr Lys Lys Ala Leu
        275                 280                 285

Arg Gly Trp Glu Arg Val Tyr His Ser Trp Met Arg Leu Asp Ser Ala
    290                 295                 300

Ala Ser Glu Glu Ala Tyr Trp Gln Glu Val Ala Thr Cys Gln Thr Ala
305                 310                 315                 320

Met Arg Gly Glu Phe Gly Asp Pro Ala Ile Tyr Gln Phe Leu Ala Gln
                325                 330                 335

Lys Glu Asn His Asp Ile Trp Arg Gly Tyr Pro Glu Arg Val Ile Asp
            340                 345                 350

Phe Ala Glu Leu Asn His Leu Gln Arg Glu Leu Arg Arg Ala Lys Glu
        355                 360                 365

Asp Ala Thr Phe Thr Leu Pro Asp Ser Val Asp His Pro Leu Trp Val
    370                 375                 380

Arg Tyr Glu Ala Pro Gly Gly Thr Asn Ile His Gly Tyr Asp Leu Val
385                 390                 395                 400
```

```
Gln Asp Thr Lys Arg Asn Leu Thr Leu Ile Leu Asp Lys Phe Ile Leu
                405                 410                 415

Pro Asp Glu Asn Gly Ser Trp His Glu Val Lys Lys Val Pro Phe Ser
            420                 425                 430

Leu Ala Lys Ser Lys Gln Phe His Arg Gln Val Trp Leu Gln Glu Glu
        435                 440                 445

Gln Lys Gln Lys Lys Arg Glu Val Val Phe Tyr Asp Tyr Ser Thr Asn
    450                 455                 460

Leu Pro His Leu Gly Thr Leu Ala Gly Ala Lys Leu Gln Trp Asp Arg
465                 470                 475                 480

Asn Phe Leu Asn Lys Arg Thr Gln Gln Gln Ile Glu Glu Thr Gly Glu
                485                 490                 495

Ile Gly Lys Val Phe Phe Asn Ile Ser Val Asp Val Arg Pro Ala Val
            500                 505                 510

Glu Val Lys Asn Gly Arg Leu Gln Asn Gly Leu Gly Lys Ala Leu Thr
        515                 520                 525

Val Leu Thr His Pro Asp Gly Thr Lys Ile Val Thr Gly Trp Lys Ala
    530                 535                 540

Glu Gln Leu Glu Lys Trp Val Gly Glu Ser Gly Arg Val Ser Ser Leu
545                 550                 555                 560

Gly Leu Asp Ser Leu Ser Glu Gly Leu Arg Val Met Ser Ile Asp Leu
                565                 570                 575

Gly Gln Arg Thr Ser Ala Thr Val Ser Val Phe Glu Ile Thr Lys Glu
            580                 585                 590

Ala Pro Asp Asn Pro Tyr Lys Phe Phe Tyr Gln Leu Glu Gly Thr Glu
        595                 600                 605

Met Phe Ala Val His Gln Arg Ser Phe Leu Leu Ala Leu Pro Gly Glu
```

```
    610                 615                 620

Asn Pro Pro Gln Lys Ile Lys Gln Met Arg Glu Ile Arg Trp Lys Glu
625                 630                 635                 640

Arg Asn Arg Ile Lys Gln Gln Val Asp Gln Leu Ser Ala Ile Leu Arg
                645                 650                 655

Leu His Lys Lys Val Asn Glu Asp Glu Arg Ile Gln Ala Ile Asp Lys
            660                 665                 670

Leu Leu Gln Lys Val Ala Ser Trp Gln Leu Asn Glu Glu Ile Ala Thr
        675                 680                 685

Ala Trp Asn Gln Ala Leu Ser Gln Leu Tyr Ser Lys Ala Lys Glu Asn
    690                 695                 700

Asp Leu Gln Trp Asn Gln Ala Ile Lys Asn Ala His His Gln Leu Glu
705                 710                 715                 720

Pro Val Val Gly Lys Gln Ile Ser Leu Trp Arg Lys Asp Leu Ser Thr
                725                 730                 735

Gly Arg Gln Gly Ile Ala Gly Leu Ser Leu Trp Ser Ile Glu Glu Leu
            740                 745                 750

Glu Ala Thr Lys Lys Leu Leu Thr Arg Trp Ser Lys Arg Ser Arg Glu
        755                 760                 765

Pro Gly Val Val Lys Arg Ile Glu Arg Phe Glu Thr Phe Ala Lys Gln
    770                 775                 780

Ile Gln His His Ile Asn Gln Val Lys Glu Asn Arg Leu Lys Gln Leu
785                 790                 795                 800

Ala Asn Leu Ile Val Met Thr Ala Leu Gly Tyr Lys Tyr Asp Gln Glu
                805                 810                 815

Gln Lys Lys Trp Ile Glu Val Tyr Pro Ala Cys Gln Val Val Leu Phe
            820                 825                 830
```

```
Glu Asn Leu Arg Ser Tyr Arg Phe Ser Phe Glu Arg Ser Arg Arg Glu
        835                 840                 845

Asn Lys Lys Leu Met Glu Trp Ser His Arg Ser Ile Pro Lys Leu Val
    850                 855                 860

Gln Met Gln Gly Glu Leu Phe Gly Leu Gln Val Ala Asp Val Tyr Ala
865                 870                 875                 880

Ala Tyr Ser Ser Arg Tyr His Gly Arg Thr Gly Ala Pro Gly Ile Arg
                885                 890                 895

Cys His Ala Leu Thr Glu Ala Asp Leu Arg Asn Glu Thr Asn Ile Ile
            900                 905                 910

His Glu Leu Ile Glu Ala Gly Phe Ile Lys Glu Glu His Arg Pro Tyr
        915                 920                 925

Leu Gln Gln Gly Asp Leu Val Pro Trp Ser Gly Gly Glu Leu Phe Ala
    930                 935                 940

Thr Leu Gln Lys Pro Tyr Asp Asn Pro Arg Ile Leu Thr Leu His Ala
945                 950                 955                 960

Asp Ile Asn Ala Ala Gln Asn Ile Gln Lys Arg Phe Trp His Pro Ser
                965                 970                 975

Met Trp Phe Arg Val Asn Cys Glu Ser Val Met Glu Gly Glu Ile Val
            980                 985                 990

Thr Tyr Val Pro Lys Asn Lys Thr  Val His Lys Lys Gln  Gly Lys Thr
        995                 1000                1005

Phe Arg  Phe Val Lys Val Glu  Gly Ser Asp Val Tyr  Glu Trp Ala
    1010                1015                1020

Lys Trp  Ser Lys Asn Arg Asn  Lys Asn Thr Phe Ser  Ser Ile Thr
    1025                1030                1035
```

Glu Arg Lys Pro Pro Ser Ser Met Ile Leu Phe Arg Asp Pro Ser
    1040   1045   1050

Gly Thr Phe Phe Lys Glu Gln Glu Trp Val Glu Gln Lys Thr Phe
    1055   1060   1065

Trp Gly Lys Val Gln Ser Met Ile Gln Ala Tyr Met Lys Lys Thr
    1070   1075   1080

Ile Val Gln Arg Met Glu Glu
    1085   1090

<210> 73
<211> 1194
<212> PRT
<213> Dsulfonatronum thiodismutans

<400> 73

Met Val Leu Gly Arg Lys Asp Asp Thr Ala Glu Leu Arg Arg Ala Leu
1   5   10   15

Trp Thr Thr His Glu His Val Asn Leu Ala Val Ala Glu Val Glu Arg
            20   25   30

Val Leu Leu Arg Cys Arg Gly Arg Ser Tyr Trp Thr Leu Asp Arg Arg
        35   40   45

Gly Asp Pro Val His Val Pro Glu Ser Gln Val Ala Glu Asp Ala Leu
    50   55   60

Ala Met Ala Arg Glu Ala Gln Arg Arg Asn Gly Trp Pro Val Val Gly
65   70   75   80

Glu Asp Glu Glu Ile Leu Leu Ala Leu Arg Tyr Leu Tyr Glu Gln Ile
                85   90   95

Val Pro Ser Cys Leu Leu Asp Asp Leu Gly Lys Pro Leu Lys Gly Asp
            100   105   110

Ala Gln Lys Ile Gly Thr Asn Tyr Ala Gly Pro Leu Phe Asp Ser Asp

```
        115                 120                 125

Thr Cys Arg Arg Asp Glu Gly Lys Asp Val Ala Cys Cys Gly Pro Phe
    130                 135                 140

His Glu Val Ala Gly Lys Tyr Leu Gly Ala Leu Pro Glu Trp Ala Thr
145                 150                 155                 160

Pro Ile Ser Lys Gln Glu Phe Asp Gly Lys Asp Ala Ser His Leu Arg
                165                 170                 175

Phe Lys Ala Thr Gly Gly Asp Asp Ala Phe Phe Arg Val Ser Ile Glu
            180                 185                 190

Lys Ala Asn Ala Trp Tyr Glu Asp Pro Ala Asn Gln Asp Ala Leu Lys
        195                 200                 205

Asn Lys Ala Tyr Asn Lys Asp Asp Trp Lys Lys Glu Lys Asp Lys Gly
    210                 215                 220

Ile Ser Ser Trp Ala Val Lys Tyr Ile Gln Lys Gln Leu Gln Leu Gly
225                 230                 235                 240

Gln Asp Pro Arg Thr Glu Val Arg Arg Lys Leu Trp Leu Glu Leu Gly
                245                 250                 255

Leu Leu Pro Leu Phe Ile Pro Val Phe Asp Lys Thr Met Val Gly Asn
            260                 265                 270

Leu Trp Asn Arg Leu Ala Val Arg Leu Ala Leu Ala His Leu Leu Ser
        275                 280                 285

Trp Glu Ser Trp Asn His Arg Ala Val Gln Asp Gln Ala Leu Ala Arg
    290                 295                 300

Ala Lys Arg Asp Glu Leu Ala Ala Leu Phe Leu Gly Met Glu Asp Gly
305                 310                 315                 320

Phe Ala Gly Leu Arg Glu Tyr Glu Leu Arg Arg Asn Glu Ser Ile Lys
                325                 330                 335
```

```
Gln His Ala Phe Glu Pro Val Asp Arg Pro Tyr Val Val Ser Gly Arg
            340                 345                 350

Ala Leu Arg Ser Trp Thr Arg Val Arg Glu Glu Trp Leu Arg His Gly
        355                 360                 365

Asp Thr Gln Glu Ser Arg Lys Asn Ile Cys Asn Arg Leu Gln Asp Arg
    370                 375                 380

Leu Arg Gly Lys Phe Gly Asp Pro Asp Val Phe His Trp Leu Ala Glu
385                 390                 395                 400

Asp Gly Gln Glu Ala Leu Trp Lys Glu Arg Asp Cys Val Thr Ser Phe
                405                 410                 415

Ser Leu Leu Asn Asp Ala Asp Gly Leu Leu Glu Lys Arg Lys Gly Tyr
            420                 425                 430

Ala Leu Met Thr Phe Ala Asp Ala Arg Leu His Pro Arg Trp Ala Met
        435                 440                 445

Tyr Glu Ala Pro Gly Gly Ser Asn Leu Arg Thr Tyr Gln Ile Arg Lys
    450                 455                 460

Thr Glu Asn Gly Leu Trp Ala Asp Val Val Leu Leu Ser Pro Arg Asn
465                 470                 475                 480

Glu Ser Ala Ala Val Glu Glu Lys Thr Phe Asn Val Arg Leu Ala Pro
                485                 490                 495

Ser Gly Gln Leu Ser Asn Val Ser Phe Asp Gln Ile Gln Lys Gly Ser
            500                 505                 510

Lys Met Val Gly Arg Cys Arg Tyr Gln Ser Ala Asn Gln Gln Phe Glu
        515                 520                 525

Gly Leu Leu Gly Gly Ala Glu Ile Leu Phe Asp Arg Lys Arg Ile Ala
    530                 535                 540
```

```
Asn Glu Gln His Gly Ala Thr Asp Leu Ala Ser Lys Pro Gly His Val
545                 550                 555                 560

Trp Phe Lys Leu Thr Leu Asp Val Arg Pro Gln Ala Pro Gln Gly Trp
                565                 570                 575

Leu Asp Gly Lys Gly Arg Pro Ala Leu Pro Pro Glu Ala Lys His Phe
            580                 585                 590

Lys Thr Ala Leu Ser Asn Lys Ser Lys Phe Ala Asp Gln Val Arg Pro
        595                 600                 605

Gly Leu Arg Val Leu Ser Val Asp Leu Gly Val Arg Ser Phe Ala Ala
    610                 615                 620

Cys Ser Val Phe Glu Leu Val Arg Gly Gly Pro Asp Gln Gly Thr Tyr
625                 630                 635                 640

Phe Pro Ala Ala Asp Gly Arg Thr Val Asp Asp Pro Glu Lys Leu Trp
                645                 650                 655

Ala Lys His Glu Arg Ser Phe Lys Ile Thr Leu Pro Gly Glu Asn Pro
            660                 665                 670

Ser Arg Lys Glu Glu Ile Ala Arg Arg Ala Ala Met Glu Glu Leu Arg
        675                 680                 685

Ser Leu Asn Gly Asp Ile Arg Arg Leu Lys Ala Ile Leu Arg Leu Ser
    690                 695                 700

Val Leu Gln Glu Asp Asp Pro Arg Thr Glu His Leu Arg Leu Phe Met
705                 710                 715                 720

Glu Ala Ile Val Asp Asp Pro Ala Lys Ser Ala Leu Asn Ala Glu Leu
                725                 730                 735

Phe Lys Gly Phe Gly Asp Asp Arg Phe Arg Ser Thr Pro Asp Leu Trp
            740                 745                 750
```

```
Lys Gln His Cys His Phe Phe His Asp Lys Ala Glu Lys Val Val Ala
        755                 760                 765

Glu Arg Phe Ser Arg Trp Arg Thr Glu Thr Arg Pro Lys Ser Ser Ser
    770                 775                 780

Trp Gln Asp Trp Arg Glu Arg Arg Gly Tyr Ala Gly Gly Lys Ser Tyr
785                 790                 795                 800

Trp Ala Val Thr Tyr Leu Glu Ala Val Arg Gly Leu Ile Leu Arg Trp
                805                 810                 815

Asn Met Arg Gly Arg Thr Tyr Gly Glu Val Asn Arg Gln Asp Lys Lys
            820                 825                 830

Gln Phe Gly Thr Val Ala Ser Ala Leu Leu His His Ile Asn Gln Leu
        835                 840                 845

Lys Glu Asp Arg Ile Lys Thr Gly Ala Asp Met Ile Ile Gln Ala Ala
    850                 855                 860

Arg Gly Phe Val Pro Arg Lys Asn Gly Ala Gly Trp Val Gln Val His
865                 870                 875                 880

Glu Pro Cys Arg Leu Ile Leu Phe Glu Asp Leu Ala Arg Tyr Arg Phe
                885                 890                 895

Arg Thr Asp Arg Ser Arg Arg Glu Asn Ser Arg Leu Met Arg Trp Ser
            900                 905                 910

His Arg Glu Ile Val Asn Glu Val Gly Met Gln Gly Glu Leu Tyr Gly
        915                 920                 925

Leu His Val Asp Thr Thr Glu Ala Gly Phe Ser Ser Arg Tyr Leu Ala
    930                 935                 940

Ser Ser Gly Ala Pro Gly Val Arg Cys Arg His Leu Val Glu Glu Asp
945                 950                 955                 960

Phe His Asp Gly Leu Pro Gly Met His Leu Val Gly Glu Leu Asp Trp
```

```
               965                 970                 975

Leu Leu Pro Lys Asp Lys Asp Arg Thr Ala Asn Glu Ala Arg Arg Leu
            980                 985                 990

Leu Gly Gly Met Val Arg Pro Gly  Met Leu Val Pro Trp  Asp Gly Gly
        995                 1000                1005

Glu Leu  Phe Ala Thr Leu Asn  Ala Ala Ser Gln Leu  His Val Ile
    1010                1015                1020

His Ala  Asp Ile Asn Ala Ala  Gln Asn Leu Gln Arg  Arg Phe Trp
    1025                1030                1035

Gly Arg  Cys Gly Glu Ala Ile  Arg Ile Val Cys Asn  Gln Leu Ser
    1040                1045                1050

Val Asp  Gly Ser Thr Arg Tyr  Glu Met Ala Lys Ala  Pro Lys Ala
    1055                1060                1065

Arg Leu  Leu Gly Ala Leu Gln  Gln Leu Lys Asn Gly  Asp Ala Pro
    1070                1075                1080

Phe His  Leu Thr Ser Ile Pro  Asn Ser Gln Lys Pro  Glu Asn Ser
    1085                1090                1095

Tyr Val  Met Thr Pro Thr Asn  Ala Gly Lys Lys Tyr  Arg Ala Gly
    1100                1105                1110

Pro Gly  Glu Lys Ser Ser Gly  Glu Glu Asp Glu Leu  Ala Leu Asp
    1115                1120                1125

Ile Val  Glu Gln Ala Glu Glu  Leu Ala Gln Gly Arg  Lys Thr Phe
    1130                1135                1140

Phe Arg  Asp Pro Ser Gly Val  Phe Phe Ala Pro Asp  Arg Trp Leu
    1145                1150                1155

Pro Ser  Glu Ile Tyr Trp Ser  Arg Ile Arg Arg Arg  Ile Trp Gln
    1160                1165                1170
```

Val Thr Leu Glu Arg Asn Ser Ser Gly Arg Gln Glu Arg Ala Glu
    1175   1180   1185

Met Asp Glu Met Pro Tyr
    1190

<210> 74
<211> 1300
<212> PRT
<213> Francisella novicida

<400> 74

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
```

<210> 75
<211> 1082
<212> PRT
<213> Geobacillus thermodenitrificans

<400> 75

```
Met Lys Tyr Lys Ile Gly Leu Asp Ile Gly Ile Thr Ser Ile Gly Trp
1               5                   10                  15

Ala Val Ile Asn Leu Asp Ile Pro Arg Ile Glu Asp Leu Gly Val Arg
            20                  25                  30

Ile Phe Asp Arg Ala Glu Asn Pro Lys Thr Gly Glu Ser Leu Ala Leu
        35                  40                  45

Pro Arg Arg Leu Ala Arg Ser Ala Arg Arg Arg Leu Arg Arg Arg Lys
    50                  55                  60
```

```
His Arg Leu Glu Arg Ile Arg Arg Leu Phe Val Arg Glu Gly Ile Leu
65                  70                  75                  80

Thr Lys Glu Glu Leu Asn Lys Leu Phe Glu Lys Lys His Glu Ile Asp
                85                  90                  95

Val Trp Gln Leu Arg Val Glu Ala Leu Asp Arg Lys Leu Asn Asn Asp
            100                 105                 110

Glu Leu Ala Arg Ile Leu Leu His Leu Ala Lys Arg Arg Gly Phe Arg
        115                 120                 125

Ser Asn Arg Lys Ser Glu Arg Thr Asn Lys Glu Asn Ser Thr Met Leu
    130                 135                 140

Lys His Ile Glu Glu Asn Gln Ser Ile Leu Ser Ser Tyr Arg Thr Val
145                 150                 155                 160

Ala Glu Met Val Val Lys Asp Pro Lys Phe Ser Leu His Lys Arg Asn
                165                 170                 175

Lys Glu Asp Asn Tyr Thr Asn Thr Val Ala Arg Asp Asp Leu Glu Arg
            180                 185                 190

Glu Ile Lys Leu Ile Phe Ala Lys Gln Arg Glu Tyr Gly Asn Ile Val
        195                 200                 205

Cys Thr Glu Ala Phe Glu His Glu Tyr Ile Ser Ile Trp Ala Ser Gln
    210                 215                 220

Arg Pro Phe Ala Ser Lys Asp Asp Ile Glu Lys Lys Val Gly Phe Cys
225                 230                 235                 240

Thr Phe Glu Pro Lys Glu Lys Arg Ala Pro Lys Ala Thr Tyr Thr Phe
                245                 250                 255

Gln Ser Phe Thr Val Trp Glu His Ile Asn Lys Leu Arg Leu Val Ser
            260                 265                 270
```

```
Pro Gly Gly Ile Arg Ala Leu Thr Asp Asp Glu Arg Arg Leu Ile Tyr
        275                 280                 285

Lys Gln Ala Phe His Lys Asn Lys Ile Thr Phe His Asp Val Arg Thr
    290                 295                 300

Leu Leu Asn Leu Pro Asp Asp Thr Arg Phe Lys Gly Leu Leu Tyr Asp
305                 310                 315                 320

Arg Asn Thr Thr Leu Lys Glu Asn Glu Lys Val Arg Phe Leu Glu Leu
                325                 330                 335

Gly Ala Tyr His Lys Ile Arg Lys Ala Ile Asp Ser Val Tyr Gly Lys
            340                 345                 350

Gly Ala Ala Lys Ser Phe Arg Pro Ile Asp Phe Asp Thr Phe Gly Tyr
        355                 360                 365

Ala Leu Thr Met Phe Lys Asp Asp Thr Asp Ile Arg Ser Tyr Leu Arg
    370                 375                 380

Asn Glu Tyr Glu Gln Asn Gly Lys Arg Met Glu Asn Leu Ala Asp Lys
385                 390                 395                 400

Val Tyr Asp Glu Glu Leu Ile Glu Glu Leu Leu Asn Leu Ser Phe Ser
                405                 410                 415

Lys Phe Gly His Leu Ser Leu Lys Ala Leu Arg Asn Ile Leu Pro Tyr
            420                 425                 430

Met Glu Gln Gly Glu Val Tyr Ser Thr Ala Cys Glu Arg Ala Gly Tyr
        435                 440                 445

Thr Phe Thr Gly Pro Lys Lys Lys Gln Lys Thr Val Leu Leu Pro Asn
    450                 455                 460

Ile Pro Pro Ile Ala Asn Pro Val Val Met Arg Ala Leu Thr Gln Ala
465                 470                 475                 480

Arg Lys Val Val Asn Ala Ile Ile Lys Lys Tyr Gly Ser Pro Val Ser
```

```
                485                 490                 495

Ile His Ile Glu Leu Ala Arg Glu Leu Ser Gln Ser Phe Asp Glu Arg
            500                 505                 510

Arg Lys Met Gln Lys Glu Gln Glu Gly Asn Arg Lys Lys Asn Glu Thr
        515                 520                 525

Ala Ile Arg Gln Leu Val Glu Tyr Gly Leu Thr Leu Asn Pro Thr Gly
    530                 535                 540

Leu Asp Ile Val Lys Phe Lys Leu Trp Ser Glu Gln Asn Gly Lys Cys
545                 550                 555                 560

Ala Tyr Ser Leu Gln Pro Ile Glu Ile Glu Arg Leu Leu Glu Pro Gly
                565                 570                 575

Tyr Thr Glu Val Asp His Val Ile Pro Tyr Ser Arg Ser Leu Asp Asp
            580                 585                 590

Ser Tyr Thr Asn Lys Val Leu Val Leu Thr Lys Glu Asn Arg Glu Lys
        595                 600                 605

Gly Asn Arg Thr Pro Ala Glu Tyr Leu Gly Leu Gly Ser Glu Arg Trp
    610                 615                 620

Gln Gln Phe Glu Thr Phe Val Leu Thr Asn Lys Gln Phe Ser Lys Lys
625                 630                 635                 640

Lys Arg Asp Arg Leu Leu Arg Leu His Tyr Asp Glu Asn Glu Glu Asn
                645                 650                 655

Glu Phe Lys Asn Arg Asn Leu Asn Asp Thr Arg Tyr Ile Ser Arg Phe
            660                 665                 670

Leu Ala Asn Phe Ile Arg Glu His Leu Lys Phe Ala Asp Ser Asp Asp
        675                 680                 685

Lys Gln Lys Val Tyr Thr Val Asn Gly Arg Ile Thr Ala His Leu Arg
    690                 695                 700
```

```
Ser Arg Trp Asn Phe Asn Lys Asn Arg Glu Glu Ser Asn Leu His His
705                 710                 715                 720

Ala Val Asp Ala Ala Ile Val Ala Cys Thr Thr Pro Ser Asp Ile Ala
                725                 730                 735

Arg Val Thr Ala Phe Tyr Gln Arg Arg Glu Gln Asn Lys Glu Leu Ser
            740                 745                 750

Lys Lys Thr Asp Pro Gln Phe Pro Gln Pro Trp Pro His Phe Ala Asp
        755                 760                 765

Glu Leu Gln Ala Arg Leu Ser Lys Asn Pro Lys Glu Ser Ile Lys Ala
    770                 775                 780

Leu Asn Leu Gly Asn Tyr Asp Asn Glu Lys Leu Glu Ser Leu Gln Pro
785                 790                 795                 800

Val Phe Val Ser Arg Met Pro Lys Arg Ser Ile Thr Gly Ala Ala His
                805                 810                 815

Gln Glu Thr Leu Arg Arg Tyr Ile Gly Ile Asp Glu Arg Ser Gly Lys
            820                 825                 830

Ile Gln Thr Val Val Lys Lys Lys Leu Ser Glu Ile Gln Leu Asp Lys
        835                 840                 845

Thr Gly His Phe Pro Met Tyr Gly Lys Glu Ser Asp Pro Arg Thr Tyr
    850                 855                 860

Glu Ala Ile Arg Gln Arg Leu Leu Glu His Asn Asn Asp Pro Lys Lys
865                 870                 875                 880

Ala Phe Gln Glu Pro Leu Tyr Lys Pro Lys Lys Asn Gly Glu Leu Gly
                885                 890                 895

Pro Ile Ile Arg Thr Ile Lys Ile Ile Asp Thr Thr Asn Gln Val Ile
            900                 905                 910
```

Pro Leu Asn Asp Gly Lys Thr Val Ala Tyr Asn Ser Asn Ile Val Arg
915 920 925

Val Asp Val Phe Glu Lys Asp Gly Lys Tyr Tyr Cys Val Pro Ile Tyr
930 935 940

Thr Ile Asp Met Met Lys Gly Ile Leu Pro Asn Lys Ala Ile Glu Pro
945 950 955 960

Asn Lys Pro Tyr Ser Glu Trp Lys Glu Met Thr Glu Asp Tyr Thr Phe
965 970 975

Arg Phe Ser Leu Tyr Pro Asn Asp Leu Ile Arg Ile Glu Phe Pro Arg
980 985 990

Glu Lys Thr Ile Lys Thr Ala Val Gly Glu Glu Ile Lys Ile Lys Asp
995 1000 1005

Leu Phe Ala Tyr Tyr Gln Thr Ile Asp Ser Ser Asn Gly Gly Leu
1010 1015 1020

Ser Leu Val Ser His Asp Asn Asn Phe Ser Leu Arg Ser Ile Gly
1025 1030 1035

Ser Arg Thr Leu Lys Arg Phe Glu Lys Tyr Gln Val Asp Val Leu
1040 1045 1050

Gly Asn Ile Tyr Lys Val Arg Gly Glu Lys Arg Val Gly Val Ala
1055 1060 1065

Ser Ser Ser His Ser Lys Ala Gly Glu Thr Ile Arg Pro Leu
1070 1075 1080

<210> 76
<211> 887
<212> PRT
<213> Natronobacterium gregoryi

<400> 76

Met Thr Val Ile Asp Leu Asp Ser Thr Thr Thr Ala Asp Glu Leu Thr

```
1               5                   10                  15

Ser Gly His Thr Tyr Asp Ile Ser Val Thr Leu Thr Gly Val Tyr Asp
            20                  25                  30

Asn Thr Asp Glu Gln His Pro Arg Met Ser Leu Ala Phe Glu Gln Asp
        35                  40                  45

Asn Gly Glu Arg Arg Tyr Ile Thr Leu Trp Lys Asn Thr Thr Pro Lys
    50                  55                  60

Asp Val Phe Thr Tyr Asp Tyr Ala Thr Gly Ser Thr Tyr Ile Phe Thr
65                  70                  75                  80

Asn Ile Asp Tyr Glu Val Lys Asp Gly Tyr Glu Asn Leu Thr Ala Thr
                85                  90                  95

Tyr Gln Thr Thr Val Glu Asn Ala Thr Ala Gln Glu Val Gly Thr Thr
            100                 105                 110

Asp Glu Asp Glu Thr Phe Ala Gly Gly Glu Pro Leu Asp His His Leu
        115                 120                 125

Asp Asp Ala Leu Asn Glu Thr Pro Asp Asp Ala Glu Thr Glu Ser Asp
    130                 135                 140

Ser Gly His Val Met Thr Ser Phe Ala Ser Arg Asp Gln Leu Pro Glu
145                 150                 155                 160

Trp Thr Leu His Thr Tyr Thr Leu Thr Ala Thr Asp Gly Ala Lys Thr
                165                 170                 175

Asp Thr Glu Tyr Ala Arg Arg Thr Leu Ala Tyr Thr Val Arg Gln Glu
            180                 185                 190

Leu Tyr Thr Asp His Asp Ala Ala Pro Val Ala Thr Asp Gly Leu Met
        195                 200                 205

Leu Leu Thr Pro Glu Pro Leu Gly Glu Thr Pro Leu Asp Leu Asp Cys
    210                 215                 220
```

```
Gly Val Arg Val Glu Ala Asp Glu Thr Arg Thr Leu Asp Tyr Thr Thr
225                 230                 235                 240

Ala Lys Asp Arg Leu Leu Ala Arg Glu Leu Val Glu Glu Gly Leu Lys
                245                 250                 255

Arg Ser Leu Trp Asp Asp Tyr Leu Val Arg Gly Ile Asp Glu Val Leu
            260                 265                 270

Ser Lys Glu Pro Val Leu Thr Cys Asp Glu Phe Asp Leu His Glu Arg
        275                 280                 285

Tyr Asp Leu Ser Val Glu Val Gly His Ser Gly Arg Ala Tyr Leu His
    290                 295                 300

Ile Asn Phe Arg His Arg Phe Val Pro Lys Leu Thr Leu Ala Asp Ile
305                 310                 315                 320

Asp Asp Asp Asn Ile Tyr Pro Gly Leu Arg Val Lys Thr Thr Tyr Arg
                325                 330                 335

Pro Arg Arg Gly His Ile Val Trp Gly Leu Arg Asp Glu Cys Ala Thr
            340                 345                 350

Asp Ser Leu Asn Thr Leu Gly Asn Gln Ser Val Val Ala Tyr His Arg
        355                 360                 365

Asn Asn Gln Thr Pro Ile Asn Thr Asp Leu Leu Asp Ala Ile Glu Ala
    370                 375                 380

Ala Asp Arg Arg Val Val Glu Thr Arg Arg Gln Gly His Gly Asp Asp
385                 390                 395                 400

Ala Val Ser Phe Pro Gln Glu Leu Leu Ala Val Glu Pro Asn Thr His
                405                 410                 415

Gln Ile Lys Gln Phe Ala Ser Asp Gly Phe His Gln Gln Ala Arg Ser
            420                 425                 430
```

```
Lys Thr Arg Leu Ser Ala Ser Arg Cys Ser Glu Lys Ala Gln Ala Phe
        435                 440                 445

Ala Glu Arg Leu Asp Pro Val Arg Leu Asn Gly Ser Thr Val Glu Phe
    450                 455                 460

Ser Ser Glu Phe Phe Thr Gly Asn Asn Glu Gln Gln Leu Arg Leu Leu
465                 470                 475                 480

Tyr Glu Asn Gly Glu Ser Val Leu Thr Phe Arg Asp Gly Ala Arg Gly
                485                 490                 495

Ala His Pro Asp Glu Thr Phe Ser Lys Gly Ile Val Asn Pro Pro Glu
            500                 505                 510

Ser Phe Glu Val Ala Val Val Leu Pro Glu Gln Gln Ala Asp Thr Cys
        515                 520                 525

Lys Ala Gln Trp Asp Thr Met Ala Asp Leu Leu Asn Gln Ala Gly Ala
    530                 535                 540

Pro Pro Thr Arg Ser Glu Thr Val Gln Tyr Asp Ala Phe Ser Ser Pro
545                 550                 555                 560

Glu Ser Ile Ser Leu Asn Val Ala Gly Ala Ile Asp Pro Ser Glu Val
                565                 570                 575

Asp Ala Ala Phe Val Val Leu Pro Pro Asp Gln Glu Gly Phe Ala Asp
            580                 585                 590

Leu Ala Ser Pro Thr Glu Thr Tyr Asp Glu Leu Lys Lys Ala Leu Ala
        595                 600                 605

Asn Met Gly Ile Tyr Ser Gln Met Ala Tyr Phe Asp Arg Phe Arg Asp
    610                 615                 620

Ala Lys Ile Phe Tyr Thr Arg Asn Val Ala Leu Gly Leu Leu Ala Ala
625                 630                 635                 640
```

```
Ala Gly Gly Val Ala Phe Thr Thr Glu His Ala Met Pro Gly Asp Ala
                645                 650                 655

Asp Met Phe Ile Gly Ile Asp Val Ser Arg Ser Tyr Pro Glu Asp Gly
            660                 665                 670

Ala Ser Gly Gln Ile Asn Ile Ala Ala Thr Ala Thr Ala Val Tyr Lys
        675                 680                 685

Asp Gly Thr Ile Leu Gly His Ser Ser Thr Arg Pro Gln Leu Gly Glu
    690                 695                 700

Lys Leu Gln Ser Thr Asp Val Arg Asp Ile Met Lys Asn Ala Ile Leu
705                 710                 715                 720

Gly Tyr Gln Gln Val Thr Gly Glu Ser Pro Thr His Ile Val Ile His
                725                 730                 735

Arg Asp Gly Phe Met Asn Glu Asp Leu Asp Pro Ala Thr Glu Phe Leu
            740                 745                 750

Asn Glu Gln Gly Val Glu Tyr Asp Ile Val Glu Ile Arg Lys Gln Pro
        755                 760                 765

Gln Thr Arg Leu Leu Ala Val Ser Asp Val Gln Tyr Asp Thr Pro Val
    770                 775                 780

Lys Ser Ile Ala Ala Ile Asn Gln Asn Glu Pro Arg Ala Thr Val Ala
785                 790                 795                 800

Thr Phe Gly Ala Pro Glu Tyr Leu Ala Thr Arg Asp Gly Gly Gly Leu
                805                 810                 815

Pro Arg Pro Ile Gln Ile Glu Arg Val Ala Gly Glu Thr Asp Ile Glu
            820                 825                 830

Thr Leu Thr Arg Gln Val Tyr Leu Leu Ser Gln Ser His Ile Gln Val
        835                 840                 845

His Asn Ser Thr Ala Arg Leu Pro Ile Thr Thr Ala Tyr Ala Asp Gln
```

```
    850                 855                 860

Ala Ser Thr His Ala Thr Lys Gly Tyr Leu Val Gln Thr Gly Ala Phe
865                 870                 875                 880

Glu Ser Asn Val Gly Phe Leu
                885
```

<210> 77
<211> 1387
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 77

```
Asp Tyr Lys Val Tyr Asp Val Arg Lys Met Ile Ala Lys Ser Glu Gln
1               5                   10                  15

Glu Ile Gly Lys Ala Thr Ala Lys Tyr Phe Phe Tyr Ser Asn Ile Met
            20                  25                  30

Asn Phe Phe Lys Thr Glu Ile Thr Leu Ala Asn Gly Glu Ile Arg Lys
        35                  40                  45

Arg Pro Leu Ile Glu Thr Asn Gly Glu Thr Gly Glu Ile Val Trp Asp
    50                  55                  60

Lys Gly Arg Asp Phe Ala Thr Val Arg Lys Val Leu Ser Met Pro Gln
65                  70                  75                  80

Val Asn Ile Val Lys Lys Thr Glu Val Gln Thr Gly Gly Phe Ser Lys
                85                  90                  95

Glu Ser Ile Leu Pro Lys Arg Asn Ser Asp Lys Leu Ile Ala Arg Lys
            100                 105                 110

Lys Asp Trp Asp Pro Lys Lys Tyr Gly Gly Phe Asp Ser Pro Thr Val
        115                 120                 125
```

```
Ala Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys Gly Lys Ser Lys
    130                 135                 140

Lys Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr Ile Met Glu Arg
145                 150                 155                 160

Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala Lys Gly Tyr
                165                 170                 175

Lys Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro Lys Tyr Ser Leu
            180                 185                 190

Phe Glu Leu Glu Asn Gly Arg Lys Arg Met Leu Ala Ser Ala Gly Glu
        195                 200                 205

Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro Ser Lys Tyr Val Asn Phe
    210                 215                 220

Leu Tyr Leu Ala Ser His Tyr Glu Lys Leu Lys Gly Ser Pro Glu Asp
225                 230                 235                 240

Asn Glu Gln Lys Gln Leu Phe Val Glu Gln His Lys His Tyr Leu Asp
                245                 250                 255

Glu Ile Ile Glu Gln Ile Ser Glu Phe Ser Lys Arg Val Ile Leu Ala
            260                 265                 270

Asp Ala Asn Leu Asp Lys Val Leu Ser Ala Tyr Asn Lys His Arg Asp
        275                 280                 285

Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile Ile His Leu Phe Thr Leu
    290                 295                 300

Thr Asn Leu Gly Ala Pro Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile
305                 310                 315                 320

Asp Arg Lys Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu
                325                 330                 335

Ile His Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser
```

```
            340                 345                 350

Gln Leu Gly Gly Asp Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly
        355                 360                 365

Ser Gly Gly Ser Gly Gly Ser Gly Gly Asp Lys Lys Tyr Ser Ile Gly
    370                 375                 380

Leu Ala Ile Gly Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu
385                 390                 395                 400

Tyr Lys Val Pro Ser Lys Lys Phe Lys Val Leu Gly Asn Thr Asp Arg
                405                 410                 415

His Ser Ile Lys Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly
            420                 425                 430

Glu Thr Ala Glu Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr
        435                 440                 445

Thr Arg Arg Lys Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn
    450                 455                 460

Glu Met Ala Lys Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser
465                 470                 475                 480

Phe Leu Val Glu Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly
                485                 490                 495

Asn Ile Val Asp Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr
            500                 505                 510

His Leu Arg Lys Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg
        515                 520                 525

Leu Ile Tyr Leu Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe
    530                 535                 540

Leu Ile Glu Gly Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu
545                 550                 555                 560
```

```
Phe Ile Gln Leu Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro
                565                 570                 575

Ile Asn Ala Ser Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu
            580                 585                 590

Ser Lys Ser Arg Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu
        595                 600                 605

Lys Lys Asn Gly Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu
    610                 615                 620

Thr Pro Asn Phe Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu
625                 630                 635                 640

Gln Leu Ser Lys Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala
                645                 650                 655

Gln Ile Gly Asp Gln Tyr Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu
            660                 665                 670

Ser Asp Ala Ile Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile
        675                 680                 685

Thr Lys Ala Pro Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His
    690                 695                 700

His Gln Asp Leu Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro
705                 710                 715                 720

Glu Lys Tyr Lys Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala
                725                 730                 735

Gly Tyr Ile Asp Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile
            740                 745                 750

Lys Pro Ile Leu Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys
        755                 760                 765
```

```
Leu Asn Arg Glu Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly
    770                 775                 780

Ser Ile Pro His Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg
785                 790                 795                 800

Arg Gln Glu Asp Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile
                805                 810                 815

Glu Lys Ile Leu Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala
            820                 825                 830

Arg Gly Asn Ser Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr
        835                 840                 845

Ile Thr Pro Trp Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala
    850                 855                 860

Gln Ser Phe Ile Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn
865                 870                 875                 880

Glu Lys Val Leu Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val
                885                 890                 895

Tyr Asn Glu Leu Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys
            900                 905                 910

Pro Ala Phe Leu Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu
        915                 920                 925

Phe Lys Thr Asn Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr
    930                 935                 940

Phe Lys Lys Ile Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu
945                 950                 955                 960

Asp Arg Phe Asn Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile
                965                 970                 975
```

```
Ile Lys Asp Lys Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu
            980                 985                 990

Glu Asp Ile Val Leu Thr Leu Thr  Leu Phe Glu Asp Arg  Glu Met Ile
        995                1000                1005

Glu Glu  Arg Leu Lys Thr Tyr  Ala His Leu Phe Asp  Asp Lys Val
    1010                1015                1020

Met Lys  Gln Leu Lys Arg Arg  Arg Tyr Thr Gly Trp  Gly Arg Leu
    1025                1030                1035

Ser Arg  Lys Leu Ile Asn Gly  Ile Arg Asp Lys Gln  Ser Gly Lys
    1040                1045                1050

Thr Ile  Leu Asp Phe Leu Lys  Ser Asp Gly Phe Ala  Asn Arg Asn
    1055                1060                1065

Phe Met  Gln Leu Ile His Asp  Asp Ser Leu Thr Phe  Lys Glu Asp
    1070                1075                1080

Ile Gln  Lys Ala Gln Val Ser  Gly Gln Gly Asp Ser  Leu His Glu
    1085                1090                1095

His Ile  Ala Asn Leu Ala Gly  Ser Pro Ala Ile Lys  Lys Gly Ile
    1100                1105                1110

Leu Gln  Thr Val Lys Val Val  Asp Glu Leu Val Lys  Val Met Gly
    1115                1120                1125

Arg His  Lys Pro Glu Asn Ile  Val Ile Glu Met Ala  Arg Glu Asn
    1130                1135                1140

Gln Thr  Thr Gln Lys Gly Gln  Lys Asn Ser Arg Glu  Arg Met Lys
    1145                1150                1155

Arg Ile  Glu Glu Gly Ile Lys  Glu Leu Gly Ser Gln  Ile Leu Lys
    1160                1165                1170

Glu His  Pro Val Glu Asn Thr  Gln Leu Gln Asn Glu  Lys Leu Tyr
```

```
    1175                1180                1185

Leu Tyr  Tyr Leu Gln Asn Gly  Arg Asp Met Tyr Val  Asp Gln Glu
    1190                1195                1200

Leu Asp  Ile Asn Arg Leu Ser  Asp Tyr Asp Val Asp  His Ile Val
    1205                1210                1215

Pro Gln  Ser Phe Leu Lys Asp  Asp Ser Ile Asp Asn  Lys Val Leu
    1220                1225                1230

Thr Arg  Ser Asp Lys Asn Arg  Gly Lys Ser Asp Asn  Val Pro Ser
    1235                1240                1245

Glu Glu  Val Val Lys Lys Met  Lys Asn Tyr Trp Arg  Gln Leu Leu
    1250                1255                1260

Asn Ala  Lys Leu Ile Thr Gln  Arg Lys Phe Asp Asn  Leu Thr Lys
    1265                1270                1275

Ala Glu  Arg Gly Gly Leu Ser  Glu Leu Asp Lys Ala  Gly Phe Ile
    1280                1285                1290

Lys Arg  Gln Leu Val Glu Thr  Arg Gln Ile Thr Lys  His Val Ala
    1295                1300                1305

Gln Ile  Leu Asp Ser Arg Met  Asn Thr Lys Tyr Asp  Glu Asn Asp
    1310                1315                1320

Lys Leu  Ile Arg Glu Val Lys  Val Ile Thr Leu Lys  Ser Lys Leu
    1325                1330                1335

Val Ser  Asp Phe Arg Lys Asp  Phe Gln Phe Tyr Lys  Val Arg Glu
    1340                1345                1350

Ile Asn  Asn Tyr His His Ala  His Asp Ala Tyr Leu  Asn Ala Val
    1355                1360                1365

Val Gly  Thr Ala Leu Ile Lys  Lys Tyr Pro Lys Leu  Glu Ser Glu
    1370                1375                1380
```

Phe Val Tyr Gly
    1385

<210> 78
<211> 1388
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 78

Glu Ile Gly Lys Ala Thr Ala Lys Tyr Phe Phe Tyr Ser Asn Ile Met
1   5   10   15

Asn Phe Phe Lys Thr Glu Ile Thr Leu Ala Asn Gly Glu Ile Arg Lys
            20   25   30

Arg Pro Leu Ile Glu Thr Asn Gly Glu Thr Gly Glu Ile Val Trp Asp
        35   40   45

Lys Gly Arg Asp Phe Ala Thr Val Arg Lys Val Leu Ser Met Pro Gln
    50   55   60

Val Asn Ile Val Lys Lys Thr Glu Val Gln Thr Gly Gly Phe Ser Lys
65   70   75   80

Glu Ser Ile Leu Pro Lys Arg Asn Ser Asp Lys Leu Ile Ala Arg Lys
                85   90   95

Lys Asp Trp Asp Pro Lys Lys Tyr Gly Gly Phe Asp Ser Pro Thr Val
            100   105   110

Ala Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys Gly Lys Ser Lys
        115   120   125

Lys Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr Ile Met Glu Arg
    130   135   140

Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala Lys Gly Tyr

```
145                 150                 155                 160

Lys Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro Lys Tyr Ser Leu
                165                 170                 175

Phe Glu Leu Glu Asn Gly Arg Lys Arg Met Leu Ala Ser Ala Gly Glu
            180                 185                 190

Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro Ser Lys Tyr Val Asn Phe
        195                 200                 205

Leu Tyr Leu Ala Ser His Tyr Glu Lys Leu Lys Gly Ser Pro Glu Asp
    210                 215                 220

Asn Glu Gln Lys Gln Leu Phe Val Glu Gln His Lys His Tyr Leu Asp
225                 230                 235                 240

Glu Ile Ile Glu Gln Ile Ser Glu Phe Ser Lys Arg Val Ile Leu Ala
                245                 250                 255

Asp Ala Asn Leu Asp Lys Val Leu Ser Ala Tyr Asn Lys His Arg Asp
            260                 265                 270

Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile Ile His Leu Phe Thr Leu
        275                 280                 285

Thr Asn Leu Gly Ala Pro Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile
    290                 295                 300

Asp Arg Lys Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu
305                 310                 315                 320

Ile His Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser
                325                 330                 335

Gln Leu Gly Gly Asp Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly
            340                 345                 350

Ser Gly Gly Ser Gly Gly Ser Gly Gly Met Asp Lys Lys Tyr Ser Ile
        355                 360                 365
```

```
Gly Leu Ala Ile Gly Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp
    370                 375                 380

Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys Val Leu Gly Asn Thr Asp
385                 390                 395                 400

Arg His Ser Ile Lys Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser
                405                 410                 415

Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg
            420                 425                 430

Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser
        435                 440                 445

Asn Glu Met Ala Lys Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu
    450                 455                 460

Ser Phe Leu Val Glu Glu Asp Lys Lys His Glu Arg His Pro Ile Phe
465                 470                 475                 480

Gly Asn Ile Val Asp Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile
                485                 490                 495

Tyr His Leu Arg Lys Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu
            500                 505                 510

Arg Leu Ile Tyr Leu Ala Leu Ala His Met Ile Lys Phe Arg Gly His
        515                 520                 525

Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys
    530                 535                 540

Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn
545                 550                 555                 560

Pro Ile Asn Ala Ser Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg
                565                 570                 575
```

```
Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly
            580                 585                 590

Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly
        595                 600                 605

Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys
    610                 615                 620

Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu
625                 630                 635                 640

Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu Phe Leu Ala Ala Lys Asn
                645                 650                 655

Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu
            660                 665                 670

Ile Thr Lys Ala Pro Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu
        675                 680                 685

His His Gln Asp Leu Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu
    690                 695                 700

Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr
705                 710                 715                 720

Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe
                725                 730                 735

Ile Lys Pro Ile Leu Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val
            740                 745                 750

Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn
        755                 760                 765

Gly Ser Ile Pro His Gln Ile His Leu Gly Glu Leu His Ala Ile Leu
    770                 775                 780
```

```
Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys
785                 790                 795                 800

Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu
                805                 810                 815

Ala Arg Gly Asn Ser Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu
            820                 825                 830

Thr Ile Thr Pro Trp Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser
        835                 840                 845

Ala Gln Ser Phe Ile Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro
    850                 855                 860

Asn Glu Lys Val Leu Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr
865                 870                 875                 880

Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg
                885                 890                 895

Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu
            900                 905                 910

Leu Phe Lys Thr Asn Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp
        915                 920                 925

Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val
    930                 935                 940

Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys
945                 950                 955                 960

Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile
                965                 970                 975

Leu Glu Asp Ile Val Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met
            980                 985                 990

Ile Glu Glu Arg Leu Lys Thr Tyr  Ala His Leu Phe Asp  Asp Lys Val
```

995 1000 1005

Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu
1010 1015 1020

Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys Gln Ser Gly Lys
1025 1030 1035

Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala Asn Arg Asn
1040 1045 1050

Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys Glu Asp
1055 1060 1065

Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His Glu
1070 1075 1080

His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
1085 1090 1095

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly
1100 1105 1110

Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn
1115 1120 1125

Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys
1130 1135 1140

Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys
1145 1150 1155

Glu His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr
1160 1165 1170

Leu Tyr Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu
1175 1180 1185

Leu Asp Ile Asn Arg Leu Ser Asp Tyr Asp Val Asp His Ile Val
1190 1195 1200

```
Pro Gln  Ser Phe Leu Lys Asp  Asp Ser Ile Asp Asn  Lys Val Leu
    1205                 1210                 1215

Thr Arg  Ser Asp Lys Asn Arg  Gly Lys Ser Asp Asn  Val Pro Ser
    1220                 1225                 1230

Glu Glu  Val Val Lys Lys Met  Lys Asn Tyr Trp Arg  Gln Leu Leu
    1235                 1240                 1245

Asn Ala  Lys Leu Ile Thr Gln  Arg Lys Phe Asp Asn  Leu Thr Lys
    1250                 1255                 1260

Ala Glu  Arg Gly Gly Leu Ser  Glu Leu Asp Lys Ala  Gly Phe Ile
    1265                 1270                 1275

Lys Arg  Gln Leu Val Glu Thr  Arg Gln Ile Thr Lys  His Val Ala
    1280                 1285                 1290

Gln Ile  Leu Asp Ser Arg Met  Asn Thr Lys Tyr Asp  Glu Asn Asp
    1295                 1300                 1305

Lys Leu  Ile Arg Glu Val Lys  Val Ile Thr Leu Lys  Ser Lys Leu
    1310                 1315                 1320

Val Ser  Asp Phe Arg Lys Asp  Phe Gln Phe Tyr Lys  Val Arg Glu
    1325                 1330                 1335

Ile Asn  Asn Tyr His His Ala  His Asp Ala Tyr Leu  Asn Ala Val
    1340                 1345                 1350

Val Gly  Thr Ala Leu Ile Lys  Lys Tyr Pro Lys Leu  Glu Ser Glu
    1355                 1360                 1365

Phe Val  Tyr Gly Asp Tyr Lys  Val Tyr Asp Val Arg  Lys Met Ile
    1370                 1375                 1380

Ala Lys  Ser Glu Gln
    1385
```

<210> 79
<211> 1387
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 79

Asn Ile Met Asn Phe Phe Lys Thr Glu Ile Thr Leu Ala Asn Gly Glu
1 5 10 15

Ile Arg Lys Arg Pro Leu Ile Glu Thr Asn Gly Glu Thr Gly Glu Ile
20 25 30

Val Trp Asp Lys Gly Arg Asp Phe Ala Thr Val Arg Lys Val Leu Ser
35 40 45

Met Pro Gln Val Asn Ile Val Lys Lys Thr Glu Val Gln Thr Gly Gly
50 55 60

Phe Ser Lys Glu Ser Ile Leu Pro Lys Arg Asn Ser Asp Lys Leu Ile
65 70 75 80

Ala Arg Lys Lys Asp Trp Asp Pro Lys Lys Tyr Gly Gly Phe Asp Ser
85 90 95

Pro Thr Val Ala Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys Gly
100 105 110

Lys Ser Lys Lys Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr Ile
115 120 125

Met Glu Arg Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala
130 135 140

Lys Gly Tyr Lys Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro Lys
145 150 155 160

Tyr Ser Leu Phe Glu Leu Glu Asn Gly Arg Lys Arg Met Leu Ala Ser
165 170 175

```
Ala Gly Glu Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro Ser Lys Tyr
            180                 185                 190

Val Asn Phe Leu Tyr Leu Ala Ser His Tyr Glu Lys Leu Lys Gly Ser
        195                 200                 205

Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val Glu Gln His Lys His
    210                 215                 220

Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser Glu Phe Ser Lys Arg Val
225                 230                 235                 240

Ile Leu Ala Asp Ala Asn Leu Asp Lys Val Leu Ser Ala Tyr Asn Lys
                245                 250                 255

His Arg Asp Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile Ile His Leu
            260                 265                 270

Phe Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala Phe Lys Tyr Phe Asp
        275                 280                 285

Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp
    290                 295                 300

Ala Thr Leu Ile His Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile
305                 310                 315                 320

Asp Leu Ser Gln Leu Gly Gly Asp Gly Gly Ser Gly Gly Ser Gly Gly
                325                 330                 335

Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Asp Lys Lys Tyr
            340                 345                 350

Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly Trp Ala Val Ile
        355                 360                 365

Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys Val Leu Gly Asn
    370                 375                 380
```

```
Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly Ala Leu Leu Phe
385                 390                 395                 400

Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys Arg Thr Ala Arg
                405                 410                 415

Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr Leu Gln Glu Ile
            420                 425                 430

Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe Phe His Arg Leu
        435                 440                 445

Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His Glu Arg His Pro
    450                 455                 460

Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His Glu Lys Tyr Pro
465                 470                 475                 480

Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser Thr Asp Lys Ala
                485                 490                 495

Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met Ile Lys Phe Arg
            500                 505                 510

Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp Asn Ser Asp Val
        515                 520                 525

Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn Gln Leu Phe Glu
    530                 535                 540

Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys Ala Ile Leu Ser
545                 550                 555                 560

Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu Ile Ala Gln Leu
                565                 570                 575

Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu Ile Ala Leu Ser
            580                 585                 590
```

```
Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp Leu Ala Glu Asp
        595                 600                 605

Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp Asp Leu Asp Asn
    610                 615                 620

Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu Phe Leu Ala Ala
625                 630                 635                 640

Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile Leu Arg Val Asn
                645                 650                 655

Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met Ile Lys Arg Tyr
            660                 665                 670

Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala Leu Val Arg Gln
        675                 680                 685

Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp Gln Ser Lys Asn
    690                 695                 700

Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln Glu Glu Phe Tyr
705                 710                 715                 720

Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly Thr Glu Glu Leu
                725                 730                 735

Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys Gln Arg Thr Phe
            740                 745                 750

Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly Glu Leu His Ala
        755                 760                 765

Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu Lys Asp Asn Arg
    770                 775                 780

Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro Tyr Tyr Val Gly
785                 790                 795                 800

Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met Thr Arg Lys Ser
```

```
                805                 810                 815

Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val Val Asp Lys Gly
            820                 825                 830

Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn Phe Asp Lys Asn
        835                 840                 845

Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu Leu Tyr Glu Tyr
    850                 855                 860

Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr Val Thr Glu Gly
865                 870                 875                 880

Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys Lys Ala Ile Val
                885                 890                 895

Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val Lys Gln Leu Lys
            900                 905                 910

Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser Val Glu Ile Ser
        915                 920                 925

Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr Tyr His Asp Leu
    930                 935                 940

Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn Glu Glu Asn Glu
945                 950                 955                 960

Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu Phe Glu Asp Arg
                965                 970                 975

Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His Leu Phe Asp Asp
            980                 985                 990

Lys Val Met Lys Gln Leu Lys Arg  Arg Arg Tyr Thr Gly  Trp Gly Arg
        995                 1000                1005

Leu Ser  Arg Lys Leu Ile Asn  Gly Ile Arg Asp Lys  Gln Ser Gly
    1010                1015                1020
```

```
Lys Thr  Ile Leu Asp Phe Leu  Lys Ser Asp Gly Phe  Ala Asn Arg
    1025                1030                1035

Asn Phe  Met Gln Leu Ile His  Asp Asp Ser Leu Thr  Phe Lys Glu
    1040                1045                1050

Asp Ile  Gln Lys Ala Gln Val  Ser Gly Gln Gly Asp  Ser Leu His
    1055                1060                1065

Glu His  Ile Ala Asn Leu Ala  Gly Ser Pro Ala Ile  Lys Lys Gly
    1070                1075                1080

Ile Leu  Gln Thr Val Lys Val  Val Asp Glu Leu Val  Lys Val Met
    1085                1090                1095

Gly Arg  His Lys Pro Glu Asn  Ile Val Ile Glu Met  Ala Arg Glu
    1100                1105                1110

Asn Gln  Thr Thr Gln Lys Gly  Gln Lys Asn Ser Arg  Glu Arg Met
    1115                1120                1125

Lys Arg  Ile Glu Glu Gly Ile  Lys Glu Leu Gly Ser  Gln Ile Leu
    1130                1135                1140

Lys Glu  His Pro Val Glu Asn  Thr Gln Leu Gln Asn  Glu Lys Leu
    1145                1150                1155

Tyr Leu  Tyr Tyr Leu Gln Asn  Gly Arg Asp Met Tyr  Val Asp Gln
    1160                1165                1170

Glu Leu  Asp Ile Asn Arg Leu  Ser Asp Tyr Asp Val  Asp His Ile
    1175                1180                1185

Val Pro  Gln Ser Phe Leu Lys  Asp Asp Ser Ile Asp  Asn Lys Val
    1190                1195                1200

Leu Thr  Arg Ser Asp Lys Asn  Arg Gly Lys Ser Asp  Asn Val Pro
    1205                1210                1215
```

```
Ser Glu  Glu Val Val Lys Lys  Met Lys Asn Tyr Trp  Arg Gln Leu
    1220                1225                1230

Leu Asn  Ala Lys Leu Ile Thr  Gln Arg Lys Phe Asp  Asn Leu Thr
    1235                1240                1245

Lys Ala  Glu Arg Gly Gly Leu  Ser Glu Leu Asp Lys  Ala Gly Phe
    1250                1255                1260

Ile Lys  Arg Gln Leu Val Glu  Thr Arg Gln Ile Thr  Lys His Val
    1265                1270                1275

Ala Gln  Ile Leu Asp Ser Arg  Met Asn Thr Lys Tyr  Asp Glu Asn
    1280                1285                1290

Asp Lys  Leu Ile Arg Glu Val  Lys Val Ile Thr Leu  Lys Ser Lys
    1295                1300                1305

Leu Val  Ser Asp Phe Arg Lys  Asp Phe Gln Phe Tyr  Lys Val Arg
    1310                1315                1320

Glu Ile  Asn Asn Tyr His His  Ala His Asp Ala Tyr  Leu Asn Ala
    1325                1330                1335

Val Val  Gly Thr Ala Leu Ile  Lys Lys Tyr Pro Lys  Leu Glu Ser
    1340                1345                1350

Glu Phe  Val Tyr Gly Asp Tyr  Lys Val Tyr Asp Val  Arg Lys Met
    1355                1360                1365

Ile Ala  Lys Ser Glu Gln Glu  Ile Gly Lys Ala Thr  Ala Lys Tyr
    1370                1375                1380

Phe Phe  Tyr Ser
    1385
```

<210> 80
<211> 1388
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 80

Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val Glu Gln His Lys His
1   5   10   15

Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser Glu Phe Ser Lys Arg Val
            20   25   30

Ile Leu Ala Asp Ala Asn Leu Asp Lys Val Leu Ser Ala Tyr Asn Lys
        35   40   45

His Arg Asp Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile Ile His Leu
    50   55   60

Phe Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala Phe Lys Tyr Phe Asp
65   70   75   80

Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp
                85   90   95

Ala Thr Leu Ile His Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile
            100   105   110

Asp Leu Ser Gln Leu Gly Gly Asp Gly Gly Ser Gly Gly Ser Gly Gly
        115   120   125

Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Met Asp Lys Lys
    130   135   140

Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly Trp Ala Val
145   150   155   160

Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys Val Leu Gly
                165   170   175

Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly Ala Leu Leu
            180   185   190

```
Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys Arg Thr Ala
        195                 200                 205

Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr Leu Gln Glu
    210                 215                 220

Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe Phe His Arg
225                 230                 235                 240

Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His Glu Arg His
                245                 250                 255

Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His Glu Lys Tyr
            260                 265                 270

Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser Thr Asp Lys
        275                 280                 285

Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met Ile Lys Phe
    290                 295                 300

Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp Asn Ser Asp
305                 310                 315                 320

Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn Gln Leu Phe
                325                 330                 335

Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys Ala Ile Leu
            340                 345                 350

Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu Ile Ala Gln
        355                 360                 365

Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu Ile Ala Leu
    370                 375                 380

Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp Leu Ala Glu
385                 390                 395                 400
```

```
Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp Asp Leu Asp
                405                 410                 415

Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu Phe Leu Ala
            420                 425                 430

Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile Leu Arg Val
        435                 440                 445

Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met Ile Lys Arg
    450                 455                 460

Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala Leu Val Arg
465                 470                 475                 480

Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp Gln Ser Lys
                485                 490                 495

Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln Glu Glu Phe
            500                 505                 510

Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly Thr Glu Glu
        515                 520                 525

Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys Gln Arg Thr
    530                 535                 540

Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly Glu Leu His
545                 550                 555                 560

Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu Lys Asp Asn
                565                 570                 575

Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro Tyr Tyr Val
            580                 585                 590

Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met Thr Arg Lys
        595                 600                 605

Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val Val Asp Lys
```

610 615 620

Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn Phe Asp Lys
625 630 635 640

Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu Leu Tyr Glu
645 650 655

Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr Val Thr Glu
660 665 670

Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys Lys Ala Ile
675 680 685

Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val Lys Gln Leu
690 695 700

Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser Val Glu Ile
705 710 715 720

Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr Tyr His Asp
725 730 735

Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn Glu Glu Asn
740 745 750

Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu Phe Glu Asp
755 760 765

Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His Leu Phe Asp
770 775 780

Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr Gly Trp Gly
785 790 795 800

Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys Gln Ser Gly
805 810 815

Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala Asn Arg Asn
820 825 830

```
Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys Glu Asp Ile
        835                 840                 845

Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His Glu His Ile
    850                 855                 860

Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile Leu Gln Thr
865                 870                 875                 880

Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg His Lys Pro
                885                 890                 895

Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr Thr Gln Lys
            900                 905                 910

Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu Glu Gly Ile
        915                 920                 925

Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val Glu Asn Thr
    930                 935                 940

Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln Asn Gly Arg
945                 950                 955                 960

Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu Ser Asp Tyr
                965                 970                 975

Asp Val Asp His Ile Val Pro Gln Ser Phe Leu Lys Asp Asp Ser Ile
            980                 985                 990

Asp Asn Lys Val Leu Thr Arg Ser  Asp Lys Asn Arg Gly  Lys Ser Asp
        995                 1000                1005

Asn Val  Pro Ser Glu Glu Val  Val Lys Lys Met Lys  Asn Tyr Trp
    1010                1015                1020

Arg Gln  Leu Leu Asn Ala Lys  Leu Ile Thr Gln Arg  Lys Phe Asp
    1025                1030                1035
```

```
Asn Leu  Thr Lys Ala Glu Arg  Gly Gly Leu Ser Glu  Leu Asp Lys
    1040                1045                1050

Ala Gly  Phe Ile Lys Arg Gln  Leu Val Glu Thr Arg  Gln Ile Thr
    1055                1060                1065

Lys His  Val Ala Gln Ile Leu  Asp Ser Arg Met Asn  Thr Lys Tyr
    1070                1075                1080

Asp Glu  Asn Asp Lys Leu Ile  Arg Glu Val Lys Val  Ile Thr Leu
    1085                1090                1095

Lys Ser  Lys Leu Val Ser Asp  Phe Arg Lys Asp Phe  Gln Phe Tyr
    1100                1105                1110

Lys Val  Arg Glu Ile Asn Asn  Tyr His His Ala His  Asp Ala Tyr
    1115                1120                1125

Leu Asn  Ala Val Val Gly Thr  Ala Leu Ile Lys Lys  Tyr Pro Lys
    1130                1135                1140

Leu Glu  Ser Glu Phe Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val
    1145                1150                1155

Arg Lys  Met Ile Ala Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr
    1160                1165                1170

Ala Lys  Tyr Phe Phe Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr
    1175                1180                1185

Glu Ile  Thr Leu Ala Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile
    1190                1195                1200

Glu Thr  Asn Gly Glu Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg
    1205                1210                1215

Asp Phe  Ala Thr Val Arg Lys  Val Leu Ser Met Pro  Gln Val Asn
    1220                1225                1230
```

```
Ile Val  Lys Lys Thr Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu
    1235                1240                1245

Ser Ile  Leu Pro Lys Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys
    1250                1255                1260

Lys Asp  Trp Asp Pro Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr
    1265                1270                1275

Val Ala  Tyr Ser Val Leu Val  Val Ala Lys Val Glu  Lys Gly Lys
    1280                1285                1290

Ser Lys  Lys Leu Lys Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile
    1295                1300                1305

Met Glu  Arg Ser Ser Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu
    1310                1315                1320

Ala Lys  Gly Tyr Lys Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu
    1325                1330                1335

Pro Lys  Tyr Ser Leu Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met
    1340                1345                1350

Leu Ala  Ser Ala Gly Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu
    1355                1360                1365

Pro Ser  Lys Tyr Val Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu
    1370                1375                1380

Lys Leu  Lys Gly Ser
    1385
```

<210> 81
<211> 1387
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 81

```
Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile Ile His Leu Phe Thr Leu
1               5                  10                  15

Thr Asn Leu Gly Ala Pro Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile
            20                  25                  30

Asp Arg Lys Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu
        35                  40                  45

Ile His Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser
    50                  55                  60

Gln Leu Gly Gly Asp Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly
65                  70                  75                  80

Ser Gly Gly Ser Gly Gly Ser Gly Gly Asp Lys Lys Tyr Ser Ile Gly
                85                  90                  95

Leu Ala Ile Gly Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu
            100                 105                 110

Tyr Lys Val Pro Ser Lys Lys Phe Lys Val Leu Gly Asn Thr Asp Arg
        115                 120                 125

His Ser Ile Lys Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly
    130                 135                 140

Glu Thr Ala Glu Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr
145                 150                 155                 160

Thr Arg Arg Lys Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn
                165                 170                 175

Glu Met Ala Lys Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser
            180                 185                 190

Phe Leu Val Glu Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly
        195                 200                 205
```

```
Asn Ile Val Asp Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr
    210                 215                 220

His Leu Arg Lys Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg
225                 230                 235                 240

Leu Ile Tyr Leu Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe
                245                 250                 255

Leu Ile Glu Gly Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu
            260                 265                 270

Phe Ile Gln Leu Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro
        275                 280                 285

Ile Asn Ala Ser Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu
    290                 295                 300

Ser Lys Ser Arg Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu
305                 310                 315                 320

Lys Lys Asn Gly Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu
                325                 330                 335

Thr Pro Asn Phe Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu
            340                 345                 350

Gln Leu Ser Lys Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala
        355                 360                 365

Gln Ile Gly Asp Gln Tyr Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu
    370                 375                 380

Ser Asp Ala Ile Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile
385                 390                 395                 400

Thr Lys Ala Pro Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His
                405                 410                 415

His Gln Asp Leu Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro
```

```
            420                 425                 430

Glu Lys Tyr Lys Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala
        435                 440                 445

Gly Tyr Ile Asp Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile
    450                 455                 460

Lys Pro Ile Leu Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys
465                 470                 475                 480

Leu Asn Arg Glu Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly
                485                 490                 495

Ser Ile Pro His Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg
            500                 505                 510

Arg Gln Glu Asp Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile
        515                 520                 525

Glu Lys Ile Leu Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala
    530                 535                 540

Arg Gly Asn Ser Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr
545                 550                 555                 560

Ile Thr Pro Trp Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala
                565                 570                 575

Gln Ser Phe Ile Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn
            580                 585                 590

Glu Lys Val Leu Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val
        595                 600                 605

Tyr Asn Glu Leu Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys
    610                 615                 620

Pro Ala Phe Leu Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu
625                 630                 635                 640
```

```
Phe Lys Thr Asn Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr
                645                 650                 655

Phe Lys Lys Ile Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu
            660                 665                 670

Asp Arg Phe Asn Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile
        675                 680                 685

Ile Lys Asp Lys Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu
    690                 695                 700

Glu Asp Ile Val Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile
705                 710                 715                 720

Glu Glu Arg Leu Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met
                725                 730                 735

Lys Gln Leu Lys Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg
            740                 745                 750

Lys Leu Ile Asn Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu
        755                 760                 765

Asp Phe Leu Lys Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu
    770                 775                 780

Ile His Asp Asp Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln
785                 790                 795                 800

Val Ser Gly Gln Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala
                805                 810                 815

Gly Ser Pro Ala Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val
            820                 825                 830

Asp Glu Leu Val Lys Val Met Gly Arg His Lys Pro Glu Asn Ile Val
        835                 840                 845
```

```
Ile Glu Met Ala Arg Glu Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn
    850                 855                 860

Ser Arg Glu Arg Met Lys Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly
865                 870                 875                 880

Ser Gln Ile Leu Lys Glu His Pro Val Glu Asn Thr Gln Leu Gln Asn
                885                 890                 895

Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val
            900                 905                 910

Asp Gln Glu Leu Asp Ile Asn Arg Leu Ser Asp Tyr Asp Val Asp His
        915                 920                 925

Ile Val Pro Gln Ser Phe Leu Lys Asp Asp Ser Ile Asp Asn Lys Val
    930                 935                 940

Leu Thr Arg Ser Asp Lys Asn Arg Gly Lys Ser Asp Asn Val Pro Ser
945                 950                 955                 960

Glu Glu Val Val Lys Lys Met Lys Asn Tyr Trp Arg Gln Leu Leu Asn
                965                 970                 975

Ala Lys Leu Ile Thr Gln Arg Lys Phe Asp Asn Leu Thr Lys Ala Glu
            980                 985                 990

Arg Gly Gly Leu Ser Glu Leu Asp  Lys Ala Gly Phe Ile  Lys Arg Gln
        995                 1000                1005

Leu Val  Glu Thr Arg Gln Ile  Thr Lys His Val Ala  Gln Ile Leu
    1010                1015                1020

Asp Ser  Arg Met Asn Thr Lys  Tyr Asp Glu Asn Asp  Lys Leu Ile
    1025                1030                1035

Arg Glu  Val Lys Val Ile Thr  Leu Lys Ser Lys Leu  Val Ser Asp
    1040                1045                1050
```

```
Phe Arg  Lys Asp Phe Gln Phe  Tyr Lys Val Arg Glu  Ile Asn Asn
    1055                1060                1065

Tyr His  His Ala His Asp Ala  Tyr Leu Asn Ala Val  Val Gly Thr
    1070                1075                1080

Ala Leu  Ile Lys Lys Tyr Pro  Lys Leu Glu Ser Glu  Phe Val Tyr
    1085                1090                1095

Gly Asp  Tyr Lys Val Tyr Asp  Val Arg Lys Met Ile  Ala Lys Ser
    1100                1105                1110

Glu Gln  Glu Ile Gly Lys Ala  Thr Ala Lys Tyr Phe  Phe Tyr Ser
    1115                1120                1125

Asn Ile  Met Asn Phe Phe Lys  Thr Glu Ile Thr Leu  Ala Asn Gly
    1130                1135                1140

Glu Ile  Arg Lys Arg Pro Leu  Ile Glu Thr Asn Gly  Glu Thr Gly
    1145                1150                1155

Glu Ile  Val Trp Asp Lys Gly  Arg Asp Phe Ala Thr  Val Arg Lys
    1160                1165                1170

Val Leu  Ser Met Pro Gln Val  Asn Ile Val Lys Lys  Thr Glu Val
    1175                1180                1185

Gln Thr  Gly Gly Phe Ser Lys  Glu Ser Ile Leu Pro  Lys Arg Asn
    1190                1195                1200

Ser Asp  Lys Leu Ile Ala Arg  Lys Lys Asp Trp Asp  Pro Lys Lys
    1205                1210                1215

Tyr Gly  Gly Phe Asp Ser Pro  Thr Val Ala Tyr Ser  Val Leu Val
    1220                1225                1230

Val Ala  Lys Val Glu Lys Gly  Lys Ser Lys Lys Leu  Lys Ser Val
    1235                1240                1245

Lys Glu  Leu Leu Gly Ile Thr  Ile Met Glu Arg Ser  Ser Phe Glu
```

```
    1250                1255                1260

Lys Asn  Pro Ile Asp Phe Leu  Glu Ala Lys Gly Tyr  Lys Glu Val
    1265                1270                1275

Lys Lys  Asp Leu Ile Ile Lys  Leu Pro Lys Tyr Ser  Leu Phe Glu
    1280                1285                1290

Leu Glu  Asn Gly Arg Lys Arg  Met Leu Ala Ser Ala  Gly Glu Leu
    1295                1300                1305

Gln Lys  Gly Asn Glu Leu Ala  Leu Pro Ser Lys Tyr  Val Asn Phe
    1310                1315                1320

Leu Tyr  Leu Ala Ser His Tyr  Glu Lys Leu Lys Gly  Ser Pro Glu
    1325                1330                1335

Asp Asn  Glu Gln Lys Gln Leu  Phe Val Glu Gln His  Lys His Tyr
    1340                1345                1350

Leu Asp  Glu Ile Ile Glu Gln  Ile Ser Glu Phe Ser  Lys Arg Val
    1355                1360                1365

Ile Leu  Ala Asp Ala Asn Leu  Asp Lys Val Leu Ser  Ala Tyr Asn
    1370                1375                1380

Lys His  Arg Asp
    1385


<210>  82
<211>  357
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  82

Asp Tyr Lys Val Tyr Asp Val Arg Lys Met Ile Ala Lys Ser Glu Gln
1               5                   10                  15
```

```
Glu Ile Gly Lys Ala Thr Ala Lys Tyr Phe Phe Tyr Ser Asn Ile Met
            20                  25                  30

Asn Phe Phe Lys Thr Glu Ile Thr Leu Ala Asn Gly Glu Ile Arg Lys
        35                  40                  45

Arg Pro Leu Ile Glu Thr Asn Gly Glu Thr Gly Glu Ile Val Trp Asp
    50                  55                  60

Lys Gly Arg Asp Phe Ala Thr Val Arg Lys Val Leu Ser Met Pro Gln
65                  70                  75                  80

Val Asn Ile Val Lys Lys Thr Glu Val Gln Thr Gly Gly Phe Ser Lys
                85                  90                  95

Glu Ser Ile Leu Pro Lys Arg Asn Ser Asp Lys Leu Ile Ala Arg Lys
            100                 105                 110

Lys Asp Trp Asp Pro Lys Lys Tyr Gly Gly Phe Asp Ser Pro Thr Val
        115                 120                 125

Ala Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys Gly Lys Ser Lys
    130                 135                 140

Lys Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr Ile Met Glu Arg
145                 150                 155                 160

Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala Lys Gly Tyr
                165                 170                 175

Lys Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro Lys Tyr Ser Leu
            180                 185                 190

Phe Glu Leu Glu Asn Gly Arg Lys Arg Met Leu Ala Ser Ala Gly Glu
        195                 200                 205

Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro Ser Lys Tyr Val Asn Phe
    210                 215                 220

Leu Tyr Leu Ala Ser His Tyr Glu Lys Leu Lys Gly Ser Pro Glu Asp
```

225 230 235 240

Asn Glu Gln Lys Gln Leu Phe Val Glu Gln His Lys His Tyr Leu Asp
245 250 255

Glu Ile Ile Glu Gln Ile Ser Glu Phe Ser Lys Arg Val Ile Leu Ala
260 265 270

Asp Ala Asn Leu Asp Lys Val Leu Ser Ala Tyr Asn Lys His Arg Asp
275 280 285

Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile Ile His Leu Phe Thr Leu
290 295 300

Thr Asn Leu Gly Ala Pro Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile
305 310 315 320

Asp Arg Lys Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu
325 330 335

Ile His Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser
340 345 350

Gln Leu Gly Gly Asp
355

<210> 83
<211> 341
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 83

Glu Ile Gly Lys Ala Thr Ala Lys Tyr Phe Phe Tyr Ser Asn Ile Met
1 5 10 15

Asn Phe Phe Lys Thr Glu Ile Thr Leu Ala Asn Gly Glu Ile Arg Lys
20 25 30

```
Arg Pro Leu Ile Glu Thr Asn Gly Glu Thr Gly Glu Ile Val Trp Asp
        35                  40                  45

Lys Gly Arg Asp Phe Ala Thr Val Arg Lys Val Leu Ser Met Pro Gln
    50                  55                  60

Val Asn Ile Val Lys Lys Thr Glu Val Gln Thr Gly Gly Phe Ser Lys
65                  70                  75                  80

Glu Ser Ile Leu Pro Lys Arg Asn Ser Asp Lys Leu Ile Ala Arg Lys
                85                  90                  95

Lys Asp Trp Asp Pro Lys Lys Tyr Gly Gly Phe Asp Ser Pro Thr Val
            100                 105                 110

Ala Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys Gly Lys Ser Lys
        115                 120                 125

Lys Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr Ile Met Glu Arg
    130                 135                 140

Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala Lys Gly Tyr
145                 150                 155                 160

Lys Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro Lys Tyr Ser Leu
                165                 170                 175

Phe Glu Leu Glu Asn Gly Arg Lys Arg Met Leu Ala Ser Ala Gly Glu
            180                 185                 190

Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro Ser Lys Tyr Val Asn Phe
        195                 200                 205

Leu Tyr Leu Ala Ser His Tyr Glu Lys Leu Lys Gly Ser Pro Glu Asp
    210                 215                 220

Asn Glu Gln Lys Gln Leu Phe Val Glu Gln His Lys His Tyr Leu Asp
225                 230                 235                 240

Glu Ile Ile Glu Gln Ile Ser Glu Phe Ser Lys Arg Val Ile Leu Ala
```

245 250 255

Asp Ala Asn Leu Asp Lys Val Leu Ser Ala Tyr Asn Lys His Arg Asp
260 265 270

Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile Ile His Leu Phe Thr Leu
275 280 285

Thr Asn Leu Gly Ala Pro Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile
290 295 300

Asp Arg Lys Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu
305 310 315 320

Ile His Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser
325 330 335

Gln Leu Gly Gly Asp
340

<210> 84
<211> 328
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 84

Asn Ile Met Asn Phe Phe Lys Thr Glu Ile Thr Leu Ala Asn Gly Glu
1 5 10 15

Ile Arg Lys Arg Pro Leu Ile Glu Thr Asn Gly Glu Thr Gly Glu Ile
20 25 30

Val Trp Asp Lys Gly Arg Asp Phe Ala Thr Val Arg Lys Val Leu Ser
35 40 45

Met Pro Gln Val Asn Ile Val Lys Lys Thr Glu Val Gln Thr Gly Gly
50 55 60

```
Phe Ser Lys Glu Ser Ile Leu Pro Lys Arg Asn Ser Asp Lys Leu Ile
65                  70                  75                  80


Ala Arg Lys Lys Asp Trp Asp Pro Lys Lys Tyr Gly Gly Phe Asp Ser
                85                  90                  95


Pro Thr Val Ala Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys Gly
            100                 105                 110


Lys Ser Lys Lys Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr Ile
        115                 120                 125


Met Glu Arg Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala
    130                 135                 140


Lys Gly Tyr Lys Glu Val Lys Lys Asp Leu Ile Ile Lys Leu Pro Lys
145                 150                 155                 160


Tyr Ser Leu Phe Glu Leu Glu Asn Gly Arg Lys Arg Met Leu Ala Ser
                165                 170                 175


Ala Gly Glu Leu Gln Lys Gly Asn Glu Leu Ala Leu Pro Ser Lys Tyr
            180                 185                 190


Val Asn Phe Leu Tyr Leu Ala Ser His Tyr Glu Lys Leu Lys Gly Ser
        195                 200                 205


Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val Glu Gln His Lys His
    210                 215                 220


Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser Glu Phe Ser Lys Arg Val
225                 230                 235                 240


Ile Leu Ala Asp Ala Asn Leu Asp Lys Val Leu Ser Ala Tyr Asn Lys
                245                 250                 255


His Arg Asp Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile Ile His Leu
            260                 265                 270


Phe Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala Phe Lys Tyr Phe Asp
```

275 280 285

Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp
290 295 300

Ala Thr Leu Ile His Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile
305 310 315 320

Asp Leu Ser Gln Leu Gly Gly Asp
325

<210> 85
<211> 120
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 85

Pro Glu Asp Asn Glu Gln Lys Gln Leu Phe Val Glu Gln His Lys His
1 5 10 15

Tyr Leu Asp Glu Ile Ile Glu Gln Ile Ser Glu Phe Ser Lys Arg Val
20 25 30

Ile Leu Ala Asp Ala Asn Leu Asp Lys Val Leu Ser Ala Tyr Asn Lys
35 40 45

His Arg Asp Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile Ile His Leu
50 55 60

Phe Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala Phe Lys Tyr Phe Asp
65 70 75 80

Thr Thr Ile Asp Arg Lys Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp
85 90 95

Ala Thr Leu Ile His Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile
100 105 110

Asp Leu Ser Gln Leu Gly Gly Asp
        115   120

<210> 86
<211> 69
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 86

Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile Ile His Leu Phe Thr Leu
1   5   10   15

Thr Asn Leu Gly Ala Pro Ala Ala Phe Lys Tyr Phe Asp Thr Thr Ile
            20   25   30

Asp Arg Lys Arg Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu
        35   40   45

Ile His Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser
    50   55   60

Gln Leu Gly Gly Asp
65

<210> 87
<211> 1367
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 87

Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val Gly
1   5   10   15

Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
            20   25   30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly

```
        35                  40                  45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
    50                  55                  60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65                  70                  75                  80

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe
                85                  90                  95

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
            100                 105                 110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
        115                 120                 125

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
    130                 135                 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145                 150                 155                 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
                165                 170                 175

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255
```

```
Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460
```

```
Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670
```

```
Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
        755                 760                 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815

Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
```

```
               885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975

Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990

Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005

Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020

Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035

Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
    1040                1045                1050

Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065

Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
    1070                1075                1080

Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095
```

```
Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110

Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125

Lys Tyr  Gly Gly Phe Val Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140

Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155

Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170

Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Arg Glu
    1205                1210                1215

Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230

Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245

Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260

Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275

Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290
```

Asn Lys His Arg Asp Lys Pro Ile Arg Glu Gln Ala Glu Asn Ile
    1295   1300   1305

Ile His Leu Phe Thr Leu Thr Asn Leu Gly Ala Pro Ala Ala Phe
    1310   1315   1320

Lys Tyr Phe Asp Thr Thr Ile Asp Arg Lys Gln Tyr Arg Ser Thr
    1325   1330   1335

Lys Glu Val Leu Asp Ala Thr Leu Ile His Gln Ser Ile Thr Gly
    1340   1345   1350

Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp
    1355   1360   1365

<210> 88
<211> 1367
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 88

Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val Gly
1   5   10   15

Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
            20   25   30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
        35   40   45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
    50   55   60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65   70   75   80

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe
                85   90   95

```
Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
            100                 105                 110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
        115                 120                 125

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
    130                 135                 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145                 150                 155                 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
                165                 170                 175

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300
```

```
Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510
```

```
Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
```

```
                725                 730                 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
        755                 760                 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815

Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940
```

```
Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960


Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975


Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990


Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005


Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020


Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035


Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
    1040                1045                1050


Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065


Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
    1070                1075                1080


Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095


Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110


Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125


Lys Tyr  Gly Gly Phe Val Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140
```

```
Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155

Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170

Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Arg Glu
    1205                1210                1215

Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230

Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245

Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260

Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275

Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290

Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305

Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                1315                1320

Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Glu Tyr  Arg Ser Thr
    1325                1330                1335
```

Lys Glu Val Leu Asp Ala Thr Leu Ile His Gln Ser Ile Thr Gly
    1340   1345   1350

Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp
    1355   1360   1365

<210> 89
<211> 677
<212> PRT
<213> Unknown

<220>
<223> MOLONEY MURINE LEUKEMIA VIRUS

<400> 89

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1   5   10   15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20   25   30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35   40   45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50   55   60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65   70   75   80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85   90   95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100   105   110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115   120   125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130   135   140

```
Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350
```

```
Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
```

```
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675


<210>  90
<211>  560
<212>  PRT
<213>  Unknown

<220>
<223>  MOLONEY MURINE LEUKEMIA VIRUS


<220>
<221>  SITE
<222>  (229)..(229)
<223>  Xaa can be any naturally occurring amino acid

<400>  90

Ala Phe Pro Leu Glu Arg Pro Asp Trp Asp Tyr Thr Thr Gln Ala Gly
1               5                   10                  15

Arg Asn His Leu Val His Tyr Arg Gln Leu Leu Leu Ala Gly Leu Gln
            20                  25                  30
```

```
Asn Ala Gly Arg Ser Pro Thr Asn Leu Ala Lys Val Lys Gly Ile Thr
        35                  40                  45

Gln Gly Pro Asn Glu Ser Pro Ser Ala Phe Leu Glu Arg Leu Lys Glu
    50                  55                  60

Ala Tyr Arg Arg Tyr Thr Pro Tyr Asp Pro Glu Asp Pro Gly Gln Glu
65                  70                  75                  80

Thr Asn Val Ser Met Ser Phe Ile Trp Gln Ser Ala Pro Asp Ile Gly
                85                  90                  95

Arg Lys Leu Gly Arg Leu Glu Asp Leu Lys Ser Lys Thr Leu Gly Asp
            100                 105                 110

Leu Val Arg Glu Ala Glu Lys Ile Phe Asn Lys Arg Glu Thr Pro Glu
        115                 120                 125

Glu Arg Glu Glu Arg Ile Arg Arg Glu Thr Glu Glu Lys Glu Glu Arg
    130                 135                 140

Arg Arg Thr Val Asp Glu Gln Lys Glu Lys Glu Arg Asp Arg Arg Arg
145                 150                 155                 160

His Arg Glu Met Ser Lys Leu Leu Ala Thr Val Val Ile Gly Gln Glu
                165                 170                 175

Gln Asp Arg Gln Glu Gly Glu Arg Lys Arg Pro Gln Leu Asp Lys Asp
            180                 185                 190

Gln Cys Ala Tyr Cys Lys Glu Lys Gly His Trp Ala Lys Asp Cys Pro
        195                 200                 205

Lys Lys Pro Arg Gly Pro Arg Gly Pro Arg Pro Gln Thr Ser Leu Leu
    210                 215                 220

Thr Leu Gly Asp Xaa Gly Gly Gln Gly Gln Asp Pro Pro Pro Glu Pro
225                 230                 235                 240
```

```
Arg Ile Thr Leu Lys Val Gly Gly Gln Pro Val Thr Phe Leu Val Asp
                245                 250                 255

Thr Gly Ala Gln His Ser Val Leu Thr Gln Asn Pro Gly Pro Leu Ser
            260                 265                 270

Asp Lys Ser Ala Trp Val Gln Gly Ala Thr Gly Gly Lys Arg Tyr Arg
        275                 280                 285

Trp Thr Thr Asp Arg Lys Val His Leu Ala Thr Gly Lys Val Thr His
    290                 295                 300

Ser Phe Leu His Val Pro Asp Cys Pro Tyr Pro Leu Leu Gly Arg Asp
305                 310                 315                 320

Leu Leu Thr Lys Leu Lys Ala Gln Ile His Phe Glu Gly Ser Gly Ala
                325                 330                 335

Gln Val Val Gly Pro Met Gly Gln Pro Leu Gln Val Leu Thr Leu Asn
            340                 345                 350

Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu Pro Asp Val
        355                 360                 365

Ser Leu Gly Phe Thr Trp Leu Ser Asp Phe Pro Gln Ala Trp Ala Glu
    370                 375                 380

Ser Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu Ile Ile Pro
385                 390                 395                 400

Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr Pro Met Ser
                405                 410                 415

Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg Leu Leu Asp
            420                 425                 430

Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr Pro Leu Leu
        435                 440                 445
```

```
Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val Gln Asp Leu
    450                 455                 460

Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr Val Pro Asn
465                 470                 475                 480

Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln Trp Tyr Thr
                485                 490                 495

Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu His Pro Thr
            500                 505                 510

Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu Met Gly Ile
        515                 520                 525

Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe Lys Asn Ser
    530                 535                 540

Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala Asp Phe Arg
545                 550                 555                 560
```

<210> 91
<211> 669
<212> PRT
<213> Unknown

<220>
<223> FELINE LEUKEMIA VIRUS

<400> 91

```
Thr Leu Gln Leu Glu Glu Glu Tyr Arg Leu Phe Glu Pro Glu Ser Thr
1               5                   10                  15

Gln Lys Gln Glu Met Asp Ile Trp Leu Lys Asn Phe Pro Gln Ala Trp
            20                  25                  30

Ala Glu Thr Gly Gly Met Gly Thr Ala His Cys Gln Ala Pro Val Leu
        35                  40                  45

Ile Gln Leu Lys Ala Thr Ala Thr Pro Ile Ser Ile Arg Gln Tyr Pro
    50                  55                  60
```

```
Met Pro His Glu Ala Tyr Gln Gly Ile Lys Pro His Ile Arg Arg Met
65                  70                  75                  80

Leu Asp Gln Gly Ile Leu Lys Pro Cys Gln Ser Pro Trp Asn Thr Pro
                85                  90                  95

Leu Leu Pro Val Lys Lys Pro Gly Thr Glu Asp Tyr Arg Pro Val Gln
            100                 105                 110

Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr Val
        115                 120                 125

Pro Asn Pro Tyr Asn Leu Leu Ser Thr Leu Pro Pro Ser His Pro Trp
    130                 135                 140

Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu His
145                 150                 155                 160

Ser Glu Ser Gln Leu Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu Ile
                165                 170                 175

Gly Leu Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe Lys
            180                 185                 190

Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Ser Asp Leu Ala Asp
        195                 200                 205

Phe Arg Val Arg Tyr Pro Ala Leu Val Leu Leu Gln Tyr Val Asp Asp
    210                 215                 220

Leu Leu Leu Ala Ala Ala Thr Arg Thr Glu Cys Leu Glu Gly Thr Lys
225                 230                 235                 240

Ala Leu Leu Glu Thr Leu Gly Asn Lys Gly Tyr Arg Ala Ser Ala Lys
                245                 250                 255

Lys Ala Gln Ile Cys Leu Gln Glu Val Thr Tyr Leu Gly Tyr Ser Leu
            260                 265                 270
```

```
Lys Asp Gly Gln Arg Trp Leu Thr Lys Ala Arg Lys Glu Ala Ile Leu
        275                 280                 285

Ser Ile Pro Val Pro Lys Asn Ser Arg Gln Val Arg Glu Phe Leu Gly
    290                 295                 300

Thr Ala Gly Tyr Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Leu Ala
305                 310                 315                 320

Ala Pro Leu Tyr Pro Leu Thr Arg Pro Gly Thr Leu Phe Gln Trp Gly
                325                 330                 335

Thr Glu Gln Gln Leu Ala Phe Glu Asp Ile Lys Lys Ala Leu Leu Ser
            340                 345                 350

Ser Pro Ala Leu Gly Leu Pro Asp Ile Thr Lys Pro Phe Glu Leu Phe
        355                 360                 365

Ile Asp Glu Asn Ser Gly Phe Ala Lys Gly Val Leu Val Gln Lys Leu
    370                 375                 380

Gly Pro Trp Lys Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp Thr
385                 390                 395                 400

Val Ala Ser Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile Ala
                405                 410                 415

Ile Leu Val Lys Asp Ala Gly Lys Leu Thr Leu Gly Gln Pro Leu Thr
            420                 425                 430

Ile Leu Thr Ser His Pro Val Glu Ala Leu Val Arg Gln Pro Pro Asn
        435                 440                 445

Lys Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Met Leu Leu
    450                 455                 460

Asp Ala Glu Arg Val His Phe Gly Pro Thr Val Ser Leu Asn Pro Ala
465                 470                 475                 480

Thr Leu Leu Pro Leu Pro Ser Gly Gly Asn His His Asp Cys Leu Gln
```

485 490 495

Ile Leu Ala Glu Thr His Gly Thr Arg Pro Asp Leu Thr Asp Gln Pro
500 505 510

Leu Pro Asp Ala Asp Leu Thr Trp Tyr Thr Asp Gly Ser Ser Phe Ile
515 520 525

Arg Asn Gly Glu Arg Glu Ala Gly Ala Ala Val Thr Thr Glu Ser Glu
530 535 540

Val Ile Trp Ala Ala Pro Leu Pro Pro Gly Thr Ser Ala Gln Arg Ala
545 550 555 560

Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys Lys
565 570 575

Leu Thr Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Thr His Val
580 585 590

His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly Lys
595 600 605

Glu Ile Lys Asn Lys Asn Glu Ile Leu Ala Leu Leu Glu Ala Leu Phe
610 615 620

Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys Gly
625 630 635 640

Asp Ser Pro Gln Ala Lys Gly Asn Arg Leu Ala Asp Asp Thr Ala Lys
645 650 655

Lys Ala Ala Thr Glu Thr His Ser Ser Leu Thr Val Leu
660 665

<210> 92
<211> 559
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<220>
<221> SITE
<222> (280)..(280)
<223> Xaa can be any naturally occurring amino acid

<400> 92

Pro Ile Ser Pro Ile Glu Thr Val Pro Val Lys Leu Lys Pro Gly Met
1 5 10 15

Asp Gly Pro Lys Val Lys Gln Trp Pro Leu Thr Glu Glu Lys Ile Lys
20 25 30

Ala Leu Val Glu Ile Cys Thr Glu Met Glu Lys Glu Gly Lys Ile Ser
35 40 45

Lys Ile Gly Pro Glu Asn Pro Tyr Asn Thr Pro Val Phe Ala Ile Lys
50 55 60

Lys Lys Asp Ser Thr Lys Trp Arg Lys Leu Val Asp Phe Arg Glu Leu
65 70 75 80

Asn Lys Arg Thr Gln Asp Phe Trp Glu Val Gln Leu Gly Ile Pro His
85 90 95

Pro Ala Gly Leu Lys Lys Lys Lys Ser Val Thr Val Leu Asp Val Gly
100 105 110

Asp Ala Tyr Phe Ser Val Pro Leu Asp Glu Asp Phe Arg Lys Tyr Thr
115 120 125

Ala Phe Thr Ile Pro Ser Ile Asn Asn Glu Thr Pro Gly Ile Arg Tyr
130 135 140

Gln Tyr Asn Val Leu Pro Gln Gly Trp Lys Gly Ser Pro Ala Ile Phe
145 150 155 160

Gln Ser Ser Met Thr Lys Ile Leu Glu Pro Phe Arg Lys Gln Asn Pro
165 170 175

```
Asp Ile Val Ile Tyr Gln Tyr Met Asp Asp Leu Tyr Val Gly Ser Asp
            180                 185                 190

Leu Glu Ile Gly Gln His Arg Thr Lys Ile Glu Glu Leu Arg Gln His
        195                 200                 205

Leu Leu Arg Trp Gly Leu Thr Thr Pro Asp Lys Lys His Gln Lys Glu
    210                 215                 220

Pro Pro Phe Leu Trp Met Gly Tyr Glu Leu His Pro Asp Lys Trp Thr
225                 230                 235                 240

Val Gln Pro Ile Val Leu Pro Glu Lys Asp Ser Trp Thr Val Asn Asp
                245                 250                 255

Ile Gln Lys Leu Val Gly Lys Leu Asn Trp Ala Ser Gln Ile Tyr Pro
            260                 265                 270

Gly Ile Lys Val Arg Gln Leu Xaa Lys Leu Leu Arg Gly Thr Lys Ala
        275                 280                 285

Leu Thr Glu Val Ile Pro Leu Thr Glu Glu Ala Glu Leu Glu Leu Ala
    290                 295                 300

Glu Asn Arg Glu Ile Leu Lys Glu Pro Val His Gly Val Tyr Tyr Asp
305                 310                 315                 320

Pro Ser Lys Asp Leu Ile Ala Glu Ile Gln Lys Gln Gly Gln Gly Gln
                325                 330                 335

Trp Thr Tyr Gln Ile Tyr Gln Glu Pro Phe Lys Asn Leu Lys Thr Gly
            340                 345                 350

Lys Tyr Ala Arg Met Arg Gly Ala His Thr Asn Asp Val Lys Gln Leu
        355                 360                 365

Thr Glu Ala Val Gln Lys Ile Thr Thr Glu Ser Ile Val Ile Trp Gly
    370                 375                 380
```

```
Lys Thr Pro Lys Phe Lys Leu Pro Ile Gln Lys Glu Thr Trp Glu Thr
385                 390                 395                 400

Trp Trp Thr Glu Tyr Trp Gln Ala Thr Trp Ile Pro Glu Trp Glu Phe
                405                 410                 415

Val Asn Thr Pro Pro Leu Val Lys Leu Trp Tyr Gln Leu Glu Lys Glu
            420                 425                 430

Pro Ile Val Gly Ala Glu Thr Phe Tyr Val Asp Gly Ala Ala Asn Arg
        435                 440                 445

Glu Thr Lys Leu Gly Lys Ala Gly Tyr Val Thr Asn Arg Gly Arg Gln
    450                 455                 460

Lys Val Val Thr Leu Thr Asp Thr Thr Asn Gln Lys Thr Glu Leu Gln
465                 470                 475                 480

Ala Ile Tyr Leu Ala Leu Gln Asp Ser Gly Leu Glu Val Asn Ile Val
                485                 490                 495

Thr Asp Ser Gln Tyr Ala Leu Gly Ile Ile Gln Ala Gln Pro Asp Gln
            500                 505                 510

Ser Glu Ser Glu Leu Val Asn Gln Ile Ile Glu Gln Leu Ile Lys Lys
        515                 520                 525

Glu Lys Val Tyr Leu Ala Trp Val Pro Ala His Lys Gly Ile Gly Gly
    530                 535                 540

Asn Glu Gln Val Asp Lys Leu Val Ser Ala Gly Ile Arg Lys Val
545                 550                 555
```

<210> 93
<211> 440
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 93

```
Pro Ile Ser Pro Ile Glu Thr Val Pro Val Lys Leu Lys Pro Gly Met
1               5                  10                  15

Asp Gly Pro Lys Val Lys Gln Trp Pro Leu Thr Glu Glu Lys Ile Lys
            20                  25                  30

Ala Leu Val Glu Ile Cys Thr Glu Met Glu Lys Glu Gly Lys Ile Ser
        35                  40                  45

Lys Ile Gly Pro Glu Asn Pro Tyr Asn Thr Pro Val Phe Ala Ile Lys
    50                  55                  60

Lys Lys Asp Ser Thr Lys Trp Arg Lys Leu Val Asp Phe Arg Glu Leu
65                  70                  75                  80

Asn Lys Arg Thr Gln Asp Phe Trp Glu Val Gln Leu Gly Ile Pro His
                85                  90                  95

Pro Ala Gly Leu Lys Lys Lys Lys Ser Val Thr Val Leu Asp Val Gly
            100                 105                 110

Asp Ala Tyr Phe Ser Val Pro Leu Asp Glu Asp Phe Arg Lys Tyr Thr
        115                 120                 125

Ala Phe Thr Ile Pro Ser Ile Asn Asn Glu Thr Pro Gly Ile Arg Tyr
    130                 135                 140

Gln Tyr Asn Val Leu Pro Gln Gly Trp Lys Gly Ser Pro Ala Ile Phe
145                 150                 155                 160

Gln Ser Ser Met Thr Lys Ile Leu Glu Pro Phe Arg Lys Gln Asn Pro
                165                 170                 175

Asp Ile Val Ile Tyr Gln Tyr Met Asp Asp Leu Tyr Val Gly Ser Asp
            180                 185                 190

Leu Glu Ile Gly Gln His Arg Thr Lys Ile Glu Glu Leu Arg Gln His
        195                 200                 205
```

```
Leu Leu Arg Trp Gly Leu Thr Thr Pro Asp Lys Lys His Gln Lys Glu
    210                 215                 220

Pro Pro Phe Leu Trp Met Gly Tyr Glu Leu His Pro Asp Lys Trp Thr
225                 230                 235                 240

Val Gln Pro Ile Val Leu Pro Glu Lys Asp Ser Trp Thr Val Asn Asp
                245                 250                 255

Ile Gln Lys Leu Val Gly Lys Leu Asn Trp Ala Ser Gln Ile Tyr Pro
            260                 265                 270

Gly Ile Lys Val Arg Gln Leu Cys Lys Leu Leu Arg Gly Thr Lys Ala
        275                 280                 285

Leu Thr Glu Val Ile Pro Leu Thr Glu Glu Ala Glu Leu Glu Leu Ala
    290                 295                 300

Glu Asn Arg Glu Ile Leu Lys Glu Pro Val His Gly Val Tyr Tyr Asp
305                 310                 315                 320

Pro Ser Lys Asp Leu Ile Ala Glu Ile Gln Lys Gln Gly Gln Gly Gln
                325                 330                 335

Trp Thr Tyr Gln Ile Tyr Gln Glu Pro Phe Lys Asn Leu Lys Thr Gly
            340                 345                 350

Lys Tyr Ala Arg Met Arg Gly Ala His Thr Asn Asp Val Lys Gln Leu
        355                 360                 365

Thr Glu Ala Val Gln Lys Ile Thr Thr Glu Ser Ile Val Ile Trp Gly
    370                 375                 380

Lys Thr Pro Lys Phe Lys Leu Pro Ile Gln Lys Glu Thr Trp Glu Thr
385                 390                 395                 400

Trp Trp Thr Glu Tyr Trp Gln Ala Thr Trp Ile Pro Glu Trp Glu Phe
                405                 410                 415

Val Asn Thr Pro Pro Leu Val Lys Leu Trp Tyr Gln Leu Glu Lys Glu
```

```
            420                 425                 430

Pro Ile Val Gly Ala Glu Thr Phe
        435                 440


<210>  94
<211>  858
<212>  PRT
<213>  Unknown

<220>
<223>  ROUS SARCOMA VIRUS

<400>  94

Thr Val Ala Leu His Leu Ala Ile Pro Leu Lys Trp Lys Pro Asn His
1               5                   10                  15


Thr Pro Val Trp Ile Asp Gln Trp Pro Leu Pro Glu Gly Lys Leu Val
            20                  25                  30


Ala Leu Thr Gln Leu Val Glu Lys Glu Leu Gln Leu Gly His Ile Glu
        35                  40                  45


Pro Ser Leu Ser Cys Trp Asn Thr Pro Val Phe Val Ile Arg Lys Ala
    50                  55                  60


Ser Gly Ser Tyr Arg Leu Leu His Asp Leu Arg Ala Val Asn Ala Lys
65                  70                  75                  80


Leu Val Pro Phe Gly Ala Val Gln Gln Gly Ala Pro Val Leu Ser Ala
                85                  90                  95


Leu Pro Arg Gly Trp Pro Leu Met Val Leu Asp Leu Lys Asp Cys Phe
            100                 105                 110


Phe Ser Ile Pro Leu Ala Glu Gln Asp Arg Glu Ala Phe Ala Phe Thr
        115                 120                 125


Leu Pro Ser Val Asn Asn Gln Ala Pro Ala Arg Arg Phe Gln Trp Lys
    130                 135                 140
```

```
Val Leu Pro Gln Gly Met Thr Cys Ser Pro Thr Ile Cys Gln Leu Ile
145                 150                 155                 160

Val Gly Gln Ile Leu Glu Pro Leu Arg Leu Lys His Pro Ser Leu Arg
                165                 170                 175

Met Leu His Tyr Met Asp Asp Leu Leu Leu Ala Ala Ser Ser His Asp
            180                 185                 190

Gly Leu Glu Ala Ala Gly Glu Glu Val Ile Ser Thr Leu Glu Arg Ala
        195                 200                 205

Gly Phe Thr Ile Ser Pro Asp Lys Val Gln Lys Glu Pro Gly Val Gln
    210                 215                 220

Tyr Leu Gly Tyr Lys Leu Gly Ser Thr Tyr Ala Ala Pro Val Gly Leu
225                 230                 235                 240

Val Ala Glu Pro Arg Ile Ala Thr Leu Trp Asp Val Gln Lys Leu Val
                245                 250                 255

Gly Ser Leu Gln Trp Leu Arg Pro Ala Leu Gly Ile Pro Pro Arg Leu
            260                 265                 270

Arg Gly Pro Phe Tyr Glu Gln Leu Arg Gly Ser Asp Pro Asn Glu Ala
        275                 280                 285

Arg Glu Trp Asn Leu Asp Met Lys Met Ala Trp Arg Glu Ile Val Gln
    290                 295                 300

Leu Ser Thr Thr Ala Ala Leu Glu Arg Trp Asp Pro Ala Leu Pro Leu
305                 310                 315                 320

Glu Gly Ala Val Ala Arg Cys Glu Gln Gly Ala Ile Gly Val Leu Gly
                325                 330                 335

Gln Gly Leu Ser Thr His Pro Arg Pro Cys Leu Trp Leu Phe Ser Thr
            340                 345                 350

Gln Pro Thr Lys Ala Phe Thr Ala Trp Leu Glu Val Leu Thr Leu Leu
```

```
        355                 360                 365

Ile Thr Lys Leu Arg Ala Ser Ala Val Arg Thr Phe Gly Lys Glu Val
    370                 375                 380

Asp Ile Leu Leu Leu Pro Ala Cys Phe Arg Asp Glu Leu Pro Leu Pro
385                 390                 395                 400

Glu Gly Ile Leu Leu Ala Leu Arg Gly Phe Ala Gly Lys Ile Arg Ser
                405                 410                 415

Ser Asp Thr Pro Ser Ile Phe Asp Ile Ala Arg Pro Leu His Val Ser
            420                 425                 430

Leu Lys Val Arg Val Thr Asp His Pro Val Pro Gly Pro Thr Val Phe
        435                 440                 445

Thr Asp Ala Ser Ser Ser Thr His Lys Gly Val Val Val Trp Arg Glu
    450                 455                 460

Gly Pro Arg Trp Glu Ile Lys Glu Ile Ala Asp Leu Gly Ala Ser Val
465                 470                 475                 480

Gln Gln Leu Glu Ala Arg Ala Val Ala Met Ala Leu Leu Leu Trp Pro
                485                 490                 495

Thr Thr Pro Thr Asn Val Val Thr Asp Ser Ala Phe Val Ala Lys Met
            500                 505                 510

Leu Leu Lys Met Gly Gln Glu Gly Val Pro Ser Thr Ala Ala Ala Phe
        515                 520                 525

Ile Leu Glu Asp Ala Leu Ser Gln Arg Ser Ala Met Ala Ala Val Leu
    530                 535                 540

His Val Arg Ser His Ser Glu Val Pro Gly Phe Phe Thr Glu Gly Asn
545                 550                 555                 560

Asp Val Ala Asp Ser Gln Ala Thr Phe Gln Ala Tyr Pro Leu Arg Glu
                565                 570                 575
```

```
Ala Lys Asp Leu His Thr Ala Leu His Ile Gly Pro Arg Ala Leu Ser
            580                 585                 590

Lys Ala Cys Asn Ile Ser Met Gln Gln Ala Arg Glu Val Val Gln Thr
        595                 600                 605

Cys Pro His Cys Asn Ser Ala Pro Ala Leu Glu Ala Gly Val Asn Pro
    610                 615                 620

Arg Gly Leu Gly Pro Leu Gln Ile Trp Gln Thr Asp Phe Thr Leu Glu
625                 630                 635                 640

Pro Arg Met Ala Pro Arg Ser Trp Leu Ala Val Thr Val Asp Thr Ala
                645                 650                 655

Ser Ser Ala Ile Val Val Thr Gln His Gly Arg Val Thr Ser Val Ala
            660                 665                 670

Ala Gln His His Trp Ala Thr Val Ile Ala Val Leu Gly Arg Pro Lys
        675                 680                 685

Ala Ile Lys Thr Asp Asn Gly Ser Cys Phe Thr Ser Lys Ser Thr Arg
    690                 695                 700

Glu Trp Leu Ala Arg Trp Gly Ile Ala His Thr Thr Gly Ile Pro Gly
705                 710                 715                 720

Asn Ser Gln Gly Gln Ala Met Val Glu Arg Ala Asn Arg Leu Leu Lys
                725                 730                 735

Asp Lys Ile Arg Val Leu Ala Glu Gly Asp Gly Phe Met Lys Arg Ile
            740                 745                 750

Pro Thr Ser Lys Gln Gly Glu Leu Leu Ala Lys Ala Met Tyr Ala Leu
        755                 760                 765

Asn His Phe Glu Arg Gly Glu Asn Thr Lys Thr Pro Ile Gln Lys His
    770                 775                 780
```

```
Trp Arg Pro Thr Val Leu Thr Glu Gly Pro Pro Val Lys Ile Arg Ile
785                 790                 795                 800


Glu Thr Gly Glu Trp Glu Lys Gly Trp Asn Val Leu Val Trp Gly Arg
                805                 810                 815


Gly Tyr Ala Ala Val Lys Asn Arg Asp Thr Asp Lys Val Ile Trp Val
            820                 825                 830


Pro Ser Arg Lys Val Lys Pro Asp Ile Ala Gln Lys Asp Glu Val Thr
        835                 840                 845


Lys Lys Asp Glu Ala Ser Pro Leu Phe Ala
    850                 855
```

<210> 95
<211> 675
<212> PRT
<213> Unknown

<220>
<223> CAULIFLOWER MOSAIC VIRUS

<400> 95

```
Met Met Asp His Leu Leu Gln Lys Thr Gln Ile Gln Asn Gln Thr Glu
1               5                   10                  15


Gln Val Met Asn Ile Thr Asn Pro Asn Ser Ile Tyr Ile Lys Gly Arg
            20                  25                  30


Leu Tyr Phe Lys Gly Tyr Lys Lys Ile Glu Leu His Cys Phe Val Asp
        35                  40                  45


Thr Gly Ala Ser Leu Cys Ile Ala Ser Lys Phe Val Ile Pro Glu Glu
    50                  55                  60


His Trp Ile Asn Ala Glu Arg Pro Ile Met Val Lys Ile Ala Asp Gly
65                  70                  75                  80


Ser Ser Ile Thr Ile Asn Lys Val Cys Arg Asp Ile Asp Leu Ile Ile
                85                  90                  95
```

```
Ala Gly Glu Ile Phe His Ile Pro Thr Val Tyr Gln Gln Glu Ser Gly
            100                 105                 110

Ile Asp Phe Ile Ile Gly Asn Asn Phe Cys Gln Leu Tyr Glu Pro Phe
        115                 120                 125

Ile Gln Phe Thr Asp Arg Val Ile Phe Thr Lys Asp Arg Thr Tyr Pro
    130                 135                 140

Val His Ile Ala Lys Leu Thr Arg Ala Val Arg Val Gly Thr Glu Gly
145                 150                 155                 160

Phe Leu Glu Ser Met Lys Lys Arg Ser Lys Thr Gln Gln Pro Glu Pro
                165                 170                 175

Val Asn Ile Ser Thr Asn Lys Ile Ala Ile Leu Ser Glu Gly Arg Arg
            180                 185                 190

Leu Ser Glu Glu Lys Leu Phe Ile Thr Gln Gln Arg Met Gln Lys Ile
        195                 200                 205

Glu Glu Leu Leu Glu Lys Val Cys Ser Glu Asn Pro Leu Asp Pro Asn
    210                 215                 220

Lys Thr Lys Gln Trp Met Lys Ala Ser Ile Lys Leu Ser Asp Pro Ser
225                 230                 235                 240

Lys Ala Ile Lys Val Lys Pro Met Lys Tyr Ser Pro Met Asp Arg Glu
                245                 250                 255

Glu Phe Asp Lys Gln Ile Lys Glu Leu Leu Asp Leu Lys Val Ile Lys
            260                 265                 270

Pro Ser Lys Ser Pro His Met Ala Pro Ala Phe Leu Val Asn Asn Glu
        275                 280                 285

Ala Glu Lys Arg Arg Gly Lys Lys Arg Met Val Val Asn Tyr Lys Ala
    290                 295                 300
```

```
Met Asn Lys Ala Thr Val Gly Asp Ala Tyr Asn Leu Pro Asn Lys Asp
305                 310                 315                 320

Glu Leu Leu Thr Leu Ile Arg Gly Lys Lys Ile Phe Ser Ser Phe Asp
                325                 330                 335

Cys Lys Ser Gly Phe Trp Gln Val Leu Leu Asp Gln Asp Ser Arg Pro
            340                 345                 350

Leu Thr Ala Phe Thr Cys Pro Gln Gly His Tyr Glu Trp Asn Val Val
        355                 360                 365

Pro Phe Gly Leu Lys Gln Ala Pro Ser Ile Phe Gln Arg His Met Asp
    370                 375                 380

Glu Ala Phe Arg Val Phe Arg Lys Phe Cys Cys Val Tyr Val Asp Asp
385                 390                 395                 400

Ile Leu Val Phe Ser Asn Asn Glu Glu Asp His Leu Leu His Val Ala
                405                 410                 415

Met Ile Leu Gln Lys Cys Asn Gln His Gly Ile Ile Leu Ser Lys Lys
            420                 425                 430

Lys Ala Gln Leu Phe Lys Lys Lys Ile Asn Phe Leu Gly Leu Glu Ile
        435                 440                 445

Asp Glu Gly Thr His Lys Pro Gln Gly His Ile Leu Glu His Ile Asn
    450                 455                 460

Lys Phe Pro Asp Thr Leu Glu Asp Lys Lys Gln Leu Gln Arg Phe Leu
465                 470                 475                 480

Gly Ile Leu Thr Tyr Ala Ser Asp Tyr Ile Pro Lys Leu Ala Gln Ile
                485                 490                 495

Arg Lys Pro Leu Gln Ala Lys Leu Lys Glu Asn Val Pro Trp Lys Trp
            500                 505                 510
```

```
Thr Lys Glu Asp Thr Leu Tyr Met Gln Lys Val Lys Lys Asn Leu Gln
        515                 520                 525

Gly Phe Pro Pro Leu His His Pro Leu Pro Glu Glu Lys Leu Ile Ile
    530                 535                 540

Glu Thr Asp Ala Ser Asp Asp Tyr Trp Gly Gly Met Leu Lys Ala Ile
545                 550                 555                 560

Lys Ile Asn Glu Gly Thr Asn Thr Glu Leu Ile Cys Arg Tyr Ala Ser
                565                 570                 575

Gly Ser Phe Lys Ala Ala Glu Lys Asn Tyr His Ser Asn Asp Lys Glu
            580                 585                 590

Thr Leu Ala Val Ile Asn Thr Ile Lys Lys Phe Ser Ile Tyr Leu Thr
        595                 600                 605

Pro Val His Phe Leu Ile Arg Thr Asp Asn Thr His Phe Lys Ser Phe
    610                 615                 620

Val Asn Leu Asn Tyr Lys Gly Asp Ser Lys Leu Gly Arg Asn Ile Arg
625                 630                 635                 640

Trp Gln Ala Trp Leu Ser His Tyr Ser Phe Asp Val Glu His Ile Lys
                645                 650                 655

Gly Thr Asp Asn His Phe Ala Asp Phe Leu Ser Arg Glu Phe Asn Arg
            660                 665                 670

Val Asn Ser
        675
```

<210> 96
<211> 366
<212> PRT
<213> Unknown

<220>
<223> KLEBSIELLA PNEUMONIA

<400> 96

```
Met Lys Glu Lys Ile Ser Lys Ile Asp Lys Asn Phe Tyr Thr Asp Ile
1               5                  10                  15

Phe Ile Lys Thr Ser Phe Gln Asn Glu Phe Glu Ala Gly Gly Val Ile
            20                  25                  30

Pro Pro Ile Ala Lys Asn Gln Val Ser Thr Ile Ser Asn Lys Asn Lys
        35                  40                  45

Thr Phe Tyr Ser Leu Ala His Ser Ser Pro His Tyr Ser Ile Gln Thr
    50                  55                  60

Arg Ile Glu Lys Phe Leu Leu Lys Asn Ile Pro Leu Ser Ala Ser Ser
65                  70                  75                  80

Phe Ala Phe Arg Lys Glu Arg Ser Tyr Leu His Tyr Leu Glu Pro His
                85                  90                  95

Thr Gln Asn Val Lys Tyr Cys His Leu Asp Ile Val Ser Phe Phe His
            100                 105                 110

Ser Ile Asp Val Asn Ile Val Arg Asp Thr Phe Ser Val Tyr Phe Ser
        115                 120                 125

Asp Glu Phe Leu Val Lys Glu Lys Gln Ser Leu Leu Asp Ala Phe Met
    130                 135                 140

Ala Ser Val Thr Leu Thr Ala Glu Leu Asp Gly Val Glu Lys Thr Phe
145                 150                 155                 160

Ile Pro Met Gly Phe Lys Ser Ser Pro Ser Ile Ser Asn Ile Ile Phe
                165                 170                 175

Arg Lys Ile Asp Ile Leu Ile Gln Lys Phe Cys Asp Lys Asn Lys Ile
            180                 185                 190

Thr Tyr Thr Arg Tyr Ala Asp Asp Leu Leu Phe Ser Thr Lys Lys Glu
        195                 200                 205
```

```
Asn Asn Ile Leu Ser Ser Thr Phe Phe Ile Asn Glu Ile Ser Ser Ile
    210                 215                 220

Leu Ser Ile Asn Lys Phe Lys Leu Asn Lys Ser Lys Tyr Leu Tyr Lys
225                 230                 235                 240

Glu Gly Thr Ile Ser Leu Gly Gly Tyr Val Ile Glu Asn Ile Leu Lys
                245                 250                 255

Asp Asn Ser Ser Gly Asn Ile Arg Leu Ser Ser Ser Lys Leu Asn Pro
            260                 265                 270

Leu Tyr Lys Ala Leu Tyr Glu Ile Lys Lys Gly Ser Ser Ser Lys His
        275                 280                 285

Ile Cys Ile Lys Val Phe Asn Leu Lys Leu Lys Arg Phe Ile Tyr Lys
    290                 295                 300

Lys Asn Lys Glu Lys Phe Glu Ala Lys Phe Tyr Ser Ser Gln Leu Lys
305                 310                 315                 320

Asn Lys Leu Leu Gly Tyr Arg Ser Tyr Leu Leu Ser Phe Val Ile Phe
                325                 330                 335

His Lys Lys Tyr Lys Cys Ile Asn Pro Ile Phe Leu Glu Lys Cys Val
            340                 345                 350

Phe Leu Ile Ser Glu Ile Glu Ser Ile Met Asn Arg Lys Phe
        355                 360                 365
```

<210> 97
<211> 263
<212> PRT
<213> E. Coli

<400> 97

```
Met Lys Ile Thr Ser Asn Asn Val Thr Ala Val Ile Asn Gly Lys Gly
1               5                   10                  15

Trp His Ser Ile Asn Trp Lys Lys Cys His Gln His Val Lys Thr Ile
            20                  25                  30
```

```
Gln Thr Arg Ile Ala Lys Ala Ala Cys Asn Gln Gln Trp Arg Thr Val
        35                  40                  45

Gly Arg Leu Gln Arg Leu Leu Val Arg Ser Phe Ser Ala Arg Ala Leu
    50                  55                  60

Ala Val Lys Arg Val Thr Glu Asn Ser Gly Arg Lys Thr Pro Gly Val
65                  70                  75                  80

Asp Gly Gln Ile Trp Ser Thr Pro Glu Ser Lys Trp Glu Ala Ile Phe
                85                  90                  95

Lys Leu Arg Arg Lys Gly Tyr Lys Pro Leu Pro Leu Lys Arg Val Phe
            100                 105                 110

Ile Pro Lys Ser Asn Gly Lys Lys Arg Pro Leu Gly Ile Pro Val Met
        115                 120                 125

Leu Asp Arg Ala Met Gln Ala Leu His Leu Leu Gly Leu Glu Pro Val
    130                 135                 140

Ser Glu Thr Asn Ala Asp His Asn Ser Tyr Gly Phe Arg Pro Ala Arg
145                 150                 155                 160

Cys Thr Ala Asp Ala Ile Gln Gln Val Cys Asn Met Tyr Ser Ser Arg
                165                 170                 175

Asn Ala Ser Lys Trp Val Leu Glu Gly Asp Ile Lys Gly Cys Phe Glu
            180                 185                 190

His Ile Ser His Glu Trp Leu Leu Glu Asn Ile Pro Met Asp Lys Gln
        195                 200                 205

Ile Leu Arg Asn Trp Leu Lys Ala Gly Ile Ile Glu Lys Ser Ile Phe
    210                 215                 220

Ser Lys Thr Leu Ser Gly Thr Pro Gln Gly Gly Ile Ile Ser Pro Val
225                 230                 235                 240
```

```
Leu Ala Asn Met Ala Leu Asp Gly Leu Glu Arg Leu Leu Gln Asn Arg
                245                 250                 255


Phe Gly Arg Asn Arg Leu Ile
            260


<210>  98
<211>  438
<212>  PRT
<213>  BACILLUS SUBTILIS

<400>  98

Met Ser Lys Ile Lys Ile Asn Tyr Glu Lys Tyr His Ile Lys Pro Phe
1               5                   10                  15


Pro His Phe Asp Gln Arg Ile Lys Val Asn Lys Lys Val Lys Glu Asn
            20                  25                  30


Leu Gln Asn Pro Phe Tyr Ile Ala Ala His Ser Phe Tyr Pro Phe Ile
        35                  40                  45


His Tyr Lys Lys Ile Ser Tyr Lys Phe Lys Asn Gly Thr Leu Ser Ser
    50                  55                  60


Pro Lys Glu Arg Asp Ile Phe Tyr Ser Gly His Met Asp Gly Tyr Ile
65                  70                  75                  80


Tyr Lys His Tyr Gly Glu Ile Leu Asn His Lys Tyr Asn Asn Thr Cys
                85                  90                  95


Ile Gly Lys Gly Ile Asp His Val Ser Leu Ala Tyr Arg Asn Asn Lys
            100                 105                 110


Met Gly Lys Ser Asn Ile His Phe Ala Ala Glu Val Ile Asn Phe Ile
        115                 120                 125


Ser Glu Gln Gln Gln Ala Phe Ile Phe Val Ser Asp Phe Ser Ser Tyr
    130                 135                 140


Phe Asp Ser Leu Asp His Ala Ile Leu Lys Glu Lys Leu Ile Glu Val
```

```
145                 150                 155                 160

Leu Glu Glu Gln Asp Lys Leu Ser Lys Asp Trp Trp Asn Val Phe Lys
                165                 170                 175

His Ile Thr Arg Tyr Asn Trp Val Glu Lys Glu Glu Val Ile Ser Asp
            180                 185                 190

Leu Glu Cys Thr Lys Glu Lys Ile Ala Arg Asp Lys Lys Ser Arg Glu
        195                 200                 205

Arg Tyr Tyr Thr Pro Ala Glu Phe Arg Glu Phe Arg Lys Arg Val Asn
    210                 215                 220

Ile Lys Ser Asn Asp Thr Gly Val Gly Ile Pro Gln Gly Thr Ala Ile
225                 230                 235                 240

Ser Ala Val Leu Ala Asn Val Tyr Ala Ile Asp Leu Asp Gln Lys Leu
                245                 250                 255

Asn Gln Tyr Ala Leu Lys Tyr Gly Gly Ile Tyr Arg Arg Tyr Ser Asp
            260                 265                 270

Asp Ile Ile Met Val Leu Pro Met Thr Ser Asp Gly Gln Asp Pro Ser
        275                 280                 285

Asn Asp His Val Ser Phe Ile Lys Ser Val Val Lys Arg Asn Lys Val
    290                 295                 300

Thr Met Gly Asp Ser Lys Thr Ser Val Leu Tyr Tyr Ala Asn Asn Asn
305                 310                 315                 320

Ile Tyr Glu Asp Tyr Gln Arg Lys Arg Glu Ser Lys Met Asp Tyr Leu
                325                 330                 335

Gly Phe Ser Phe Asp Gly Met Thr Val Lys Ile Arg Glu Lys Ser Leu
            340                 345                 350

Phe Lys Tyr Tyr His Arg Thr Tyr Lys Lys Ile Asn Ser Ile Asn Trp
        355                 360                 365
```

```
Ala Ser Val Lys Lys Glu Lys Lys Val Gly Arg Lys Lys Leu Tyr Leu
    370                 375                 380

Leu Tyr Ser His Leu Gly Arg Asn Tyr Lys Gly His Gly Asn Phe Ile
385                 390                 395                 400

Ser Tyr Cys Lys Lys Ala His Ala Val Phe Glu Gly Asn Lys Lys Ile
                405                 410                 415

Glu Ser Leu Ile Asn Gln Gln Ile Lys Arg His Trp Lys Lys Ile Gln
            420                 425                 430

Lys Arg Leu Val Asp Val
        435
```

<210> 99
<211> 426
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 99

```
Asp Thr Ser Asn Leu Met Glu Gln Ile Leu Ser Ser Asp Asn Leu Asn
1               5                   10                  15

Arg Ala Tyr Leu Gln Val Val Arg Asn Lys Gly Ala Glu Gly Val Asp
            20                  25                  30

Gly Met Lys Tyr Thr Glu Leu Lys Glu His Leu Ala Lys Asn Gly Glu
        35                  40                  45

Thr Ile Lys Gly Gln Leu Arg Thr Arg Lys Tyr Lys Pro Gln Pro Ala
    50                  55                  60

Arg Arg Val Glu Ile Pro Lys Pro Asp Gly Gly Val Arg Asn Leu Gly
65                  70                  75                  80

Val Pro Thr Val Thr Asp Arg Phe Ile Gln Gln Ala Ile Ala Gln Val
```

```
                85                  90                  95

Leu Thr Pro Ile Tyr Glu Glu Gln Phe His Asp His Ser Tyr Gly Phe
            100                 105                 110

Arg Pro Asn Arg Cys Ala Gln Gln Ala Ile Leu Thr Ala Leu Asn Ile
        115                 120                 125

Met Asn Asp Gly Asn Asp Trp Ile Val Asp Ile Asp Leu Glu Lys Phe
    130                 135                 140

Phe Asp Thr Val Asn His Asp Lys Leu Met Thr Leu Ile Gly Arg Thr
145                 150                 155                 160

Ile Lys Asp Gly Asp Val Ile Ser Ile Val Arg Lys Tyr Leu Val Ser
                165                 170                 175

Gly Ile Met Ile Asp Asp Glu Tyr Glu Asp Ser Ile Val Gly Thr Pro
            180                 185                 190

Gln Gly Gly Asn Leu Ser Pro Leu Leu Ala Asn Ile Met Leu Asn Glu
        195                 200                 205

Leu Asp Lys Glu Met Glu Lys Arg Gly Leu Asn Phe Val Arg Tyr Ala
    210                 215                 220

Asp Asp Cys Ile Ile Met Val Gly Ser Glu Met Ser Ala Asn Arg Val
225                 230                 235                 240

Met Arg Asn Ile Ser Arg Phe Ile Glu Glu Lys Leu Gly Leu Lys Val
                245                 250                 255

Asn Met Thr Lys Ser Lys Val Asp Arg Pro Ser Gly Leu Lys Tyr Leu
            260                 265                 270

Gly Phe Gly Phe Tyr Phe Asp Pro Arg Ala His Gln Phe Lys Ala Lys
        275                 280                 285

Pro His Ala Lys Ser Val Ala Lys Phe Lys Lys Arg Met Lys Glu Leu
    290                 295                 300
```

```
Thr Cys Arg Ser Trp Gly Val Ser Asn Ser Tyr Lys Val Glu Lys Leu
305                 310                 315                 320


Asn Gln Leu Ile Arg Gly Trp Ile Asn Tyr Phe Lys Ile Gly Ser Met
                325                 330                 335


Lys Thr Leu Cys Lys Glu Leu Asp Ser Arg Ile Arg Tyr Arg Leu Arg
            340                 345                 350


Met Cys Ile Trp Lys Gln Trp Lys Thr Pro Gln Asn Gln Glu Lys Asn
        355                 360                 365


Leu Val Lys Leu Gly Ile Asp Arg Asn Thr Ala Arg Arg Val Ala Tyr
    370                 375                 380


Thr Gly Lys Arg Ile Ala Tyr Val Cys Asn Lys Gly Ala Val Asn Val
385                 390                 395                 400


Ala Ile Ser Asn Lys Arg Leu Ala Ser Phe Gly Leu Ile Ser Met Leu
                405                 410                 415


Asp Tyr Tyr Ile Glu Lys Cys Val Thr Cys
            420                 425


<210>  100
<211>  412
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  100

Ala Leu Leu Glu Arg Ile Leu Ala Arg Asp Asn Leu Ile Thr Ala Leu
1               5                   10                  15


Lys Arg Val Glu Ala Asn Gln Gly Ala Pro Gly Ile Asp Gly Val Ser
            20                  25                  30


Thr Asp Gln Leu Arg Asp Tyr Ile Arg Ala His Trp Ser Thr Ile His
```

```
        35                  40                  45

Ala Gln Leu Leu Ala Gly Thr Tyr Arg Pro Ala Pro Val Arg Arg Val
    50                  55                  60

Glu Ile Pro Lys Pro Gly Gly Gly Thr Arg Gln Leu Gly Ile Pro Thr
65                  70                  75                  80

Val Val Asp Arg Leu Ile Gln Gln Ala Ile Leu Gln Glu Leu Thr Pro
                85                  90                  95

Ile Phe Asp Pro Asp Phe Ser Ser Ser Ser Phe Gly Phe Arg Pro Gly
            100                 105                 110

Arg Asn Ala His Asp Ala Val Arg Gln Ala Gln Gly Tyr Ile Gln Glu
        115                 120                 125

Gly Tyr Arg Tyr Val Val Asp Met Asp Leu Glu Lys Phe Phe Asp Arg
    130                 135                 140

Val Asn His Asp Ile Leu Met Ser Arg Val Ala Arg Lys Val Lys Asp
145                 150                 155                 160

Lys Arg Val Leu Lys Leu Ile Arg Ala Tyr Leu Gln Ala Gly Val Met
                165                 170                 175

Ile Glu Gly Val Lys Val Gln Thr Glu Glu Gly Thr Pro Gln Gly Gly
            180                 185                 190

Pro Leu Ser Pro Leu Leu Ala Asn Ile Leu Leu Asp Asp Leu Asp Lys
        195                 200                 205

Glu Leu Glu Lys Arg Gly Leu Lys Phe Cys Arg Tyr Ala Asp Asp Cys
    210                 215                 220

Asn Ile Tyr Val Lys Ser Leu Arg Ala Gly Gln Arg Val Lys Gln Ser
225                 230                 235                 240

Ile Gln Arg Phe Leu Glu Lys Thr Leu Lys Leu Lys Val Asn Glu Glu
                245                 250                 255
```

```
Lys Ser Ala Val Asp Arg Pro Trp Lys Arg Ala Phe Leu Gly Phe Ser
            260                 265                 270

Phe Thr Pro Glu Arg Lys Ala Arg Ile Arg Leu Ala Pro Arg Ser Ile
        275                 280                 285

Gln Arg Leu Lys Gln Arg Ile Arg Gln Leu Thr Asn Pro Asn Trp Ser
    290                 295                 300

Ile Ser Met Pro Glu Arg Ile His Arg Val Asn Gln Tyr Val Met Gly
305                 310                 315                 320

Trp Ile Gly Tyr Phe Arg Leu Val Glu Thr Pro Ser Val Leu Gln Thr
                325                 330                 335

Ile Glu Gly Trp Ile Arg Arg Arg Leu Arg Leu Cys Gln Trp Leu Gln
            340                 345                 350

Trp Lys Arg Val Arg Thr Arg Ile Arg Glu Leu Arg Ala Leu Gly Leu
        355                 360                 365

Lys Glu Thr Ala Val Met Glu Ile Ala Asn Thr Arg Lys Gly Ala Trp
    370                 375                 380

Arg Thr Thr Lys Thr Pro Gln Leu His Gln Ala Leu Gly Lys Thr Tyr
385                 390                 395                 400

Trp Thr Ala Gln Gly Leu Lys Ser Leu Thr Gln Arg
                405                 410
```

<210> 101
<211> 126
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 101
uacaccauca cggucuaugc guuuuagagc uagaaauagc aaguuaaaau aaggcuaguc 60

cguuaucaac uugaaaaagu ggcaccgagu cggugcuauc uucgccccau gcauagaccg 120

ugaugg 126

<210> 102
<211> 126
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 102
cgcgucgcgc ucgucagauc guuuuagagc uagaaauagc aaguuaaaau aaggcuaguc 60

cguuaucaac uugaaaaagu ggcaccgagu cggugcuuuc cgccuaccug caucugacga 120

gcgcga 126

<210> 103
<211> 132
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 103
aucggagaau acaugaacau guuuuagagc uagaaauagc aaguuaaaau aaggcuaguc 60

cguuaucaac uugaaaaagu ggcaccgagu cggugccgga gaauacauga acaucggacc 120

cgcgcuaucu uc 132

<210> 104
<211> 126
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> misc_feature
<222> (107)..(109)
<223> n is a, c, g, or u

<400> 104
uacaccauca cggucuaugc guuuuagagc uagaaauagc aaguuaaaau aaggcuaguc 60

cguuaucaac uugaaaaagu ggcaccgagu cggugcuauc uucgccnnnu gcauagaccg 120

ugaugg 126

<210> 105
<211> 126
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 105
uacaccauca cggucuaugc guuuuagagc uagaaauagc aaguuaaaau aaggcuaguc 60

cguuaucaac uugaaaaagu ggcaccgagu cggugcgggg gggggggggu gcauagaccg 120

ugaugg 126

<210> 106
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 106

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr

```
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300
```

```
Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510
```

```
Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675
```

<210> 107
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 107

```
Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205
```

```
Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415
```

```
Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
```

625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

<210> 108
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 108

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

```
Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
```

```
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540
```

```
Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560


Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575


Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590


Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605


Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620


Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640


Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655


Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670


Glu Asn Ser Ser Pro
        675


<210>  109
<211>  677
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  109

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15


Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
```

```
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Lys Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240
```

```
Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445
```

```
Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655
```

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

<210> 110
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 110

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

```
Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Arg Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350
```

```
Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
```

565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

<210> 111
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 111

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

```
Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
```

```
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480
```

```
Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Lys Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675
```

<210> 112
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 112

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Pro Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

```
Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380
```

```
Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590
```

```
Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675
```

<210> 113
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 113

```
Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80
```

```
Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285
```

```
Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Gly Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
```

```
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675
```

<210> 114
<211> 677
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 114

```
Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15


Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30


Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45


Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60


Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80


Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95


Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110


Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125


Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140


Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160


His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175


Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190


Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
```

```
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415
```

```
Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Lys Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620
```

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

<210> 115
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 115

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

```
Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Lys Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320
```

```
Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525
```

```
Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675


<210>  116
<211>  677
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  116

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15
```

```
Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220
```

```
Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Phe Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
```

```
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655
```

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

<210> 117
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 117

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln

```
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350
```

```
Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560
```

```
Ala Gln Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asn Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675
```

<210> 118
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 118

```
Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45
```

```
Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255
```

```
Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Arg Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Phe Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460
```

```
Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
```

675

<210> 119
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 119

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Pro Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

```
His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
```

```
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590
```

```
Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Lys Gly
        595                 600                 605


Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620


Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640


Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655


Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670


Glu Asn Ser Ser Pro
        675


<210>  120
<211>  677
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  120

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15


Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30


Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45


Ile Ile Leu Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60


Pro Met Lys Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
```

```
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Ala Leu Phe Asp Glu Ala Leu Arg Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285
```

```
Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Lys Phe Leu
    290                 295                 300

Gly Thr Ala Gly Asn Cys Arg Leu Phe Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Gly Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Lys Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495
```

```
Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asn Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile Gln Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asn Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675
```

<210> 121
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 121

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1   5   10   15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20   25   30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35   40   45

Ile Ile Leu Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50   55   60

Pro Met Lys Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65   70   75   80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85   90   95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100   105   110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115   120   125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130   135   140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145   150   155   160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165   170   175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180   185   190

```
Lys Asn Ser Pro Ala Leu Phe Asn Glu Ala Leu Arg Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Lys Phe Leu
    290                 295                 300

Gly Thr Ala Gly Asn Cys Arg Leu Phe Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400
```

```
Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Gly Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Lys Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asn Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile Gln Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
```

610 615 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asn Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

<210> 122
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 122

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

```
Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Lys Ala Gly Phe Cys Arg Leu Phe Ile Pro Gly Phe Ala Glu Met
```

```
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525
```

```
Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675


<210>  123
<211>  2117
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  123

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
```

```
1               5                   10                  15

Arg Lys Val Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn
            20                  25                  30

Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys
        35                  40                  45

Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn
    50                  55                  60

Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr
65                  70                  75                  80

Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg
                85                  90                  95

Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp
            100                 105                 110

Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp
        115                 120                 125

Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val
    130                 135                 140

Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu
145                 150                 155                 160

Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu
                165                 170                 175

Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu
            180                 185                 190

Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln
        195                 200                 205

Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val
    210                 215                 220
```

```
Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu
225                 230                 235                 240

Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe
                245                 250                 255

Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser
            260                 265                 270

Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr
        275                 280                 285

Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr
    290                 295                 300

Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu
305                 310                 315                 320

Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser
                325                 330                 335

Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu
            340                 345                 350

Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile
        355                 360                 365

Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly
    370                 375                 380

Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys
385                 390                 395                 400

Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu
                405                 410                 415

Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile
            420                 425                 430
```

```
His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr
        435                 440                 445

Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe
    450                 455                 460

Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe
465                 470                 475                 480

Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe
                485                 490                 495

Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg
            500                 505                 510

Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys
        515                 520                 525

His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys
    530                 535                 540

Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly
545                 550                 555                 560

Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys
                565                 570                 575

Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys
            580                 585                 590

Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser
        595                 600                 605

Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe
    610                 615                 620

Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr
625                 630                 635                 640
```

```
Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr
                645                 650                 655

Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg
            660                 665                 670

Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile
        675                 680                 685

Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp
    690                 695                 700

Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu
705                 710                 715                 720

Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp
                725                 730                 735

Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys
            740                 745                 750

Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val
        755                 760                 765

Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu
    770                 775                 780

Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys
785                 790                 795                 800

Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu
                805                 810                 815

His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr
            820                 825                 830

Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile
        835                 840                 845

Asn Arg Leu Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe
```

```
    850                 855                 860

Leu Lys Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys
865                 870                 875                 880

Asn Arg Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys
                885                 890                 895

Met Lys Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln
            900                 905                 910

Arg Lys Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu
        915                 920                 925

Leu Asp Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln
    930                 935                 940

Ile Thr Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys
945                 950                 955                 960

Tyr Asp Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu
                965                 970                 975

Lys Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
            980                 985                 990

Val Arg Glu Ile Asn Asn Tyr His  His Ala His Asp Ala  Tyr Leu Asn
        995                 1000                1005

Ala Val  Val Gly Thr Ala Leu  Ile Lys Lys Tyr Pro  Lys Leu Glu
    1010                1015                1020

Ser Glu  Phe Val Tyr Gly Asp  Tyr Lys Val Tyr Asp  Val Arg Lys
    1025                1030                1035

Met Ile  Ala Lys Ser Glu Gln  Glu Ile Gly Lys Ala  Thr Ala Lys
    1040                1045                1050

Tyr Phe  Phe Tyr Ser Asn Ile  Met Asn Phe Phe Lys  Thr Glu Ile
    1055                1060                1065
```

```
Thr Leu  Ala Asn Gly Glu Ile  Arg Lys Arg Pro Leu  Ile Glu Thr
    1070                1075                1080

Asn Gly  Glu Thr Gly Glu Ile  Val Trp Asp Lys Gly  Arg Asp Phe
    1085                1090                1095

Ala Thr  Val Arg Lys Val Leu  Ser Met Pro Gln Val  Asn Ile Val
    1100                1105                1110

Lys Lys  Thr Glu Val Gln Thr  Gly Gly Phe Ser Lys  Glu Ser Ile
    1115                1120                1125

Leu Pro  Lys Arg Asn Ser Asp  Lys Leu Ile Ala Arg  Lys Lys Asp
    1130                1135                1140

Trp Asp  Pro Lys Lys Tyr Gly  Gly Phe Asp Ser Pro  Thr Val Ala
    1145                1150                1155

Tyr Ser  Val Leu Val Val Ala  Lys Val Glu Lys Gly  Lys Ser Lys
    1160                1165                1170

Lys Leu  Lys Ser Val Lys Glu  Leu Leu Gly Ile Thr  Ile Met Glu
    1175                1180                1185

Arg Ser  Ser Phe Glu Lys Asn  Pro Ile Asp Phe Leu  Glu Ala Lys
    1190                1195                1200

Gly Tyr  Lys Glu Val Lys Lys  Asp Leu Ile Ile Lys  Leu Pro Lys
    1205                1210                1215

Tyr Ser  Leu Phe Glu Leu Glu  Asn Gly Arg Lys Arg  Met Leu Ala
    1220                1225                1230

Ser Ala  Gly Glu Leu Gln Lys  Gly Asn Glu Leu Ala  Leu Pro Ser
    1235                1240                1245

Lys Tyr  Val Asn Phe Leu Tyr  Leu Ala Ser His Tyr  Glu Lys Leu
    1250                1255                1260
```

```
Lys Gly  Ser Pro Glu Asp Asn  Glu Gln Lys Gln Leu  Phe Val Glu
    1265                1270                1275

Gln His  Lys His Tyr Leu Asp  Glu Ile Ile Glu Gln  Ile Ser Glu
    1280                1285                1290

Phe Ser  Lys Arg Val Ile Leu  Ala Asp Ala Asn Leu  Asp Lys Val
    1295                1300                1305

Leu Ser  Ala Tyr Asn Lys His  Arg Asp Lys Pro Ile  Arg Glu Gln
    1310                1315                1320

Ala Glu  Asn Ile Ile His Leu  Phe Thr Leu Thr Asn  Leu Gly Ala
    1325                1330                1335

Pro Ala  Ala Phe Lys Tyr Phe  Asp Thr Thr Ile Asp  Arg Lys Arg
    1340                1345                1350

Tyr Thr  Ser Thr Lys Glu Val  Leu Asp Ala Thr Leu  Ile His Gln
    1355                1360                1365

Ser Ile  Thr Gly Leu Tyr Glu  Thr Arg Ile Asp Leu  Ser Gln Leu
    1370                1375                1380

Gly Gly  Asp Ser Gly Gly Ser  Ser Gly Gly Ser Ser  Gly Ser Glu
    1385                1390                1395

Thr Pro  Gly Thr Ser Glu Ser  Ala Thr Pro Glu Ser  Ser Gly Gly
    1400                1405                1410

Ser Ser  Gly Gly Ser Ser Thr  Leu Asn Ile Glu Asp  Glu Tyr Arg
    1415                1420                1425

Leu His  Glu Thr Ser Lys Glu  Pro Asp Val Ser Leu  Gly Ser Thr
    1430                1435                1440

Trp Leu  Ser Asp Phe Pro Gln  Ala Trp Ala Glu Thr  Gly Gly Met
    1445                1450                1455
```

```
Gly Leu  Ala Val Arg Gln Ala  Pro Leu Ile Ile Pro  Leu Lys Ala
    1460                1465                1470

Thr Ser  Thr Pro Val Ser Ile  Lys Gln Tyr Pro Met  Ser Gln Glu
    1475                1480                1485

Ala Arg  Leu Gly Ile Lys Pro  His Ile Gln Arg Leu  Leu Asp Gln
    1490                1495                1500

Gly Ile  Leu Val Pro Cys Gln  Ser Pro Trp Asn Thr  Pro Leu Leu
    1505                1510                1515

Pro Val  Lys Lys Pro Gly Thr  Asn Asp Tyr Arg Pro  Val Gln Asp
    1520                1525                1530

Leu Arg  Glu Val Asn Lys Arg  Val Glu Asp Ile His  Pro Thr Val
    1535                1540                1545

Pro Asn  Pro Tyr Asn Leu Leu  Ser Gly Leu Pro Pro  Ser His Gln
    1550                1555                1560

Trp Tyr  Thr Val Leu Asp Leu  Lys Asp Ala Phe Phe  Cys Leu Arg
    1565                1570                1575

Leu His  Pro Thr Ser Gln Pro  Leu Phe Ala Phe Glu  Trp Arg Asp
    1580                1585                1590

Pro Glu  Met Gly Ile Ser Gly  Gln Leu Thr Trp Thr  Arg Leu Pro
    1595                1600                1605

Gln Gly  Phe Lys Asn Ser Pro  Thr Leu Phe Asp Glu  Ala Leu His
    1610                1615                1620

Arg Asp  Leu Ala Asp Phe Arg  Ile Gln His Pro Asp  Leu Ile Leu
    1625                1630                1635

Leu Gln  Tyr Val Asp Asp Leu  Leu Leu Ala Ala Thr  Ser Glu Leu
    1640                1645                1650

Asp Cys  Gln Gln Gly Thr Arg  Ala Leu Leu Gln Thr  Leu Gly Asn
```

```
    1655                1660                1665

Leu Gly  Tyr Arg Ala Ser Ala  Lys Lys Ala Gln Ile  Cys Gln Lys
    1670                1675                1680

Gln Val  Lys Tyr Leu Gly Tyr  Leu Leu Lys Glu Gly  Gln Arg Trp
    1685                1690                1695

Leu Thr  Glu Ala Arg Lys Glu  Thr Val Met Gly Gln  Pro Thr Pro
    1700                1705                1710

Lys Thr  Pro Arg Gln Leu Arg  Glu Phe Leu Gly Thr  Ala Gly Phe
    1715                1720                1725

Cys Arg  Leu Trp Ile Pro Gly  Phe Ala Glu Met Ala  Ala Pro Leu
    1730                1735                1740

Tyr Pro  Leu Thr Lys Thr Gly  Thr Leu Phe Asn Trp  Gly Pro Asp
    1745                1750                1755

Gln Gln  Lys Ala Tyr Gln Glu  Ile Lys Gln Ala Leu  Leu Thr Ala
    1760                1765                1770

Pro Ala  Leu Gly Leu Pro Asp  Leu Thr Lys Pro Phe  Glu Leu Phe
    1775                1780                1785

Val Asp  Glu Lys Gln Gly Tyr  Ala Lys Gly Val Leu  Thr Gln Lys
    1790                1795                1800

Leu Gly  Pro Trp Arg Arg Pro  Val Ala Tyr Leu Ser  Lys Lys Leu
    1805                1810                1815

Asp Pro  Val Ala Ala Gly Trp  Pro Pro Cys Leu Arg  Met Val Ala
    1820                1825                1830

Ala Ile  Ala Val Leu Thr Lys  Asp Ala Gly Lys Leu  Thr Met Gly
    1835                1840                1845

Gln Pro  Leu Val Ile Leu Ala  Pro His Ala Val Glu  Ala Leu Val
    1850                1855                1860
```

```
Lys Gln  Pro Pro Asp Arg Trp  Leu Ser Asn Ala Arg  Met Thr His
    1865                1870                1875

Tyr Gln  Ala Leu Leu Leu Asp  Thr Asp Arg Val Gln  Phe Gly Pro
    1880                1885                1890

Val Val  Ala Leu Asn Pro Ala  Thr Leu Leu Pro Leu  Pro Glu Glu
    1895                1900                1905

Gly Leu  Gln His Asn Cys Leu  Asp Ile Leu Ala Glu  Ala His Gly
    1910                1915                1920

Thr Arg  Pro Asp Leu Thr Asp  Gln Pro Leu Pro Asp  Ala Asp His
    1925                1930                1935

Thr Trp  Tyr Thr Asp Gly Ser  Ser Leu Leu Gln Glu  Gly Gln Arg
    1940                1945                1950

Lys Ala  Gly Ala Ala Val Thr  Thr Glu Thr Glu Val  Ile Trp Ala
    1955                1960                1965

Lys Ala  Leu Pro Ala Gly Thr  Ser Ala Gln Arg Ala  Glu Leu Ile
    1970                1975                1980

Ala Leu  Thr Gln Ala Leu Lys  Met Ala Glu Gly Lys  Lys Leu Asn
    1985                1990                1995

Val Tyr  Thr Asp Ser Arg Tyr  Ala Phe Ala Thr Ala  His Ile His
    2000                2005                2010

Gly Glu  Ile Tyr Arg Arg Arg  Gly Leu Leu Thr Ser  Glu Gly Lys
    2015                2020                2025

Glu Ile  Lys Asn Lys Asp Glu  Ile Leu Ala Leu Leu  Lys Ala Leu
    2030                2035                2040

Phe Leu  Pro Lys Arg Leu Ser  Ile Ile His Cys Pro  Gly His Gln
    2045                2050                2055
```

Lys Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln
    2060   2065   2070

Ala Ala Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr
    2075   2080   2085

Leu Leu Ile Glu Asn Ser Ser Pro Ser Gly Gly Ser Lys Arg Thr
    2090   2095   2100

Ala Asp Gly Ser Glu Phe Glu Pro Lys Lys Lys Arg Lys Val
    2105   2110   2115

<210> 124
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 124

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1   5   10   15

Arg Lys Val

<210> 125
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 125

Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Pro Lys Lys Lys Arg Lys
1   5   10   15

Val

<210> 126
<211> 1367
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 126

Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val Gly
1 5 10 15

Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
20 25 30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
35 40 45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
50 55 60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65 70 75 80

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe
85 90 95

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
100 105 110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
115 120 125

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
130 135 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145 150 155 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
165 170 175

```
Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380
```

```
Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
```

595 600 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
610 615 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625 630 635 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
645 650 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
660 665 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
675 680 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
690 695 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705 710 715 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
725 730 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
740 745 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
755 760 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
770 775 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785 790 795 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
805 810 815

```
Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975

Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990

Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005

Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020
```

```
Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035

Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
    1040                1045                1050

Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065

Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
    1070                1075                1080

Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095

Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110

Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125

Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140

Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155

Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170

Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                1210                1215
```

```
Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230


Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245


Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260


Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275


Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290


Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305


Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                1315                1320


Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Arg Tyr  Thr Ser Thr
    1325                1330                1335


Lys Glu  Val Leu Asp Ala Thr  Leu Ile His Gln Ser  Ile Thr Gly
    1340                1345                1350


Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln Leu Gly  Gly Asp
    1355                1360                1365


<210>  127
<211>  33
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  127

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Ser Glu Thr Pro Gly Thr
1               5                  10                  15
```

Ser Glu Ser Ala Thr Pro Glu Ser Ser Gly Gly Ser Ser Gly Gly Ser
            20   25   30

Ser

<210> 128
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 128

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1   5   10   15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20   25   30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35   40   45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50   55   60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65   70   75   80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85   90   95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100   105   110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115   120   125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130   135   140

```
Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350
```

```
Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560
```

```
Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575


Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590


Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605


Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620


Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640


Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655


Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670


Glu Asn Ser Ser Pro
        675


<210>  129
<211>  328
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  129

Met Gly Lys Arg His Arg Asn Leu Ile Asp Gln Ile Thr Thr Trp Glu
1               5                   10                  15


Asn Leu Leu Asp Ala Tyr Arg Lys Thr Ser His Gly Lys Arg Arg Thr
            20                  25                  30


Trp Gly Tyr Leu Glu Phe Lys Glu Tyr Asp Leu Ala Asn Leu Leu Ala
        35                  40                  45
```

```
Leu Gln Ala Glu Leu Lys Ala Gly Asn Tyr Glu Arg Gly Pro Tyr Arg
    50                  55                  60

Glu Phe Leu Val Tyr Glu Pro Lys Pro Arg Leu Ile Ser Ala Leu Glu
65                  70                  75                  80

Phe Lys Asp Arg Leu Val Gln His Ala Leu Cys Asn Ile Val Ala Pro
                85                  90                  95

Ile Phe Glu Ala Gly Leu Leu Pro Tyr Thr Tyr Ala Cys Arg Pro Asp
            100                 105                 110

Lys Gly Thr His Ala Gly Val Cys His Val Gln Ala Glu Leu Arg Arg
        115                 120                 125

Thr Arg Ala Thr His Phe Leu Lys Ser Asp Phe Ser Lys Phe Phe Pro
    130                 135                 140

Ser Ile Asp Arg Ala Ala Leu Tyr Ala Met Ile Asp Lys Lys Ile His
145                 150                 155                 160

Cys Ala Ala Thr Arg Arg Leu Leu Arg Val Val Leu Pro Asp Glu Gly
                165                 170                 175

Val Gly Ile Pro Ile Gly Ser Leu Thr Ser Gln Leu Phe Ala Asn Val
            180                 185                 190

Tyr Gly Gly Ala Val Asp Arg Leu Leu His Asp Glu Leu Lys Gln Arg
        195                 200                 205

His Trp Ala Arg Tyr Met Asp Asp Ile Val Val Leu Gly Asp Asp Pro
    210                 215                 220

Glu Glu Leu Arg Ala Val Phe Tyr Arg Leu Arg Asp Phe Ala Ser Glu
225                 230                 235                 240

Arg Leu Gly Leu Lys Ile Ser His Trp Gln Val Ala Pro Val Ser Arg
                245                 250                 255
```

```
Gly Ile Asn Phe Leu Gly Tyr Arg Ile Trp Pro Thr His Lys Leu Leu
            260                 265                 270

Arg Lys Ser Ser Val Lys Arg Ala Lys Arg Lys Val Ala Asn Phe Ile
        275                 280                 285

Lys His Gly Glu Asp Glu Ser Leu Gln Arg Phe Leu Ala Ser Trp Ser
    290                 295                 300

Gly His Ala Gln Trp Ala Asp Thr His Asn Leu Phe Thr Trp Met Glu
305                 310                 315                 320

Glu Gln Tyr Gly Ile Ala Cys His
                325
```

<210> 130
<211> 1367
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 130

```
Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val Gly
1               5                   10                  15

Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
            20                  25                  30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
        35                  40                  45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
    50                  55                  60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65                  70                  75                  80

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe
                85                  90                  95
```

```
Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
            100                 105                 110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
        115                 120                 125

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
    130                 135                 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145                 150                 155                 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
                165                 170                 175

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300
```

```
Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
```

```
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735
```

```
Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
        755                 760                 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815

Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940
```

```
Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960


Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975


Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990


Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005


Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020


Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035


Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
    1040                1045                1050


Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065


Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
    1070                1075                1080


Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095


Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110


Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125


Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140
```

```
Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155

Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170

Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                1210                1215

Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230

Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245

Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260

Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275

Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290

Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305

Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                1315                1320

Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Arg Tyr  Thr Ser Thr
    1325                1330                1335

Lys Glu  Val Leu Asp Ala Thr  Leu Ile His Gln Ser  Ile Thr Gly
```

1340 1345 1350

Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp
1355 1360 1365

<210> 131
<211> 76
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 131
gttttagagc tagaaatagc aagttaaaat aaggctagtc cgttatcaac ttgaaaaagt 60

ggcaccgagt cggtgc 76

<210> 132
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 132

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

```
Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300
```

```
Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510
```

```
Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675


<210>  133
<211>  21
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  133
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Ser Gly Gly Ser Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Pro Lys
1   5   10   15

Lys Lys Arg Lys Val
            20

<210> 134
<211> 2117
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 134

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1   5   10   15

Arg Lys Val Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn
            20   25   30

Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys
        35   40   45

Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn
    50   55   60

Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr
65   70   75   80

Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg
                85   90   95

Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp
            100   105   110

Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp
        115   120   125

Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val
    130   135   140

```
Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu
145                 150                 155                 160

Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu
                165                 170                 175

Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu
            180                 185                 190

Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln
        195                 200                 205

Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val
    210                 215                 220

Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu
225                 230                 235                 240

Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe
                245                 250                 255

Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser
            260                 265                 270

Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr
        275                 280                 285

Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr
    290                 295                 300

Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu
305                 310                 315                 320

Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser
                325                 330                 335

Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu
            340                 345                 350
```

```
Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile
        355                 360                 365

Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly
    370                 375                 380

Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys
385                 390                 395                 400

Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu
                405                 410                 415

Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile
            420                 425                 430

His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr
        435                 440                 445

Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe
    450                 455                 460

Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe
465                 470                 475                 480

Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe
                485                 490                 495

Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg
            500                 505                 510

Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys
        515                 520                 525

His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys
    530                 535                 540

Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly
545                 550                 555                 560
```

```
Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys
                565                 570                 575

Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys
            580                 585                 590

Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser
        595                 600                 605

Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe
    610                 615                 620

Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr
625                 630                 635                 640

Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr
                645                 650                 655

Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg
            660                 665                 670

Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile
        675                 680                 685

Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp
    690                 695                 700

Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu
705                 710                 715                 720

Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp
                725                 730                 735

Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys
            740                 745                 750

Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val
        755                 760                 765

Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu
```

770 775 780

Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys
785 790 795 800

Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu
805 810 815

His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr
820 825 830

Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile
835 840 845

Asn Arg Leu Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe
850 855 860

Leu Lys Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys
865 870 875 880

Asn Arg Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys
885 890 895

Met Lys Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln
900 905 910

Arg Lys Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu
915 920 925

Leu Asp Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln
930 935 940

Ile Thr Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys
945 950 955 960

Tyr Asp Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu
965 970 975

Lys Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
980 985 990

```
Val Arg Glu Ile Asn Asn Tyr His  His Ala His Asp Ala  Tyr Leu Asn
        995                 1000                1005


Ala Val  Val Gly Thr Ala Leu  Ile Lys Lys Tyr Pro  Lys Leu Glu
    1010                1015                1020


Ser Glu  Phe Val Tyr Gly Asp  Tyr Lys Val Tyr Asp  Val Arg Lys
    1025                1030                1035


Met Ile  Ala Lys Ser Glu Gln  Glu Ile Gly Lys Ala  Thr Ala Lys
    1040                1045                1050


Tyr Phe  Phe Tyr Ser Asn Ile  Met Asn Phe Phe Lys  Thr Glu Ile
    1055                1060                1065


Thr Leu  Ala Asn Gly Glu Ile  Arg Lys Arg Pro Leu  Ile Glu Thr
    1070                1075                1080


Asn Gly  Glu Thr Gly Glu Ile  Val Trp Asp Lys Gly  Arg Asp Phe
    1085                1090                1095


Ala Thr  Val Arg Lys Val Leu  Ser Met Pro Gln Val  Asn Ile Val
    1100                1105                1110


Lys Lys  Thr Glu Val Gln Thr  Gly Gly Phe Ser Lys  Glu Ser Ile
    1115                1120                1125


Leu Pro  Lys Arg Asn Ser Asp  Lys Leu Ile Ala Arg  Lys Lys Asp
    1130                1135                1140


Trp Asp  Pro Lys Lys Tyr Gly  Gly Phe Asp Ser Pro  Thr Val Ala
    1145                1150                1155


Tyr Ser  Val Leu Val Val Ala  Lys Val Glu Lys Gly  Lys Ser Lys
    1160                1165                1170


Lys Leu  Lys Ser Val Lys Glu  Leu Leu Gly Ile Thr  Ile Met Glu
    1175                1180                1185
```

```
Arg Ser  Ser Phe Glu Lys Asn  Pro Ile Asp Phe Leu  Glu Ala Lys
    1190                1195                1200

Gly Tyr  Lys Glu Val Lys Lys  Asp Leu Ile Ile Lys  Leu Pro Lys
    1205                1210                1215

Tyr Ser  Leu Phe Glu Leu Glu  Asn Gly Arg Lys Arg  Met Leu Ala
    1220                1225                1230

Ser Ala  Gly Glu Leu Gln Lys  Gly Asn Glu Leu Ala  Leu Pro Ser
    1235                1240                1245

Lys Tyr  Val Asn Phe Leu Tyr  Leu Ala Ser His Tyr  Glu Lys Leu
    1250                1255                1260

Lys Gly  Ser Pro Glu Asp Asn  Glu Gln Lys Gln Leu  Phe Val Glu
    1265                1270                1275

Gln His  Lys His Tyr Leu Asp  Glu Ile Ile Glu Gln  Ile Ser Glu
    1280                1285                1290

Phe Ser  Lys Arg Val Ile Leu  Ala Asp Ala Asn Leu  Asp Lys Val
    1295                1300                1305

Leu Ser  Ala Tyr Asn Lys His  Arg Asp Lys Pro Ile  Arg Glu Gln
    1310                1315                1320

Ala Glu  Asn Ile Ile His Leu  Phe Thr Leu Thr Asn  Leu Gly Ala
    1325                1330                1335

Pro Ala  Ala Phe Lys Tyr Phe  Asp Thr Thr Ile Asp  Arg Lys Arg
    1340                1345                1350

Tyr Thr  Ser Thr Lys Glu Val  Leu Asp Ala Thr Leu  Ile His Gln
    1355                1360                1365

Ser Ile  Thr Gly Leu Tyr Glu  Thr Arg Ile Asp Leu  Ser Gln Leu
    1370                1375                1380
```

```
Gly Gly  Asp Ser Gly Gly Ser  Ser Gly Gly Ser Ser  Gly Ser Glu
    1385                1390                1395

Thr Pro  Gly Thr Ser Glu Ser  Ala Thr Pro Glu Ser  Ser Gly Gly
    1400                1405                1410

Ser Ser  Gly Gly Ser Ser Thr  Leu Asn Ile Glu Asp  Glu Tyr Arg
    1415                1420                1425

Leu His  Glu Thr Ser Lys Glu  Pro Asp Val Ser Leu  Gly Ser Thr
    1430                1435                1440

Trp Leu  Ser Asp Phe Pro Gln  Ala Trp Ala Glu Thr  Gly Gly Met
    1445                1450                1455

Gly Leu  Ala Val Arg Gln Ala  Pro Leu Ile Ile Pro  Leu Lys Ala
    1460                1465                1470

Thr Ser  Thr Pro Val Ser Ile  Lys Gln Tyr Pro Met  Ser Gln Glu
    1475                1480                1485

Ala Arg  Leu Gly Ile Lys Pro  His Ile Gln Arg Leu  Leu Asp Gln
    1490                1495                1500

Gly Ile  Leu Val Pro Cys Gln  Ser Pro Trp Asn Thr  Pro Leu Leu
    1505                1510                1515

Pro Val  Lys Lys Pro Gly Thr  Asn Asp Tyr Arg Pro  Val Gln Asp
    1520                1525                1530

Leu Arg  Glu Val Asn Lys Arg  Val Glu Asp Ile His  Pro Thr Val
    1535                1540                1545

Pro Asn  Pro Tyr Asn Leu Leu  Ser Gly Leu Pro Pro  Ser His Gln
    1550                1555                1560

Trp Tyr  Thr Val Leu Asp Leu  Lys Asp Ala Phe Phe  Cys Leu Arg
    1565                1570                1575

Leu His  Pro Thr Ser Gln Pro  Leu Phe Ala Phe Glu  Trp Arg Asp
```

```
    1580                1585                1590

Pro Glu  Met Gly Ile Ser Gly  Gln Leu Thr Trp Thr  Arg Leu Pro
    1595                1600                1605

Gln Gly  Phe Lys Asn Ser Pro  Thr Leu Phe Asn Glu  Ala Leu His
    1610                1615                1620

Arg Asp  Leu Ala Asp Phe Arg  Ile Gln His Pro Asp  Leu Ile Leu
    1625                1630                1635

Leu Gln  Tyr Val Asp Asp Leu  Leu Leu Ala Ala Thr  Ser Glu Leu
    1640                1645                1650

Asp Cys  Gln Gln Gly Thr Arg  Ala Leu Leu Gln Thr  Leu Gly Asn
    1655                1660                1665

Leu Gly  Tyr Arg Ala Ser Ala  Lys Lys Ala Gln Ile  Cys Gln Lys
    1670                1675                1680

Gln Val  Lys Tyr Leu Gly Tyr  Leu Leu Lys Glu Gly  Gln Arg Trp
    1685                1690                1695

Leu Thr  Glu Ala Arg Lys Glu  Thr Val Met Gly Gln  Pro Thr Pro
    1700                1705                1710

Lys Thr  Pro Arg Gln Leu Arg  Glu Phe Leu Gly Lys  Ala Gly Phe
    1715                1720                1725

Cys Arg  Leu Phe Ile Pro Gly  Phe Ala Glu Met Ala  Ala Pro Leu
    1730                1735                1740

Tyr Pro  Leu Thr Lys Pro Gly  Thr Leu Phe Asn Trp  Gly Pro Asp
    1745                1750                1755

Gln Gln  Lys Ala Tyr Gln Glu  Ile Lys Gln Ala Leu  Leu Thr Ala
    1760                1765                1770

Pro Ala  Leu Gly Leu Pro Asp  Leu Thr Lys Pro Phe  Glu Leu Phe
    1775                1780                1785
```

```
Val Asp  Glu Lys Gln Gly Tyr  Ala Lys Gly Val Leu  Thr Gln Lys
    1790                1795                1800

Leu Gly  Pro Trp Arg Arg Pro  Val Ala Tyr Leu Ser  Lys Lys Leu
    1805                1810                1815

Asp Pro  Val Ala Ala Gly Trp  Pro Pro Cys Leu Arg  Met Val Ala
    1820                1825                1830

Ala Ile  Ala Val Leu Thr Lys  Asp Ala Gly Lys Leu  Thr Met Gly
    1835                1840                1845

Gln Pro  Leu Val Ile Leu Ala  Pro His Ala Val Glu  Ala Leu Val
    1850                1855                1860

Lys Gln  Pro Pro Asp Arg Trp  Leu Ser Asn Ala Arg  Met Thr His
    1865                1870                1875

Tyr Gln  Ala Leu Leu Leu Asp  Thr Asp Arg Val Gln  Phe Gly Pro
    1880                1885                1890

Val Val  Ala Leu Asn Pro Ala  Thr Leu Leu Pro Leu  Pro Glu Glu
    1895                1900                1905

Gly Leu  Gln His Asn Cys Leu  Asp Ile Leu Ala Glu  Ala His Gly
    1910                1915                1920

Thr Arg  Pro Asp Leu Thr Asp  Gln Pro Leu Pro Asp  Ala Asp His
    1925                1930                1935

Thr Trp  Tyr Thr Asp Gly Ser  Ser Leu Leu Gln Glu  Gly Gln Arg
    1940                1945                1950

Lys Ala  Gly Ala Ala Val Thr  Thr Glu Thr Glu Val  Ile Trp Ala
    1955                1960                1965

Lys Ala  Leu Pro Ala Gly Thr  Ser Ala Gln Arg Ala  Glu Leu Ile
    1970                1975                1980
```

```
Ala Leu  Thr Gln Ala Leu Lys  Met Ala Glu Gly Lys  Lys Leu Asn
    1985                1990                1995


Val Tyr  Thr Asp Ser Arg Tyr  Ala Phe Ala Thr Ala  His Ile His
    2000                2005                2010


Gly Glu  Ile Tyr Arg Arg Arg  Gly Trp Leu Thr Ser  Glu Gly Lys
    2015                2020                2025


Glu Ile  Lys Asn Lys Asp Glu  Ile Leu Ala Leu Leu  Lys Ala Leu
    2030                2035                2040


Phe Leu  Pro Lys Arg Leu Ser  Ile Ile His Cys Pro  Gly His Gln
    2045                2050                2055


Lys Gly  His Ser Ala Glu Ala  Arg Gly Asn Arg Met  Ala Asp Gln
    2060                2065                2070


Ala Ala  Arg Lys Ala Ala Ile  Thr Glu Thr Pro Asp  Thr Ser Thr
    2075                2080                2085


Leu Leu  Ile Glu Asn Ser Ser  Pro Ser Gly Gly Ser  Lys Arg Thr
    2090                2095                2100


Ala Asp  Gly Ser Glu Phe Glu  Pro Lys Lys Lys Arg  Lys Val
    2105                2110                2115
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Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val Gly
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Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
            20                  25                  30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
        35                  40                  45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
    50                  55                  60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65                  70                  75                  80

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe
                85                  90                  95

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
            100                 105                 110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
        115                 120                 125

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
    130                 135                 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145                 150                 155                 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
                165                 170                 175

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
```

```
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415
```

```
Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620
```

```
Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
        755                 760                 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815

Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830
```

```
Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975

Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990

Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005

Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020

Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035

Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
```

```
    1040                1045                1050

Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065

Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
    1070                1075                1080

Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095

Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110

Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125

Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140

Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155

Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170

Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                1210                1215

Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230

Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245
```

```
Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260


Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275


Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290


Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305


Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                1315                1320


Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Arg Tyr  Thr Ser Thr
    1325                1330                1335


Lys Glu  Val Leu Asp Ala Thr  Leu Ile His Gln Ser  Ile Thr Gly
    1340                1345                1350


Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln Leu Gly  Gly Asp
    1355                1360                1365


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Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15
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```
Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
```

```
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Lys Ala Gly Phe Cys Arg Leu Phe Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445
```

```
Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655
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Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

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Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val Gly
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Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
20 25 30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
35 40 45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
50 55 60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65 70 75 80

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe
85 90 95

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
100 105 110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His

```
        115                 120                 125

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
    130                 135                 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145                 150                 155                 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
                165                 170                 175

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335
```

```
Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540
```

```
Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750
```

```
His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
        755                 760                 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815

Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
```

965 970 975

Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
980 985 990

Gly Thr Ala Leu Ile Lys Lys Tyr Pro Lys Leu Glu Ser Glu Phe Val
995 1000 1005

Tyr Gly Asp Tyr Lys Val Tyr Asp Val Arg Lys Met Ile Ala Lys
1010 1015 1020

Ser Glu Gln Glu Ile Gly Lys Ala Thr Ala Lys Tyr Phe Phe Tyr
1025 1030 1035

Ser Asn Ile Met Asn Phe Phe Lys Thr Glu Ile Thr Leu Ala Asn
1040 1045 1050

Gly Glu Ile Arg Lys Arg Pro Leu Ile Glu Thr Asn Gly Glu Thr
1055 1060 1065

Gly Glu Ile Val Trp Asp Lys Gly Arg Asp Phe Ala Thr Val Arg
1070 1075 1080

Lys Val Leu Ser Met Pro Gln Val Asn Ile Val Lys Lys Thr Glu
1085 1090 1095

Val Gln Thr Gly Gly Phe Ser Lys Glu Ser Ile Leu Pro Lys Arg
1100 1105 1110

Asn Ser Asp Lys Leu Ile Ala Arg Lys Lys Asp Trp Asp Pro Lys
1115 1120 1125

Lys Tyr Gly Gly Phe Asp Ser Pro Thr Val Ala Tyr Ser Val Leu
1130 1135 1140

Val Val Ala Lys Val Glu Lys Gly Lys Ser Lys Lys Leu Lys Ser
1145 1150 1155

Val Lys Glu Leu Leu Gly Ile Thr Ile Met Glu Arg Ser Ser Phe
1160 1165 1170

```
Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                1210                1215

Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230

Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245

Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260

Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275

Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290

Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305

Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                1315                1320

Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Arg Tyr  Thr Ser Thr
    1325                1330                1335

Lys Glu  Val Leu Asp Ala Thr  Leu Ile His Gln Ser  Ile Thr Gly
    1340                1345                1350

Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln Leu Gly  Gly Asp
    1355                1360                1365
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<213> Artificial Sequence

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Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1   5   10   15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20   25   30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35   40   45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50   55   60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65   70   75   80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85   90   95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100   105   110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115   120   125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130   135   140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu

```
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Lys Ala Gly Phe Cys Arg Leu Phe Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365
```

```
Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575
```

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

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<210> 145
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<213> Artificial Sequence

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Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1 5 10 15

Arg Lys Val Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr
20 25 30

Ser Lys Glu Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe

```
        35                  40                  45

Pro Gln Ala Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln
    50                  55                  60

Ala Pro Leu Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile
65                  70                  75                  80

Lys Gln Tyr Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His
                85                  90                  95

Ile Gln Arg Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro
            100                 105                 110

Trp Asn Thr Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr
        115                 120                 125

Arg Pro Val Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile
    130                 135                 140

His Pro Thr Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro
145                 150                 155                 160

Ser His Gln Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys
                165                 170                 175

Leu Arg Leu His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg
            180                 185                 190

Asp Pro Glu Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro
        195                 200                 205

Gln Gly Phe Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg
    210                 215                 220

Asp Leu Ala Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln
225                 230                 235                 240

Tyr Val Asp Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln
                245                 250                 255
```

```
Gln Gly Thr Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg
            260                 265                 270

Ala Ser Ala Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu
        275                 280                 285

Gly Tyr Leu Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys
    290                 295                 300

Glu Thr Val Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg
305                 310                 315                 320

Glu Phe Leu Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe
                325                 330                 335

Ala Glu Met Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu
            340                 345                 350

Phe Asn Trp Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln
        355                 360                 365

Ala Leu Leu Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro
    370                 375                 380

Phe Glu Leu Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu
385                 390                 395                 400

Thr Gln Lys Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys
                405                 410                 415

Lys Leu Asp Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val
            420                 425                 430

Ala Ala Ile Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly
        435                 440                 445

Gln Pro Leu Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys
    450                 455                 460
```

```
Gln Pro Pro Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln
465                 470                 475                 480

Ala Leu Leu Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala
                485                 490                 495

Leu Asn Pro Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His
            500                 505                 510

Asn Cys Leu Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu
        515                 520                 525

Thr Asp Gln Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly
    530                 535                 540

Ser Ser Leu Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr
545                 550                 555                 560

Thr Glu Thr Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser
                565                 570                 575

Ala Gln Arg Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala
            580                 585                 590

Glu Gly Lys Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala
        595                 600                 605

Thr Ala His Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr
    610                 615                 620

Ser Glu Gly Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu
625                 630                 635                 640

Lys Ala Leu Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly
                645                 650                 655

His Gln Lys Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp
            660                 665                 670
```

```
Gln Ala Ala Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr
        675                 680                 685

Leu Leu Ile Glu Asn Ser Ser Pro Ser Gly Gly Ser Ser Gly Gly Ser
    690                 695                 700

Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser
705                 710                 715                 720

Ser Gly Gly Ser Ser Gly Gly Ser Ser Asp Lys Lys Tyr Ser Ile Gly
                725                 730                 735

Leu Asp Ile Gly Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu
            740                 745                 750

Tyr Lys Val Pro Ser Lys Lys Phe Lys Val Leu Gly Asn Thr Asp Arg
        755                 760                 765

His Ser Ile Lys Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly
    770                 775                 780

Glu Thr Ala Glu Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr
785                 790                 795                 800

Thr Arg Arg Lys Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn
                805                 810                 815

Glu Met Ala Lys Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser
            820                 825                 830

Phe Leu Val Glu Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly
        835                 840                 845

Asn Ile Val Asp Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr
    850                 855                 860

His Leu Arg Lys Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg
865                 870                 875                 880

Leu Ile Tyr Leu Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe
```

```
               885                 890                 895

Leu Ile Glu Gly Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu
            900                 905                 910

Phe Ile Gln Leu Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro
        915                 920                 925

Ile Asn Ala Ser Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu
    930                 935                 940

Ser Lys Ser Arg Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu
945                 950                 955                 960

Lys Lys Asn Gly Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu
               965                 970                 975

Thr Pro Asn Phe Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu
            980                 985                 990

Gln Leu Ser Lys Asp Thr Tyr Asp  Asp Asp Leu Asp Asn  Leu Leu Ala
        995                 1000                1005

Gln Ile  Gly Asp Gln Tyr Ala  Asp Leu Phe Leu Ala  Ala Lys Asn
    1010                1015                1020

Leu Ser  Asp Ala Ile Leu Leu  Ser Asp Ile Leu Arg  Val Asn Thr
    1025                1030                1035

Glu Ile  Thr Lys Ala Pro Leu  Ser Ala Ser Met Ile  Lys Arg Tyr
    1040                1045                1050

Asp Glu  His His Gln Asp Leu  Thr Leu Leu Lys Ala  Leu Val Arg
    1055                1060                1065

Gln Gln  Leu Pro Glu Lys Tyr  Lys Glu Ile Phe Phe  Asp Gln Ser
    1070                1075                1080

Lys Asn  Gly Tyr Ala Gly Tyr  Ile Asp Gly Gly Ala  Ser Gln Glu
    1085                1090                1095
```

```
Glu Phe  Tyr Lys Phe Ile Lys  Pro Ile Leu Glu Lys  Met Asp Gly
    1100                1105                1110

Thr Glu  Glu Leu Leu Val Lys  Leu Asn Arg Glu Asp  Leu Leu Arg
    1115                1120                1125

Lys Gln  Arg Thr Phe Asp Asn  Gly Ser Ile Pro His  Gln Ile His
    1130                1135                1140

Leu Gly  Glu Leu His Ala Ile  Leu Arg Arg Gln Glu  Asp Phe Tyr
    1145                1150                1155

Pro Phe  Leu Lys Asp Asn Arg  Glu Lys Ile Glu Lys  Ile Leu Thr
    1160                1165                1170

Phe Arg  Ile Pro Tyr Tyr Val  Gly Pro Leu Ala Arg  Gly Asn Ser
    1175                1180                1185

Arg Phe  Ala Trp Met Thr Arg  Lys Ser Glu Glu Thr  Ile Thr Pro
    1190                1195                1200

Trp Asn  Phe Glu Glu Val Val  Asp Lys Gly Ala Ser  Ala Gln Ser
    1205                1210                1215

Phe Ile  Glu Arg Met Thr Asn  Phe Asp Lys Asn Leu  Pro Asn Glu
    1220                1225                1230

Lys Val  Leu Pro Lys His Ser  Leu Leu Tyr Glu Tyr  Phe Thr Val
    1235                1240                1245

Tyr Asn  Glu Leu Thr Lys Val  Lys Tyr Val Thr Glu  Gly Met Arg
    1250                1255                1260

Lys Pro  Ala Phe Leu Ser Gly  Glu Gln Lys Lys Ala  Ile Val Asp
    1265                1270                1275

Leu Leu  Phe Lys Thr Asn Arg  Lys Val Thr Val Lys  Gln Leu Lys
    1280                1285                1290
```

```
Glu Asp  Tyr Phe Lys Lys Ile  Glu Cys Phe Asp Ser  Val Glu Ile
    1295                1300                1305

Ser Gly  Val Glu Asp Arg Phe  Asn Ala Ser Leu Gly  Thr Tyr His
    1310                1315                1320

Asp Leu  Leu Lys Ile Ile Lys  Asp Lys Asp Phe Leu  Asp Asn Glu
    1325                1330                1335

Glu Asn  Glu Asp Ile Leu Glu  Asp Ile Val Leu Thr  Leu Thr Leu
    1340                1345                1350

Phe Glu  Asp Arg Glu Met Ile  Glu Glu Arg Leu Lys  Thr Tyr Ala
    1355                1360                1365

His Leu  Phe Asp Asp Lys Val  Met Lys Gln Leu Lys  Arg Arg Arg
    1370                1375                1380

Tyr Thr  Gly Trp Gly Arg Leu  Ser Arg Lys Leu Ile  Asn Gly Ile
    1385                1390                1395

Arg Asp  Lys Gln Ser Gly Lys  Thr Ile Leu Asp Phe  Leu Lys Ser
    1400                1405                1410

Asp Gly  Phe Ala Asn Arg Asn  Phe Met Gln Leu Ile  His Asp Asp
    1415                1420                1425

Ser Leu  Thr Phe Lys Glu Asp  Ile Gln Lys Ala Gln  Val Ser Gly
    1430                1435                1440

Gln Gly  Asp Ser Leu His Glu  His Ile Ala Asn Leu  Ala Gly Ser
    1445                1450                1455

Pro Ala  Ile Lys Lys Gly Ile  Leu Gln Thr Val Lys  Val Val Asp
    1460                1465                1470

Glu Leu  Val Lys Val Met Gly  Arg His Lys Pro Glu  Asn Ile Val
    1475                1480                1485
```

```
Ile Glu  Met Ala Arg Glu Asn  Gln Thr Thr Gln Lys  Gly Gln Lys
    1490                 1495                 1500

Asn Ser  Arg Glu Arg Met Lys  Arg Ile Glu Glu Gly  Ile Lys Glu
    1505                 1510                 1515

Leu Gly  Ser Gln Ile Leu Lys  Glu His Pro Val Glu  Asn Thr Gln
    1520                 1525                 1530

Leu Gln  Asn Glu Lys Leu Tyr  Leu Tyr Tyr Leu Gln  Asn Gly Arg
    1535                 1540                 1545

Asp Met  Tyr Val Asp Gln Glu  Leu Asp Ile Asn Arg  Leu Ser Asp
    1550                 1555                 1560

Tyr Asp  Val Asp Ala Ile Val  Pro Gln Ser Phe Leu  Lys Asp Asp
    1565                 1570                 1575

Ser Ile  Asp Asn Lys Val Leu  Thr Arg Ser Asp Lys  Asn Arg Gly
    1580                 1585                 1590

Lys Ser  Asp Asn Val Pro Ser  Glu Glu Val Val Lys  Lys Met Lys
    1595                 1600                 1605

Asn Tyr  Trp Arg Gln Leu Leu  Asn Ala Lys Leu Ile  Thr Gln Arg
    1610                 1615                 1620

Lys Phe  Asp Asn Leu Thr Lys  Ala Glu Arg Gly Gly  Leu Ser Glu
    1625                 1630                 1635

Leu Asp  Lys Ala Gly Phe Ile  Lys Arg Gln Leu Val  Glu Thr Arg
    1640                 1645                 1650

Gln Ile  Thr Lys His Val Ala  Gln Ile Leu Asp Ser  Arg Met Asn
    1655                 1660                 1665

Thr Lys  Tyr Asp Glu Asn Asp  Lys Leu Ile Arg Glu  Val Lys Val
    1670                 1675                 1680

Ile Thr  Leu Lys Ser Lys Leu  Val Ser Asp Phe Arg  Lys Asp Phe
```

```
    1685                1690                1695

Gln Phe  Tyr Lys Val Arg Glu  Ile Asn Asn Tyr His  His Ala His
    1700                1705                1710

Asp Ala  Tyr Leu Asn Ala Val  Val Gly Thr Ala Leu  Ile Lys Lys
    1715                1720                1725

Tyr Pro  Lys Leu Glu Ser Glu  Phe Val Tyr Gly Asp  Tyr Lys Val
    1730                1735                1740

Tyr Asp  Val Arg Lys Met Ile  Ala Lys Ser Glu Gln  Glu Ile Gly
    1745                1750                1755

Lys Ala  Thr Ala Lys Tyr Phe  Phe Tyr Ser Asn Ile  Met Asn Phe
    1760                1765                1770

Phe Lys  Thr Glu Ile Thr Leu  Ala Asn Gly Glu Ile  Arg Lys Arg
    1775                1780                1785

Pro Leu  Ile Glu Thr Asn Gly  Glu Thr Gly Glu Ile  Val Trp Asp
    1790                1795                1800

Lys Gly  Arg Asp Phe Ala Thr  Val Arg Lys Val Leu  Ser Met Pro
    1805                1810                1815

Gln Val  Asn Ile Val Lys Lys  Thr Glu Val Gln Thr  Gly Gly Phe
    1820                1825                1830

Ser Lys  Glu Ser Ile Leu Pro  Lys Arg Asn Ser Asp  Lys Leu Ile
    1835                1840                1845

Ala Arg  Lys Lys Asp Trp Asp  Pro Lys Lys Tyr Gly  Gly Phe Asp
    1850                1855                1860

Ser Pro  Thr Val Ala Tyr Ser  Val Leu Val Val Ala  Lys Val Glu
    1865                1870                1875

Lys Gly  Lys Ser Lys Lys Leu  Lys Ser Val Lys Glu  Leu Leu Gly
    1880                1885                1890
```

```
Ile Thr  Ile Met Glu Arg Ser  Ser Phe Glu Lys Asn  Pro Ile Asp
    1895                1900                1905

Phe Leu  Glu Ala Lys Gly Tyr  Lys Glu Val Lys Lys  Asp Leu Ile
    1910                1915                1920

Ile Lys  Leu Pro Lys Tyr Ser  Leu Phe Glu Leu Glu  Asn Gly Arg
    1925                1930                1935

Lys Arg  Met Leu Ala Ser Ala  Gly Glu Leu Gln Lys  Gly Asn Glu
    1940                1945                1950

Leu Ala  Leu Pro Ser Lys Tyr  Val Asn Phe Leu Tyr  Leu Ala Ser
    1955                1960                1965

His Tyr  Glu Lys Leu Lys Gly  Ser Pro Glu Asp Asn  Glu Gln Lys
    1970                1975                1980

Gln Leu  Phe Val Glu Gln His  Lys His Tyr Leu Asp  Glu Ile Ile
    1985                1990                1995

Glu Gln  Ile Ser Glu Phe Ser  Lys Arg Val Ile Leu  Ala Asp Ala
    2000                2005                2010

Asn Leu  Asp Lys Val Leu Ser  Ala Tyr Asn Lys His  Arg Asp Lys
    2015                2020                2025

Pro Ile  Arg Glu Gln Ala Glu  Asn Ile Ile His Leu  Phe Thr Leu
    2030                2035                2040

Thr Asn  Leu Gly Ala Pro Ala  Ala Phe Lys Tyr Phe  Asp Thr Thr
    2045                2050                2055

Ile Asp  Arg Lys Arg Tyr Thr  Ser Thr Lys Glu Val  Leu Asp Ala
    2060                2065                2070

Thr Leu  Ile His Gln Ser Ile  Thr Gly Leu Tyr Glu  Thr Arg Ile
    2075                2080                2085
```

Asp Leu Ser Gln Leu Gly Gly Asp Ser Gly Gly Ser Lys Arg Thr
    2090   2095   2100

Ala Asp Gly Ser Glu Phe Glu Pro Lys Lys Lys Arg Lys Val
    2105   2110   2115

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<210> 147
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<400> 147

Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val Gly
1   5   10   15

Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
            20   25   30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
        35   40   45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
    50   55   60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65   70   75   80

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe
                85   90   95

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
            100   105   110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His

```
        115                 120                 125

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
    130                 135                 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145                 150                 155                 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
                165                 170                 175

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335
```

```
Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540
```

```
Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750
```

```
His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
        755                 760                 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815

Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
```

965 970 975

Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
980 985 990

Gly Thr Ala Leu Ile Lys Lys Tyr Pro Lys Leu Glu Ser Glu Phe Val
995 1000 1005

Tyr Gly Asp Tyr Lys Val Tyr Asp Val Arg Lys Met Ile Ala Lys
1010 1015 1020

Ser Glu Gln Glu Ile Gly Lys Ala Thr Ala Lys Tyr Phe Phe Tyr
1025 1030 1035

Ser Asn Ile Met Asn Phe Phe Lys Thr Glu Ile Thr Leu Ala Asn
1040 1045 1050

Gly Glu Ile Arg Lys Arg Pro Leu Ile Glu Thr Asn Gly Glu Thr
1055 1060 1065

Gly Glu Ile Val Trp Asp Lys Gly Arg Asp Phe Ala Thr Val Arg
1070 1075 1080

Lys Val Leu Ser Met Pro Gln Val Asn Ile Val Lys Lys Thr Glu
1085 1090 1095

Val Gln Thr Gly Gly Phe Ser Lys Glu Ser Ile Leu Pro Lys Arg
1100 1105 1110

Asn Ser Asp Lys Leu Ile Ala Arg Lys Lys Asp Trp Asp Pro Lys
1115 1120 1125

Lys Tyr Gly Gly Phe Asp Ser Pro Thr Val Ala Tyr Ser Val Leu
1130 1135 1140

Val Val Ala Lys Val Glu Lys Gly Lys Ser Lys Lys Leu Lys Ser
1145 1150 1155

Val Lys Glu Leu Leu Gly Ile Thr Ile Met Glu Arg Ser Ser Phe
1160 1165 1170

```
Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                1210                1215

Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230

Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245

Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260

Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275

Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290

Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305

Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                1315                1320

Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Arg Tyr  Thr Ser Thr
    1325                1330                1335

Lys Glu  Val Leu Asp Ala Thr  Leu Ile His Gln Ser  Ile Thr Gly
    1340                1345                1350

Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln Leu Gly  Gly Asp
    1355                1360                1365
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<210> 148

<400> 148
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<210> 149
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 149

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1   5   10   15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20   25   30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35   40   45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50   55   60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65   70   75   80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85   90   95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100   105   110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115   120   125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130   135   140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu

145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

```
Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575
```

```
Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675
```

<210> 150
<211> 2144
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 150

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Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1               5                   10                  15

Arg Lys Val Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr
            20                  25                  30

Ser Lys Glu Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe
        35                  40                  45

Pro Gln Ala Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln
    50                  55                  60
```

```
Ala Pro Leu Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile
65                  70                  75                  80

Lys Gln Tyr Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His
                85                  90                  95

Ile Gln Arg Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro
            100                 105                 110

Trp Asn Thr Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr
        115                 120                 125

Arg Pro Val Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile
    130                 135                 140

His Pro Thr Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro
145                 150                 155                 160

Ser His Gln Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys
                165                 170                 175

Leu Arg Leu His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg
            180                 185                 190

Asp Pro Glu Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro
        195                 200                 205

Gln Gly Phe Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg
    210                 215                 220

Asp Leu Ala Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln
225                 230                 235                 240

Tyr Val Asp Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln
                245                 250                 255

Gln Gly Thr Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg
            260                 265                 270
```

```
Ala Ser Ala Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu
        275                 280                 285

Gly Tyr Leu Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys
    290                 295                 300

Glu Thr Val Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg
305                 310                 315                 320

Glu Phe Leu Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe
                325                 330                 335

Ala Glu Met Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu
            340                 345                 350

Phe Asn Trp Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln
        355                 360                 365

Ala Leu Leu Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro
    370                 375                 380

Phe Glu Leu Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu
385                 390                 395                 400

Thr Gln Lys Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys
                405                 410                 415

Lys Leu Asp Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val
            420                 425                 430

Ala Ala Ile Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly
        435                 440                 445

Gln Pro Leu Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys
    450                 455                 460

Gln Pro Pro Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln
465                 470                 475                 480
```

```
Ala Leu Leu Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala
                485                 490                 495

Leu Asn Pro Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His
            500                 505                 510

Asn Cys Leu Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu
        515                 520                 525

Thr Asp Gln Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly
    530                 535                 540

Ser Ser Leu Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr
545                 550                 555                 560

Thr Glu Thr Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser
                565                 570                 575

Ala Gln Arg Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala
            580                 585                 590

Glu Gly Lys Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala
        595                 600                 605

Thr Ala His Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr
    610                 615                 620

Ser Glu Gly Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu
625                 630                 635                 640

Lys Ala Leu Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly
                645                 650                 655

His Gln Lys Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp
            660                 665                 670

Gln Ala Ala Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr
        675                 680                 685

Leu Leu Ile Glu Asn Ser Ser Pro Ser Gly Gly Ser Ser Gly Gly Ser
```

```
    690                 695                 700

Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser
705                 710                 715                 720

Ala Gly Ser Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Gly Ser Ala Ala
                725                 730                 735

Pro Ala Ala Lys Lys Lys Lys Leu Asp Gly Ser Gly Ser Gly Gly Ser
            740                 745                 750

Ser Gly Gly Ser Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr
        755                 760                 765

Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser
    770                 775                 780

Lys Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys
785                 790                 795                 800

Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala
                805                 810                 815

Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn
            820                 825                 830

Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val
        835                 840                 845

Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu
    850                 855                 860

Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu
865                 870                 875                 880

Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys
                885                 890                 895

Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala
            900                 905                 910
```

```
Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp
        915                 920                 925

Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val
    930                 935                 940

Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly
945                 950                 955                 960

Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg
                965                 970                 975

Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu
            980                 985                 990

Phe Gly Asn Leu Ile Ala Leu Ser  Leu Gly Leu Thr Pro  Asn Phe Lys
        995                 1000                1005

Ser Asn  Phe Asp Leu Ala Glu  Asp Ala Lys Leu Gln  Leu Ser Lys
    1010                1015                1020

Asp Thr  Tyr Asp Asp Asp Leu  Asp Asn Leu Leu Ala  Gln Ile Gly
    1025                1030                1035

Asp Gln  Tyr Ala Asp Leu Phe  Leu Ala Ala Lys Asn  Leu Ser Asp
    1040                1045                1050

Ala Ile  Leu Leu Ser Asp Ile  Leu Arg Val Asn Thr  Glu Ile Thr
    1055                1060                1065

Lys Ala  Pro Leu Ser Ala Ser  Met Ile Lys Arg Tyr  Asp Glu His
    1070                1075                1080

His Gln  Asp Leu Thr Leu Leu  Lys Ala Leu Val Arg  Gln Gln Leu
    1085                1090                1095

Pro Glu  Lys Tyr Lys Glu Ile  Phe Phe Asp Gln Ser  Lys Asn Gly
    1100                1105                1110
```

```
Tyr Ala  Gly Tyr Ile Asp Gly  Gly Ala Ser Gln Glu  Glu Phe Tyr
    1115                1120                1125

Lys Phe  Ile Lys Pro Ile Leu  Glu Lys Met Asp Gly  Thr Glu Glu
    1130                1135                1140

Leu Leu  Val Lys Leu Asn Arg  Glu Asp Leu Leu Arg  Lys Gln Arg
    1145                1150                1155

Thr Phe  Asp Asn Gly Ser Ile  Pro His Gln Ile His  Leu Gly Glu
    1160                1165                1170

Leu His  Ala Ile Leu Arg Arg  Gln Glu Asp Phe Tyr  Pro Phe Leu
    1175                1180                1185

Lys Asp  Asn Arg Glu Lys Ile  Glu Lys Ile Leu Thr  Phe Arg Ile
    1190                1195                1200

Pro Tyr  Tyr Val Gly Pro Leu  Ala Arg Gly Asn Ser  Arg Phe Ala
    1205                1210                1215

Trp Met  Thr Arg Lys Ser Glu  Glu Thr Ile Thr Pro  Trp Asn Phe
    1220                1225                1230

Glu Glu  Val Val Asp Lys Gly  Ala Ser Ala Gln Ser  Phe Ile Glu
    1235                1240                1245

Arg Met  Thr Asn Phe Asp Lys  Asn Leu Pro Asn Glu  Lys Val Leu
    1250                1255                1260

Pro Lys  His Ser Leu Leu Tyr  Glu Tyr Phe Thr Val  Tyr Asn Glu
    1265                1270                1275

Leu Thr  Lys Val Lys Tyr Val  Thr Glu Gly Met Arg  Lys Pro Ala
    1280                1285                1290

Phe Leu  Ser Gly Glu Gln Lys  Lys Ala Ile Val Asp  Leu Leu Phe
    1295                1300                1305
```

```
Lys Thr  Asn Arg Lys Val Thr  Val Lys Gln Leu Lys  Glu Asp Tyr
    1310                1315                1320

Phe Lys  Lys Ile Glu Cys Phe  Asp Ser Val Glu Ile  Ser Gly Val
    1325                1330                1335

Glu Asp  Arg Phe Asn Ala Ser  Leu Gly Thr Tyr His  Asp Leu Leu
    1340                1345                1350

Lys Ile  Ile Lys Asp Lys Asp  Phe Leu Asp Asn Glu  Glu Asn Glu
    1355                1360                1365

Asp Ile  Leu Glu Asp Ile Val  Leu Thr Leu Thr Leu  Phe Glu Asp
    1370                1375                1380

Arg Glu  Met Ile Glu Glu Arg  Leu Lys Thr Tyr Ala  His Leu Phe
    1385                1390                1395

Asp Asp  Lys Val Met Lys Gln  Leu Lys Arg Arg Arg  Tyr Thr Gly
    1400                1405                1410

Trp Gly  Arg Leu Ser Arg Lys  Leu Ile Asn Gly Ile  Arg Asp Lys
    1415                1420                1425

Gln Ser  Gly Lys Thr Ile Leu  Asp Phe Leu Lys Ser  Asp Gly Phe
    1430                1435                1440

Ala Asn  Arg Asn Phe Met Gln  Leu Ile His Asp Asp  Ser Leu Thr
    1445                1450                1455

Phe Lys  Glu Asp Ile Gln Lys  Ala Gln Val Ser Gly  Gln Gly Asp
    1460                1465                1470

Ser Leu  His Glu His Ile Ala  Asn Leu Ala Gly Ser  Pro Ala Ile
    1475                1480                1485

Lys Lys  Gly Ile Leu Gln Thr  Val Lys Val Val Asp  Glu Leu Val
    1490                1495                1500

Lys Val  Met Gly Arg His Lys  Pro Glu Asn Ile Val  Ile Glu Met
```

```
    1505                1510                1515

Ala Arg  Glu Asn Gln Thr Thr  Gln Lys Gly Gln Lys  Asn Ser Arg
    1520                1525                1530

Glu Arg  Met Lys Arg Ile Glu  Glu Gly Ile Lys Glu  Leu Gly Ser
    1535                1540                1545

Gln Ile  Leu Lys Glu His Pro  Val Glu Asn Thr Gln  Leu Gln Asn
    1550                1555                1560

Glu Lys  Leu Tyr Leu Tyr Tyr  Leu Gln Asn Gly Arg  Asp Met Tyr
    1565                1570                1575

Val Asp  Gln Glu Leu Asp Ile  Asn Arg Leu Ser Asp  Tyr Asp Val
    1580                1585                1590

Asp Ala  Ile Val Pro Gln Ser  Phe Leu Lys Asp Asp  Ser Ile Asp
    1595                1600                1605

Asn Lys  Val Leu Thr Arg Ser  Asp Lys Asn Arg Gly  Lys Ser Asp
    1610                1615                1620

Asn Val  Pro Ser Glu Glu Val  Val Lys Lys Met Lys  Asn Tyr Trp
    1625                1630                1635

Arg Gln  Leu Leu Asn Ala Lys  Leu Ile Thr Gln Arg  Lys Phe Asp
    1640                1645                1650

Asn Leu  Thr Lys Ala Glu Arg  Gly Gly Leu Ser Glu  Leu Asp Lys
    1655                1660                1665

Ala Gly  Phe Ile Lys Arg Gln  Leu Val Glu Thr Arg  Gln Ile Thr
    1670                1675                1680

Lys His  Val Ala Gln Ile Leu  Asp Ser Arg Met Asn  Thr Lys Tyr
    1685                1690                1695

Asp Glu  Asn Asp Lys Leu Ile  Arg Glu Val Lys Val  Ile Thr Leu
    1700                1705                1710
```

```
Lys Ser  Lys Leu Val Ser Asp  Phe Arg Lys Asp Phe  Gln Phe Tyr
    1715                1720                1725

Lys Val  Arg Glu Ile Asn Asn  Tyr His His Ala His  Asp Ala Tyr
    1730                1735                1740

Leu Asn  Ala Val Val Gly Thr  Ala Leu Ile Lys Lys  Tyr Pro Lys
    1745                1750                1755

Leu Glu  Ser Glu Phe Val Tyr  Gly Asp Tyr Lys Val  Tyr Asp Val
    1760                1765                1770

Arg Lys  Met Ile Ala Lys Ser  Glu Gln Glu Ile Gly  Lys Ala Thr
    1775                1780                1785

Ala Lys  Tyr Phe Phe Tyr Ser  Asn Ile Met Asn Phe  Phe Lys Thr
    1790                1795                1800

Glu Ile  Thr Leu Ala Asn Gly  Glu Ile Arg Lys Arg  Pro Leu Ile
    1805                1810                1815

Glu Thr  Asn Gly Glu Thr Gly  Glu Ile Val Trp Asp  Lys Gly Arg
    1820                1825                1830

Asp Phe  Ala Thr Val Arg Lys  Val Leu Ser Met Pro  Gln Val Asn
    1835                1840                1845

Ile Val  Lys Lys Thr Glu Val  Gln Thr Gly Gly Phe  Ser Lys Glu
    1850                1855                1860

Ser Ile  Leu Pro Lys Arg Asn  Ser Asp Lys Leu Ile  Ala Arg Lys
    1865                1870                1875

Lys Asp  Trp Asp Pro Lys Lys  Tyr Gly Gly Phe Asp  Ser Pro Thr
    1880                1885                1890

Val Ala  Tyr Ser Val Leu Val  Val Ala Lys Val Glu  Lys Gly Lys
    1895                1900                1905
```

```
Ser Lys  Lys Leu Lys Ser Val  Lys Glu Leu Leu Gly  Ile Thr Ile
    1910                1915                1920

Met Glu  Arg Ser Ser Phe Glu  Lys Asn Pro Ile Asp  Phe Leu Glu
    1925                1930                1935

Ala Lys  Gly Tyr Lys Glu Val  Lys Lys Asp Leu Ile  Ile Lys Leu
    1940                1945                1950

Pro Lys  Tyr Ser Leu Phe Glu  Leu Glu Asn Gly Arg  Lys Arg Met
    1955                1960                1965

Leu Ala  Ser Ala Gly Glu Leu  Gln Lys Gly Asn Glu  Leu Ala Leu
    1970                1975                1980

Pro Ser  Lys Tyr Val Asn Phe  Leu Tyr Leu Ala Ser  His Tyr Glu
    1985                1990                1995

Lys Leu  Lys Gly Ser Pro Glu  Asp Asn Glu Gln Lys  Gln Leu Phe
    2000                2005                2010

Val Glu  Gln His Lys His Tyr  Leu Asp Glu Ile Ile  Glu Gln Ile
    2015                2020                2025

Ser Glu  Phe Ser Lys Arg Val  Ile Leu Ala Asp Ala  Asn Leu Asp
    2030                2035                2040

Lys Val  Leu Ser Ala Tyr Asn  Lys His Arg Asp Lys  Pro Ile Arg
    2045                2050                2055

Glu Gln  Ala Glu Asn Ile Ile  His Leu Phe Thr Leu  Thr Asn Leu
    2060                2065                2070

Gly Ala  Pro Ala Ala Phe Lys  Tyr Phe Asp Thr Thr  Ile Asp Arg
    2075                2080                2085

Lys Arg  Tyr Thr Ser Thr Lys  Glu Val Leu Asp Ala  Thr Leu Ile
    2090                2095                2100
```

His Gln Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser
    2105   2110   2115

Gln Leu Gly Gly Asp Ser Gly Gly Ser Lys Arg Thr Ala Asp Gly
    2120   2125   2130

Ser Glu Phe Glu Pro Lys Lys Lys Arg Lys Val
    2135   2140

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Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val Gly
1   5   10   15

Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
            20   25   30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
        35   40   45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
    50   55   60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65   70   75   80

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe

```
                85                  90                  95

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
            100                 105                 110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
        115                 120                 125

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
    130                 135                 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145                 150                 155                 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
                165                 170                 175

Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300
```

```
Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510
```

```
Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
        595                 600                 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720
```

```
Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
        755                 760                 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815

Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
```

```
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975

Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990

Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005

Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020

Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035

Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
    1040                1045                1050

Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065

Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
    1070                1075                1080

Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095

Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110

Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125

Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140
```

```
Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155

Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170

Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                1210                1215

Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230

Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245

Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260

Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275

Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290

Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305

Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                1315                1320

Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Arg Tyr  Thr Ser Thr
    1325                1330                1335
```

Lys Glu Val Leu Asp Ala Thr Leu Ile His Gln Ser Ile Thr Gly
1340 1345 1350

Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu Gly Gly Asp
1355 1360 1365

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Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1 5 10 15

Arg Lys Val Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn
20 25 30

Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys
35 40 45

Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn
50 55 60

Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr
65 70 75 80

Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg
85 90 95

Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp
100 105 110

Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp
115 120 125

Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val
130 135 140

```
Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu
145                 150                 155                 160

Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu
                165                 170                 175

Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu
            180                 185                 190

Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln
        195                 200                 205

Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val
    210                 215                 220

Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu
225                 230                 235                 240

Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe
                245                 250                 255

Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser
            260                 265                 270

Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr
        275                 280                 285

Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr
    290                 295                 300

Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu
305                 310                 315                 320

Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser
                325                 330                 335

Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu
            340                 345                 350
```

```
Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile
        355                 360                 365

Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly
    370                 375                 380

Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys
385                 390                 395                 400

Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu
                405                 410                 415

Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile
            420                 425                 430

His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr
        435                 440                 445

Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe
    450                 455                 460

Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe
465                 470                 475                 480

Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe
                485                 490                 495

Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg
            500                 505                 510

Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys
        515                 520                 525

His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys
    530                 535                 540

Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly
545                 550                 555                 560
```

```
Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys
                565                 570                 575

Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys
            580                 585                 590

Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser
        595                 600                 605

Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe
    610                 615                 620

Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr
625                 630                 635                 640

Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr
                645                 650                 655

Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg
            660                 665                 670

Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile
        675                 680                 685

Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp
    690                 695                 700

Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu
705                 710                 715                 720

Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp
                725                 730                 735

Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys
            740                 745                 750

Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val
        755                 760                 765

Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu
```

770 775 780

Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys
785 790 795 800

Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu
805 810 815

His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr
820 825 830

Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile
835 840 845

Asn Arg Leu Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe
850 855 860

Leu Lys Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys
865 870 875 880

Asn Arg Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys
885 890 895

Met Lys Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln
900 905 910

Arg Lys Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu
915 920 925

Leu Asp Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln
930 935 940

Ile Thr Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys
945 950 955 960

Tyr Asp Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu
965 970 975

Lys Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
980 985 990

```
Val Arg Glu Ile Asn Asn Tyr His  His Ala His Asp Ala  Tyr Leu Asn
        995                 1000                1005


Ala Val  Val Gly Thr Ala Leu  Ile Lys Lys Tyr Pro  Lys Leu Glu
    1010                1015                1020


Ser Glu  Phe Val Tyr Gly Asp  Tyr Lys Val Tyr Asp  Val Arg Lys
    1025                1030                1035


Met Ile  Ala Lys Ser Glu Gln  Glu Ile Gly Lys Ala  Thr Ala Lys
    1040                1045                1050


Tyr Phe  Phe Tyr Ser Asn Ile  Met Asn Phe Phe Lys  Thr Glu Ile
    1055                1060                1065


Thr Leu  Ala Asn Gly Glu Ile  Arg Lys Arg Pro Leu  Ile Glu Thr
    1070                1075                1080


Asn Gly  Glu Thr Gly Glu Ile  Val Trp Asp Lys Gly  Arg Asp Phe
    1085                1090                1095


Ala Thr  Val Arg Lys Val Leu  Ser Met Pro Gln Val  Asn Ile Val
    1100                1105                1110


Lys Lys  Thr Glu Val Gln Thr  Gly Gly Phe Ser Lys  Glu Ser Ile
    1115                1120                1125


Leu Pro  Lys Arg Asn Ser Asp  Lys Leu Ile Ala Arg  Lys Lys Asp
    1130                1135                1140


Trp Asp  Pro Lys Lys Tyr Gly  Gly Phe Asp Ser Pro  Thr Val Ala
    1145                1150                1155


Tyr Ser  Val Leu Val Val Ala  Lys Val Glu Lys Gly  Lys Ser Lys
    1160                1165                1170


Lys Leu  Lys Ser Val Lys Glu  Leu Leu Gly Ile Thr  Ile Met Glu
    1175                1180                1185
```

```
Arg Ser  Ser Phe Glu Lys Asn  Pro Ile Asp Phe Leu  Glu Ala Lys
    1190                1195                1200

Gly Tyr  Lys Glu Val Lys Lys  Asp Leu Ile Ile Lys  Leu Pro Lys
    1205                1210                1215

Tyr Ser  Leu Phe Glu Leu Glu  Asn Gly Arg Lys Arg  Met Leu Ala
    1220                1225                1230

Ser Ala  Gly Glu Leu Gln Lys  Gly Asn Glu Leu Ala  Leu Pro Ser
    1235                1240                1245

Lys Tyr  Val Asn Phe Leu Tyr  Leu Ala Ser His Tyr  Glu Lys Leu
    1250                1255                1260

Lys Gly  Ser Pro Glu Asp Asn  Glu Gln Lys Gln Leu  Phe Val Glu
    1265                1270                1275

Gln His  Lys His Tyr Leu Asp  Glu Ile Ile Glu Gln  Ile Ser Glu
    1280                1285                1290

Phe Ser  Lys Arg Val Ile Leu  Ala Asp Ala Asn Leu  Asp Lys Val
    1295                1300                1305

Leu Ser  Ala Tyr Asn Lys His  Arg Asp Lys Pro Ile  Arg Glu Gln
    1310                1315                1320

Ala Glu  Asn Ile Ile His Leu  Phe Thr Leu Thr Asn  Leu Gly Ala
    1325                1330                1335

Pro Ala  Ala Phe Lys Tyr Phe  Asp Thr Thr Ile Asp  Arg Lys Arg
    1340                1345                1350

Tyr Thr  Ser Thr Lys Glu Val  Leu Asp Ala Thr Leu  Ile His Gln
    1355                1360                1365

Ser Ile  Thr Gly Leu Tyr Glu  Thr Arg Ile Asp Leu  Ser Gln Leu
    1370                1375                1380
```

```
Gly Gly  Asp Ser Gly Gly Ser  Ser Gly Gly Ser Ser  Gly Ser Glu
    1385                1390                1395

Thr Pro  Gly Thr Ser Glu Ser  Ala Thr Pro Glu Ser  Ser Gly Gly
    1400                1405                1410

Ser Ser  Gly Gly Ser Ser Gly  Ile Gln Gly Leu Ala  Lys Leu Ile
    1415                1420                1425

Ala Asp  Val Ala Pro Ser Ala  Ile Arg Glu Asn Asp  Ile Lys Ser
    1430                1435                1440

Tyr Phe  Gly Arg Lys Val Ala  Ile Asp Ala Ser Met  Ser Ile Tyr
    1445                1450                1455

Gln Phe  Leu Ile Ala Val Arg  Gln Gly Gly Asp Val  Leu Gln Asn
    1460                1465                1470

Glu Glu  Gly Glu Thr Thr Ser  His Leu Met Gly Met  Phe Tyr Arg
    1475                1480                1485

Thr Ile  Arg Met Met Glu Asn  Gly Ile Lys Pro Val  Tyr Val Phe
    1490                1495                1500

Asp Gly  Lys Pro Pro Gln Leu  Lys Ser Gly Glu Leu  Ala Lys Arg
    1505                1510                1515

Ser Glu  Arg Arg Ala Glu Ala  Glu Lys Gln Leu Gln  Gln Ala Gln
    1520                1525                1530

Ala Ala  Gly Ala Glu Gln Glu  Val Glu Lys Phe Thr  Lys Arg Leu
    1535                1540                1545

Val Lys  Val Thr Lys Gln His  Asn Asp Glu Cys Lys  His Leu Leu
    1550                1555                1560

Ser Leu  Met Gly Ile Pro Tyr  Leu Asp Ala Pro Ser  Glu Ala Glu
    1565                1570                1575

Ala Ser  Cys Ala Ala Leu Val  Lys Ala Gly Lys Val  Tyr Ala Ala
```

```
    1580                1585                1590

Ala Thr  Glu Asp Met Asp Cys  Leu Thr Phe Gly Ser  Pro Val Leu
    1595                1600                1605

Met Arg  His Leu Thr Ala Ser  Glu Ala Lys Lys Leu  Pro Ile Gln
    1610                1615                1620

Glu Phe  His Leu Ser Arg Ile  Leu Gln Glu Leu Gly  Leu Asn Gln
    1625                1630                1635

Glu Gln  Phe Val Asp Leu Cys  Ile Leu Leu Gly Ser  Asp Tyr Cys
    1640                1645                1650

Glu Ser  Ile Arg Gly Ile Gly  Pro Lys Arg Ala Val  Asp Leu Ile
    1655                1660                1665

Gln Lys  His Lys Ser Ile Glu  Glu Ile Val Arg Arg  Leu Asp Pro
    1670                1675                1680

Asn Lys  Tyr Pro Val Pro Glu  Asn Trp Leu His Lys  Glu Ala His
    1685                1690                1695

Gln Leu  Phe Leu Glu Pro Glu  Val Leu Asp Pro Glu  Ser Val Glu
    1700                1705                1710

Leu Lys  Trp Ser Glu Pro Asn  Glu Glu Glu Leu Ile  Lys Phe Met
    1715                1720                1725

Cys Gly  Glu Lys Gln Phe Ser  Glu Glu Arg Ile Arg  Ser Gly Val
    1730                1735                1740

Lys Arg  Leu Ser Lys Ser Arg  Gln Gly Ser Thr Gln  Gly Arg Leu
    1745                1750                1755

Asp Asp  Phe Phe Lys Val Thr  Gly Ser Leu Ser Ser  Ala Lys Arg
    1760                1765                1770

Lys Glu  Pro Glu Pro Lys Gly  Ser Thr Lys Lys Lys  Ala Lys Thr
    1775                1780                1785
```

```
Gly Ala  Ala Gly Lys Phe Lys  Arg Gly Lys Ser Gly  Gly Ser Ser
    1790                 1795                 1800

Gly Gly  Ser Ser Gly Ser Glu  Thr Pro Gly Thr Ser  Glu Ser Ala
    1805                 1810                 1815

Thr Pro  Glu Ser Ser Gly Gly  Ser Ser Gly Gly Ser  Ser Thr Leu
    1820                 1825                 1830

Asn Ile  Glu Asp Glu Tyr Arg  Leu His Glu Thr Ser  Lys Glu Pro
    1835                 1840                 1845

Asp Val  Ser Leu Gly Ser Thr  Trp Leu Ser Asp Phe  Pro Gln Ala
    1850                 1855                 1860

Trp Ala  Glu Thr Gly Gly Met  Gly Leu Ala Val Arg  Gln Ala Pro
    1865                 1870                 1875

Leu Ile  Ile Pro Leu Lys Ala  Thr Ser Thr Pro Val  Ser Ile Lys
    1880                 1885                 1890

Gln Tyr  Pro Met Ser Gln Glu  Ala Arg Leu Gly Ile  Lys Pro His
    1895                 1900                 1905

Ile Gln  Arg Leu Leu Asp Gln  Gly Ile Leu Val Pro  Cys Gln Ser
    1910                 1915                 1920

Pro Trp  Asn Thr Pro Leu Leu  Pro Val Lys Lys Pro  Gly Thr Asn
    1925                 1930                 1935

Asp Tyr  Arg Pro Val Gln Asp  Leu Arg Glu Val Asn  Lys Arg Val
    1940                 1945                 1950

Glu Asp  Ile His Pro Thr Val  Pro Asn Pro Tyr Asn  Leu Leu Ser
    1955                 1960                 1965

Gly Leu  Pro Pro Ser His Gln  Trp Tyr Thr Val Leu  Asp Leu Lys
    1970                 1975                 1980
```

```
Asp Ala  Phe Phe Cys Leu Arg  Leu His Pro Thr Ser  Gln Pro Leu
    1985                 1990                 1995

Phe Ala  Phe Glu Trp Arg Asp  Pro Glu Met Gly Ile  Ser Gly Gln
    2000                 2005                 2010

Leu Thr  Trp Thr Arg Leu Pro  Gln Gly Phe Lys Asn  Ser Pro Thr
    2015                 2020                 2025

Leu Phe  Asn Glu Ala Leu His  Arg Asp Leu Ala Asp  Phe Arg Ile
    2030                 2035                 2040

Gln His  Pro Asp Leu Ile Leu  Leu Gln Tyr Val Asp  Asp Leu Leu
    2045                 2050                 2055

Leu Ala  Ala Thr Ser Glu Leu  Asp Cys Gln Gln Gly  Thr Arg Ala
    2060                 2065                 2070

Leu Leu  Gln Thr Leu Gly Asn  Leu Gly Tyr Arg Ala  Ser Ala Lys
    2075                 2080                 2085

Lys Ala  Gln Ile Cys Gln Lys  Gln Val Lys Tyr Leu  Gly Tyr Leu
    2090                 2095                 2100

Leu Lys  Glu Gly Gln Arg Trp  Leu Thr Glu Ala Arg  Lys Glu Thr
    2105                 2110                 2115

Val Met  Gly Gln Pro Thr Pro  Lys Thr Pro Arg Gln  Leu Arg Glu
    2120                 2125                 2130

Phe Leu  Gly Lys Ala Gly Phe  Cys Arg Leu Phe Ile  Pro Gly Phe
    2135                 2140                 2145

Ala Glu  Met Ala Ala Pro Leu  Tyr Pro Leu Thr Lys  Pro Gly Thr
    2150                 2155                 2160

Leu Phe  Asn Trp Gly Pro Asp  Gln Gln Lys Ala Tyr  Gln Glu Ile
    2165                 2170                 2175
```

```
Lys Gln  Ala Leu Leu Thr Ala  Pro Ala Leu Gly Leu  Pro Asp Leu
    2180                 2185                 2190

Thr Lys  Pro Phe Glu Leu Phe  Val Asp Glu Lys Gln  Gly Tyr Ala
    2195                 2200                 2205

Lys Gly  Val Leu Thr Gln Lys  Leu Gly Pro Trp Arg  Arg Pro Val
    2210                 2215                 2220

Ala Tyr  Leu Ser Lys Lys Leu  Asp Pro Val Ala Ala  Gly Trp Pro
    2225                 2230                 2235

Pro Cys  Leu Arg Met Val Ala  Ala Ile Ala Val Leu  Thr Lys Asp
    2240                 2245                 2250

Ala Gly  Lys Leu Thr Met Gly  Gln Pro Leu Val Ile  Leu Ala Pro
    2255                 2260                 2265

His Ala  Val Glu Ala Leu Val  Lys Gln Pro Pro Asp  Arg Trp Leu
    2270                 2275                 2280

Ser Asn  Ala Arg Met Thr His  Tyr Gln Ala Leu Leu  Leu Asp Thr
    2285                 2290                 2295

Asp Arg  Val Gln Phe Gly Pro  Val Val Ala Leu Asn  Pro Ala Thr
    2300                 2305                 2310

Leu Leu  Pro Leu Pro Glu Glu  Gly Leu Gln His Asn  Cys Leu Asp
    2315                 2320                 2325

Ile Leu  Ala Glu Ala His Gly  Thr Arg Pro Asp Leu  Thr Asp Gln
    2330                 2335                 2340

Pro Leu  Pro Asp Ala Asp His  Thr Trp Tyr Thr Asp  Gly Ser Ser
    2345                 2350                 2355

Leu Leu  Gln Glu Gly Gln Arg  Lys Ala Gly Ala Ala  Val Thr Thr
    2360                 2365                 2370

Glu Thr  Glu Val Ile Trp Ala  Lys Ala Leu Pro Ala  Gly Thr Ser
```

2375 2380 2385

Ala Gln Arg Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met
2390 2395 2400

Ala Glu Gly Lys Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala
2405 2410 2415

Phe Ala Thr Ala His Ile His Gly Glu Ile Tyr Arg Arg Arg Gly
2420 2425 2430

Trp Leu Thr Ser Glu Gly Lys Glu Ile Lys Asn Lys Asp Glu Ile
2435 2440 2445

Leu Ala Leu Leu Lys Ala Leu Phe Leu Pro Lys Arg Leu Ser Ile
2450 2455 2460

Ile His Cys Pro Gly His Gln Lys Gly His Ser Ala Glu Ala Arg
2465 2470 2475

Gly Asn Arg Met Ala Asp Gln Ala Ala Arg Lys Ala Ala Ile Thr
2480 2485 2490

Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile Glu Asn Ser Ser Pro
2495 2500 2505

Ser Gly Gly Ser Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Pro
2510 2515 2520

Lys Lys Lys Arg Lys Val
2525

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<210> 156

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<223> Synthetic

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Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val Gly
1 5 10 15

Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
20 25 30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
35 40 45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
50 55 60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65 70 75 80

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe
85 90 95

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
100 105 110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
115 120 125

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
130 135 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145 150 155 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
165 170 175

```
Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380
```

```
Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
385                 390                 395                 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
                405                 410                 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
            420                 425                 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
        435                 440                 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
    450                 455                 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465                 470                 475                 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
                485                 490                 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
            500                 505                 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
        515                 520                 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
    530                 535                 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545                 550                 555                 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
                565                 570                 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
            580                 585                 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
```

595 600 605

Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
610 615 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625 630 635 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
645 650 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
660 665 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
675 680 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
690 695 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705 710 715 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
725 730 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
740 745 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
755 760 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
770 775 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785 790 795 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
805 810 815

```
Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975

Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990

Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005

Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020
```

```
Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035

Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
    1040                1045                1050

Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065

Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
    1070                1075                1080

Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095

Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110

Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125

Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140

Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155

Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170

Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                1210                1215
```

```
Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
    1220                1225                1230


Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245


Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260


Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275


Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290


Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305


Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                1315                1320


Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Arg Tyr  Thr Ser Thr
    1325                1330                1335


Lys Glu  Val Leu Asp Ala Thr  Leu Ile His Gln Ser  Ile Thr Gly
    1340                1345                1350


Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln Leu Gly  Gly Asp
    1355                1360                1365


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<210>  159
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<212>  PRT
<213>  Artificial Sequence

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<400> 159

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
195 200 205

```
Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Lys Ala Gly Phe Cys Arg Leu Phe Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415
```

```
Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
```

625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

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<210> 161
<211> 379
<212> PRT
<213> Artificial Sequence

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<223> Synthetic

<400> 161

Gly Ile Gln Gly Leu Ala Lys Leu Ile Ala Asp Val Ala Pro Ser Ala
1 5 10 15

Ile Arg Glu Asn Asp Ile Lys Ser Tyr Phe Gly Arg Lys Val Ala Ile
20 25 30

Asp Ala Ser Met Ser Ile Tyr Gln Phe Leu Ile Ala Val Arg Gln Gly
35 40 45

Gly Asp Val Leu Gln Asn Glu Glu Gly Glu Thr Thr Ser His Leu Met
50 55 60

Gly Met Phe Tyr Arg Thr Ile Arg Met Met Glu Asn Gly Ile Lys Pro
65 70 75 80

Val Tyr Val Phe Asp Gly Lys Pro Pro Gln Leu Lys Ser Gly Glu Leu
85 90 95

```
Ala Lys Arg Ser Glu Arg Arg Ala Glu Ala Glu Lys Gln Leu Gln Gln
            100                 105                 110

Ala Gln Ala Ala Gly Ala Glu Gln Glu Val Glu Lys Phe Thr Lys Arg
        115                 120                 125

Leu Val Lys Val Thr Lys Gln His Asn Asp Glu Cys Lys His Leu Leu
    130                 135                 140

Ser Leu Met Gly Ile Pro Tyr Leu Asp Ala Pro Ser Glu Ala Glu Ala
145                 150                 155                 160

Ser Cys Ala Ala Leu Val Lys Ala Gly Lys Val Tyr Ala Ala Ala Thr
                165                 170                 175

Glu Asp Met Asp Cys Leu Thr Phe Gly Ser Pro Val Leu Met Arg His
            180                 185                 190

Leu Thr Ala Ser Glu Ala Lys Lys Leu Pro Ile Gln Glu Phe His Leu
        195                 200                 205

Ser Arg Ile Leu Gln Glu Leu Gly Leu Asn Gln Glu Gln Phe Val Asp
    210                 215                 220

Leu Cys Ile Leu Leu Gly Ser Asp Tyr Cys Glu Ser Ile Arg Gly Ile
225                 230                 235                 240

Gly Pro Lys Arg Ala Val Asp Leu Ile Gln Lys His Lys Ser Ile Glu
                245                 250                 255

Glu Ile Val Arg Arg Leu Asp Pro Asn Lys Tyr Pro Val Pro Glu Asn
            260                 265                 270

Trp Leu His Lys Glu Ala His Gln Leu Phe Leu Glu Pro Glu Val Leu
        275                 280                 285

Asp Pro Glu Ser Val Glu Leu Lys Trp Ser Glu Pro Asn Glu Glu Glu
    290                 295                 300
```

```
Leu Ile Lys Phe Met Cys Gly Glu Lys Gln Phe Ser Glu Glu Arg Ile
305                 310                 315                 320


Arg Ser Gly Val Lys Arg Leu Ser Lys Ser Arg Gln Gly Ser Thr Gln
                325                 330                 335


Gly Arg Leu Asp Asp Phe Phe Lys Val Thr Gly Ser Leu Ser Ser Ala
            340                 345                 350


Lys Arg Lys Glu Pro Glu Pro Lys Gly Ser Thr Lys Lys Lys Ala Lys
        355                 360                 365


Thr Gly Ala Ala Gly Lys Phe Lys Arg Gly Lys
    370                 375


<210>  162
<211>  1803
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  162

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1               5                   10                  15


Arg Lys Val Gly Lys Arg Asn Tyr Ile Leu Gly Leu Asp Ile Gly Ile
            20                  25                  30


Thr Ser Val Gly Tyr Gly Ile Ile Asp Tyr Glu Thr Arg Asp Val Ile
        35                  40                  45


Asp Ala Gly Val Arg Leu Phe Lys Glu Ala Asn Val Glu Asn Asn Glu
    50                  55                  60


Gly Arg Arg Ser Lys Arg Gly Ala Arg Arg Leu Lys Arg Arg Arg Arg
65                  70                  75                  80


His Arg Ile Gln Arg Val Lys Lys Leu Leu Phe Asp Tyr Asn Leu Leu
                85                  90                  95
```

```
Thr Asp His Ser Glu Leu Ser Gly Ile Asn Pro Tyr Glu Ala Arg Val
            100                 105                 110

Lys Gly Leu Ser Gln Lys Leu Ser Glu Glu Glu Phe Ser Ala Ala Leu
        115                 120                 125

Leu His Leu Ala Lys Arg Arg Gly Val His Asn Val Asn Glu Val Glu
    130                 135                 140

Glu Asp Thr Gly Asn Glu Leu Ser Thr Lys Glu Gln Ile Ser Arg Asn
145                 150                 155                 160

Ser Lys Ala Leu Glu Glu Lys Tyr Val Ala Glu Leu Gln Leu Glu Arg
                165                 170                 175

Leu Lys Lys Asp Gly Glu Val Arg Gly Ser Ile Asn Arg Phe Lys Thr
            180                 185                 190

Ser Asp Tyr Val Lys Glu Ala Lys Gln Leu Leu Lys Val Gln Lys Ala
        195                 200                 205

Tyr His Gln Leu Asp Gln Ser Phe Ile Asp Thr Tyr Ile Asp Leu Leu
    210                 215                 220

Glu Thr Arg Arg Thr Tyr Tyr Glu Gly Pro Gly Glu Gly Ser Pro Phe
225                 230                 235                 240

Gly Trp Lys Asp Ile Lys Glu Trp Tyr Glu Met Leu Met Gly His Cys
                245                 250                 255

Thr Tyr Phe Pro Glu Glu Leu Arg Ser Val Lys Tyr Ala Tyr Asn Ala
            260                 265                 270

Asp Leu Tyr Asn Ala Leu Asn Asp Leu Asn Asn Leu Val Ile Thr Arg
        275                 280                 285

Asp Glu Asn Glu Lys Leu Glu Tyr Tyr Glu Lys Phe Gln Ile Ile Glu
    290                 295                 300
```

```
Asn Val Phe Lys Gln Lys Lys Lys Pro Thr Leu Lys Gln Ile Ala Lys
305                 310                 315                 320

Glu Ile Leu Val Asn Glu Glu Asp Ile Lys Gly Tyr Arg Val Thr Ser
                325                 330                 335

Thr Gly Lys Pro Glu Phe Thr Asn Leu Lys Val Tyr His Asp Ile Lys
            340                 345                 350

Asp Ile Thr Ala Arg Lys Glu Ile Ile Glu Asn Ala Glu Leu Leu Asp
        355                 360                 365

Gln Ile Ala Lys Ile Leu Thr Ile Tyr Gln Ser Ser Glu Asp Ile Gln
    370                 375                 380

Glu Glu Leu Thr Asn Leu Asn Ser Glu Leu Thr Gln Glu Glu Ile Glu
385                 390                 395                 400

Gln Ile Ser Asn Leu Lys Gly Tyr Thr Gly Thr His Asn Leu Ser Leu
                405                 410                 415

Lys Ala Ile Asn Leu Ile Leu Asp Glu Leu Trp His Thr Asn Asp Asn
            420                 425                 430

Gln Ile Ala Ile Phe Asn Arg Leu Lys Leu Val Pro Lys Lys Val Asp
        435                 440                 445

Leu Ser Gln Gln Lys Glu Ile Pro Thr Thr Leu Val Asp Asp Phe Ile
    450                 455                 460

Leu Ser Pro Val Val Lys Arg Ser Phe Ile Gln Ser Ile Lys Val Ile
465                 470                 475                 480

Asn Ala Ile Ile Lys Lys Tyr Gly Leu Pro Asn Asp Ile Ile Ile Glu
                485                 490                 495

Leu Ala Arg Glu Lys Asn Ser Lys Asp Ala Gln Lys Met Ile Asn Glu
            500                 505                 510

Met Gln Lys Arg Asn Arg Gln Thr Asn Glu Arg Ile Glu Glu Ile Ile
```

```
        515                 520                 525

Arg Thr Thr Gly Lys Glu Asn Ala Lys Tyr Leu Ile Glu Lys Ile Lys
    530                 535                 540

Leu His Asp Met Gln Glu Gly Lys Cys Leu Tyr Ser Leu Glu Ala Ile
545                 550                 555                 560

Pro Leu Glu Asp Leu Leu Asn Asn Pro Phe Asn Tyr Glu Val Asp His
                565                 570                 575

Ile Ile Pro Arg Ser Val Ser Phe Asp Asn Ser Phe Asn Asn Lys Val
            580                 585                 590

Leu Val Lys Gln Glu Glu Ala Ser Lys Lys Gly Asn Arg Thr Pro Phe
        595                 600                 605

Gln Tyr Leu Ser Ser Ser Asp Ser Lys Ile Ser Tyr Glu Thr Phe Lys
    610                 615                 620

Lys His Ile Leu Asn Leu Ala Lys Gly Lys Gly Arg Ile Ser Lys Thr
625                 630                 635                 640

Lys Lys Glu Tyr Leu Leu Glu Glu Arg Asp Ile Asn Arg Phe Ser Val
                645                 650                 655

Gln Lys Asp Phe Ile Asn Arg Asn Leu Val Asp Thr Arg Tyr Ala Thr
            660                 665                 670

Arg Gly Leu Met Asn Leu Leu Arg Ser Tyr Phe Arg Val Asn Asn Leu
        675                 680                 685

Asp Val Lys Val Lys Ser Ile Asn Gly Gly Phe Thr Ser Phe Leu Arg
    690                 695                 700

Arg Lys Trp Lys Phe Lys Lys Glu Arg Asn Lys Gly Tyr Lys His His
705                 710                 715                 720

Ala Glu Asp Ala Leu Ile Ile Ala Asn Ala Asp Phe Ile Phe Lys Glu
                725                 730                 735
```

```
Trp Lys Lys Leu Asp Lys Ala Lys Lys Val Met Glu Asn Gln Met Phe
            740                 745                 750

Glu Glu Lys Gln Ala Glu Ser Met Pro Glu Ile Glu Thr Glu Gln Glu
        755                 760                 765

Tyr Lys Glu Ile Phe Ile Thr Pro His Gln Ile Lys His Ile Lys Asp
    770                 775                 780

Phe Lys Asp Tyr Lys Tyr Ser His Arg Val Asp Lys Lys Pro Asn Arg
785                 790                 795                 800

Glu Leu Ile Asn Asp Thr Leu Tyr Ser Thr Arg Lys Asp Asp Lys Gly
                805                 810                 815

Asn Thr Leu Ile Val Asn Asn Leu Asn Gly Leu Tyr Asp Lys Asp Asn
            820                 825                 830

Asp Lys Leu Lys Lys Leu Ile Asn Lys Ser Pro Glu Lys Leu Leu Met
        835                 840                 845

Tyr His His Asp Pro Gln Thr Tyr Gln Lys Leu Lys Leu Ile Met Glu
    850                 855                 860

Gln Tyr Gly Asp Glu Lys Asn Pro Leu Tyr Lys Tyr Tyr Glu Glu Thr
865                 870                 875                 880

Gly Asn Tyr Leu Thr Lys Tyr Ser Lys Lys Asp Asn Gly Pro Val Ile
                885                 890                 895

Lys Lys Ile Lys Tyr Tyr Gly Asn Lys Leu Asn Ala His Leu Asp Ile
            900                 905                 910

Thr Asp Asp Tyr Pro Asn Ser Arg Asn Lys Val Val Lys Leu Ser Leu
        915                 920                 925

Lys Pro Tyr Arg Phe Asp Val Tyr Leu Asp Asn Gly Val Tyr Lys Phe
    930                 935                 940
```

```
Val Thr Val Lys Asn Leu Asp Val Ile Lys Lys Glu Asn Tyr Tyr Glu
945                 950                 955                 960


Val Asn Ser Lys Cys Tyr Glu Glu Ala Lys Lys Leu Lys Lys Ile Ser
                965                 970                 975


Asn Gln Ala Glu Phe Ile Ala Ser Phe Tyr Asn Asn Asp Leu Ile Lys
            980                 985                 990


Ile Asn Gly Glu Leu Tyr Arg Val  Ile Gly Val Asn Asn  Asp Leu Leu
        995                 1000                1005


Asn Arg  Ile Glu Val Asn Met  Ile Asp Ile Thr Tyr  Arg Glu Tyr
    1010                1015                1020


Leu Glu  Asn Met Asn Asp Lys  Arg Pro Pro Arg Ile  Ile Lys Thr
    1025                1030                1035


Ile Ala  Ser Lys Thr Gln Ser  Ile Lys Lys Tyr Ser  Thr Asp Ile
    1040                1045                1050


Leu Gly  Asn Leu Tyr Glu Val  Lys Ser Lys Lys His  Pro Gln Ile
    1055                1060                1065


Ile Lys  Lys Gly Ser Gly Gly  Ser Ser Gly Gly Ser  Ser Gly Ser
    1070                1075                1080


Glu Thr  Pro Gly Thr Ser Glu  Ser Ala Thr Pro Glu  Ser Ser Gly
    1085                1090                1095


Gly Ser  Ser Gly Gly Ser Ser  Thr Leu Asn Ile Glu  Asp Glu Tyr
    1100                1105                1110


Arg Leu  His Glu Thr Ser Lys  Glu Pro Asp Val Ser  Leu Gly Ser
    1115                1120                1125


Thr Trp  Leu Ser Asp Phe Pro  Gln Ala Trp Ala Glu  Thr Gly Gly
    1130                1135                1140
```

```
Met Gly  Leu Ala Val Arg Gln  Ala Pro Leu Ile Ile  Pro Leu Lys
    1145                1150                1155

Ala Thr  Ser Thr Pro Val Ser  Ile Lys Gln Tyr Pro  Met Ser Gln
    1160                1165                1170

Glu Ala  Arg Leu Gly Ile Lys  Pro His Ile Gln Arg  Leu Leu Asp
    1175                1180                1185

Gln Gly  Ile Leu Val Pro Cys  Gln Ser Pro Trp Asn  Thr Pro Leu
    1190                1195                1200

Leu Pro  Val Lys Lys Pro Gly  Thr Asn Asp Tyr Arg  Pro Val Gln
    1205                1210                1215

Asp Leu  Arg Glu Val Asn Lys  Arg Val Glu Asp Ile  His Pro Thr
    1220                1225                1230

Val Pro  Asn Pro Tyr Asn Leu  Leu Ser Gly Leu Pro  Pro Ser His
    1235                1240                1245

Gln Trp  Tyr Thr Val Leu Asp  Leu Lys Asp Ala Phe  Phe Cys Leu
    1250                1255                1260

Arg Leu  His Pro Thr Ser Gln  Pro Leu Phe Ala Phe  Glu Trp Arg
    1265                1270                1275

Asp Pro  Glu Met Gly Ile Ser  Gly Gln Leu Thr Trp  Thr Arg Leu
    1280                1285                1290

Pro Gln  Gly Phe Lys Asn Ser  Pro Thr Leu Phe Asp  Glu Ala Leu
    1295                1300                1305

His Arg  Asp Leu Ala Asp Phe  Arg Ile Gln His Pro  Asp Leu Ile
    1310                1315                1320

Leu Leu  Gln Tyr Val Asp Asp  Leu Leu Leu Ala Ala  Thr Ser Glu
    1325                1330                1335

Leu Asp  Cys Gln Gln Gly Thr  Arg Ala Leu Leu Gln  Thr Leu Gly
```

```
    1340                1345                1350

Asn Leu  Gly Tyr Arg Ala Ser  Ala Lys Lys Ala Gln  Ile Cys Gln
    1355                1360                1365

Lys Gln  Val Lys Tyr Leu Gly  Tyr Leu Leu Lys Glu  Gly Gln Arg
    1370                1375                1380

Trp Leu  Thr Glu Ala Arg Lys  Glu Thr Val Met Gly  Gln Pro Thr
    1385                1390                1395

Pro Lys  Thr Pro Arg Gln Leu  Arg Glu Phe Leu Gly  Thr Ala Gly
    1400                1405                1410

Phe Cys  Arg Leu Trp Ile Pro  Gly Phe Ala Glu Met  Ala Ala Pro
    1415                1420                1425

Leu Tyr  Pro Leu Thr Lys Thr  Gly Thr Leu Phe Asn  Trp Gly Pro
    1430                1435                1440

Asp Gln  Gln Lys Ala Tyr Gln  Glu Ile Lys Gln Ala  Leu Leu Thr
    1445                1450                1455

Ala Pro  Ala Leu Gly Leu Pro  Asp Leu Thr Lys Pro  Phe Glu Leu
    1460                1465                1470

Phe Val  Asp Glu Lys Gln Gly  Tyr Ala Lys Gly Val  Leu Thr Gln
    1475                1480                1485

Lys Leu  Gly Pro Trp Arg Arg  Pro Val Ala Tyr Leu  Ser Lys Lys
    1490                1495                1500

Leu Asp  Pro Val Ala Ala Gly  Trp Pro Pro Cys Leu  Arg Met Val
    1505                1510                1515

Ala Ala  Ile Ala Val Leu Thr  Lys Asp Ala Gly Lys  Leu Thr Met
    1520                1525                1530

Gly Gln  Pro Leu Val Ile Leu  Ala Pro His Ala Val  Glu Ala Leu
    1535                1540                1545
```

```
Val Lys  Gln Pro Pro Asp Arg  Trp Leu Ser Asn Ala  Arg Met Thr
    1550                1555                1560

His Tyr  Gln Ala Leu Leu Leu  Asp Thr Asp Arg Val  Gln Phe Gly
    1565                1570                1575

Pro Val  Val Ala Leu Asn Pro  Ala Thr Leu Leu Pro  Leu Pro Glu
    1580                1585                1590

Glu Gly  Leu Gln His Asn Cys  Leu Asp Ile Leu Ala  Glu Ala His
    1595                1600                1605

Gly Thr  Arg Pro Asp Leu Thr  Asp Gln Pro Leu Pro  Asp Ala Asp
    1610                1615                1620

His Thr  Trp Tyr Thr Asp Gly  Ser Ser Leu Leu Gln  Glu Gly Gln
    1625                1630                1635

Arg Lys  Ala Gly Ala Ala Val  Thr Thr Glu Thr Glu  Val Ile Trp
    1640                1645                1650

Ala Lys  Ala Leu Pro Ala Gly  Thr Ser Ala Gln Arg  Ala Glu Leu
    1655                1660                1665

Ile Ala  Leu Thr Gln Ala Leu  Lys Met Ala Glu Gly  Lys Lys Leu
    1670                1675                1680

Asn Val  Tyr Thr Asp Ser Arg  Tyr Ala Phe Ala Thr  Ala His Ile
    1685                1690                1695

His Gly  Glu Ile Tyr Arg Arg  Arg Gly Leu Leu Thr  Ser Glu Gly
    1700                1705                1710

Lys Glu  Ile Lys Asn Lys Asp  Glu Ile Leu Ala Leu  Leu Lys Ala
    1715                1720                1725

Leu Phe  Leu Pro Lys Arg Leu  Ser Ile Ile His Cys  Pro Gly His
    1730                1735                1740
```

Gln Lys Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp
    1745   1750   1755

Gln Ala Ala Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser
    1760   1765   1770

Thr Leu Leu Ile Glu Asn Ser Ser Pro Ser Gly Gly Ser Lys Arg
    1775   1780   1785

Thr Ala Asp Gly Ser Glu Phe Glu Pro Lys Lys Lys Arg Lys Val
    1790   1795   1800

<210> 163
<211> 2117
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 163

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1   5   10   15

Arg Lys Val Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn
            20   25   30

Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys
        35   40   45

Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn
    50   55   60

Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr
65   70   75   80

Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg
                85   90   95

Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp
            100   105   110

```
Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp
        115                 120                 125

Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val
    130                 135                 140

Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu
145                 150                 155                 160

Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu
                165                 170                 175

Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu
            180                 185                 190

Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln
        195                 200                 205

Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val
    210                 215                 220

Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu
225                 230                 235                 240

Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe
                245                 250                 255

Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser
            260                 265                 270

Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr
        275                 280                 285

Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr
    290                 295                 300

Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu
305                 310                 315                 320
```

```
Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser
                325                 330                 335

Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu
            340                 345                 350

Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile
        355                 360                 365

Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly
    370                 375                 380

Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys
385                 390                 395                 400

Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu
                405                 410                 415

Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile
            420                 425                 430

His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr
        435                 440                 445

Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe
    450                 455                 460

Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe
465                 470                 475                 480

Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe
                485                 490                 495

Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg
            500                 505                 510

Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys
        515                 520                 525
```

```
His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys
    530                 535                 540

Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly
545                 550                 555                 560

Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys
                565                 570                 575

Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys
            580                 585                 590

Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser
        595                 600                 605

Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe
    610                 615                 620

Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr
625                 630                 635                 640

Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr
                645                 650                 655

Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg
            660                 665                 670

Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile
        675                 680                 685

Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp
    690                 695                 700

Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu
705                 710                 715                 720

Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp
                725                 730                 735

Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys
```

```
            740                 745                 750

Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val
        755                 760                 765

Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu
    770                 775                 780

Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys
785                 790                 795                 800

Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu
                805                 810                 815

His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr
            820                 825                 830

Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile
        835                 840                 845

Asn Arg Leu Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe
    850                 855                 860

Leu Lys Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys
865                 870                 875                 880

Asn Arg Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys
                885                 890                 895

Met Lys Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln
            900                 905                 910

Arg Lys Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu
        915                 920                 925

Leu Asp Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln
    930                 935                 940

Ile Thr Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys
945                 950                 955                 960
```

```
Tyr Asp Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu
               965                 970                 975

Lys Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
            980                 985                 990

Val Arg Glu Ile Asn Asn Tyr His  His Ala His Asp Ala  Tyr Leu Asn
        995                 1000                1005

Ala Val  Val Gly Thr Ala Leu  Ile Lys Lys Tyr Pro  Lys Leu Glu
    1010                1015                1020

Ser Glu  Phe Val Tyr Gly Asp  Tyr Lys Val Tyr Asp  Val Arg Lys
    1025                1030                1035

Met Ile  Ala Lys Ser Glu Gln  Glu Ile Gly Lys Ala  Thr Ala Lys
    1040                1045                1050

Tyr Phe  Phe Tyr Ser Asn Ile  Met Asn Phe Phe Lys  Thr Glu Ile
    1055                1060                1065

Thr Leu  Ala Asn Gly Glu Ile  Arg Lys Arg Pro Leu  Ile Glu Thr
    1070                1075                1080

Asn Gly  Glu Thr Gly Glu Ile  Val Trp Asp Lys Gly  Arg Asp Phe
    1085                1090                1095

Ala Thr  Val Arg Lys Val Leu  Ser Met Pro Gln Val  Asn Ile Val
    1100                1105                1110

Lys Lys  Thr Glu Val Gln Thr  Gly Gly Phe Ser Lys  Glu Ser Ile
    1115                1120                1125

Leu Pro  Lys Arg Asn Ser Asp  Lys Leu Ile Ala Arg  Lys Lys Asp
    1130                1135                1140

Trp Asp  Pro Lys Lys Tyr Gly  Gly Phe Val Ser Pro  Thr Val Ala
    1145                1150                1155
```

```
Tyr Ser  Val Leu Val Val Ala  Lys Val Glu Lys Gly  Lys Ser Lys
    1160                1165                1170

Lys Leu  Lys Ser Val Lys Glu  Leu Leu Gly Ile Thr  Ile Met Glu
    1175                1180                1185

Arg Ser  Ser Phe Glu Lys Asn  Pro Ile Asp Phe Leu  Glu Ala Lys
    1190                1195                1200

Gly Tyr  Lys Glu Val Lys Lys  Asp Leu Ile Ile Lys  Leu Pro Lys
    1205                1210                1215

Tyr Ser  Leu Phe Glu Leu Glu  Asn Gly Arg Lys Arg  Met Leu Ala
    1220                1225                1230

Ser Ala  Arg Glu Leu Gln Lys  Gly Asn Glu Leu Ala  Leu Pro Ser
    1235                1240                1245

Lys Tyr  Val Asn Phe Leu Tyr  Leu Ala Ser His Tyr  Glu Lys Leu
    1250                1255                1260

Lys Gly  Ser Pro Glu Asp Asn  Glu Gln Lys Gln Leu  Phe Val Glu
    1265                1270                1275

Gln His  Lys His Tyr Leu Asp  Glu Ile Ile Glu Gln  Ile Ser Glu
    1280                1285                1290

Phe Ser  Lys Arg Val Ile Leu  Ala Asp Ala Asn Leu  Asp Lys Val
    1295                1300                1305

Leu Ser  Ala Tyr Asn Lys His  Arg Asp Lys Pro Ile  Arg Glu Gln
    1310                1315                1320

Ala Glu  Asn Ile Ile His Leu  Phe Thr Leu Thr Asn  Leu Gly Ala
    1325                1330                1335

Pro Ala  Ala Phe Lys Tyr Phe  Asp Thr Thr Ile Asp  Arg Lys Gln
    1340                1345                1350
```

```
Tyr Arg  Ser Thr Lys Glu Val  Leu Asp Ala Thr Leu  Ile His Gln
    1355                1360                1365

Ser Ile  Thr Gly Leu Tyr Glu  Thr Arg Ile Asp Leu  Ser Gln Leu
    1370                1375                1380

Gly Gly  Asp Ser Gly Gly Ser  Ser Gly Gly Ser Ser  Gly Ser Glu
    1385                1390                1395

Thr Pro  Gly Thr Ser Glu Ser  Ala Thr Pro Glu Ser  Ser Gly Gly
    1400                1405                1410

Ser Ser  Gly Gly Ser Ser Thr  Leu Asn Ile Glu Asp  Glu Tyr Arg
    1415                1420                1425

Leu His  Glu Thr Ser Lys Glu  Pro Asp Val Ser Leu  Gly Ser Thr
    1430                1435                1440

Trp Leu  Ser Asp Phe Pro Gln  Ala Trp Ala Glu Thr  Gly Gly Met
    1445                1450                1455

Gly Leu  Ala Val Arg Gln Ala  Pro Leu Ile Ile Pro  Leu Lys Ala
    1460                1465                1470

Thr Ser  Thr Pro Val Ser Ile  Lys Gln Tyr Pro Met  Ser Gln Glu
    1475                1480                1485

Ala Arg  Leu Gly Ile Lys Pro  His Ile Gln Arg Leu  Leu Asp Gln
    1490                1495                1500

Gly Ile  Leu Val Pro Cys Gln  Ser Pro Trp Asn Thr  Pro Leu Leu
    1505                1510                1515

Pro Val  Lys Lys Pro Gly Thr  Asn Asp Tyr Arg Pro  Val Gln Asp
    1520                1525                1530

Leu Arg  Glu Val Asn Lys Arg  Val Glu Asp Ile His  Pro Thr Val
    1535                1540                1545

Pro Asn  Pro Tyr Asn Leu Leu  Ser Gly Leu Pro Pro  Ser His Gln
```

```
    1550                1555                1560

Trp Tyr  Thr Val Leu Asp Leu  Lys Asp Ala Phe Phe  Cys Leu Arg
    1565                1570                1575

Leu His  Pro Thr Ser Gln Pro  Leu Phe Ala Phe Glu  Trp Arg Asp
    1580                1585                1590

Pro Glu  Met Gly Ile Ser Gly  Gln Leu Thr Trp Thr  Arg Leu Pro
    1595                1600                1605

Gln Gly  Phe Lys Asn Ser Pro  Thr Leu Phe Asn Glu  Ala Leu His
    1610                1615                1620

Arg Asp  Leu Ala Asp Phe Arg  Ile Gln His Pro Asp  Leu Ile Leu
    1625                1630                1635

Leu Gln  Tyr Val Asp Asp Leu  Leu Leu Ala Ala Thr  Ser Glu Leu
    1640                1645                1650

Asp Cys  Gln Gln Gly Thr Arg  Ala Leu Leu Gln Thr  Leu Gly Asn
    1655                1660                1665

Leu Gly  Tyr Arg Ala Ser Ala  Lys Lys Ala Gln Ile  Cys Gln Lys
    1670                1675                1680

Gln Val  Lys Tyr Leu Gly Tyr  Leu Leu Lys Glu Gly  Gln Arg Trp
    1685                1690                1695

Leu Thr  Glu Ala Arg Lys Glu  Thr Val Met Gly Gln  Pro Thr Pro
    1700                1705                1710

Lys Thr  Pro Arg Gln Leu Arg  Glu Phe Leu Gly Lys  Ala Gly Phe
    1715                1720                1725

Cys Arg  Leu Phe Ile Pro Gly  Phe Ala Glu Met Ala  Ala Pro Leu
    1730                1735                1740

Tyr Pro  Leu Thr Lys Pro Gly  Thr Leu Phe Asn Trp  Gly Pro Asp
    1745                1750                1755
```

```
Gln Gln  Lys Ala Tyr Gln Glu  Ile Lys Gln Ala Leu  Leu Thr Ala
    1760                1765                1770

Pro Ala  Leu Gly Leu Pro Asp  Leu Thr Lys Pro Phe  Glu Leu Phe
    1775                1780                1785

Val Asp  Glu Lys Gln Gly Tyr  Ala Lys Gly Val Leu  Thr Gln Lys
    1790                1795                1800

Leu Gly  Pro Trp Arg Arg Pro  Val Ala Tyr Leu Ser  Lys Lys Leu
    1805                1810                1815

Asp Pro  Val Ala Ala Gly Trp  Pro Pro Cys Leu Arg  Met Val Ala
    1820                1825                1830

Ala Ile  Ala Val Leu Thr Lys  Asp Ala Gly Lys Leu  Thr Met Gly
    1835                1840                1845

Gln Pro  Leu Val Ile Leu Ala  Pro His Ala Val Glu  Ala Leu Val
    1850                1855                1860

Lys Gln  Pro Pro Asp Arg Trp  Leu Ser Asn Ala Arg  Met Thr His
    1865                1870                1875

Tyr Gln  Ala Leu Leu Leu Asp  Thr Asp Arg Val Gln  Phe Gly Pro
    1880                1885                1890

Val Val  Ala Leu Asn Pro Ala  Thr Leu Leu Pro Leu  Pro Glu Glu
    1895                1900                1905

Gly Leu  Gln His Asn Cys Leu  Asp Ile Leu Ala Glu  Ala His Gly
    1910                1915                1920

Thr Arg  Pro Asp Leu Thr Asp  Gln Pro Leu Pro Asp  Ala Asp His
    1925                1930                1935

Thr Trp  Tyr Thr Asp Gly Ser  Ser Leu Leu Gln Glu  Gly Gln Arg
    1940                1945                1950
```

```
Lys Ala  Gly Ala Ala Val Thr  Thr Glu Thr Glu Val  Ile Trp Ala
    1955                 1960                 1965

Lys Ala  Leu Pro Ala Gly Thr  Ser Ala Gln Arg Ala  Glu Leu Ile
    1970                 1975                 1980

Ala Leu  Thr Gln Ala Leu Lys  Met Ala Glu Gly Lys  Lys Leu Asn
    1985                 1990                 1995

Val Tyr  Thr Asp Ser Arg Tyr  Ala Phe Ala Thr Ala  His Ile His
    2000                 2005                 2010

Gly Glu  Ile Tyr Arg Arg Arg  Gly Trp Leu Thr Ser  Glu Gly Lys
    2015                 2020                 2025

Glu Ile  Lys Asn Lys Asp Glu  Ile Leu Ala Leu Leu  Lys Ala Leu
    2030                 2035                 2040

Phe Leu  Pro Lys Arg Leu Ser  Ile Ile His Cys Pro  Gly His Gln
    2045                 2050                 2055

Lys Gly  His Ser Ala Glu Ala  Arg Gly Asn Arg Met  Ala Asp Gln
    2060                 2065                 2070

Ala Ala  Arg Lys Ala Ala Ile  Thr Glu Thr Pro Asp  Thr Ser Thr
    2075                 2080                 2085

Leu Leu  Ile Glu Asn Ser Ser  Pro Ser Gly Gly Ser  Lys Arg Thr
    2090                 2095                 2100

Ala Asp  Gly Ser Glu Phe Glu  Pro Lys Lys Lys Arg  Lys Val
    2105                 2110                 2115
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<400> 164

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
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Arg Lys Val Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn
20 25 30

Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys
35 40 45

Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn
50 55 60

Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr
65 70 75 80

Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg
85 90 95

Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp
100 105 110

Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp
115 120 125

Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val
130 135 140

Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu
145 150 155 160

Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu
165 170 175

Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu
180 185 190

Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln
195 200 205

```
Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val
    210                 215                 220

Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu
225                 230                 235                 240

Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe
                245                 250                 255

Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser
            260                 265                 270

Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr
        275                 280                 285

Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr
    290                 295                 300

Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu
305                 310                 315                 320

Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser
                325                 330                 335

Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu
            340                 345                 350

Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile
        355                 360                 365

Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly
    370                 375                 380

Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys
385                 390                 395                 400

Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu
                405                 410                 415
```

```
Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile
            420                 425                 430

His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr
        435                 440                 445

Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe
    450                 455                 460

Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe
465                 470                 475                 480

Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe
                485                 490                 495

Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg
            500                 505                 510

Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys
        515                 520                 525

His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys
    530                 535                 540

Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly
545                 550                 555                 560

Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys
                565                 570                 575

Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys
            580                 585                 590

Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser
        595                 600                 605

Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe
    610                 615                 620

Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr
```

625 630 635 640

Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr
645 650 655

Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg
660 665 670

Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile
675 680 685

Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp
690 695 700

Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu
705 710 715 720

Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp
725 730 735

Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys
740 745 750

Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val
755 760 765

Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu
770 775 780

Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys
785 790 795 800

Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu
805 810 815

His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr
820 825 830

Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile
835 840 845

```
Asn Arg Leu Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe
    850                 855                 860

Leu Lys Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys
865                 870                 875                 880

Asn Arg Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys
                885                 890                 895

Met Lys Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln
            900                 905                 910

Arg Lys Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu
        915                 920                 925

Leu Asp Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln
    930                 935                 940

Ile Thr Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys
945                 950                 955                 960

Tyr Asp Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu
                965                 970                 975

Lys Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
            980                 985                 990

Val Arg Glu Ile Asn Asn Tyr His  His Ala His Asp Ala  Tyr Leu Asn
        995                 1000                1005

Ala Val  Val Gly Thr Ala Leu  Ile Lys Lys Tyr Pro  Lys Leu Glu
    1010                1015                1020

Ser Glu  Phe Val Tyr Gly Asp  Tyr Lys Val Tyr Asp  Val Arg Lys
    1025                1030                1035

Met Ile  Ala Lys Ser Glu Gln  Glu Ile Gly Lys Ala  Thr Ala Lys
    1040                1045                1050
```

```
Tyr Phe  Phe Tyr Ser Asn Ile  Met Asn Phe Phe Lys  Thr Glu Ile
    1055                1060                1065

Thr Leu  Ala Asn Gly Glu Ile  Arg Lys Arg Pro Leu  Ile Glu Thr
    1070                1075                1080

Asn Gly  Glu Thr Gly Glu Ile  Val Trp Asp Lys Gly  Arg Asp Phe
    1085                1090                1095

Ala Thr  Val Arg Lys Val Leu  Ser Met Pro Gln Val  Asn Ile Val
    1100                1105                1110

Lys Lys  Thr Glu Val Gln Thr  Gly Gly Phe Ser Lys  Glu Ser Ile
    1115                1120                1125

Leu Pro  Lys Arg Asn Ser Asp  Lys Leu Ile Ala Arg  Lys Lys Asp
    1130                1135                1140

Trp Asp  Pro Lys Lys Tyr Gly  Gly Phe Val Ser Pro  Thr Val Ala
    1145                1150                1155

Tyr Ser  Val Leu Val Val Ala  Lys Val Glu Lys Gly  Lys Ser Lys
    1160                1165                1170

Lys Leu  Lys Ser Val Lys Glu  Leu Leu Gly Ile Thr  Ile Met Glu
    1175                1180                1185

Arg Ser  Ser Phe Glu Lys Asn  Pro Ile Asp Phe Leu  Glu Ala Lys
    1190                1195                1200

Gly Tyr  Lys Glu Val Lys Lys  Asp Leu Ile Ile Lys  Leu Pro Lys
    1205                1210                1215

Tyr Ser  Leu Phe Glu Leu Glu  Asn Gly Arg Lys Arg  Met Leu Ala
    1220                1225                1230

Ser Ala  Arg Glu Leu Gln Lys  Gly Asn Glu Leu Ala  Leu Pro Ser
    1235                1240                1245
```

```
Lys Tyr  Val Asn Phe Leu Tyr  Leu Ala Ser His Tyr  Glu Lys Leu
    1250                1255                1260

Lys Gly  Ser Pro Glu Asp Asn  Glu Gln Lys Gln Leu  Phe Val Glu
    1265                1270                1275

Gln His  Lys His Tyr Leu Asp  Glu Ile Ile Glu Gln  Ile Ser Glu
    1280                1285                1290

Phe Ser  Lys Arg Val Ile Leu  Ala Asp Ala Asn Leu  Asp Lys Val
    1295                1300                1305

Leu Ser  Ala Tyr Asn Lys His  Arg Asp Lys Pro Ile  Arg Glu Gln
    1310                1315                1320

Ala Glu  Asn Ile Ile His Leu  Phe Thr Leu Thr Asn  Leu Gly Ala
    1325                1330                1335

Pro Ala  Ala Phe Lys Tyr Phe  Asp Thr Thr Ile Asp  Arg Lys Glu
    1340                1345                1350

Tyr Arg  Ser Thr Lys Glu Val  Leu Asp Ala Thr Leu  Ile His Gln
    1355                1360                1365

Ser Ile  Thr Gly Leu Tyr Glu  Thr Arg Ile Asp Leu  Ser Gln Leu
    1370                1375                1380

Gly Gly  Asp Ser Gly Gly Ser  Ser Gly Gly Ser Ser  Gly Ser Glu
    1385                1390                1395

Thr Pro  Gly Thr Ser Glu Ser  Ala Thr Pro Glu Ser  Ser Gly Gly
    1400                1405                1410

Ser Ser  Gly Gly Ser Ser Thr  Leu Asn Ile Glu Asp  Glu Tyr Arg
    1415                1420                1425

Leu His  Glu Thr Ser Lys Glu  Pro Asp Val Ser Leu  Gly Ser Thr
    1430                1435                1440

Trp Leu  Ser Asp Phe Pro Gln  Ala Trp Ala Glu Thr  Gly Gly Met
```

```
    1445                1450                1455

Gly Leu  Ala Val Arg Gln Ala  Pro Leu Ile Ile Pro  Leu Lys Ala
    1460                1465                1470

Thr Ser  Thr Pro Val Ser Ile  Lys Gln Tyr Pro Met  Ser Gln Glu
    1475                1480                1485

Ala Arg  Leu Gly Ile Lys Pro  His Ile Gln Arg Leu  Leu Asp Gln
    1490                1495                1500

Gly Ile  Leu Val Pro Cys Gln  Ser Pro Trp Asn Thr  Pro Leu Leu
    1505                1510                1515

Pro Val  Lys Lys Pro Gly Thr  Asn Asp Tyr Arg Pro  Val Gln Asp
    1520                1525                1530

Leu Arg  Glu Val Asn Lys Arg  Val Glu Asp Ile His  Pro Thr Val
    1535                1540                1545

Pro Asn  Pro Tyr Asn Leu Leu  Ser Gly Leu Pro Pro  Ser His Gln
    1550                1555                1560

Trp Tyr  Thr Val Leu Asp Leu  Lys Asp Ala Phe Phe  Cys Leu Arg
    1565                1570                1575

Leu His  Pro Thr Ser Gln Pro  Leu Phe Ala Phe Glu  Trp Arg Asp
    1580                1585                1590

Pro Glu  Met Gly Ile Ser Gly  Gln Leu Thr Trp Thr  Arg Leu Pro
    1595                1600                1605

Gln Gly  Phe Lys Asn Ser Pro  Thr Leu Phe Asn Glu  Ala Leu His
    1610                1615                1620

Arg Asp  Leu Ala Asp Phe Arg  Ile Gln His Pro Asp  Leu Ile Leu
    1625                1630                1635

Leu Gln  Tyr Val Asp Asp Leu  Leu Leu Ala Ala Thr  Ser Glu Leu
    1640                1645                1650
```

```
Asp Cys  Gln Gln Gly Thr Arg  Ala Leu Leu Gln Thr  Leu Gly Asn
    1655                1660                1665

Leu Gly  Tyr Arg Ala Ser Ala  Lys Lys Ala Gln Ile  Cys Gln Lys
    1670                1675                1680

Gln Val  Lys Tyr Leu Gly Tyr  Leu Leu Lys Glu Gly  Gln Arg Trp
    1685                1690                1695

Leu Thr  Glu Ala Arg Lys Glu  Thr Val Met Gly Gln  Pro Thr Pro
    1700                1705                1710

Lys Thr  Pro Arg Gln Leu Arg  Glu Phe Leu Gly Lys  Ala Gly Phe
    1715                1720                1725

Cys Arg  Leu Phe Ile Pro Gly  Phe Ala Glu Met Ala  Ala Pro Leu
    1730                1735                1740

Tyr Pro  Leu Thr Lys Pro Gly  Thr Leu Phe Asn Trp  Gly Pro Asp
    1745                1750                1755

Gln Gln  Lys Ala Tyr Gln Glu  Ile Lys Gln Ala Leu  Leu Thr Ala
    1760                1765                1770

Pro Ala  Leu Gly Leu Pro Asp  Leu Thr Lys Pro Phe  Glu Leu Phe
    1775                1780                1785

Val Asp  Glu Lys Gln Gly Tyr  Ala Lys Gly Val Leu  Thr Gln Lys
    1790                1795                1800

Leu Gly  Pro Trp Arg Arg Pro  Val Ala Tyr Leu Ser  Lys Lys Leu
    1805                1810                1815

Asp Pro  Val Ala Ala Gly Trp  Pro Pro Cys Leu Arg  Met Val Ala
    1820                1825                1830

Ala Ile  Ala Val Leu Thr Lys  Asp Ala Gly Lys Leu  Thr Met Gly
    1835                1840                1845
```

```
Gln Pro  Leu Val Ile Leu Ala  Pro His Ala Val Glu  Ala Leu Val
    1850                1855                1860

Lys Gln  Pro Pro Asp Arg Trp  Leu Ser Asn Ala Arg  Met Thr His
    1865                1870                1875

Tyr Gln  Ala Leu Leu Leu Asp  Thr Asp Arg Val Gln  Phe Gly Pro
    1880                1885                1890

Val Val  Ala Leu Asn Pro Ala  Thr Leu Leu Pro Leu  Pro Glu Glu
    1895                1900                1905

Gly Leu  Gln His Asn Cys Leu  Asp Ile Leu Ala Glu  Ala His Gly
    1910                1915                1920

Thr Arg  Pro Asp Leu Thr Asp  Gln Pro Leu Pro Asp  Ala Asp His
    1925                1930                1935

Thr Trp  Tyr Thr Asp Gly Ser  Ser Leu Leu Gln Glu  Gly Gln Arg
    1940                1945                1950

Lys Ala  Gly Ala Ala Val Thr  Thr Glu Thr Glu Val  Ile Trp Ala
    1955                1960                1965

Lys Ala  Leu Pro Ala Gly Thr  Ser Ala Gln Arg Ala  Glu Leu Ile
    1970                1975                1980

Ala Leu  Thr Gln Ala Leu Lys  Met Ala Glu Gly Lys  Lys Leu Asn
    1985                1990                1995

Val Tyr  Thr Asp Ser Arg Tyr  Ala Phe Ala Thr Ala  His Ile His
    2000                2005                2010

Gly Glu  Ile Tyr Arg Arg Arg  Gly Trp Leu Thr Ser  Glu Gly Lys
    2015                2020                2025

Glu Ile  Lys Asn Lys Asp Glu  Ile Leu Ala Leu Leu  Lys Ala Leu
    2030                2035                2040
```

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln
    2045   2050   2055

Lys Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln
    2060   2065   2070

Ala Ala Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr
    2075   2080   2085

Leu Leu Ile Glu Asn Ser Ser Pro Ser Gly Gly Ser Lys Arg Thr
    2090   2095   2100

Ala Asp Gly Ser Glu Phe Glu Pro Lys Lys Lys Arg Lys Val
    2105   2110   2115

<210> 165
<211> 150
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE
<222> (6)..(150)
<223> may be absent

<400> 165

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
1   5   10   15

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly
            20   25   30

Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly
        35   40   45

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
    50   55   60

Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser

65 70 75 80

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
85 90 95

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly
100 105 110

Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly
115 120 125

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
130 135 140

Ser Gly Gly Gly Gly Ser
145 150

<210> 166
<211> 31
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE
<222> (2)..(31)
<223> may be absent

<400> 166

Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
1 5 10 15

Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
20 25 30

<210> 167
<211> 150
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<220>
<221> SITE
<222> (6)..(150)
<223> may be absent

<400> 167

Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu
1 5 10 15

Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala
20 25 30

Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala
35 40 45

Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala
50 55 60

Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys
65 70 75 80

Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu
85 90 95

Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala
100 105 110

Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala
115 120 125

Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala Lys Glu Ala Ala Ala
130 135 140

Lys Glu Ala Ala Ala Lys
145 150

<210> 168
<211> 90
<212> PRT

<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE
<222> (4)..(90)
<223> may be absent

<400> 168

Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly
1 5 10 15

Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly
20 25 30

Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser
35 40 45

Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly
50 55 60

Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly
65 70 75 80

Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser
85 90

<210> 169
<211> 120
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE
<222> (5)..(120)
<223> may be absent

<400> 169

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser
1   5   10   15

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser
            20   25   30

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser
        35   40   45

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser
    50   55   60

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser
65   70   75   80

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser
                85   90   95

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Gly Ser
            100   105   110

Ser Gly Gly Ser Ser Gly Gly Ser
        115   120

<210> 170
<211> 60
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE
<222> (1)..(1)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> SITE
<222> (3)..(60)
<223> may be absent

<400> 170

Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro
1   5   10   15

Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro
            20   25   30

Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro
        35   40   45

Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro Xaa Pro
    50   55   60

<210> 171
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 171

Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser
1   5   10   15

<210> 172
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 172

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Ser Glu Thr Pro Gly Thr
1   5   10   15

Ser Glu Ser Ala Thr Pro Glu Ser Ser Gly Gly Ser Ser Gly Gly Ser
            20   25   30

<210> 173
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 173

Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser
1   5   10

<210> 174
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 174

Ser Gly Gly Ser
1

<210> 175
<211> 60
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 175

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Ser Glu Thr Pro Gly Thr
1   5   10   15

Ser Glu Ser Ala Thr Pro Glu Ser Ala Gly Ser Tyr Pro Tyr Asp Val
            20   25   30

Pro Asp Tyr Ala Gly Ser Ala Ala Pro Ala Ala Lys Lys Lys Lys Leu
        35   40   45

Asp Gly Ser Gly Ser Gly Gly Ser Ser Gly Gly Ser
    50   55   60

<210> 176
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE
<222> (4)..(21)
<223> may be absent

<400> 176

Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Gly
1 5 10 15

Gly Ser Gly Gly Ser
20

<210> 177
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 177
cggtggaccg atgatct 17

<210> 178
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 178
gccacctggc tactaga 17

<210> 179
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 179

agatcatcgg tccaccg 17

<210> 180
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 180
tctagtagcc aggtggc 17

<210> 181
<211> 136
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 181
ggcccagact gagcacgtga gttttagagc tagaaatagc aagttaaaat aaggctagtc 60

cgttatcaac ttgaaaaagt ggcaccgagt cggtgctctg ccatcacggt ggaccgatga 120

tctcgtgctc agtctg 136

<210> 182
<211> 154
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 182
ggcactgcgg ctggaggtgg gttttagagc tagaaatagc aagttaaaat aaggctagtc 60

cgttatcaac ttgaaaaagt ggcaccgagt cggtgcacac agcaccagag tctccgcttt 120

aacccccagc cacctggcta ctagacctcc agcc 154

<210> 183
<211> 141
<212> DNA
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 183
gcatggtgca cctgactcct ggttttagag ctagaaatag caagttaaaa taaggctagt 60

ccgttatcaa cttgaaaaag tggcaccgag tcggtgcaga cttctcttca ggccacctgg 120

ctactagaga gtcaggtgca c 141

<210> 184

<400> 184
000

<210> 185

<400> 185
000

<210> 186

<400> 186
000

<210> 187

<400> 187
000

<210> 188

<400> 188
000

<210> 189

<400> 189
000

<210> 190
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 190

Ala Val Lys Arg Pro Ala Ala Thr Lys Lys Ala Gly Gln Ala Lys Lys
1 5 10 15

Lys Lys Leu Asp
            20

<210> 191
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 191

Met Ser Arg Arg Arg Lys Ala Asn Pro Thr Lys Leu Ser Glu Asn Ala
1   5   10   15

Lys Lys Leu Ala Lys Glu Val Glu Asn
            20   25

<210> 192
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 192

Pro Ala Ala Lys Arg Val Lys Leu Asp
1   5

<210> 193
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 193

Lys Leu Lys Ile Lys Arg Pro Val Lys
1   5

<210> 194
<211> 8

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 194

Val Ser Arg Lys Arg Pro Arg Pro
1 5

<210> 195
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 195

Glu Gly Ala Pro Pro Ala Lys Arg Ala Arg
1 5 10

<210> 196
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 196

Pro Pro Gln Pro Lys Lys Lys Pro Leu Asp Gly Glu
1 5 10

<210> 197

<400> 197
000

<210> 198
<211> 380
<212> PRT
<213> Homo sapiens

<400> 198

Met Gly Ile Gln Gly Leu Ala Lys Leu Ile Ala Asp Val Ala Pro Ser

```
1               5                   10                  15

Ala Ile Arg Glu Asn Asp Ile Lys Ser Tyr Phe Gly Arg Lys Val Ala
            20                  25                  30

Ile Asp Ala Ser Met Ser Ile Tyr Gln Phe Leu Ile Ala Val Arg Gln
        35                  40                  45

Gly Gly Asp Val Leu Gln Asn Glu Glu Gly Glu Thr Thr Ser His Leu
    50                  55                  60

Met Gly Met Phe Tyr Arg Thr Ile Arg Met Met Glu Asn Gly Ile Lys
65                  70                  75                  80

Pro Val Tyr Val Phe Asp Gly Lys Pro Pro Gln Leu Lys Ser Gly Glu
                85                  90                  95

Leu Ala Lys Arg Ser Glu Arg Arg Ala Glu Ala Glu Lys Gln Leu Gln
            100                 105                 110

Gln Ala Gln Ala Ala Gly Ala Glu Gln Glu Val Glu Lys Phe Thr Lys
        115                 120                 125

Arg Leu Val Lys Val Thr Lys Gln His Asn Asp Glu Cys Lys His Leu
    130                 135                 140

Leu Ser Leu Met Gly Ile Pro Tyr Leu Asp Ala Pro Ser Glu Ala Glu
145                 150                 155                 160

Ala Ser Cys Ala Ala Leu Val Lys Ala Gly Lys Val Tyr Ala Ala Ala
                165                 170                 175

Thr Glu Asp Met Asp Cys Leu Thr Phe Gly Ser Pro Val Leu Met Arg
            180                 185                 190

His Leu Thr Ala Ser Glu Ala Lys Lys Leu Pro Ile Gln Glu Phe His
        195                 200                 205

Leu Ser Arg Ile Leu Gln Glu Leu Gly Leu Asn Gln Glu Gln Phe Val
    210                 215                 220
```

```
Asp Leu Cys Ile Leu Leu Gly Ser Asp Tyr Cys Glu Ser Ile Arg Gly
225                 230                 235                 240

Ile Gly Pro Lys Arg Ala Val Asp Leu Ile Gln Lys His Lys Ser Ile
                245                 250                 255

Glu Glu Ile Val Arg Arg Leu Asp Pro Asn Lys Tyr Pro Val Pro Glu
            260                 265                 270

Asn Trp Leu His Lys Glu Ala His Gln Leu Phe Leu Glu Pro Glu Val
        275                 280                 285

Leu Asp Pro Glu Ser Val Glu Leu Lys Trp Ser Glu Pro Asn Glu Glu
    290                 295                 300

Glu Leu Ile Lys Phe Met Cys Gly Glu Lys Gln Phe Ser Glu Glu Arg
305                 310                 315                 320

Ile Arg Ser Gly Val Lys Arg Leu Ser Lys Ser Arg Gln Gly Ser Thr
                325                 330                 335

Gln Gly Arg Leu Asp Asp Phe Phe Lys Val Thr Gly Ser Leu Ser Ser
            340                 345                 350

Ala Lys Arg Lys Glu Pro Glu Pro Lys Gly Ser Thr Lys Lys Lys Ala
        355                 360                 365

Lys Thr Gly Ala Ala Gly Lys Phe Lys Arg Gly Lys
    370                 375                 380
```

<210> 199
<211> 380
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 199

```
Met Gly Ile Gln Gly Leu Ala Lys Leu Ile Ala Asp Val Ala Pro Ser
```

```
1               5                   10                  15

Ala Ile Arg Glu Asn Asp Ile Lys Ser Tyr Phe Gly Arg Lys Val Ala
            20                  25                  30

Ile Asp Ala Ser Met Ser Ile Tyr Gln Phe Leu Ile Ala Val Arg Gln
        35                  40                  45

Gly Gly Asp Val Leu Gln Asn Glu Glu Gly Glu Thr Thr Ser His Leu
    50                  55                  60

Met Gly Met Phe Tyr Arg Thr Ile Arg Met Met Glu Asn Gly Ile Lys
65                  70                  75                  80

Pro Val Tyr Val Phe Asp Gly Lys Pro Pro Gln Leu Lys Ser Gly Glu
                85                  90                  95

Leu Ala Lys Arg Ser Glu Arg Arg Ala Glu Ala Glu Lys Gln Leu Gln
            100                 105                 110

Gln Ala Gln Ala Ala Gly Ala Glu Gln Glu Val Glu Lys Phe Thr Lys
        115                 120                 125

Arg Leu Val Lys Val Thr Lys Gln His Asn Asp Glu Cys Lys His Leu
    130                 135                 140

Leu Ser Leu Met Gly Ile Pro Tyr Leu Asp Ala Pro Ser Glu Ala Glu
145                 150                 155                 160

Ala Ser Cys Ala Ala Leu Val Arg Ala Gly Lys Val Tyr Ala Ala Ala
                165                 170                 175

Thr Glu Asp Met Asp Cys Leu Thr Phe Gly Ser Pro Val Leu Met Arg
            180                 185                 190

His Leu Thr Ala Ser Glu Ala Lys Lys Leu Pro Ile Gln Glu Phe His
        195                 200                 205

Leu Ser Arg Ile Leu Gln Glu Leu Gly Leu Asn Gln Glu Gln Phe Val
    210                 215                 220
```

```
Asp Leu Cys Ile Leu Leu Gly Ser Asp Tyr Cys Glu Ser Ile Arg Gly
225                 230                 235                 240

Ile Gly Pro Lys Arg Ala Val Asp Leu Ile Gln Lys His Lys Ser Ile
                245                 250                 255

Glu Glu Ile Val Arg Arg Leu Asp Pro Asn Lys Tyr Pro Val Pro Glu
            260                 265                 270

Asn Trp Leu His Lys Glu Ala His Gln Leu Phe Leu Glu Pro Glu Val
        275                 280                 285

Leu Asp Pro Glu Ser Val Glu Leu Lys Trp Ser Glu Pro Asn Glu Glu
    290                 295                 300

Glu Leu Ile Lys Phe Met Cys Gly Glu Lys Gln Phe Ser Glu Glu Arg
305                 310                 315                 320

Ile Arg Ser Gly Val Lys Arg Leu Ser Lys Ser Arg Gln Gly Ser Thr
                325                 330                 335

Gln Gly Arg Leu Asp Asp Phe Phe Lys Val Thr Gly Ser Leu Ser Ser
            340                 345                 350

Ala Lys Arg Lys Glu Pro Glu Pro Lys Gly Ser Thr Lys Lys Lys Ala
        355                 360                 365

Lys Thr Gly Ala Ala Gly Lys Phe Lys Arg Gly Lys
    370                 375                 380
```

<210> 200
<211> 380
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 200

```
Met Gly Ile Gln Gly Leu Ala Lys Leu Ile Ala Asp Val Ala Pro Ser
```

```
1               5                   10                  15

Ala Ile Arg Glu Asn Asp Ile Lys Ser Tyr Phe Gly Arg Lys Val Ala
            20                  25                  30

Ile Asp Ala Ser Met Ser Ile Tyr Gln Phe Leu Ile Ala Val Arg Gln
        35                  40                  45

Gly Gly Asp Val Leu Gln Asn Glu Glu Gly Glu Thr Thr Ser His Leu
    50                  55                  60

Met Gly Met Phe Tyr Arg Thr Ile Arg Met Met Glu Asn Gly Ile Lys
65                  70                  75                  80

Pro Val Tyr Val Phe Asp Gly Lys Pro Pro Gln Leu Lys Ser Gly Glu
                85                  90                  95

Leu Ala Lys Arg Ser Glu Arg Arg Ala Glu Ala Glu Lys Gln Leu Gln
            100                 105                 110

Gln Ala Gln Ala Ala Gly Ala Glu Gln Glu Val Glu Lys Phe Thr Lys
        115                 120                 125

Arg Leu Val Lys Val Thr Lys Gln His Asn Asp Glu Cys Lys His Leu
    130                 135                 140

Leu Ser Leu Met Gly Ile Pro Tyr Leu Asp Ala Pro Ser Glu Ala Glu
145                 150                 155                 160

Ala Ser Cys Ala Ala Leu Val Lys Ala Gly Lys Val Tyr Ala Ala Ala
                165                 170                 175

Thr Glu Asp Met Asp Cys Leu Thr Phe Gly Ala Pro Val Leu Met Arg
            180                 185                 190

His Leu Thr Ala Ser Glu Ala Lys Lys Leu Pro Ile Gln Glu Phe His
        195                 200                 205

Leu Ser Arg Ile Leu Gln Glu Leu Gly Leu Asn Gln Glu Gln Phe Val
    210                 215                 220
```

```
Asp Leu Cys Ile Leu Leu Gly Ser Asp Tyr Cys Glu Ser Ile Arg Gly
225                 230                 235                 240

Ile Gly Pro Lys Arg Ala Val Asp Leu Ile Gln Lys His Lys Ser Ile
                245                 250                 255

Glu Glu Ile Val Arg Arg Leu Asp Pro Asn Lys Tyr Pro Val Pro Glu
            260                 265                 270

Asn Trp Leu His Lys Glu Ala His Gln Leu Phe Leu Glu Pro Glu Val
        275                 280                 285

Leu Asp Pro Glu Ser Val Glu Leu Lys Trp Ser Glu Pro Asn Glu Glu
    290                 295                 300

Glu Leu Ile Lys Phe Met Cys Gly Glu Lys Gln Phe Ser Glu Glu Arg
305                 310                 315                 320

Ile Arg Ser Gly Val Lys Arg Leu Ser Lys Ser Arg Gln Gly Ser Thr
                325                 330                 335

Gln Gly Arg Leu Asp Asp Phe Phe Lys Val Thr Gly Ser Leu Ser Ser
            340                 345                 350

Ala Lys Arg Lys Glu Pro Glu Pro Lys Gly Ser Thr Lys Lys Lys Ala
        355                 360                 365

Lys Thr Gly Ala Ala Gly Lys Phe Lys Arg Gly Lys
    370                 375                 380
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<210> 201
<211> 380
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 201

```
Met Gly Ile Gln Gly Leu Ala Lys Leu Ile Ala Asp Val Ala Pro Ser
```

```
1               5                   10                  15

Ala Ile Arg Glu Asn Asp Ile Lys Ser Tyr Phe Gly Arg Lys Val Ala
            20                  25                  30

Ile Asp Ala Ser Met Ser Ile Tyr Gln Phe Leu Ile Ala Val Arg Gln
        35                  40                  45

Gly Gly Asp Val Leu Gln Asn Glu Glu Gly Glu Thr Thr Ser His Leu
    50                  55                  60

Met Gly Met Phe Tyr Arg Thr Ile Arg Met Met Glu Asn Gly Ile Lys
65                  70                  75                  80

Pro Val Tyr Val Phe Asp Gly Lys Pro Pro Gln Leu Lys Ser Gly Glu
                85                  90                  95

Leu Ala Lys Arg Ser Glu Arg Arg Ala Glu Ala Glu Lys Gln Leu Gln
            100                 105                 110

Gln Ala Gln Ala Ala Gly Ala Glu Gln Glu Val Glu Lys Phe Thr Lys
        115                 120                 125

Arg Leu Val Lys Val Thr Lys Gln His Asn Asp Glu Cys Lys His Leu
    130                 135                 140

Leu Ser Leu Met Gly Ile Pro Tyr Leu Asp Ala Pro Ser Glu Ala Glu
145                 150                 155                 160

Ala Ser Cys Ala Ala Leu Val Lys Ala Gly Lys Val Tyr Ala Ala Ala
                165                 170                 175

Thr Glu Asp Met Asp Cys Leu Thr Phe Gly Ser Pro Val Leu Met Arg
            180                 185                 190

His Leu Thr Ala Ser Glu Ala Lys Lys Leu Pro Ile Gln Glu Phe His
        195                 200                 205

Leu Ser Arg Ile Leu Gln Glu Leu Gly Leu Asn Gln Glu Gln Phe Val
    210                 215                 220
```

```
Asp Leu Cys Ile Leu Leu Gly Ser Asp Tyr Cys Glu Ser Ile Arg Gly
225                 230                 235                 240

Ile Gly Pro Lys Arg Ala Val Asp Leu Ile Gln Lys His Lys Ser Ile
                245                 250                 255

Glu Glu Ile Val Arg Arg Leu Asp Pro Asn Lys Tyr Pro Val Pro Glu
            260                 265                 270

Asn Trp Leu His Lys Glu Ala His Gln Leu Phe Leu Glu Pro Glu Val
        275                 280                 285

Leu Asp Pro Glu Ser Val Glu Leu Lys Trp Ser Glu Pro Asn Glu Glu
    290                 295                 300

Glu Leu Ile Lys Phe Met Cys Gly Glu Lys Gln Phe Ser Glu Glu Arg
305                 310                 315                 320

Ile Arg Ser Gly Val Lys Arg Leu Ser Lys Ser Arg Gln Gly Ser Thr
                325                 330                 335

Gln Gly Arg Leu Asp Asp Phe Phe Lys Val Thr Gly Ser Leu Ser Ser
            340                 345                 350

Ala Arg Arg Lys Glu Pro Glu Pro Lys Gly Ser Thr Lys Lys Lys Ala
        355                 360                 365

Lys Thr Gly Ala Ala Gly Lys Phe Lys Arg Gly Lys
    370                 375                 380
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<210> 202
<211> 908
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 202

```
Met Gly Val Asn Asp Leu Trp Gln Ile Leu Glu Pro Val Lys Gln His
```

```
1               5                   10                  15

Ile Pro Leu Arg Asn Leu Gly Gly Lys Thr Ile Ala Val Asp Leu Ser
            20                  25                  30

Leu Trp Val Cys Glu Ala Gln Thr Val Lys Lys Met Met Gly Ser Val
        35                  40                  45

Met Lys Pro His Leu Arg Asn Leu Phe Phe Arg Ile Ser Tyr Leu Thr
    50                  55                  60

Gln Met Asp Val Lys Leu Val Phe Val Met Glu Gly Glu Pro Pro Lys
65                  70                  75                  80

Leu Lys Ala Asp Val Ile Ser Lys Arg Asn Gln Ser Arg Tyr Gly Ser
                85                  90                  95

Ser Gly Lys Ser Trp Ser Gln Lys Thr Gly Arg Ser His Phe Lys Ser
            100                 105                 110

Val Leu Arg Glu Cys Leu His Met Leu Glu Cys Leu Gly Ile Pro Trp
        115                 120                 125

Val Gln Ala Ala Gly Glu Ala Glu Ala Met Cys Ala Tyr Leu Asn Ala
    130                 135                 140

Gly Gly His Val Asp Gly Cys Leu Thr Asn Asp Gly Asp Thr Phe Leu
145                 150                 155                 160

Tyr Gly Ala Gln Thr Val Tyr Arg Asn Phe Thr Met Asn Thr Lys Asp
                165                 170                 175

Pro His Val Asp Cys Tyr Thr Met Ser Ser Ile Lys Ser Lys Leu Gly
            180                 185                 190

Leu Asp Arg Asp Ala Leu Val Gly Leu Ala Ile Leu Leu Gly Cys Asp
        195                 200                 205

Tyr Leu Pro Lys Gly Val Pro Gly Val Gly Lys Glu Gln Ala Leu Lys
    210                 215                 220
```

```
Leu Ile Gln Ile Leu Lys Gly Gln Ser Leu Leu Gln Arg Phe Asn Arg
225                 230                 235                 240

Trp Asn Glu Thr Ser Cys Asn Ser Ser Pro Gln Leu Leu Val Thr Lys
                245                 250                 255

Lys Leu Ala His Cys Ser Val Cys Ser His Pro Gly Ser Pro Lys Asp
            260                 265                 270

His Glu Arg Asn Gly Cys Arg Leu Cys Lys Ser Asp Lys Tyr Cys Glu
        275                 280                 285

Pro His Asp Tyr Glu Tyr Cys Cys Pro Cys Glu Trp His Arg Thr Glu
    290                 295                 300

His Asp Arg Gln Leu Ser Glu Val Glu Asn Asn Ile Lys Lys Lys Ala
305                 310                 315                 320

Cys Cys Cys Glu Gly Phe Pro Phe His Glu Val Ile Gln Glu Phe Leu
                325                 330                 335

Leu Asn Lys Asp Lys Leu Val Lys Val Ile Arg Tyr Gln Arg Pro Asp
            340                 345                 350

Leu Leu Leu Phe Gln Arg Phe Thr Leu Glu Lys Met Glu Trp Pro Asn
        355                 360                 365

His Tyr Ala Cys Glu Lys Leu Leu Val Leu Leu Thr His Tyr Asp Met
    370                 375                 380

Ile Glu Arg Lys Leu Gly Ser Arg Asn Ser Asn Gln Leu Gln Pro Ile
385                 390                 395                 400

Arg Ile Val Lys Thr Arg Ile Arg Asn Gly Val His Cys Phe Glu Ile
                405                 410                 415

Glu Trp Glu Lys Pro Glu His Tyr Ala Met Glu Asp Lys Gln His Gly
            420                 425                 430
```

```
Glu Phe Ala Leu Leu Thr Ile Glu Glu Glu Ser Leu Phe Glu Ala Ala
        435                 440                 445

Tyr Pro Glu Ile Val Ala Val Tyr Gln Lys Gln Lys Leu Glu Ile Lys
    450                 455                 460

Gly Lys Lys Gln Lys Arg Ile Lys Pro Lys Glu Asn Asn Leu Pro Glu
465                 470                 475                 480

Pro Asp Glu Val Met Ser Phe Gln Ser His Met Thr Leu Lys Pro Thr
                485                 490                 495

Cys Glu Ile Phe His Lys Gln Asn Ser Lys Leu Asn Ser Gly Ile Ser
            500                 505                 510

Pro Asp Pro Thr Leu Pro Gln Glu Ser Ile Ser Ala Ser Leu Asn Ser
        515                 520                 525

Leu Leu Leu Pro Lys Asn Thr Pro Cys Leu Asn Ala Gln Glu Gln Phe
    530                 535                 540

Met Ser Ser Leu Arg Pro Leu Ala Ile Gln Gln Ile Lys Ala Val Ser
545                 550                 555                 560

Lys Ser Leu Ile Ser Glu Ser Ser Gln Pro Asn Thr Ser Ser His Asn
                565                 570                 575

Ile Ser Val Ile Ala Asp Leu His Leu Ser Thr Ile Asp Trp Glu Gly
            580                 585                 590

Thr Ser Phe Ser Asn Ser Pro Ala Ile Gln Arg Asn Thr Phe Ser His
        595                 600                 605

Asp Leu Lys Ser Glu Val Glu Ser Glu Leu Ser Ala Ile Pro Asp Gly
    610                 615                 620

Phe Glu Asn Ile Pro Glu Gln Leu Ser Cys Glu Ser Glu Arg Tyr Thr
625                 630                 635                 640
```

```
Ala Asn Ile Lys Lys Val Leu Asp Glu Asp Ser Asp Gly Ile Ser Pro
                645                 650                 655

Glu Glu His Leu Leu Ser Gly Ile Thr Asp Leu Cys Leu Gln Asp Leu
            660                 665                 670

Pro Leu Lys Glu Arg Ile Phe Thr Lys Leu Ser Tyr Pro Gln Asp Asn
        675                 680                 685

Leu Gln Pro Asp Val Asn Leu Lys Thr Leu Ser Ile Leu Ser Val Lys
    690                 695                 700

Glu Ser Cys Ile Ala Asn Ser Gly Ser Asp Cys Thr Ser His Leu Ser
705                 710                 715                 720

Lys Asp Leu Pro Gly Ile Pro Leu Gln Asn Glu Ser Arg Asp Ser Lys
                725                 730                 735

Ile Leu Lys Gly Asp Gln Leu Leu Gln Glu Asp Tyr Lys Val Asn Thr
            740                 745                 750

Ser Val Pro Tyr Ser Val Ser Asn Thr Val Val Lys Thr Cys Asn Val
        755                 760                 765

Arg Pro Pro Asn Thr Ala Leu Asp His Ser Arg Lys Val Asp Met Gln
    770                 775                 780

Thr Thr Arg Lys Ile Leu Met Lys Lys Ser Val Cys Leu Asp Arg His
785                 790                 795                 800

Ser Ser Asp Glu Gln Ser Ala Pro Val Phe Gly Lys Ala Lys Tyr Thr
                805                 810                 815

Thr Gln Arg Met Lys His Ser Ser Gln Lys His Asn Ser Ser His Phe
            820                 825                 830

Lys Glu Ser Gly His Asn Lys Leu Ser Ser Pro Lys Ile His Ile Lys
        835                 840                 845

Glu Thr Glu Gln Cys Val Arg Ser Tyr Glu Thr Ala Glu Asn Glu Glu
```

```
    850                 855                 860

Ser Cys Phe Pro Asp Ser Thr Lys Ser Ser Leu Ser Ser Leu Gln Cys
865                 870                 875                 880

His Lys Lys Glu Asn Asn Ser Gly Thr Cys Leu Asp Ser Pro Leu Pro
                885                 890                 895

Leu Arg Gln Arg Leu Lys Leu Arg Phe Gln Ser Thr
            900                 905
```

<210> 203
<211> 1186
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 203

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Met Gly Val Gln Gly Leu Trp Lys Leu Leu Glu Cys Ser Gly Arg Gln
1               5                   10                  15

Val Ser Pro Glu Ala Leu Glu Gly Lys Ile Leu Ala Val Asp Ile Ser
            20                  25                  30

Ile Trp Leu Asn Gln Ala Leu Lys Gly Val Arg Asp Arg His Gly Asn
        35                  40                  45

Ser Ile Glu Asn Pro His Leu Leu Thr Leu Phe His Arg Leu Cys Lys
    50                  55                  60

Leu Leu Phe Phe Arg Ile Arg Pro Ile Phe Val Phe Asp Gly Asp Ala
65                  70                  75                  80

Pro Leu Leu Lys Lys Gln Thr Leu Val Lys Arg Arg Gln Arg Lys Asp
                85                  90                  95

Leu Ala Ser Ser Asp Ser Arg Lys Thr Thr Glu Lys Leu Leu Lys Thr
            100                 105                 110
```

```
Phe Leu Lys Arg Gln Ala Ile Lys Thr Ala Phe Arg Ser Lys Arg Asp
        115                 120                 125

Glu Ala Leu Pro Ser Leu Thr Gln Val Arg Arg Glu Asn Asp Leu Tyr
    130                 135                 140

Val Leu Pro Pro Leu Gln Glu Glu Glu Lys His Ser Ser Glu Glu Glu
145                 150                 155                 160

Asp Glu Lys Glu Trp Gln Glu Arg Met Asn Gln Lys Gln Ala Leu Gln
                165                 170                 175

Glu Glu Phe Phe His Asn Pro Gln Ala Ile Asp Ile Glu Ser Glu Asp
            180                 185                 190

Phe Ser Ser Leu Pro Pro Glu Val Lys His Glu Ile Leu Thr Asp Met
        195                 200                 205

Lys Glu Phe Thr Lys Arg Arg Arg Thr Leu Phe Glu Ala Met Pro Glu
    210                 215                 220

Glu Ser Asp Asp Phe Ser Gln Tyr Gln Leu Lys Gly Leu Leu Lys Lys
225                 230                 235                 240

Asn Tyr Leu Asn Gln His Ile Glu His Val Gln Lys Glu Met Asn Gln
                245                 250                 255

Gln His Ser Gly His Ile Arg Arg Gln Tyr Glu Asp Glu Gly Gly Phe
            260                 265                 270

Leu Lys Glu Val Glu Ser Arg Arg Val Val Ser Glu Asp Thr Ser His
        275                 280                 285

Tyr Ile Leu Ile Lys Gly Ile Gln Ala Lys Thr Val Ala Glu Val Asp
    290                 295                 300

Ser Glu Ser Leu Pro Ser Ser Ser Lys Met His Gly Met Ser Phe Asp
305                 310                 315                 320

Val Lys Ser Ser Pro Cys Glu Lys Leu Lys Thr Glu Lys Glu Pro Asp
```

```
                325                 330                 335

Ala Thr Pro Pro Ser Pro Arg Thr Leu Leu Ala Met Gln Ala Ala Leu
            340                 345                 350

Leu Gly Ser Ser Ser Glu Glu Glu Leu Glu Ser Glu Asn Arg Arg Gln
        355                 360                 365

Ala Arg Gly Arg Asn Ala Pro Ala Ala Val Asp Glu Gly Ser Ile Ser
    370                 375                 380

Pro Arg Thr Leu Ser Ala Ile Lys Arg Ala Leu Asp Asp Asp Glu Asp
385                 390                 395                 400

Val Lys Val Cys Ala Gly Asp Asp Val Gln Thr Gly Gly Pro Gly Ala
                405                 410                 415

Glu Glu Met Arg Ile Asn Ser Ser Thr Glu Asn Ser Asp Glu Gly Leu
            420                 425                 430

Lys Val Arg Asp Gly Lys Gly Ile Pro Phe Thr Ala Thr Leu Ala Ser
        435                 440                 445

Ser Ser Val Asn Ser Ala Glu Glu His Val Ala Ser Thr Asn Glu Gly
    450                 455                 460

Arg Glu Pro Thr Asp Ser Val Pro Lys Glu Gln Met Ser Leu Val His
465                 470                 475                 480

Val Gly Thr Glu Ala Phe Pro Ile Ser Asp Glu Ser Met Ile Lys Asp
                485                 490                 495

Arg Lys Asp Arg Leu Pro Leu Glu Ser Ala Val Val Arg His Ser Asp
            500                 505                 510

Ala Pro Gly Leu Pro Asn Gly Arg Glu Leu Thr Pro Ala Ser Pro Thr
        515                 520                 525

Cys Thr Asn Ser Val Ser Lys Asn Glu Thr His Ala Glu Val Leu Glu
    530                 535                 540
```

```
Gln Gln Asn Glu Leu Cys Pro Tyr Glu Ser Lys Phe Asp Ser Ser Leu
545                 550                 555                 560

Leu Ser Ser Asp Asp Glu Thr Lys Cys Lys Pro Asn Ser Ala Ser Glu
                565                 570                 575

Val Ile Gly Pro Val Ser Leu Gln Glu Thr Ser Ser Ile Val Ser Val
            580                 585                 590

Pro Ser Glu Ala Val Asp Asn Val Glu Asn Val Val Ser Phe Asn Ala
        595                 600                 605

Lys Glu His Glu Asn Phe Leu Glu Thr Ile Gln Glu Gln Gln Thr Thr
    610                 615                 620

Glu Ser Ala Gly Gln Asp Leu Ile Ser Ile Pro Lys Ala Val Glu Pro
625                 630                 635                 640

Met Glu Ile Asp Ser Glu Glu Ser Glu Ser Asp Gly Ser Phe Ile Glu
                645                 650                 655

Val Gln Ser Val Ile Ser Asp Glu Glu Leu Gln Ala Glu Phe Pro Glu
            660                 665                 670

Thr Ser Lys Pro Pro Ser Glu Gln Gly Glu Glu Glu Leu Val Gly Thr
        675                 680                 685

Arg Glu Gly Glu Ala Pro Ala Glu Ser Glu Ser Leu Leu Arg Asp Asn
    690                 695                 700

Ser Glu Arg Asp Asp Val Asp Gly Glu Pro Gln Glu Ala Glu Lys Asp
705                 710                 715                 720

Ala Glu Asp Ser Leu His Glu Trp Gln Asp Ile Asn Leu Glu Glu Leu
                725                 730                 735

Glu Thr Leu Glu Ser Asn Leu Leu Ala Gln Gln Asn Ser Leu Lys Ala
            740                 745                 750
```

```
Gln Lys Gln Gln Gln Glu Arg Ile Ala Ala Thr Val Thr Gly Gln Met
        755                 760                 765

Phe Leu Glu Ser Gln Glu Leu Leu Arg Leu Phe Gly Ile Pro Tyr Ile
    770                 775                 780

Gln Ala Pro Met Glu Ala Glu Ala Gln Cys Ala Ile Leu Asp Leu Thr
785                 790                 795                 800

Asp Gln Thr Ser Gly Thr Ile Thr Asp Asp Ser Asp Ile Trp Leu Phe
                805                 810                 815

Gly Ala Arg His Val Tyr Arg Asn Phe Phe Asn Lys Asn Lys Phe Val
            820                 825                 830

Glu Tyr Tyr Gln Tyr Val Asp Phe His Asn Gln Leu Gly Leu Asp Arg
        835                 840                 845

Asn Lys Leu Ile Asn Leu Ala Tyr Leu Leu Gly Ser Asp Tyr Thr Glu
    850                 855                 860

Gly Ile Pro Thr Val Gly Cys Val Thr Ala Met Glu Ile Leu Asn Glu
865                 870                 875                 880

Phe Pro Gly His Gly Leu Glu Pro Leu Leu Lys Phe Ser Glu Trp Trp
                885                 890                 895

His Glu Ala Gln Lys Asn Pro Lys Ile Arg Pro Asn Pro His Asp Thr
            900                 905                 910

Lys Val Lys Lys Lys Leu Arg Thr Leu Gln Leu Thr Pro Gly Phe Pro
        915                 920                 925

Asn Pro Ala Val Ala Glu Ala Tyr Leu Lys Pro Val Val Asp Asp Ser
    930                 935                 940

Lys Gly Ser Phe Leu Trp Gly Lys Pro Asp Leu Asp Lys Ile Arg Glu
945                 950                 955                 960
```

```
Phe Cys Gln Arg Tyr Phe Gly Trp Asn Arg Thr Lys Thr Asp Glu Ser
                965                 970                 975

Leu Phe Pro Val Leu Lys Gln Leu Asp Ala Gln Gln Thr Gln Leu Arg
            980                 985                 990

Ile Asp Ser Phe Phe Arg Leu Ala  Gln Gln Glu Lys Glu  Asp Ala Lys
        995                 1000                1005

Arg Ile  Lys Ser Gln Arg Leu  Asn Arg Ala Val Thr  Cys Met Leu
    1010                1015                1020

Arg Lys  Glu Lys Glu Ala Ala  Ala Ser Glu Ile Glu  Ala Val Ser
    1025                1030                1035

Val Ala  Met Glu Lys Glu Phe  Glu Leu Leu Asp Lys  Ala Lys Arg
    1040                1045                1050

Lys Thr  Gln Lys Arg Gly Ile  Thr Asn Thr Leu Glu  Glu Ser Ser
    1055                1060                1065

Ser Leu  Lys Arg Lys Arg Leu  Ser Asp Ser Lys Arg  Lys Asn Thr
    1070                1075                1080

Cys Gly  Gly Phe Leu Gly Glu  Thr Cys Leu Ser Glu  Ser Ser Asp
    1085                1090                1095

Gly Ser  Ser Ser Glu Asp Ala  Glu Ser Ser Ser Leu  Met Asn Val
    1100                1105                1110

Gln Arg  Arg Thr Ala Ala Lys  Glu Pro Lys Thr Ser  Ala Ser Asp
    1115                1120                1125

Ser Gln  Asn Ser Val Lys Glu  Ala Pro Val Lys Asn  Gly Gly Ala
    1130                1135                1140

Thr Thr  Ser Ser Ser Ser Asp  Ser Asp Asp Asp Gly  Gly Lys Glu
    1145                1150                1155

Lys Met  Val Leu Val Thr Ala  Arg Ser Val Phe Gly  Lys Lys Arg
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1160 1165 1170

Arg Lys Leu Arg Arg Ala Arg Gly Arg Lys Arg Lys Thr
1175 1180 1185

<210> 204
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE
<222> (21)..(21)
<223> Xaa can be any naturally occurring amino acid

<400> 204

Met Met Met Met Met Met Met Met Asn Asn Asn Asn Asn Asn Asn Asn
1 5 10 15

Asn Asn Asn Asn Xaa Gly Gly
20

<210> 205
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE
<222> (13)..(13)
<223> Xaa can be any naturally occurring amino acid

<400> 205

Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Xaa Gly Gly
1 5 10 15

<210> 206
<211> 23

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE
<222> (21)..(21)
<223> Xaa can be any naturally occurring amino acid

<400> 206

Met Met Met Met Met Met Met Met Met Asn Asn Asn Asn Asn Asn Asn
1 5 10 15

Asn Asn Asn Asn Xaa Gly Gly
20

<210> 207
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE
<222> (12)..(12)
<223> Xaa can be any naturally occurring amino acid

<400> 207

Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Xaa Gly Gly
1 5 10

<210> 208
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE

<222> (21)..(22)
<223> Xaa can be any naturally occurring amino acid

<400> 208

Met Met Met Met Met Met Met Met Asn Asn Asn Asn Asn Asn Asn Asn
1   5   10   15

Asn Asn Asn Asn Xaa Xaa Ala Gly Ala Ala Trp
            20   25

<210> 209
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE
<222> (13)..(14)
<223> Xaa can be any naturally occurring amino acid

<400> 209

Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Xaa Xaa Ala Gly
1   5   10   15

Ala Ala Trp

<210> 210
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE
<222> (21)..(22)
<223> Xaa can be any naturally occurring amino acid

<400> 210

Met Met Met Met Met Met Met Met Met Asn Asn Asn Asn Asn Asn Asn
1 5 10 15

Asn Asn Asn Asn Xaa Xaa Ala Gly Ala Ala Trp
20 25

<210> 211
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE
<222> (12)..(13)
<223> Xaa can be any naturally occurring amino acid

<400> 211

Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Xaa Xaa Ala Gly Ala
1 5 10 15

Ala Trp

<210> 212
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE
<222> (21)..(21)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> SITE
<222> (24)..(24)
<223> Xaa can be any naturally occurring amino acid

<400> 212

Met Met Met Met Met Met Met Met Asn Asn Asn Asn Asn Asn Asn Asn
1   5   10   15

Asn Asn Asn Asn Xaa Gly Gly Xaa Gly
            20   25

<210> 213
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE
<222> (13)..(13)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> SITE
<222> (16)..(16)
<223> Xaa can be any naturally occurring amino acid

<400> 213

Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Xaa Gly Gly Xaa
1   5   10   15

Gly

<210> 214
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE
<222> (21)..(21)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> SITE

<222> (24)..(24)
<223> Xaa can be any naturally occurring amino acid

<400> 214

Met Met Met Met Met Met Met Met Met Asn Asn Asn Asn Asn Asn Asn
1 5 10 15

Asn Asn Asn Asn Xaa Gly Gly Xaa Gly
20 25

<210> 215
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> SITE
<222> (12)..(12)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> SITE
<222> (15)..(15)
<223> Xaa can be any naturally occurring amino acid

<400> 215

Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Xaa Gly Gly Xaa Gly
1 5 10 15

<210> 216
<211> 125
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> misc_feature
<222> (1)..(8)
<223> n is a, c, g, or t

<400> 216

nnnnnnnngt ttttgtactc tcaagattta gaaataaatc ttgcagaagc tacaaagata 60

aggcttcatg ccgaaatcaa caccctgtca ttttatggca gggtgttttc gttatttaat 120

ttttt 125

<210> 217
<211> 121
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> misc_feature
<222> (1)..(18)
<223> n is a, c, g, or t

<400> 217
nnnnnnnnnn nnnnnnngt ttttgtactc tcagaaatgc agaagctaca aagataaggc 60

ttcatgccga aatcaacacc ctgtcatttt atggcagggt gttttcgtta tttaattttt 120

t 121

<210> 218
<211> 109
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> misc_feature
<222> (1)..(20)
<223> n is a, c, g, or t

<400> 218
nnnnnnnnnn nnnnnnnnnn gtttttgtac tctcagaaat gcagaagcta caaagataag 60

gcttcatgcc gaaatcaaca ccctgtcatt ttatggcagg gtgtttttt 109

<210> 219
<211> 102
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> misc_feature
<222> (1)..(20)
<223> n is a, c, g, or t

<400> 219
nnnnnnnnnn nnnnnnnnnn gttttagagc tagaaatagc aagttaaaat aaggctagtc 60

cgttatcaac ttgaaaaagt ggcaccgagt cggtgctttt tt   102

<210> 220
<211> 88
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> misc_feature
<222> (1)..(20)
<223> n is a, c, g, or t

<400> 220
nnnnnnnnnn nnnnnnnnnn gttttagagc tagaaatagc aagttaaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gttttttt   88

<210> 221
<211> 76
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> misc_feature
<222> (1)..(20)
<223> n is a, c, g, or t

<400> 221
nnnnnnnnnn nnnnnnnnnn gttttagagc tagaaatagc aagttaaaat aaggctagtc 60

cgttatcatt tttttt 76

<210> 222
<211> 82
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 222
guuuuagagc uagaaauagc aaguuaaaau aaaggcuagu ccguuaucaa cuugaaaaag 60

uggcaccgag ucggugcuuu uu 82

<210> 223
<211> 905
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 223
tagttattaa tagtaatcaa ttacggggtc attagttcat agcccatata tggagttccg 60

cgttacataa cttacggtaa atggcccgcc tggctgaccg cccaacgacc cccgcccatt 120

gacgtcaata atgacgtatg ttcccatagt aacgccaata gggactttcc attgacgtca 180

atgggtggag tatttacggt aaactgccca cttggcagta catcaagtgt atcatatgcc 240

aagtacgccc cctattgacg tcaatgacgg taaatggccc gcctggcatt atgcccagta 300

catgacctta tgggactttc ctacttggca gtacatctac gtattagtca tcgctattac 360

catggtgatg cggttttggc agtacatcaa tgggcgtgga tagcggtttg actcacgggg 420

atttccaagt ctccacccca ttgacgtcaa tgggagtttg ttttggcacc aaaatcaacg 480

ggactttcca aaatgtcgta acaactccgc cccattgacg caaatgggcg gtaggcgtgt 540

acggtgggag gtctatataa gcagagctgg tttagtgaac cgtcagatcg ttcactgccg 600

tataggcagg gcccagactg agcacgtgag ttttagagct agaaatagca agttaaaata 660

aggctagtcc gttatcaact tgaaaaagtg ggaccgagtc ggtcctctgc catcaaagcg 720

tgctcagtct gttttagggt catgaaggtt tttcttttcc tgagaaaaca acacgtattg 780

ttttctcagg ttttgctttt tggccttttt ctagcttaaa aaaaaaaaaa gcaaaagatg 840

ctggtggttg gcactcctgg tttccaggac ggggttcaaa tccctgcggc gtctttgctt 900

tgact 905

<210> 224
<211> 942
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 224
tagttattaa tagtaatcaa ttacggggtc attagttcat agcccatata tggagttccg 60

cgttacataa cttacggtaa atggcccgcc tggctgaccg cccaacgacc cccgcccatt 120

gacgtcaata atgacgtatg ttcccatagt aacgccaata gggactttcc attgacgtca 180

atgggtggag tatttacggt aaactgccca cttggcagta catcaagtgt atcatatgcc 240

aagtacgccc cctattgacg tcaatgacgg taaatggccc gcctggcatt atgcccagta 300

catgacctta tgggactttc ctacttggca gtacatctac gtattagtca tcgctattac 360

catggtgatg cggttttggc agtacatcaa tgggcgtgga tagcggtttg actcacgggg 420

atttccaagt ctccacccca ttgacgtcaa tgggagtttg ttttggcacc aaaatcaacg 480

ggactttcca aaatgtcgta acaactccgc cccattgacg caaatgggcg gtaggcgtgt 540

acggtgggag gtctatataa gcagagctgg tttagtgaac cgtcagatcg ttcactgccg 600

tataggcagg gcccagactg agcacgtgag ttttagagct agaaatagca agttaaaata 660

aggctagtcc gttatcaact tgaaaaagtg ggaccgagtc ggtcctctgc catcaaagcg 720

tgctcagtct gttttgtttt ggctgggttt ttccttgttc gcaccggaca cctccagtga 780

ccagacggca aggtttttat cccagtgtat attggaaaaa catgttatac ttttgacaat 840

ttaacgtgcc tagagctcaa attaaactaa taccataacg taatgcaact tacaacataa 900

ataaaggtca atgtttaatc cataaaaaaa aaaaaaaaaa aa 942

<210> 225
<211> 1370
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 225
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cgttacataa cttacggtaa atggcccgcc tggctgaccg cccaacgacc cccgcccatt 120

gacgtcaata atgacgtatg ttcccatagt aacgccaata gggactttcc attgacgtca 180

atgggtggag tatttacggt aaactgccca cttggcagta catcaagtgt atcatatgcc 240

aagtacgccc cctattgacg tcaatgacgg taaatggccc gcctggcatt atgcccagta 300

catgacctta tgggactttc ctacttggca gtacatctac gtattagtca tcgctattac 360

catggtgatg cggttttggc agtacatcaa tgggcgtgga tagcggtttg actcacgggg 420

atttccaagt ctccacccca ttgacgtcaa tgggagtttg ttttggcacc aaaatcaacg 480

ggactttcca aaatgtcgta acaactccgc cccattgacg caaatgggcg gtaggcgtgt 540

acggtgggag gtctatataa gcagagctgg tttagtgaac cgtcagatcg ttcactgccg 600

tataggcagg gcccagactg agcacgtgag ttttagagct agaaatagca agttaaaata 660

aggctagtcc gttatcaact tgaaaaagtg ggaccgagtc ggtcctctgc catcaaagcg 720

tgctcagtct gttttgtttt ggctgggttt ttccttgttc gcaccggaca cctccagtga 780

ccagacggca aggtttttat cccagtgtat attggaaaaa catgttatac ttttgacaat 840

ttaacgtgcc tagagctcaa attaaactaa taccataacg taatgcaact tacaacataa 900

ataaaggtca atgtttaatc cataaaaaaa aaaaaaaaaa aaacacactg ttttggctgg 960

gtttttcctt gttcgcaccg gacacctcca gtgaccagac ggcaaggttt ttatcccagt 1020

gtatattgga aaaacatgtt atacttttga caatttaacg tgcctagagc tcaaattaaa 1080

ctaataccat aacgtaatgc aacttacaac ataaataaag gtcaatgttt aatccataaa 1140

aaaaaaaaaa aaaaaatctc tctgttttgg ctgggttttt ccttgttcgc accggacacc 1200

tccagtgacc agacggcaag gtttttatcc cagtgtatat tggaaaaaca tgttatactt 1260

ttgacaattt aacgtgccta gagctcaaat taaactaata ccataacgta atgcaactta 1320

caacataaat aaaggtcaat gtttaatcca taaaaaaaaa aaaaaaaaaa 1370

<210> 226
<211> 807

<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 226
tagttattaa tagtaatcaa ttacggggtc attagttcat agcccatata tggagttccg 60

cgttacataa cttacggtaa atggcccgcc tggctgaccg cccaacgacc cccgcccatt 120

gacgtcaata atgacgtatg ttcccatagt aacgccaata gggactttcc attgacgtca 180

atgggtggag tatttacggt aaactgccca cttggcagta catcaagtgt atcatatgcc 240

aagtacgccc cctattgacg tcaatgacgg taaatggccc gcctggcatt atgcccagta 300

catgacctta tgggactttc ctacttggca gtacatctac gtattagtca tcgctattac 360

catggtgatg cggttttggc agtacatcaa tgggcgtgga tagcggtttg actcacgggg 420

atttccaagt ctccacccca ttgacgtcaa tgggagtttg ttttggcacc aaaatcaacg 480

ggactttcca aaatgtcgta acaactccgc cccattgacg caaatgggcg gtaggcgtgt 540

acggtgggag gtctatataa gcagagctgg tttagtgaac cgtcagatcg ttcactgccg 600

tataggcagg gcccagactg agcacgtgag ttttagagct agaaatagca agttaaaata 660

aggctagtcc gttatcaact tgaaaaagtg ggaccgagtc ggtcctctgc catcaaagcg 720

tgctcagtct gtttgtttca aaagtagact gtacgctaag ggtcatatct ttttttgttt 780

ggtttgtgtc ttggttggcg tcttaaa 807

<210> 227
<211> 743
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 227
ctaaggacca gcttctttgg gagagaacag acgcaggggc gggagggaaa aagggagagg 60

cagacgtcac ttccccttgg cggctctggc agcagattgg tcggttgagt ggcagaaagg 120

cagacgggga ctgggcaagg cactgtcggt gacatcacgg acagggcgac ttctatgtag 180

atgaggcagc gcagaggctg ctgcttcgcc acttgctgct tcaccacgaa ggagttcccg 240

tgccctggga gcgggttcag gaccgctgat cggaagtgag aatcccagct gtgtgtcagg 300

gctggaaagg gctcgggagt gcgcggggca agtgaccgtg tgtgtaaaga gtgaggcgta 360

tgaggctgtg tcggggcaga ggcccaagat ctcagttcac tgccgtatag gcagggccca 420

gactgagcac gtgagtttta gagctagaaa tagcaagtta aaataaggct agtccgttat 480

caacttgaaa aagtgggacc gagtcggtcc tctgccatca aagcgtgctc agtctgtttc 540

agcaagttca gagaaatctg aacttgctgg atttttggag cagggagatg gaataggagc 600

ttgctccgtc cactccacgc atcgacctgg tattgcagta cctccaggaa cggtgcaccc 660

actttctgga gtttcaaaag tagactgtac gctaagggtc atatcttttt ttgtttggtt 720

tgtgtcttgg ttggcgtctt aaa 743

<210> 228
<211> 141
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 228
ggcccagact gagcacgtga gttttagagc tagctcatga aaatgagcta gcaagttaaa 60

ataaggctag tccgttatca acttgaaaaa gtgggaccga gtcggtcctc tgccatcaaa 120

gcgtgctcag tctgtttttt t 141

<210> 229
<211> 129
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 229
ggcccagact gagcacgtga gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtcctctg ccatcaaagc gtgctcagtc 120

tgttttttt 129

<210> 230
<211> 197

<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 230
ggcccagact gagcacgtga gttttagagc tagaaatagc aagttaaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtcctctg ccatcaaagc gtgctcagtc 120

tgggccggca tggtcccagc ctcctcgctg gcgccggctg ggcaacatgc ttcggcatgg 180

cgaatgggac ttttttt 197

<210> 231
<211> 171
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 231
ggtgggagac gtcccaccgg cccagactga gcacgtgagt tttagagcta gaaatagcaa 60

gttaaaataa ggctagtccg ttatcaactt gaaaaagtgg gaccgagtcg gtcctctgcc 120

atcaaagctt cgaccgtgct cagtctggtg ggagacgtcc cacctttttt t 171

<210> 232
<211> 180
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 232
gagcagcatg gcgtcgctgc tcacggccca gactgagcac gtgagtttta gagctagaaa 60

tagcaagtta aaataaggct agtccgttat caacttgaaa aagtgggacc gagtcggtcc 120

tctgccatca aagcttcgac cgtgctcagt ctccatcagt tgacaccctg aggttttttt 180

<210> 233
<211> 188
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 233
gcagacctaa gtggugacat atggtctggg cccagactga gcacgtgagt tttagagcta 60

uacgtagcaa gttaaaataa ggctagtccg ttatcaactt uacgaagtgg gaccgagtcg 120

gtcctctgcc atcaaagctt cgaccgtgct cagtctgcat gcgattagaa ataatcgcat 180

gttttttt 188

<210> 234
<211> 125
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 234
tctgccatca aagctgcgac cgtgctcagt ctggtgggag acgtcccacc ggccggcatg 60

gtcccagcct cctcgctggc gccggctggg caacatgctt cggcatggcg aatgggactt 120

ttttt 125

<210> 235
<211> 328
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 235

Met Gly Lys Arg His Arg Asn Leu Ile Asp Gln Ile Thr Thr Trp Glu
1 5 10 15

Asn Leu Leu Asp Ala Tyr Arg Lys Thr Ser His Gly Lys Arg Arg Thr
            20 25 30

Trp Gly Tyr Leu Glu Phe Lys Glu Tyr Asp Leu Ala Asn Leu Leu Ala
        35 40 45

Leu Gln Ala Glu Leu Lys Ala Gly Asn Tyr Glu Arg Gly Pro Tyr Arg
    50 55 60

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Glu Phe Leu Val Tyr Glu Pro Lys Pro Arg Leu Ile Ser Ala Leu Glu
65                  70                  75                  80

Phe Lys Asp Arg Leu Val Gln His Ala Leu Cys Asn Ile Val Ala Pro
                85                  90                  95

Ile Phe Glu Ala Gly Leu Leu Pro Tyr Thr Tyr Ala Cys Arg Pro Asp
            100                 105                 110

Lys Gly Thr His Ala Gly Val Cys His Val Gln Ala Glu Leu Arg Arg
        115                 120                 125

Thr Arg Ala Thr His Phe Leu Lys Ser Asp Phe Ser Lys Phe Phe Pro
    130                 135                 140

Ser Ile Asp Arg Ala Ala Leu Tyr Ala Met Ile Asp Lys Lys Ile His
145                 150                 155                 160

Cys Ala Ala Thr Arg Arg Leu Leu Arg Val Val Leu Pro Asp Glu Gly
                165                 170                 175

Val Gly Ile Pro Ile Gly Ser Leu Thr Ser Gln Leu Phe Ala Asn Val
            180                 185                 190

Tyr Gly Gly Ala Val Asp Arg Leu Leu His Asp Glu Leu Lys Gln Arg
        195                 200                 205

His Trp Ala Arg Tyr Met Asp Asp Ile Val Val Leu Gly Asp Asp Pro
    210                 215                 220

Glu Glu Leu Arg Ala Val Phe Tyr Arg Leu Arg Asp Phe Ala Ser Glu
225                 230                 235                 240

Arg Leu Gly Leu Lys Ile Ser His Trp Gln Val Ala Pro Val Ser Arg
                245                 250                 255

Gly Ile Asn Phe Leu Gly Tyr Arg Ile Trp Pro Thr His Lys Leu Leu
            260                 265                 270
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Arg Lys Ser Ser Val Lys Arg Ala Lys Arg Lys Val Ala Asn Phe Ile
        275   280   285

Lys His Gly Glu Asp Glu Ser Leu Gln Arg Phe Leu Ala Ser Trp Ser
    290   295   300

Gly His Ala Gln Trp Ala Asp Thr His Asn Leu Phe Thr Trp Met Glu
305   310   315   320

Glu Gln Tyr Gly Ile Ala Cys His
                325

<210> 236
<211> 128
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 236

Met Glu Pro Ile Glu Glu Ala Thr Lys Cys Tyr Asp Gln Met Leu Ile
1   5   10   15

Val Glu Arg Tyr Glu Arg Val Ile Ser Tyr Leu Tyr Pro Ile Ala Gln
            20   25   30

Ser Ile Pro Arg Lys His Gly Val Ala Arg Glu Met Phe Leu Lys Cys
        35   40   45

Leu Leu Gly Gln Val Glu Leu Phe Ile Val Ala Gly Lys Ser Asn Gln
    50   55   60

Val Ser Lys Leu Tyr Ala Ala Asp Ala Gly Leu Ala Met Leu Arg Phe
65   70   75   80

Trp Leu Arg Phe Leu Ala Gly Ile Gln Lys Pro His Ala Met Thr Pro
                85   90   95

His Gln Val Glu Thr Ala Gln Val Leu Ile Ala Glu Val Gly Arg Ile
            100   105   110

Leu Gly Ser Trp Ile Ala Arg Val Asn Arg Lys Gly Gln Ala Gly Lys
115 120 125

<210> 237
<211> 169
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 237
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ggucagccgg uucuguccug cuucggcgaa cacguuacac gguucggcaa aacgucgauu 120

acugaaaaug gaaaggcggg gccgacuuca agggcaggcu gggaaauaa 169

<210> 238
<211> 149
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 238
accuucuugc auggcucugc caacgcuacg gcuuggcggg cuggccuuuc cucaauaggu 60

ggucagccgg uucuguccug cuucggcgaa cacguuacac gguucggcaa aacgucgauu 120

acugaaaaug gaaaggcggg gccgacuuc 149

<210> 239
<211> 85
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 239
accuucuugc auggcucugc caacgcuacg gcuuggcggg cuggccuuuc cucaauaggu 60

ggucaaaggg caggcuggga aauaa 85

<210> 240

<211> 160
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 240
cauggcucug ccaacgcuac ggcuuggcgg gcuggccuuu ccucaauagg uggucagccg 60

guucuguccu gcuucggcga acacguuaca cgguucggca aaacgucgau uacugaaaau 120

ggaaaggcgg ggccgacuuc aagggcaggc ugggaaauaa 160

<210> 241
<211> 140
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 241
cauggcucug ccaacgcuac ggcuuggcgg gcuggccuuu ccucaauagg uggucagccg 60

guucuguccu gcuucggcga acacguuaca cgguucggca aaacgucgau uacugaaaau 120

ggaaaggcgg ggccgacuuc 140

<210> 242
<211> 76
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 242
cauggcucug ccaacgcuac ggcuuggcgg gcuggccuuu ccucaauagg uggucaaagg 60

gcaggcuggg aaauaa 76

<210> 243
<211> 56
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 243
cauggcucug ccaacgcuac ggcuuggcgg gcuggccuuu ccucaauagg ugguca 56

<210> 244
<211> 169
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 244
accuucuugc auggcucugc caacgcuacg gcuuggcggg cuggccuuuc cucaauagau 60

gagccgccgg uucuguccug cuucggcgaa cacguuacac gguucggcaa aacgucgauu 120

acugaaaaug gaaaggcggg gccgacuuca agggcaggcu gggaaauaa 169

<210> 245
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 245

Gly Leu Asn Asp Ile Phe Glu Ala Gln Lys Ile Glu Trp His Glu
1 5 10 15

<210> 246
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 246

Glu Pro Glu Ala
1

<210> 247
<211> 26
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 247

Lys Arg Arg Trp Lys Lys Asn Phe Ile Ala Val Ser Ala Ala Asn Arg
1   5   10   15

Phe Lys Lys Ile Ser Ser Ser Gly Ala Leu
            20   25

<210> 248
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 248

Glu Glu Glu Glu Glu Glu
1   5

<210> 249
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 249

Gly Ala Pro Val Pro Tyr Pro Asp Pro Leu Glu Pro Arg
1   5   10

<210> 250

<400> 250
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<210> 251

<400> 251
000

<210> 252
<211> 1

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 252

His
1

<210> 253
<211> 2
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 253

His His
1

<210> 254
<211> 3
<212> PRT
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<220>
<223> Synthetic

<400> 254

His His His
1

<210> 255
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 255

His His His His
1

<210> 256
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 256

His His His His His
1   5

<210> 257
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 257

His His His His His His
1   5

<210> 258
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 258

His His His His His His His
1   5

<210> 259
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 259

His His His His His His His His
1   5

<210> 260
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 260

His His His His His His His His His
1   5

<210> 261
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 261

His His His His His His His His His His
1   5   10

<210> 262
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 262

His His His His His His His His His His His His His His His
1   5   10   15

His His His His His His His His His
            20   25

<210> 263

<400> 263

000

<210> 264
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 264

Thr Lys Glu Asn Pro Arg Ser Asn Gln Glu Glu Ser Tyr Asp Asp Asn
1   5   10   15

Glu Ser

<210> 265
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 265

Thr Glu Thr Ser Gln Val Ala Pro Ala
1   5

<210> 266
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 266

Lys Glu Thr Ala Ala Ala Lys Phe Glu Arg Gln His Met Asp Ser
1   5   10   15

<210> 267
<211> 38
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 267

Met Asp Glu Lys Thr Thr Gly Trp Arg Gly Gly His Val Val Glu Gly
1   5   10   15

Leu Ala Gly Glu Leu Glu Gln Leu Arg Ala Arg Leu Glu His His Pro
            20   25   30

Gln Gly Gln Arg Glu Pro
        35

<210> 268
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 268

Ser Leu Ala Glu Leu Leu Asn Ala Gly Leu Gly Gly Ser
1   5   10

<210> 269
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 269

Thr Gln Asp Pro Ser Arg Val Gly
1   5

<210> 270
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 270

Pro Asp Arg Val Arg Ala Val Ser His Trp Ser Ser
1 5 10

<210> 271
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 271

Trp Ser His Pro Gln Phe Glu Lys
1 5

<210> 272
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 272

Cys Cys Pro Gly Cys Cys
1 5

<210> 273
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 273

Glu Val His Thr Asn Gln Asp Pro Leu Asp
1 5 10

<210> 274

<400> 274
000

<210> 275
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 275

Tyr Thr Asp Ile Glu Met Asn Arg Leu Gly Lys
1 5 10

<210> 276
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 276

Asp Leu Tyr Asp Asp Asp Asp Lys
1 5

<210> 277
<211> 65
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 277
accuucuugc auggcucugc caacgcuacg gcuuggcggg cuggccuuuc cucaauaggu 60

gguca 65

<210> 278
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 278

Asp Thr Tyr Arg Tyr Ile

1 5

<210> 279
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 279

Thr Asp Phe Tyr Leu Lys
1 5

<210> 280
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 280

Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly
1 5 10

<210> 281
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 281

Gln Tyr Pro Ala Leu Thr
1 5

<210> 282
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 282

Ser Ser Thr Ser Ser Asp Phe Arg Asp Arg
1 5 10

<210> 283
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 283

Lys Asp His Leu Ile His Asn Val His Lys Glu Phe His Ala His Ala
1 5 10 15

His Asn Lys

<210> 284
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 284

Gln Pro Glu Leu Ala Pro Glu Asp
1 5

<210> 285
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 285

Arg Arg Arg Arg Arg
1 5

<210> 286

<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 286

Cys Cys Cys Cys
1

<210> 287
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 287

Phe Phe Phe Phe Phe Phe Phe Phe Phe Phe Phe
1 5 10

<210> 288
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 288

Asn Ala Asn Asn Pro Asp Trp Asp Phe
1 5

<210> 289

<400> 289
000

<210> 290

<400> 290
000

<210> 291
<211> 253

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 291

Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1 5 10 15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
20 25 30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
35 40 45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
50 55 60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65 70 75 80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
85 90 95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
100 105 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
115 120 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
130 135 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145 150 155 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
165 170 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr

180 185 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
195 200 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
210 215 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225 230 235 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
245 250

<210> 292
<211> 2365
<212> DNA
<213> Homo sapiens

<400> 292
gcgaaccttg gctgctggat gctggttctc tttgtggcca catggagtga cctgggcctc 60

tgcaagaagc gcccgaagcc tggaggatgg aacactgggg gcagccgata cccggggcag 120

ggcagccctg gaggcaaccg ctacccacct cagggcggtg gtggctgggg gcagcctcat 180

ggtggtggct gggggcagcc tcatggtggt ggctgggggc agccccatgg tggtggctgg 240

ggacagcctc atggtggtgg ctggggtcaa ggaggtggca cccacagtca gtggaacaag 300

ccgagtaagc caaaaaccaa catgaagcac atggctggtg ctgcagcagc tggggcagtg 360

gtgggggggcc ttggcggcta catgctggga agtgccatga gcaggcccat catacatttc 420

ggcagtgact atgaggaccg ttactatcgt gaaaacatgc accgttaccc caaccaagtg 480

tactacaggc ccatggatga gtacagcaac cagaacaact ttgtgcacga ctgcgtcaat 540

atcacaatca agcagcacac ggtcaccaca accaccaagg gggagaactt caccgagacc 600

gacgttaaga tgatggagcg cgtggttgag cagatgtgta tcacccagta cgagagggaa 660

tctcaggcct attaccagag aggatcgagc atggtcctct tctcctctcc acctgtgatc 720

ctcctgatct ctttcctcat cttcctgata gtgggatgag gaaggtcttc ctgttttcac 780

catctttcta atctttttcc agcttgaggg aggcggtatc cacctgcagc ccttttagtg 840

gtggtgtctc actctttctt ctctctttgt cccggatagg ctaatcaata cccttggcac 900

tgatgggcac tggaaaacat agagtagacc tgagatgctg gtcaagcccc ctttgattga 960

gttcatcatg agccgttgct aatgccaggc cagtaaaagt ataacagcaa ataaccattg 1020

gttaatctgg acttattttt ggacttagtg caacaggttg aggctaaaac aaatctcaga 1080

acagtctgaa ataccttttgc ctggatacct ctggctcctt cagcagctag agctcagtat 1140

actaatgccc tatcttagta gagatttcat agctatttag agatattttc cattttaaga 1200

aaacccgaca acatttctgc caggtttgtt aggaggccac atgatactta ttcaaaaaaa 1260

tcctagagat tcttagctct tgggatgcag gctcagcccg ctggagcatg agctctgtgt 1320

gtaccgagaa ctggggtgat gttttacttt tcacagtatg ggctacacag cagctgttca 1380

acaagagtaa atattgtcac aacactgaac ctctggctag aggacatatt cacagtgaac 1440

ataactgtaa catatatgaa aggcttctgg gacttgaaat caaatgtttg ggaatggtgc 1500

ccttggaggc aacctcccat tttagatgtt taaaggaccc tatatgtggc attcctttct 1560

ttaaactata ggtaattaag gcagctgaaa agtaaattgc cttctagaca ctgaaggcaa 1620

atctcctttg tccatttacc tggaaaccag aatgattttg acatacagga gagctgcagt 1680

tgtgaaagca ccatcatcat agaggatgat gtaattaaaa aatggtcagt gtgcaaagaa 1740

aagaactgct tgcatttctt tatttctgtc tcataattgt caaaaaccag aattaggtca 1800

agttcatagt ttctgtaatt ggcttttgaa tcaaagaata gggagacaat ctaaaaaata 1860

tcttaggttg gagatgacag aaatatgatt gatttgaagt ggaaaaagaa attctgttaa 1920

tgttaattaa agtaaaatta ttccctgaat tgtttgatat tgtcacctag cagatatgta 1980

ttacttttct gcaatgttat tattggcttg cactttgtga gtattctatg taaaaatata 2040

tatgtatata aaatatatat tgcataggac agacttagga gttttgttta gagcagttaa 2100

catctgaagt gtctaatgca ttaacttttg taaggtactg aatacttaat atgtgggaaa 2160

ccctttgcg tggtccttag gcttacaatg tgcactgaat cgtttcatgt aagaatccaa 2220

agtggacacc attaacaggt ctttgaaata tgcatgtact ttatattttc tatatttgta 2280

actttgcatg ttcttgtttt gttatataaa aaaattgtaa atgtttaata tctgactgaa 2340

attaaacgag cgaagatgag cacca 2365

<210> 293
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 293

Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1 5 10 15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
20 25 30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
35 40 45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
50 55 60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65 70 75 80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
85 90 95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
100 105 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
115 120 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
130 135 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145 150 155 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
165 170 175

```
His Asn Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
```

<210> 294
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 294

```
Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                   10                  15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95
```

```
Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Lys Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
```

<210> 295
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 295

```
Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
```

```
1               5                   10                  15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Lys Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220
```

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225 230 235 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
245 250

<210> 296
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 296

Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1 5 10 15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
20 25 30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
35 40 45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
50 55 60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65 70 75 80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
85 90 95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
100 105 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
115 120 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp

```
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Ala Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
```

<210> 297
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 297

```
Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                   10                  15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45
```

```
Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Lys Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
```

<210> 298

<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 298

Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1 5 10 15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
20 25 30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
35 40 45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
50 55 60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65 70 75 80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
85 90 95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
100 105 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
115 120 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
130 135 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145 150 155 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
165 170 175

```
His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Gly Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
```

<210> 299
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 299

```
Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                   10                  15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95
```

```
Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Ile Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
```

<210> 300
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 300

```
Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                   10                  15
```

```
Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu His
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220
```

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225 230 235 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
245 250

<210> 301
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 301

Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1 5 10 15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
20 25 30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
35 40 45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
50 55 60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65 70 75 80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
85 90 95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
100 105 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
115 120 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
130 135 140

```
Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160


Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175


His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190


Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205


Val Ile Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220


Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240


Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250


<210>  302
<211>  253
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  302

Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                   10                  15


Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30


Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45


Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
```

```
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Gln Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250

<210>  303
<211>  253
```

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 303

Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1 5 10 15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
20 25 30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
35 40 45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
50 55 60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65 70 75 80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
85 90 95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
100 105 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
115 120 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
130 135 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145 150 155 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
165 170 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr

```
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Arg Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
```

<210> 304
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 304

```
Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                   10                  15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95
```

```
Ser Gln Trp Asn Lys Leu Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
```

<210> 305
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 305

```
Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                   10                  15
```

```
Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95

Ser Gln Trp Asn Lys Pro Ser Lys Leu Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220
```

```
Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240


Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250


<210>  306
<211>  253
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  306

Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                   10                  15


Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30


Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45


Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60


Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80


Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95


Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110


Ala Gly Ala Ala Val Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125


Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140
```

```
Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160


Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175


His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190


Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205


Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220


Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240


Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250


<210>  307
<211>  253
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  307

Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                   10                  15


Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30


Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45


Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60
```

```
Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125

Met Leu Val Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
```

<210> 308
<211> 253
<212> PRT

<213> Artificial Sequence

<220>
<223> Synthetic

<400> 308

Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1 5 10 15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
20 25 30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
35 40 45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
50 55 60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65 70 75 80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
85 90 95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
100 105 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
115 120 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
130 135 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145 150 155 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Gly
165 170 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
180 185 190

```
Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205


Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220


Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240


Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250


<210>  309
<211>  253
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  309

Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                   10                  15


Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30


Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45


Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60


Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80


Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95


Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
```

100 105 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
115 120 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
130 135 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145 150 155 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
165 170 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln Arg Thr Val Thr Thr Thr
180 185 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
195 200 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
210 215 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225 230 235 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
245 250

<210> 310

<400> 310
000

<210> 311
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 311

```
Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                  10                  15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Ser Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205
```

```
Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
```

<210> 312
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 312

```
Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                   10                  15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125
```

```
Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asn Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
```

<210> 313
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 313

```
Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                   10                  15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45
```

```
Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Pro Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
```

<210> 314
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 314

Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1 5 10 15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
20 25 30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
35 40 45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
50 55 60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65 70 75 80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
85 90 95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
100 105 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
115 120 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
130 135 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145 150 155 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
165 170 175

```
His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Arg Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
```

<210> 315
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 315

```
Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                   10                  15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
```

```
                85                  90                  95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Thr Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
```

<210> 316
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 316

```
Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                  10                  15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Ser Tyr
        115                 120                 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
```

```
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250

<210>  317
<211>  253
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  317

Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                   10                  15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Val Tyr
        115                 120                 125
```

```
Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
```

<210> 318
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 318

```
Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                   10                  15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45
```

```
Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125

Val Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
```

<210> 319
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 319

Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1 5 10 15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
20 25 30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
35 40 45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
50 55 60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65 70 75 80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
85 90 95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
100 105 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
115 120 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
130 135 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145 150 155 160

Val Tyr Tyr Arg Pro Met Gly Glu Tyr Ser Asn Gln Asn Asn Phe Val
165 170 175

```
His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
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<210> 320
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 320

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Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                   10                  15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95
```

```
Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asn Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
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<210> 321
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 321

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Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
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```
1               5                   10                  15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Ser Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220
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Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225 230 235 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
245 250

<210> 322
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 322

Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1 5 10 15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
20 25 30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
35 40 45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
50 55 60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65 70 75 80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
85 90 95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
100 105 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
115 120 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp

```
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Lys Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250

<210>  323
<211>  253
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  323

Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1               5                   10                  15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
            20                  25                  30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
        35                  40                  45
```

```
Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
    50                  55                  60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65                  70                  75                  80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
                85                  90                  95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
            100                 105                 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
        115                 120                 125

Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Ser Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
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<210> 324

<211> 119
<212> DNA
<213> Homo sapiens

<400> 324
gcagtggtgg ggggccttgg gttttagagc tagaaatagc aagttaaaat aaggctagtc 60

cgttatcaac ttgaaaaagt ggcaccgagt cggtgcatgt agacgccaag gccccccac 119

<210> 325
<211> 119
<212> DNA
<213> Homo sapiens

<400> 325
tgtgtatcac ccagtacgag gttttagagc tagaaatagc aagttaaaat aaggctagtc 60

cgttatcaac ttgaaaaagt ggcaccgagt cggtgcagat tctctcttgt actgggtga 119

<210> 326
<211> 119
<212> DNA
<213> Bos Taurus

<400> 326
gcagtggtag ggggccttgg gttttagagc tagaaatagc aagttaaaat aaggctagtc 60

cgttatcaac ttgaaaaagt ggcaccgagt cggtgcatgt agacaccaag gccccctac 119

<210> 327
<211> 119
<212> DNA
<213> Mesocricetus auratus

<400> 327
gccgtggtgg ggggccttgg gttttagagc tagaaatagc aagttaaaat aaggctagtc 60

cgttatcaac ttgaaaaagt ggcaccgagt cggtgcatgt agacaccaag gccccccac 119

<210> 328
<211> 119
<212> DNA
<213> Mus musculus

<400> 328
gcagtagtgg ggggccttgg gttttagagc tagaaatagc aagttaaaat aaggctagtc 60

cgttatcaac ttgaaaaagt ggcaccgagt cggtgcatgt agacaccaag gccccccac 119

<210> 329
<211> 119
<212> DNA
<213> Odocoileus virginianus

<400> 329
gcagtggtag ggggccttgg gttttagagc tagaaatagc aagttaaaat aaggctagtc 60

cgttatcaac ttgaaaaagt ggcaccgagt cggtgcatgt agacaccaag gccccctac 119

<210> 330
<211> 119
<212> DNA
<213> Unknown

<220>
<223> Mustela putorius furo

<400> 330
gcggttgtgg ggggcctggg gttttagagc tagaaatagc aagttaaaat aaggctagtc 60

cgttatcaac ttgaaaaagt ggcaccgagt cggtgcatgt agacgcccag gccccccac 119

<210> 331
<211> 122
<212> DNA
<213> Unknown

<220>
<223> Polyomavirus simian virus

<400> 331
aacttgttta ttgcagctta taatggttac aaataaagca atagcatcac aaatttcaca 60

aataaagcat ttttttcact gcattctagt tgtggtttgt ccaaactcat caatgtatct 120

ta 122

<210> 332
<211> 252
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 332
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tctaagatac 120

attgatgagt ttggacaaac cacaactaga atgcagtgaa aaaaatgctt tatttgtgaa 180

atttgtgatg ctattgcttt atttgtaacc attataagct gcaataaaca agttctatgg 240

ccctgactgg aa 252

<210> 333
<211> 146
<212> DNA
<213> Unknown

<220>
<223> Polyomavirus simian virus

<400> 333
ccatggccca acttgtttat tgcagcttat aatggttaca ataaagcaa tagcatcaca 60

aatttcacaa ataaagcatt tttttcactg cattctagtt gtggtttgtc caaactcatc 120

aatgtatctt atcatgtctg gatctc 146

<210> 334
<211> 276
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 334
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tcgagatcca 120

gacatgataa gatacattga tgagtttgga caaaccacaa ctagaatgca gtgaaaaaaa 180

tgctttattt gtgaaatttg tgatgctatt gctttatttg taaccattat aagctgcaat 240

aaacaagttg ggccatggct atggccctga ctggaa 276

<210> 335
<211> 244
<212> DNA
<213> Unknown

<220>
<223> Polyomavirus simian virus

<400> 335
tgatcataat caagccatat cacatctgta gaggtttact tgctttaaaa aacctccaca 60

cctccccctg aacctgaaac ataaaatgaa tgcaattgtt gttgttaact tgtttattgc 120

agcttataat ggttacaaat aaagcaatag catcacaaat ttcacaaata aagcattttt 180

ttcactgcat tctagttgtg gtttgtccaa actcatcaat gtatcttatc atgtctggat 240

ctgc 244

<210> 336
<211> 374
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 336
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tcgcagatcc 120

agacatgata agatacattg atgagtttgg acaaaccaca actagaatgc agtgaaaaaa 180

atgctttatt tgtgaaattt gtgatgctat tgctttattt gtaaccatta taagctgcaa 240

taaacaagtt aacaacaaca attgcattca ttttatgttt caggttcagg gggaggtgtg 300

gaggtttttt aaagcaagta aacctctaca gatgtgatat ggcttgatta tgatcactat 360

ggccctgact ggaa 374

<210> 337
<211> 479
<212> DNA
<213> Homo sapiens

<400> 337
acgggtggca tccctgtgac ccctccccag tgcctctcct ggccctggaa gttgccactc 60

cagtgcccac cagccttgtc ctaataaaat taagttgcat cattttgtct gactaggtgt 120

ccttctataa tattatgggg tggaggggGg tggtatggag caaggggcaa gttgggaaga 180

caacctgtag ggcctgcggg gtctattggg aaccaagctg gagtgcagtg gcacaatctt 240

ggctcactgc aatctccgcc tcctgggttc aagcgattct cctgcctcag cctcccgagt 300

tgttgggatt ccaggcatgc atgaccaggc tcagctaatt tttgtttttt tggtagagac 360

ggggtttcac catattggcc aggctggtct ccaactccta atctcaggtg atctacccac 420

cttggcctcc caaattgctg ggattacagg cgtgaaccac tgctcccttc cctgtcctt 479

<210> 338
<211> 609
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 338
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tcaaggacag 120

ggaagggagc agtggttcac gcctgtaatc ccagcaattt gggaggccaa ggtgggtaga 180

tcacctgaga ttaggagttg gagaccagcc tggccaatat ggtgaaaccc cgtctctacc 240

aaaaaaacaa aaattagctg agcctggtca tgcatgcctg gaatcccaac aactcgggag 300

gctgaggcag gagaatcgct tgaacccagg aggcggagat tgcagtgagc caagattgtg 360

ccactgcact ccagcttggt tcccaataga ccccgcaggc cctacaggtt gtcttcccaa 420

cttgcccctt gctccatacc acccccctcc accccataat attatagaag gacacctagt 480

cagacaaaat gatgcaactt aattttatta ggacaaggct ggtgggcact ggagtggcaa 540

cttccagggc caggagaggc actggggagg ggtcacaggg atgccacccg tctatggccc 600

tgactggaa 609

<210> 339
<211> 228
<212> DNA
<213> Bos bovis

<400> 339
cgactgtgcc ttctagttgc cagccatctg ttgtttgccc ctcccccgtg ccttccttga 60

ccctggaagg tgccactccc actgtccttt cctaataaaa tgaggaaatt gcatcgcatt 120

gtctgagtag gtgtcattct attctggggg gtggggtggg gcaggacagc aaggggggagg 180

attgggaaga caatagcagg catgctgggg atgcggtggg ctctatgg 228

<210> 340
<211> 358
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 340
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tcccatagag 120

cccaccgcat ccccagcatg cctgctattg tcttcccaat cctccccctt gctgtcctgc 180

cccaccccac cccccagaat agaatgacac ctactcagac aatgcgatgc aatttcctca 240

ttttattagg aaaggacagt gggagtggca ccttccaggg tcaaggaagg cacgggggag 300

gggcaaacaa cagatggctg gcaactagaa ggcacagtcg ctatggccct gactggaa 358

<210> 341
<211> 527
<212> DNA
<213> Unknown

<220>
<223> Rabbit beta-globin (rbGlob)

<400> 341
ttcactcctc aggtgcaggc tgcctatcag aaggtggtgg ctggtgtggc caatgccctg 60

gctcacaaat accactgaga tcttttttccc tctgccaaaa attatgggga catcatgaag 120

cccccttgagc atctgacttc tggctaataa aggaaattta ttttcattgc aatagtgtgt 180

tggaattttt tgtgtctctc actcggaagg acatatggga gggcaaatca tttaaaacat 240

cagaatgagt atttggttta gagtttggca acatatgccc atatgctggc tgccatgaac 300

aaaggttggc tataaagagg tcatcagtat atgaaacagc cccctgctgt ccattcctta 360

ttccatagaa aagccttgac ttgaggttag attttttta tattttgttt tgtgttattt 420

ttttctttaa catccctaaa attttcctta catgttttac tagccagatt tttcctcctc 480

tcctgactac tcccagtcat agctgtccct cttctcttat ggagatc 527

<210> 342
<211> 657
<212> DNA

<213> Artificial Sequence

<220>
<223> Synthetic

<400> 342
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tcgatctcca 120

taagagaaga gggacagcta tgactgggag tagtcaggag aggaggaaaa atctggctag 180

taaaacatgt aaggaaaatt ttagggatgt taaagaaaaa aataacacaa aacaaaatat 240

aaaaaaaatc taacctcaag tcaaggcttt tctatggaat aaggaatgga cagcaggggg 300

ctgtttcata tactgatgac ctctttatag ccaacctttg ttcatggcag ccagcatatg 360

ggcatatgtt gccaaactct aaaccaaata ctcattctga tgttttaaat gatttgccct 420

cccatatgtc cttccgagtg agagacacaa aaaattccaa cacactattg caatgaaaat 480

aaatttcctt tattagccag aagtcagatg ctcaaggggc ttcatgatgt ccccataatt 540

tttggcagag ggaaaaagat ctcagtggta tttgtgagcc agggcattgg ccacaccagc 600

caccaccttc tgataggcag cctgcacctg aggagtgaac tatggccctg actggaa 657

<210> 343
<211> 271
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 343
gggggaggct aactgaaaca cggaaggaga caataccgga aggaacccgc gctatgacgg 60

caataaaaag acagaataaa acgcacgggt gttgggtcgt ttgttcataa acgcggggtt 120

cggtcccagg gctggcactc tgtcgatacc ccaccgagac cccattgggg ccaatacgcc 180

cgcgtttctt ccttttcccc accccacccc ccaagttcgg gtgaaggccc agggctcgca 240

gccaacgtcg gggcggcagg ccctgccata g 271

<210> 344
<211> 401
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 344
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tcctatggca 120

gggcctgccg ccccgacgtt ggctgcgagc cctgggcctt cacccgaact tgggggggtgg 180

ggtggggaaa aggaagaaac gcgggcgtat tggccccaat ggggtctcgg tggggtatcg 240

acagagtgcc agccctggga ccgaaccccg cgtttatgaa caaacgaccc aacacccgtg 300

cgttttattc tgtcttttta ttgccgtcat agcgcgggtt ccttccggta ttgtctcctt 360

ccgtgtttca gttagcctcc cccctatggc cctgactgga a   401

<210> 345
<211> 171
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 345
tagggtcatg aaggtttttc ttttcctgag aaaacaacac gtattgtttt ctcaggtttt 60

gctttttggc ctttttctag cttaaaaaaa aaaaaagcaa aagatgctgg tggttggcac 120

tcctggtttc caggacgggg ttcaaatccc tgcggcgtct ttgctttgac t   171

<210> 346
<211> 301
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 346
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tcagtcaaag 120

caaagacgcc gcagggattt gaaccccgtc ctggaaacca ggagtgccaa ccaccagcat 180

cttttgcttt ttttttttt aagctagaaa aaggccaaaa agcaaaacct gagaaaacaa 240

tacgtgttgt tttctcagga aaagaaaaac cttcatgacc ctactatggc cctgactgga 300

a 301

<210> 347
<211> 208
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 347
tgttttggct gggtttttcc ttgttcgcac cggacacctc cagtgaccag acggcaaggt 60

ttttatccca gtgtatattg gaaaaacatg ttatactttt gacaatttaa cgtgcctaga 120

gctcaaatta aactaatacc ataacgtaat gcaacttaca acataaataa aggtcaatgt 180

ttaatccata aaaaaaaaaa aaaaaaaa 208

<210> 348
<211> 338
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 348
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tctttttttt 120

ttttttttt tatggattaa acattgacct ttatttatgt tgtaagttgc attacgttat 180

ggtattagtt taatttgagc tctaggcacg ttaaattgtc aaaagtataa catgtttttc 240

caatatacac tgggataaaa accttgccgt ctggtcactg gaggtgtccg gtgcgaacaa 300

ggaaaaaccc agccaaaaca ctatggccct gactggaa 338

<210> 349
<211> 636
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 349
tgttttggct gggtttttcc ttgttcgcac cggacacctc cagtgaccag acggcaaggt 60

ttttatccca gtgtatattg gaaaaacatg ttatactttt gacaatttaa cgtgcctaga 120

gctcaaatta aactaatacc ataacgtaat gcaacttaca acataaataa aggtcaatgt 180

ttaatccata aaaaaaaaaa aaaaaaaaac acactgtttt ggctgggttt ttccttgttc 240

gcaccggaca cctccagtga ccagacggca aggtttttat cccagtgtat attggaaaaa 300

catgttatac ttttgacaat ttaacgtgcc tagagctcaa attaaactaa taccataacg 360

taatgcaact tacaacataa ataaaggtca atgtttaatc cataaaaaaa aaaaaaaaaa 420

aatctctctg ttttggctgg gtttttcctt gttcgcaccg gacacctcca gtgaccagac 480

ggcaaggttt ttatcccagt gtatattgga aaaacatgtt atacttttga caatttaacg 540

tgcctagagc tcaaattaaa ctaataccat aacgtaatgc aacttacaac ataaataaag 600

gtcaatgttt aatccataaa aaaaaaaaaa aaaaaa 636

<210> 350
<211> 766
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 350
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tctttttttt 120

ttttttttt tatggattaa acattgacct ttatttatgt tgtaagttgc attacgttat 180

ggtattagtt taatttgagc tctaggcacg ttaaattgtc aaaagtataa catgtttttc 240

caatatacac tgggataaaa accttgccgt ctggtcactg gaggtgtccg gtgcgaacaa 300

ggaaaaaccc agccaaaaca gagagatttt ttttttttt tttttatgga ttaaacattg 360

acctttattt atgttgtaag ttgcattacg ttatggtatt agtttaattt gagctctagg 420

cacgttaaat tgtcaaaagt ataacatgtt tttccaatat acactgggat aaaaaccttg 480

ccgtctggtc actggaggtg tccggtgcga acaaggaaaa acccagccaa aacagtgtgt 540

ttttttttt ttttttttta tggattaaac attgaccttt atttatgttg taagttgcat 600

tacgttatgg tattagttta atttgagctc taggcacgtt aaattgtcaa aagtataaca 660

tgtttttcca atatacactg ggataaaaac cttgccgtct ggtcactgga ggtgtccggt 720

gcgaacaagg aaaaacccag ccaaaacact atggccctga ctggaa 766

<210> 351
<211> 204
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 351
cagcaagttc agagaaatct gaacttgctg gatttttgga gcagggagat ggaataggag 60

cttgctccgt ccactccacg catcgacctg gtattgcagt acctccagga acggtgcacc 120

cactttctgg agtttcaaaa gtagactgta cgctaagggt catatctttt tttgtttggt 180

ttgtgtcttg gttggcgtct taaa 204

<210> 352
<211> 334
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 352
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tctttaagac 120

gccaaccaag acacaaacca aacaaaaaaa gatatgaccc ttagcgtaca gtctactttt 180

gaaactccag aaagtgggtg caccgttcct ggaggtactg caataccagg tcgatgcgtg 240

gagtggacgg agcaagctcc tattccatct ccctgctcca aaaatccagc aagttcagat 300

ttctctgaac ttgctgctat ggccctgact ggaa 334

<210> 353
<211> 73
<212> DNA
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 353
gtttcaaaag tagactgtac gctaagggtc atatcttttt ttgtttggtt tgtgtcttgg 60

ttggcgtctt aaa 73

<210> 354
<211> 203
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 354
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tctttaagac 120

gccaaccaag acacaaacca aacaaaaaaa gatatgaccc ttagcgtaca gtctactttt 180

gaaacctatg gccctgactg gaa 203

<210> 355
<211> 73
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 355
gcccggctag ctcagtcggt agagcatgag actcttaatc tcagggtcgt gggttcgagc 60

cccacgttgg gcg 73

<210> 356
<211> 203
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 356
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tccgcccaac 120

gtggggctcg aacccacgac cctgagatta agagtctcat gctctaccga ctgagctagc 180

cgggcctatg gccctgactg gaa 203

<210> 357
<211> 49
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 357
gagacggtcg ggtccagata ttcgtatctg tcgagtagag tgtgggctc 49

<210> 358
<211> 179
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 358
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tcgagcccac 120

actctactcg acagatacga atatctggac ccgaccgtct cctatggccc tgactggaa 179

<210> 359
<211> 98
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 359
gacgcaactg aatgaaatgg tgaaggacgg gtccaggtgt ggctgcttcg gcagtgcagc 60

ttgttgagta gagtgtgagc tccgtaacta gtcgcgtc 98

<210> 360
<211> 228
<212> DNA
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 360
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tcgacgcgac 120

tagttacgga gctcacactc tactcaacaa gctgcactgc cgaagcagcc acacctggac 180

ccgtccttca ccatttcatt cagttgcgtc ctatggccct gactggaa 228

<210> 361
<211> 95
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 361
gatgtaactg aatgaaatgg tgaaggacgg gtccagtagg ctgcttcggc agcctacttg 60

ttgagtagag tgtgagctcc gtaactagtt acatc 95

<210> 362
<211> 225
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 362
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tcgatgtaac 120

tagttacgga gctcacactc tactcaacaa gtaggctgcc gaagcagcct actggacccg 180

tccttcacca tttcattcag ttacatccta tggccctgac tggaa 225

<210> 363
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 363

ggcacgtacg aagggacggt gcggagagga gagtacgtgc 40

<210> 364
<211> 170
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 364
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tcgcacgtac 120

tctcctctcc gcaccgtccc ttcgtacgtg ccctatggcc ctgactggaa 170

<210> 365
<211> 68
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 365
ggccggcatg gtcccagcct cctcgctggc gccggctggg caacatgctt cggcatggcg 60

aatgggac 68

<210> 366
<211> 198
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 366
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tcgtcccatt 120

cgccatgccg aagcatgttg cccagccggc gccagcgagg aggctgggac catgccggcc 180

ctatggccct gactggaa 198

<210> 367
<211> 25

<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 367
ggactctagg actggacttt ggact 25

<210> 368
<211> 155
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 368
atccttccag tcagggccat gtttgagagc tagaaatagc aagtttaaat aaggctagtc 60

cgttatcaac ttgaaaaagt gggaccgagt cggtccacct gaaccgtata tcagtccaaa 120

gtccagtcct agagtcccta tggccctgac tggaa 155

<210> 369
<211> 1719
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 369
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ttggcatgac aagttccagg ctttggtttt cgctgctgct ggcggcagcg ttcgcaggac 120

gggcgacggc cctctggccc tggcctcaga acttccaaac ctccgaccag cgctacgtcc 180

tttacccgaa caactttcaa ttccagtacg atgtcagctc ggccgcgcag cccggctgct 240

cagtcctcga cgaggccttc cagcgctatc gtgacctgct tttcggttcc gggtcttggc 300

cccgtcctta cctcacaggg aaacggcata cactggagaa gaatgtgttg gttgtctctg 360

tagtcacacc tggatgtaac cagcttccta ctttggagtc agtggagaat tataccctga 420

ccataaatga tgaccagtgt ttactcctct ctgagactgt ctggggagct ctccgaggtc 480

tggagacttt tagccagctt gtttggaaat ctgctgaggg cacattcttt atcaacaaga 540

ctgagattga ggactttccc cgctttcctc accggggctt gctgttggat acatctcgcc 600

attacctgcc actctctagc atcctggaca ctctggatgt catggcgtac aataaattga 660

acgtgttcca ctggcatctg gtagatgatc cttccttccc atatgagagc ttcacttttc 720

cagagctcat gagaaagggg tcctacaacc ctgtcaccca catctacaca gcacaggatg 780

tgaaggaggt cattgaatac gcacggctcc ggggtatccg tgtgcttgca gagtttgaca 840

ctcctggcca cactttgtcc tggggaccag gtatccctgg attactgact ccttgctacc 900

ctgggtctga gccctctggc acctttggac cagtgaatcc cagtctcaat aatacctatg 960

agttcatgag cacattcttc ttagaagtca gctctgtctt cccagatttt tatcttcatc 1020

ttggaggaga tgaggttgat ttcacctgct ggaagtccaa cccagagatc caggacttta 1080

tgaggaagaa aggcttcggt gaggacttca agcagctgga gtccttctac atccagacgc 1140

tgctggacat cgtctcttct tatggcaagg gctatgtggt gtggcaggag gtgtttgata 1200

ataaagtaaa gattcagcca gacacaatca tacaggtgtg gcgagaggat attccagtga 1260

actatatgaa ggagctggaa ctggtcacca aggccggctt ccgggccctt ctctctgccc 1320

cctggtacct gaaccgtata tcctatggcc ctgactggaa ggatttctac gtagtggaac 1380

ccctggcatt tgaaggtacc cctgagcaga aggctctggt gattggtgga gaggcttgta 1440

tgtggggaga atatgtggac aacacaaacc tggtccccag gctctggccc agagcagggg 1500

ctgttgccga aaggctgtgg agcaacaagt tgacatctga cctgacattt gcctatgaac 1560

gtttgtcaca cttccgctgt gagttgctga ggcgaggtgt ccaggcccaa cccctcaatg 1620

taggcttctg tgagcaggag tttgaacaga cctgcccaac tttcttgtac aaagttggca 1680

ttataagaaa gcattgctta tcaatttgtt gcaacgaac 1719

<210> 370
<211> 529
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 370

Met Thr Ser Ser Arg Leu Trp Phe Ser Leu Leu Leu Ala Ala Ala Phe
1 5 10 15

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Ala Gly Arg Ala Thr Ala Leu Trp Pro Trp Pro Gln Asn Phe Gln Thr
            20                  25                  30

Ser Asp Gln Arg Tyr Val Leu Tyr Pro Asn Asn Phe Gln Phe Gln Tyr
        35                  40                  45

Asp Val Ser Ser Ala Ala Gln Pro Gly Cys Ser Val Leu Asp Glu Ala
    50                  55                  60

Phe Gln Arg Tyr Arg Asp Leu Leu Phe Gly Ser Gly Ser Trp Pro Arg
65                  70                  75                  80

Pro Tyr Leu Thr Gly Lys Arg His Thr Leu Glu Lys Asn Val Leu Val
                85                  90                  95

Val Ser Val Val Thr Pro Gly Cys Asn Gln Leu Pro Thr Leu Glu Ser
            100                 105                 110

Val Glu Asn Tyr Thr Leu Thr Ile Asn Asp Asp Gln Cys Leu Leu Leu
        115                 120                 125

Ser Glu Thr Val Trp Gly Ala Leu Arg Gly Leu Glu Thr Phe Ser Gln
    130                 135                 140

Leu Val Trp Lys Ser Ala Glu Gly Thr Phe Phe Ile Asn Lys Thr Glu
145                 150                 155                 160

Ile Glu Asp Phe Pro Arg Phe Pro His Arg Gly Leu Leu Leu Asp Thr
                165                 170                 175

Ser Arg His Tyr Leu Pro Leu Ser Ser Ile Leu Asp Thr Leu Asp Val
            180                 185                 190

Met Ala Tyr Asn Lys Leu Asn Val Phe His Trp His Leu Val Asp Asp
        195                 200                 205

Pro Ser Phe Pro Tyr Glu Ser Phe Thr Phe Pro Glu Leu Met Arg Lys
    210                 215                 220
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Gly Ser Tyr Asn Pro Val Thr His Ile Tyr Thr Ala Gln Asp Val Lys
225                 230                 235                 240

Glu Val Ile Glu Tyr Ala Arg Leu Arg Gly Ile Arg Val Leu Ala Glu
                245                 250                 255

Phe Asp Thr Pro Gly His Thr Leu Ser Trp Gly Pro Gly Ile Pro Gly
            260                 265                 270

Leu Leu Thr Pro Cys Tyr Pro Gly Ser Glu Pro Ser Gly Thr Phe Gly
        275                 280                 285

Pro Val Asn Pro Ser Leu Asn Asn Thr Tyr Glu Phe Met Ser Thr Phe
    290                 295                 300

Phe Leu Glu Val Ser Ser Val Phe Pro Asp Phe Tyr Leu His Leu Gly
305                 310                 315                 320

Gly Asp Glu Val Asp Phe Thr Cys Trp Lys Ser Asn Pro Glu Ile Gln
                325                 330                 335

Asp Phe Met Arg Lys Lys Gly Phe Gly Glu Asp Phe Lys Gln Leu Glu
            340                 345                 350

Ser Phe Tyr Ile Gln Thr Leu Leu Asp Ile Val Ser Ser Tyr Gly Lys
        355                 360                 365

Gly Tyr Val Val Trp Gln Glu Val Phe Asp Asn Lys Val Lys Ile Gln
    370                 375                 380

Pro Asp Thr Ile Ile Gln Val Trp Arg Glu Asp Ile Pro Val Asn Tyr
385                 390                 395                 400

Met Lys Glu Leu Glu Leu Val Thr Lys Ala Gly Phe Arg Ala Leu Leu
                405                 410                 415

Ser Ala Pro Trp Tyr Leu Asn Arg Ile Ser Tyr Gly Pro Asp Trp Lys
            420                 425                 430
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Asp Phe Tyr Val Val Glu Pro Leu Ala Phe Glu Gly Thr Pro Glu Gln
435 440 445

Lys Ala Leu Val Ile Gly Gly Glu Ala Cys Met Trp Gly Glu Tyr Val
450 455 460

Asp Asn Thr Asn Leu Val Pro Arg Leu Trp Pro Arg Ala Gly Ala Val
465 470 475 480

Ala Glu Arg Leu Trp Ser Asn Lys Leu Thr Ser Asp Leu Thr Phe Ala
485 490 495

Tyr Glu Arg Leu Ser His Phe Arg Cys Glu Leu Leu Arg Arg Gly Val
500 505 510

Gln Ala Gln Pro Leu Asn Val Gly Phe Cys Glu Gln Glu Phe Glu Gln
515 520 525

Thr

<210> 371
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> misc_feature
<222> (1)..(5)
<223> n is a, c, g, or t

<400> 371
nnnnntcatc ctgataaact gcaaa 25

<210> 372
<211> 82
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> misc_feature
<222> (1)..(5)
<223> n is a, c, g, or t

<400> 372
nnnnncagtt tgtacggatg actgatgagt cccaaatagg acgaaacgcg cttcggtgcg 60

tctcatcctg ataaactgca aa 82

<210> 373
<211> 333
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 373
acctgaaccg tatatcgacg caccgaagcg cgtttcgtcc tatttgggac tcatcaggat 60

atacggttca ggtgatatac ggttcaggtg acgcaccgaa gcgcgtttcg tcctatttgg 120

gactcatcag acctgaaccg tatatcatcc ttccagtcag ggccatgttt gagagctaga 180

aatagcaagt ttaaataagg ctagtccgtt atcaacttga aaaagtggga ccgagtcggt 240

ccacctgaac cgtatatcga cgcaccgaag cgcgtttcgt cctatttggg actcatcagg 300

atatacggtt caggtctatg gccctgactg gaa 333

<210> 374
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 374
cctgggtcaa tccttggggc ccagactgag cacg 34

<210> 375
<211> 51
<212> DNA
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 375
cctgggtcaa tccttggggc ccagactgag cacgtgatgg cagaggaaag g 51

<210> 376
<211> 51
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 376
cctttcctct gccatcacgt gctcagtctg ggccccaagg attgacccag g 51

<210> 377
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 377
tgatggcaga ggaaagg 17

<210> 378
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 378
gcaggcttta aaggaaccaa ttc 23

<210> 379
<211> 43
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 379
gcaggcttta aaggaaccaa ttccctgggt caatccttgg ggc 43

<210> 380
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 380
ctctggagga tctagcggag 20

<210> 381
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 381
ctctggagga tctagcggag ttttttttt ttttttttt 40

<210> 382
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 382
ctctggagga tctagcggag ccccccccc cccc 34

<210> 383
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 383
ggcccagact gagcacgtga 20

<210> 384
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 384
ggcccagact gagcacgtga 20

<210> 385
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 385
ggcccagact gagcacgtga 20

<210> 386
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 386
ggcccagact gagcacgtga 20

<210> 387
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 387
ggcccagact gagcacgtga 20

<210> 388
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 388

ggcccagact gagcacgtga 20

<210> 389
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 389
ggcccagact gagcacgtga 20

<210> 390
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 390
ggcccagact gagcacgtga 20

<210> 391
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 391
ggcccagact gagcacgtga 20

<210> 392
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 392
ggcccagact gagcacgtga 20

<210> 393
<211> 20

<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 393
ggcccagact gagcacgtga 20

<210> 394
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 394
tctgctatca cgtgctcagt ctg 23

<210> 395
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 395
gcacatacta gcccctgtct 20

<210> 396
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 396

Gln Tyr Ile Lys Ala Asn Ser Lys Phe Ile Gly Ile Thr Glu Leu
1 5 10 15

<210> 397
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 397
catgatataa aagcaaattc taaatttata ggtataactg aacta   45

<210> 398
<211> 535
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 398

Gly Ala Asp Asp Val Val Asp Ser Ser Lys Ser Phe Val Met Glu Asn
1   5   10   15

Phe Ser Ser Tyr His Gly Thr Lys Pro Gly Tyr Val Asp Ser Ile Gln
            20   25   30

Lys Gly Ile Gln Lys Pro Lys Ser Gly Thr Gln Gly Asn Tyr Asp Asp
        35   40   45

Asp Trp Lys Glu Phe Tyr Ser Thr Asp Asn Lys Tyr Asp Ala Ala Gly
    50   55   60

Tyr Ser Val Asp Asn Glu Asn Pro Leu Ser Gly Lys Ala Gly Gly Val
65   70   75   80

Val Lys Val Thr Tyr Pro Gly Leu Thr Lys Val Leu Ala Leu Lys Val
                85   90   95

Asp Asn Ala Glu Thr Ile Lys Lys Glu Leu Gly Leu Ser Leu Thr Glu
            100   105   110

Pro Leu Met Glu Gln Val Gly Thr Glu Glu Phe Ile Lys Arg Phe Gly
        115   120   125

Asp Gly Ala Ser Arg Val Val Leu Ser Leu Pro Phe Ala Glu Gly Ser
    130   135   140

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Ser Ser Val Glu Tyr Ile Asn Asn Trp Glu Gln Ala Lys Ala Leu Ser
145                 150                 155                 160

Val Glu Leu Glu Ile Asn Phe Glu Thr Arg Gly Lys Arg Gly Gln Asp
                165                 170                 175

Ala Met Tyr Glu Tyr Met Ala Gln Ala Cys Ala Gly Asn Arg Val Arg
            180                 185                 190

Arg Ser Val Gly Ser Ser Leu Ser Cys Ile Asn Leu Asp Trp Asp Val
        195                 200                 205

Ile Arg Asp Lys Thr Lys Thr Lys Ile Glu Ser Leu Lys Glu His Gly
    210                 215                 220

Pro Ile Lys Asn Lys Met Ser Glu Ser Pro Asn Lys Thr Val Ser Glu
225                 230                 235                 240

Glu Lys Ala Lys Gln Tyr Leu Glu Glu Phe His Gln Thr Ala Leu Glu
                245                 250                 255

His Pro Glu Leu Ser Glu Leu Lys Thr Val Thr Gly Thr Asn Pro Val
            260                 265                 270

Phe Ala Gly Ala Asn Tyr Ala Ala Trp Ala Val Asn Val Ala Gln Val
        275                 280                 285

Ile Asp Ser Glu Thr Ala Asp Asn Leu Glu Lys Thr Thr Ala Ala Leu
    290                 295                 300

Ser Ile Leu Pro Gly Ile Gly Ser Val Met Gly Ile Ala Asp Gly Ala
305                 310                 315                 320

Val His His Asn Thr Glu Glu Ile Val Ala Gln Ser Ile Ala Leu Ser
                325                 330                 335

Ser Leu Met Val Ala Gln Ala Ile Pro Leu Val Gly Glu Leu Val Asp
            340                 345                 350

Ile Gly Phe Ala Ala Tyr Asn Phe Val Glu Ser Ile Ile Asn Leu Phe
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        355                 360                 365

Gln Val Val His Asn Ser Tyr Asn Arg Pro Ala Tyr Ser Pro Gly His
    370                 375                 380

Lys Thr Gln Pro Phe Leu His Asp Gly Tyr Ala Val Ser Trp Asn Thr
385                 390                 395                 400

Val Glu Asp Ser Ile Ile Arg Thr Gly Phe Gln Gly Glu Ser Gly His
                405                 410                 415

Asp Ile Lys Ile Thr Ala Glu Asn Thr Pro Leu Pro Ile Ala Gly Val
            420                 425                 430

Leu Leu Pro Thr Ile Pro Gly Lys Leu Asp Val Asn Lys Ser Lys Thr
        435                 440                 445

His Ile Ser Val Asn Gly Arg Lys Ile Arg Met Arg Cys Arg Ala Ile
    450                 455                 460

Asp Gly Asp Val Thr Phe Cys Arg Pro Lys Ser Pro Val Tyr Val Gly
465                 470                 475                 480

Asn Gly Val His Ala Asn Leu His Val Ala Phe His Arg Ser Ser Ser
                485                 490                 495

Glu Lys Ile His Ser Asn Glu Ile Ser Ser Asp Ser Ile Gly Val Leu
            500                 505                 510

Gly Tyr Gln Lys Thr Val Asp His Thr Lys Val Asn Ser Lys Leu Ser
        515                 520                 525

Leu Phe Phe Glu Ile Lys Ser
    530                 535


<210>  399
<211>  1605
<212>  DNA
<213>  Artificial Sequence

<220>
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<223> Synthetic

<400> 399
ggcgccgacg acgtggtgga cagcagcaag agcttcgtga tggagaactt cagcagctac 60

cacggcacca agcccggcta cgtggacagc atccagaagg gcatccagaa gcccaagagc 120

ggcacccagg gcaactacga cgacgactgg aaggagttct acagcaccga caacaagtac 180

gacgccgccg gctacagcgt ggacaacgag aacccccctga gcggcaaggc cggcggcgtg 240

gtgaaggtga cctaccccgg cctgaccaag gtgctggccc tgaaggtgga caacgccgag 300

accatcaaga aggagctggg cctgagcctg accgagcccc tgatggagca ggtgggcacc 360

gaggagttca tcaagaggtt cggcgacggc gccagcaggg tggtgctgag cctgcccttc 420

gccgagggca gcagcagcgt ggagtacatc aacaactggg agcaggccaa ggccctgagc 480

gtggagctgg agatcaactt cgagaccagg ggcaagaggg gccaggacgc catgtacgag 540

tacatggccc aggcctgcgc cggcaacagg gtgaggagga gcgtgggcag cagcctgagc 600

tgcatcaacc tggactggga cgtgatcagg gacaagacca agaccaagat cgagagcctg 660

aaggagcacg gccccatcaa gaacaagatg agcgagagcc ccaacaagac cgtgagcgag 720

gagaaggcca agcagtacct ggaggagttc caccagaccg ccctggagca ccccgagctg 780

agcgagctga agaccgtgac cggcaccaac cccgtgttcg ccggcgccaa ctacgccgcc 840

tgggccgtga acgtggccca ggtgatcgac agcgagaccg ccgacaacct ggagaagacc 900

accgccgccc tgagcatcct gcccggcatc ggcagcgtga tgggcatcgc cgacggcgcc 960

gtgcaccaca acaccgagga gatcgtggcc cagagcatcg ccctgagcag cctgatggtg 1020

gcccaggcca tccccctggt gggcgagctg gtggacatcg gcttcgccgc ctacaacttc 1080

gtggagagca tcatcaacct gttccaggtg gtgcacaaca gctacaacag gcccgcctac 1140

agccccggcc acaagaccca gcccttcctg cacgacggct acgccgtgag ctggaacacc 1200

gtggaggaca gcatcatcag gaccggcttc cagggcgaga gcggccacga catcaagatc 1260

accgccgaga acacccccct gcccatcgcc ggcgtgctgc tgcccaccat ccccggcaag 1320

ctggacgtga acaagagcaa gacccacatc agcgtgaacg gcaggaagat caggatgagg 1380

tgcagggcca tcgacggcga cgtgaccttc tgcaggccca agagccccgt gtacgtgggc 1440

aacggcgtgc acgccaacct gcacgtggcc ttccacagga gcagcagcga gaagatccac 1500

agcaacgaga tcagcagcga cagcatcggc gtgctgggct accagaagac cgtggaccac 1560

accaaggtga acagcaagct gagcctgttc ttcgagatca agagc 1605

<210> 400
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 400

Gly Thr Tyr Arg Leu Ile Pro Asn Ala Arg Ala Asn Leu Thr Ala
1 5 10 15

<210> 401
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 401
ggcacctaca ggctgatccc caacgccagg gccaacctga ccgcc 45

<210> 402
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 402

Pro Ser Lys Phe Phe Thr Ile Ser Asp Ser Ala Thr Phe Ala Pro Gly
1 5 10 15

Pro Val Ser Asn Ala
20

<210> 403
<211> 63
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 403
ccgagcaaat tttttaccat tagcgatagc gcgacctttg cgccgggccc ggtgagcaac 60

gcg 63

<210> 404
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 404

Pro Ser Lys Leu Phe Ile Met Leu Asp Asn Ala Thr Phe Ala Pro Gly
1 5 10 15

Pro Val Val Asn Ala
            20

<210> 405
<211> 63
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 405
ccgagcaaac tgtttattat gctggataac gcgacctttg cgccgggccc ggtggtgaac 60

gcg 63

<210> 406
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 406

Thr Pro Pro Pro Tyr Gln Val Ser Cys Gly Gly Glu Ser Asp Arg Ala

1 5 10 15

Ser Ala Arg Val Ile Asp Pro Ala Ala Gln Ser
20 25

<210> 407
<211> 81
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 407
acccccccc cctaccaggt gagctgcggc ggcgagagcg acagggccag cgccagggtg 60

atcgaccccg ccgcccagag c 81

<210> 408
<211> 134
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 408

Pro Glu Tyr Ala Tyr Lys Ile Val Lys Asn Lys Lys Met Glu Asp Gly
1 5 10 15

Phe Leu Gln Gly Met Val Asp Gly Trp Tyr Gly His His Ser Asn Glu
20 25 30

Gln Gly Ser Gly Leu Met Glu Asn Glu Arg Thr Leu Asp Lys Ala Asn
35 40 45

Pro Asn Asn Asp Leu Cys Ser Trp Ser Asp His Glu Ala Ser Ser Asn
50 55 60

Asn Thr Asn Gln Glu Asp Leu Leu Gln Arg Glu Ser Arg Arg Lys Lys
65 70 75 80

Arg Ile Gly Thr Ser Thr Leu Asn Gln Arg Gly Asn Cys Asn Thr Lys
85 90 95

Cys Gln Thr Glu Glu Ala Arg Leu Lys Arg Glu Glu Val Ser Leu Val
100 105 110

Lys Ser Asp Gln Cys Ser Asn Gly Ser Leu Gln Cys Arg Ala Asn Asn
115 120 125

Ser Thr Glu Gln Val Asp
130

<210> 409
<211> 402
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 409
cccgagtacg cctacaagat cgtgaagaac aagaagatgg aggacggctt cctgcagggc 60

atggtggacg gctggtacgg ccaccacagc aacgagcagg gcagcggcct gatggagaac 120

gagaggaccc tggacaaggc caaccccaac aacgacctgt gcagctggag cgaccacgag 180

gccagcagca acaacaccaa ccaggaggac ctgctgcaga gggagagcag gaggaagaag 240

aggatcggca ccagcaccct gaaccagagg ggcaactgca acaccaagtg ccagaccgag 300

gaggccaggc tgaagaggga ggaggtgagc ctggtgaaga gcgaccagtg cagcaacggc 360

agcctgcagt gcagggccaa caacagcacc gagcaggtgg ac 402

<210> 410
<211> 154
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 410

Thr Lys Ser Thr Asn Ser Arg Ser Gly Gly Ile Ser Gly Pro Asp Asn
1 5 10 15

Glu Ala Pro Val Gly Glu Ala Pro Ser Pro Tyr Gly Asp Asn Pro Arg

```
            20                  25                  30

Pro Asn Asp Gly Asn Asn Ile Arg Ile Gly Ser Lys Gly Tyr Asn Gly
        35                  40                  45

Ile Ile Thr Asp Thr Ile Glu Glu Ser Cys Ser Cys Tyr Pro Asp Ala
    50                  55                  60

Lys Val Val Lys Ser Val Glu Leu Asp Ser Thr Ile Trp Thr Ser Gly
65                  70                  75                  80

Ser Ser Pro Asn Gln Lys Ile Ile Thr Ile Gly Trp Asp Pro Asn Gly
                85                  90                  95

Trp Thr Gly Thr Pro Met Ser Pro Asn Gly Ala Tyr Gly Thr Asp Gly
            100                 105                 110

Pro Ser Asn Gly Gln Ala Asn Gln His Gln Ala Glu Ser Ile Ser Ala
        115                 120                 125

Gly Asn Ser Ser Leu Cys Pro Ile Arg Asp Asn Trp His Gly Ser Asn
    130                 135                 140

Arg Ser Trp Ser Trp Pro Asp Gly Ala Glu
145                 150
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<210> 411
<211> 462
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 411
accaagagca ccaacagcag gagcggcggc atcagcggcc ccgacaacga ggcccccgtg 60

ggcgaggccc ccagccccta cggcgacaac cccaggccca acgacggcaa caacatcagg 120

atcggcagca agggctacaa cggcatcatc accgacacca tcgaggagag ctgcagctgc 180

taccccgacg ccaaggtggt gaagagcgtg gagctggaca gcaccatctg gaccagcggc 240

agcagcccca accagaagat catcaccatc ggctgggacc ccaacggctg gaccggcacc 300

cccatgagcc ccaacggcgc ctacggcacc gacggcccca gcaacggcca ggccaaccag 360

caccaggccg agagcatcag cgccggcaac agcagcctgt gccccatcag ggacaactgg 420

cacggcagca acaggagctg gagctggccc gacggcgccg ag 462

<210> 412
<211> 45
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 412

Glu Lys Ile Val Leu Leu Leu Ala Met Met Glu Lys Ile Val Leu Leu
1 5 10 15

Leu Ala Lys Cys Gln Thr Pro Met Gly Ala Ile Lys Ala Val Asp Gly
20 25 30

Val Thr Asn Lys Cys Pro Tyr Leu Gly Ser Pro Ser Phe
35 40 45

<210> 413
<211> 135
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 413
gagaagatcg tgctgctgct ggccatgatg gagaagatcg tgctgctgct ggccaagtgc 60

cagaccccca tgggcgccat caaggccgtg gacggcgtga ccaacaagtg cccctacctg 120

ggcagcccca gcttc 135

<210> 414
<211> 36
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 414

Ile Arg Pro Cys Phe Trp Val Glu Leu Asn Pro Asn Gln Lys Ile Ile
1 5 10 15

Thr Ile Arg Pro Cys Phe Trp Val Glu Leu Ile Cys Tyr Pro Asp Ala
20 25 30

Gly Glu Ile Thr
35

<210> 415
<211> 108
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 415
atcaggccct gcttctgggt ggagctgaac cccaaccaga agatcatcac catcaggccc 60

tgcttctggg tggagctgat ctgctacccc gacgccggcg agatcacc 108

<210> 416
<211> 45
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 416

Met Glu Lys Ile Val Leu Leu Leu Ala Glu Lys Ile Val Leu Leu Leu
1 5 10 15

Ala Met Cys Pro Tyr Leu Gly Ser Pro Ser Phe Lys Cys Gln Thr Pro
20 25 30

Met Gly Ala Ile Lys Ala Val Asp Gly Val Thr Asn Lys
35 40 45

<210> 417
<211> 135

<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 417
atggagaaga tcgtgctgct gctggccgag aagatcgtgc tgctgctggc catgtgcccc 60

tacctgggca gccccagctt caagtgccag acccccatgg gcgccatcaa ggccgtggac 120

ggcgtgacca acaag 135

<210> 418
<211> 36
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 418

Asn Pro Asn Gln Lys Ile Ile Thr Ile Cys Tyr Pro Asp Ala Gly Glu
1 5 10 15

Ile Thr Ile Arg Pro Cys Phe Trp Val Glu Leu Arg Pro Cys Phe Trp
20 25 30

Val Glu Leu Ile
35

<210> 419
<211> 108
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 419
aaccccaacc agaagatcat caccatctgc taccccgacg ccggcgagat caccatcagg 60

ccctgcttct gggtggagct gaggccctgc ttctgggtgg agctgatc 108

<210> 420
<211> 18
<212> PRT

<213> Artificial Sequence

<220>
<223> Synthetic

<400> 420

Met Val Ser Leu Val Lys Ser Asp Gln Ile Gly Thr Ser Thr Leu Asn
1 5 10 15

Gln Arg

<210> 421
<211> 54
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 421
atggtgagcc tggtgaagag cgaccagatc ggcaccagca ccctgaacca gagg 54

<210> 422
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 422

Tyr Asn Gly Ile Ile Thr Asp Thr Ile
1 5

<210> 423
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 423
tacaacggca tcatcaccga caccatc 27

<210> 424
<211> 63
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 424

Met Glu Lys Ile Val Leu Leu Leu Ala Glu Lys Ile Val Leu Leu Leu
1 5 10 15

Ala Met Met Val Ser Leu Val Lys Ser Asp Gln Cys Pro Tyr Leu Gly
20 25 30

Ser Pro Ser Phe Ile Gly Thr Ser Thr Leu Asn Gln Arg Lys Cys Gln
35 40 45

Thr Pro Met Gly Ala Ile Lys Ala Val Asp Gly Val Thr Asn Lys
50 55 60

<210> 425
<211> 135
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 425
atggagaaga tcgtgctgct gctggccgag aagatcgtgc tgctgctggc catgatggtg 60

agcctggtga agagcgacca gtgcccctac ctgggcagcc ccagcttcat cggcaccagc 120

accctgaacc agagg 135

<210> 426
<211> 45
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 426

Asn Pro Asn Gln Lys Ile Ile Thr Ile Tyr Asn Gly Ile Ile Thr Asp

1 5 10 15

Thr Ile Cys Tyr Pro Asp Ala Gly Glu Ile Thr Ile Arg Pro Cys Phe
20 25 30

Trp Val Glu Leu Arg Pro Cys Phe Trp Val Glu Leu Ile
35 40 45

<210> 427
<211> 135
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 427
aaccccaacc agaagatcat caccatctac aacggcatca tcaccgacac catctgctac 60

cccgacgccg gcgagatcac catcaggccc tgcttctggg tggagctgag gccctgcttc 120

tgggtggagc tgatc 135

<210> 428
<211> 535
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 428

Gly Ala Asp Asp Val Val Asp Ser Ser Lys Ser Phe Val Met Glu Asn
1 5 10 15

Phe Ser Ser Tyr His Gly Thr Lys Pro Gly Tyr Val Asp Ser Ile Gln
20 25 30

Lys Gly Ile Gln Lys Pro Lys Ser Gly Thr Gln Gly Asn Tyr Asp Asp
35 40 45

Asp Trp Lys Glu Phe Tyr Ser Thr Asp Asn Lys Tyr Asp Ala Ala Gly
50 55 60

```
Tyr Ser Val Asp Asn Glu Asn Pro Leu Ser Gly Lys Ala Gly Gly Val
65                  70                  75                  80

Val Lys Val Thr Tyr Pro Gly Leu Thr Lys Val Leu Ala Leu Lys Val
                85                  90                  95

Asp Asn Ala Glu Thr Ile Lys Lys Glu Leu Gly Leu Ser Leu Thr Glu
            100                 105                 110

Pro Leu Met Glu Gln Val Gly Thr Glu Glu Phe Ile Lys Arg Phe Gly
        115                 120                 125

Asp Gly Ala Ser Arg Val Val Leu Ser Leu Pro Phe Ala Glu Gly Ser
    130                 135                 140

Ser Ser Val Glu Tyr Ile Asn Asn Trp Glu Gln Ala Lys Ala Leu Ser
145                 150                 155                 160

Val Glu Leu Glu Ile Asn Phe Glu Thr Arg Gly Lys Arg Gly Gln Asp
                165                 170                 175

Ala Met Tyr Glu Tyr Met Ala Gln Ala Cys Ala Gly Asn Arg Val Arg
            180                 185                 190

Arg Ser Val Gly Ser Ser Leu Ser Cys Ile Asn Leu Asp Trp Asp Val
        195                 200                 205

Ile Arg Asp Lys Thr Lys Thr Lys Ile Glu Ser Leu Lys Glu His Gly
    210                 215                 220

Pro Ile Lys Asn Lys Met Ser Glu Ser Pro Asn Lys Thr Val Ser Glu
225                 230                 235                 240

Glu Lys Ala Lys Gln Tyr Leu Glu Glu Phe His Gln Thr Ala Leu Glu
                245                 250                 255

His Pro Glu Leu Ser Glu Leu Lys Thr Val Thr Gly Thr Asn Pro Val
            260                 265                 270

Phe Ala Gly Ala Asn Tyr Ala Ala Trp Ala Val Asn Val Ala Gln Val
```

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        275                 280                 285

Ile Asp Ser Glu Thr Ala Asp Asn Leu Glu Lys Thr Thr Ala Ala Leu
    290                 295                 300

Ser Ile Leu Pro Gly Ile Gly Ser Val Met Gly Ile Ala Asp Gly Ala
305                 310                 315                 320

Val His His Asn Thr Glu Glu Ile Val Ala Gln Ser Ile Ala Leu Ser
                325                 330                 335

Ser Leu Met Val Ala Gln Ala Ile Pro Leu Val Gly Glu Leu Val Asp
            340                 345                 350

Ile Gly Phe Ala Ala Tyr Asn Phe Val Glu Ser Ile Ile Asn Leu Phe
        355                 360                 365

Gln Val Val His Asn Ser Tyr Asn Arg Pro Ala Tyr Ser Pro Gly His
    370                 375                 380

Lys Thr Gln Pro Phe Leu His Asp Gly Tyr Ala Val Ser Trp Asn Thr
385                 390                 395                 400

Val Glu Asp Ser Ile Ile Arg Thr Gly Phe Gln Gly Glu Ser Gly His
                405                 410                 415

Asp Ile Lys Ile Thr Ala Glu Asn Thr Pro Leu Pro Ile Ala Gly Val
            420                 425                 430

Leu Leu Pro Thr Ile Pro Gly Lys Leu Asp Val Asn Lys Ser Lys Thr
        435                 440                 445

His Ile Ser Val Asn Gly Arg Lys Ile Arg Met Arg Cys Arg Ala Ile
    450                 455                 460

Asp Gly Asp Val Thr Phe Cys Arg Pro Lys Ser Pro Val Tyr Val Gly
465                 470                 475                 480

Asn Gly Val His Ala Asn Leu His Val Ala Phe His Arg Ser Ser Ser
                485                 490                 495
```

Glu Lys Ile His Ser Asn Glu Ile Ser Ser Asp Ser Ile Gly Val Leu
500 505 510

Gly Tyr Gln Lys Thr Val Asp His Thr Lys Val Asn Ser Lys Leu Ser
515 520 525

Leu Phe Phe Glu Ile Lys Ser
530 535

<210> 429
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 429
ggctaaccgt gccatttgat caggtca 27

<210> 430
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 430
ggctaaccgt gcaaattaac aaactaa 27

<210> 431
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 431
ggccatctcg tgcaaattaa caaactaa 28

<210> 432
<211> 35
<212> DNA

<213> Artificial Sequence

<220>
<223> Synthetic

<400> 432
ggtcctctgc catctcgtgc aaattaacaa actaa 35

<210> 433
<211> 42
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 433
ggcttccttt cctctgccat ctcgtgcaaa ttaacaaact aa 42

<210> 434
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 434
ggctaaccgt gccatttgat caggtca 27

<210> 435
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 435
ggctaaccgt gcaaattaac aaactaa 27

<210> 436
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 436
ggccatctcg tgcaaattaa caaactaa 28

<210> 437
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 437
ggtcctctgc catctcgtgc aaattaacaa actaa 35

<210> 438
<211> 42
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 438
ggcttccttt cctctgccat ctcgtgcaaa ttaacaaact aa 42

<210> 439
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 439
tctgccatct cgtgctc 17

<210> 440
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 440
tctgccatct cgtgctc 17

<210> 441

<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 441
tctgccatca tcgtgctc 18

<210> 442
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 442
tctgccatcc gtgctc 16

<210> 443
<211> 1517
<212> PRT
<213> S. PYOGENES

<400> 443

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1 5 10 15

Arg Lys Val Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn
20 25 30

Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys
35 40 45

Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn
50 55 60

Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr
65 70 75 80

Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg
85 90 95

```
Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp
            100                 105                 110

Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp
        115                 120                 125

Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val
    130                 135                 140

Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu
145                 150                 155                 160

Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu
                165                 170                 175

Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu
            180                 185                 190

Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln
        195                 200                 205

Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val
    210                 215                 220

Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu
225                 230                 235                 240

Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe
                245                 250                 255

Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser
            260                 265                 270

Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr
        275                 280                 285

Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr
    290                 295                 300
```

```
Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu
305                 310                 315                 320

Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser
                325                 330                 335

Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu
            340                 345                 350

Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile
        355                 360                 365

Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly
    370                 375                 380

Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys
385                 390                 395                 400

Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu
                405                 410                 415

Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile
            420                 425                 430

His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr
        435                 440                 445

Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe
    450                 455                 460

Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe
465                 470                 475                 480

Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe
                485                 490                 495

Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg
            500                 505                 510

Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys
```

```
        515                 520                 525

His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys
    530                 535                 540

Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly
545                 550                 555                 560

Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys
                565                 570                 575

Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys
            580                 585                 590

Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser
        595                 600                 605

Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe
    610                 615                 620

Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr
625                 630                 635                 640

Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr
                645                 650                 655

Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg
            660                 665                 670

Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile
        675                 680                 685

Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp
    690                 695                 700

Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu
705                 710                 715                 720

Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp
                725                 730                 735
```

```
Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys
            740                 745                 750

Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val
        755                 760                 765

Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu
    770                 775                 780

Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys
785                 790                 795                 800

Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu
                805                 810                 815

His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr
            820                 825                 830

Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile
        835                 840                 845

Asn Arg Leu Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe
    850                 855                 860

Leu Lys Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys
865                 870                 875                 880

Asn Arg Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys
                885                 890                 895

Met Lys Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln
            900                 905                 910

Arg Lys Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu
        915                 920                 925

Leu Asp Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln
    930                 935                 940
```

```
Ile Thr Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys
945                 950                 955                 960


Tyr Asp Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu
                965                 970                 975


Lys Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
            980                 985                 990


Val Arg Glu Ile Asn Asn Tyr His  His Ala His Asp Ala  Tyr Leu Asn
        995                 1000                1005


Ala Val  Val Gly Thr Ala Leu  Ile Lys Lys Tyr Pro  Lys Leu Glu
    1010                1015                1020


Ser Glu  Phe Val Tyr Gly Asp  Tyr Lys Val Tyr Asp  Val Arg Lys
    1025                1030                1035


Met Ile  Ala Lys Ser Glu Gln  Glu Ile Gly Lys Ala  Thr Ala Lys
    1040                1045                1050


Tyr Phe  Phe Tyr Ser Asn Ile  Met Asn Phe Phe Lys  Thr Glu Ile
    1055                1060                1065


Thr Leu  Ala Asn Gly Glu Ile  Arg Lys Arg Pro Leu  Ile Glu Thr
    1070                1075                1080


Asn Gly  Glu Thr Gly Glu Ile  Val Trp Asp Lys Gly  Arg Asp Phe
    1085                1090                1095


Ala Thr  Val Arg Lys Val Leu  Ser Met Pro Gln Val  Asn Ile Val
    1100                1105                1110


Lys Lys  Thr Glu Val Gln Thr  Gly Gly Phe Ser Lys  Glu Ser Ile
    1115                1120                1125


Leu Pro  Lys Arg Asn Ser Asp  Lys Leu Ile Ala Arg  Lys Lys Asp
    1130                1135                1140
```

```
Trp Asp  Pro Lys Lys Tyr Gly  Gly Phe Asp Ser Pro  Thr Val Ala
    1145                1150                1155

Tyr Ser  Val Leu Val Val Ala  Lys Val Glu Lys Gly  Lys Ser Lys
    1160                1165                1170

Lys Leu  Lys Ser Val Lys Glu  Leu Leu Gly Ile Thr  Ile Met Glu
    1175                1180                1185

Arg Ser  Ser Phe Glu Lys Asn  Pro Ile Asp Phe Leu  Glu Ala Lys
    1190                1195                1200

Gly Tyr  Lys Glu Val Lys Lys  Asp Leu Ile Ile Lys  Leu Pro Lys
    1205                1210                1215

Tyr Ser  Leu Phe Glu Leu Glu  Asn Gly Arg Lys Arg  Met Leu Ala
    1220                1225                1230

Ser Ala  Gly Glu Leu Gln Lys  Gly Asn Glu Leu Ala  Leu Pro Ser
    1235                1240                1245

Lys Tyr  Val Asn Phe Leu Tyr  Leu Ala Ser His Tyr  Glu Lys Leu
    1250                1255                1260

Lys Gly  Ser Pro Glu Asp Asn  Glu Gln Lys Gln Leu  Phe Val Glu
    1265                1270                1275

Gln His  Lys His Tyr Leu Asp  Glu Ile Ile Glu Gln  Ile Ser Glu
    1280                1285                1290

Phe Ser  Lys Arg Val Ile Leu  Ala Asp Ala Asn Leu  Asp Lys Val
    1295                1300                1305

Leu Ser  Ala Tyr Asn Lys His  Arg Asp Lys Pro Ile  Arg Glu Gln
    1310                1315                1320

Ala Glu  Asn Ile Ile His Leu  Phe Thr Leu Thr Asn  Leu Gly Ala
    1325                1330                1335

Pro Ala  Ala Phe Lys Tyr Phe  Asp Thr Thr Ile Asp  Arg Lys Arg
```

1340 1345 1350

Tyr Thr Ser Thr Lys Glu Val Leu Asp Ala Thr Leu Ile His Gln
1355 1360 1365

Ser Ile Thr Gly Leu Tyr Glu Thr Arg Ile Asp Leu Ser Gln Leu
1370 1375 1380

Gly Gly Asp Ser Gly Gly Ser Ser Gly Gly Ser Cys Leu Ser Tyr
1385 1390 1395

Glu Thr Glu Ile Leu Thr Val Glu Tyr Gly Leu Leu Pro Ile Gly
1400 1405 1410

Lys Ile Val Glu Lys Arg Ile Glu Cys Thr Val Tyr Ser Val Asp
1415 1420 1425

Asn Asn Gly Asn Ile Tyr Thr Gln Pro Val Ala Gln Trp His Asp
1430 1435 1440

Arg Gly Glu Gln Glu Val Phe Glu Tyr Cys Leu Glu Asp Gly Ser
1445 1450 1455

Leu Ile Arg Ala Thr Lys Asp His Lys Phe Met Thr Val Asp Gly
1460 1465 1470

Gln Met Leu Pro Ile Asp Glu Ile Phe Glu Arg Glu Leu Asp Leu
1475 1480 1485

Met Arg Val Asp Asn Leu Pro Asn Ser Gly Gly Ser Lys Arg Thr
1490 1495 1500

Ala Asp Gly Ser Glu Phe Glu Pro Lys Lys Lys Arg Lys Val
1505 1510 1515

<210> 444

<400> 444
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<210> 445

<211> 1367
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 445

Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn Ser Val Gly
1 5 10 15

Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys
20 25 30

Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly
35 40 45

Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys
50 55 60

Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr
65 70 75 80

Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe
85 90 95

Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His
100 105 110

Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His
115 120 125

Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser
130 135 140

Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met
145 150 155 160

Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp
165 170 175

```
Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn
            180                 185                 190

Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys
        195                 200                 205

Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu
    210                 215                 220

Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu
225                 230                 235                 240

Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp
                245                 250                 255

Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp
            260                 265                 270

Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu
        275                 280                 285

Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile
    290                 295                 300

Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met
305                 310                 315                 320

Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala
                325                 330                 335

Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp
            340                 345                 350

Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln
        355                 360                 365

Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly
    370                 375                 380

Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys
```

385 390 395 400

Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly
405 410 415

Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu
420 425 430

Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro
435 440 445

Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met
450 455 460

Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val
465 470 475 480

Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn
485 490 495

Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu
500 505 510

Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr
515 520 525

Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys
530 535 540

Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val
545 550 555 560

Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser
565 570 575

Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr
580 585 590

Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn
595 600 605

```
Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu
    610                 615                 620

Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His
625                 630                 635                 640

Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr
                645                 650                 655

Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys
            660                 665                 670

Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala
        675                 680                 685

Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys
    690                 695                 700

Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His
705                 710                 715                 720

Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile
                725                 730                 735

Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val Met Gly Arg
            740                 745                 750

His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu Asn Gln Thr
        755                 760                 765

Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys Arg Ile Glu
    770                 775                 780

Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu His Pro Val
785                 790                 795                 800

Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr Tyr Leu Gln
                805                 810                 815
```

```
Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile Asn Arg Leu
            820                 825                 830

Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe Leu Lys Asp
        835                 840                 845

Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys Asn Arg Gly
    850                 855                 860

Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys Met Lys Asn
865                 870                 875                 880

Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln Arg Lys Phe
                885                 890                 895

Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu Leu Asp Lys
            900                 905                 910

Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln Ile Thr Lys
        915                 920                 925

His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys Tyr Asp Glu
    930                 935                 940

Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu Lys Ser Lys
945                 950                 955                 960

Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys Val Arg Glu
                965                 970                 975

Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn Ala Val Val
            980                 985                 990

Gly Thr Ala Leu Ile Lys Lys Tyr  Pro Lys Leu Glu Ser  Glu Phe Val
        995                 1000                1005

Tyr Gly  Asp Tyr Lys Val Tyr  Asp Val Arg Lys Met  Ile Ala Lys
    1010                1015                1020
```

```
Ser Glu  Gln Glu Ile Gly Lys  Ala Thr Ala Lys Tyr  Phe Phe Tyr
    1025                1030                1035

Ser Asn  Ile Met Asn Phe Phe  Lys Thr Glu Ile Thr  Leu Ala Asn
    1040                1045                1050

Gly Glu  Ile Arg Lys Arg Pro  Leu Ile Glu Thr Asn  Gly Glu Thr
    1055                1060                1065

Gly Glu  Ile Val Trp Asp Lys  Gly Arg Asp Phe Ala  Thr Val Arg
    1070                1075                1080

Lys Val  Leu Ser Met Pro Gln  Val Asn Ile Val Lys  Lys Thr Glu
    1085                1090                1095

Val Gln  Thr Gly Gly Phe Ser  Lys Glu Ser Ile Leu  Pro Lys Arg
    1100                1105                1110

Asn Ser  Asp Lys Leu Ile Ala  Arg Lys Lys Asp Trp  Asp Pro Lys
    1115                1120                1125

Lys Tyr  Gly Gly Phe Asp Ser  Pro Thr Val Ala Tyr  Ser Val Leu
    1130                1135                1140

Val Val  Ala Lys Val Glu Lys  Gly Lys Ser Lys Lys  Leu Lys Ser
    1145                1150                1155

Val Lys  Glu Leu Leu Gly Ile  Thr Ile Met Glu Arg  Ser Ser Phe
    1160                1165                1170

Glu Lys  Asn Pro Ile Asp Phe  Leu Glu Ala Lys Gly  Tyr Lys Glu
    1175                1180                1185

Val Lys  Lys Asp Leu Ile Ile  Lys Leu Pro Lys Tyr  Ser Leu Phe
    1190                1195                1200

Glu Leu  Glu Asn Gly Arg Lys  Arg Met Leu Ala Ser  Ala Gly Glu
    1205                1210                1215

Leu Gln  Lys Gly Asn Glu Leu  Ala Leu Pro Ser Lys  Tyr Val Asn
```

```
    1220                1225                1230

Phe Leu  Tyr Leu Ala Ser His  Tyr Glu Lys Leu Lys  Gly Ser Pro
    1235                1240                1245

Glu Asp  Asn Glu Gln Lys Gln  Leu Phe Val Glu Gln  His Lys His
    1250                1255                1260

Tyr Leu  Asp Glu Ile Ile Glu  Gln Ile Ser Glu Phe  Ser Lys Arg
    1265                1270                1275

Val Ile  Leu Ala Asp Ala Asn  Leu Asp Lys Val Leu  Ser Ala Tyr
    1280                1285                1290

Asn Lys  His Arg Asp Lys Pro  Ile Arg Glu Gln Ala  Glu Asn Ile
    1295                1300                1305

Ile His  Leu Phe Thr Leu Thr  Asn Leu Gly Ala Pro  Ala Ala Phe
    1310                1315                1320

Lys Tyr  Phe Asp Thr Thr Ile  Asp Arg Lys Arg Tyr  Thr Ser Thr
    1325                1330                1335

Lys Glu  Val Leu Asp Ala Thr  Leu Ile His Gln Ser  Ile Thr Gly
    1340                1345                1350

Leu Tyr  Glu Thr Arg Ile Asp  Leu Ser Gln Leu Gly  Gly Asp
    1355                1360                1365


<210>  446
<211>  8
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  446

Ser Gly Gly Ser Ser Gly Gly Ser
1               5
```

<210> 447
<211> 106
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 447

Cys Leu Ser Tyr Glu Thr Glu Ile Leu Thr Val Glu Tyr Gly Leu Leu
1   5   10   15

Pro Ile Gly Lys Ile Val Glu Lys Arg Ile Glu Cys Thr Val Tyr Ser
            20   25   30

Val Asp Asn Asn Gly Asn Ile Tyr Thr Gln Pro Val Ala Gln Trp His
        35   40   45

Asp Arg Gly Glu Gln Glu Val Phe Glu Tyr Cys Leu Glu Asp Gly Ser
    50   55   60

Leu Ile Arg Ala Thr Lys Asp His Lys Phe Met Thr Val Asp Gly Gln
65   70   75   80

Met Leu Pro Ile Asp Glu Ile Phe Glu Arg Glu Leu Asp Leu Met Arg
                85   90   95

Val Asp Asn Leu Pro Asn Ser Gly Gly Ser
            100   105

<210> 448

<400> 448
000

<210> 449

<400> 449
000

<210> 450
<211> 696
<212> PRT
<213> S. PYOGENES

<400> 450

Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu Pro Asp
1 5 10 15

Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala Trp Ala
20 25 30

Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu Ile Ile
35 40 45

Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr Pro Met
50 55 60

Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg Leu Leu
65 70 75 80

Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr Pro Leu
85 90 95

Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val Gln Asp
100 105 110

Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr Val Pro
115 120 125

Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln Trp Tyr
130 135 140

Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu His Pro
145 150 155 160

Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu Met Gly
165 170 175

Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe Lys Asn
180 185 190

Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala Asp Phe
195 200 205

```
Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp Asp Leu
    210                 215                 220

Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr Arg Ala
225                 230                 235                 240

Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala Lys Lys
                245                 250                 255

Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu Leu Lys
            260                 265                 270

Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val Met Gly
        275                 280                 285

Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu Gly Thr
    290                 295                 300

Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met Ala Ala
305                 310                 315                 320

Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp Gly Pro
                325                 330                 335

Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu Thr Ala
            340                 345                 350

Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu Phe Val
        355                 360                 365

Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys Leu Gly
    370                 375                 380

Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp Pro Val
385                 390                 395                 400

Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile Ala Val
                405                 410                 415
```

```
Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu Val Ile
            420                 425                 430

Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro Asp Arg
        435                 440                 445

Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu Leu Asp
    450                 455                 460

Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro Ala Thr
465                 470                 475                 480

Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu Asp Ile
                485                 490                 495

Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln Pro Leu
            500                 505                 510

Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu Leu Gln
        515                 520                 525

Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr Glu Val
    530                 535                 540

Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg Ala Glu
545                 550                 555                 560

Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys Lys Leu
                565                 570                 575

Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His Ile His
            580                 585                 590

Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly Lys Glu
        595                 600                 605

Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu Phe Leu
    610                 615                 620

Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys Gly His
```

625 630 635 640

Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala Arg Lys
645 650 655

Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile Glu Asn
660 665 670

Ser Ser Pro Ser Gly Gly Ser Lys Arg Thr Ala Asp Gly Ser Glu Phe
675 680 685

Glu Pro Lys Lys Lys Arg Lys Val
690 695

<210> 451

<400> 451
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<210> 452
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 452

Ile Lys Ile Ala Thr Arg Lys Tyr Leu Gly Lys Gln Asn Val Tyr Asp
1 5 10 15

Ile Gly Val Glu Arg Asp His Asn Phe Ala Leu Lys Asn Gly Phe Ile
20 25 30

Ala Ser Asn
35

<210> 453
<211> 28
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 453

Cys Phe Asn Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr
1 5 10 15

Pro Glu Ser Ser Gly Gly Ser Ser Gly Gly Ser Ser
20 25

<210> 454
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 454

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

```
Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
```

```
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560
```

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

<210> 455
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 455
gtgccatcac gtgctcagtc t 21

<210> 456
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 456
gagcgatcca ggtgctgcag a 21

<210> 457
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 457
ggagcccttc ttcttctgct 20

<210> 458
<211> 881
<212> PRT
<213> S. AUREUS

<400> 458

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1 5 10 15

Arg Lys Val Gly Lys Arg Asn Tyr Ile Leu Gly Leu Ala Ile Gly Ile
20 25 30

Thr Ser Val Gly Tyr Gly Ile Ile Asp Tyr Glu Thr Arg Asp Val Ile
35 40 45

Asp Ala Gly Val Arg Leu Phe Lys Glu Ala Asn Val Glu Asn Asn Glu
50 55 60

Gly Arg Arg Ser Lys Arg Gly Ala Arg Arg Leu Lys Arg Arg Arg Arg
65 70 75 80

His Arg Ile Gln Arg Val Lys Lys Leu Leu Phe Asp Tyr Asn Leu Leu
85 90 95

Thr Asp His Ser Glu Leu Ser Gly Ile Asn Pro Tyr Glu Ala Arg Val
100 105 110

Lys Gly Leu Ser Gln Lys Leu Ser Glu Glu Glu Phe Ser Ala Ala Leu

```
        115                 120                 125

Leu His Leu Ala Lys Arg Arg Gly Val His Asn Val Asn Glu Val Glu
    130                 135                 140

Glu Asp Thr Gly Asn Glu Leu Ser Thr Lys Glu Gln Ile Ser Arg Asn
145                 150                 155                 160

Ser Lys Ala Leu Glu Glu Lys Tyr Val Ala Glu Leu Gln Leu Glu Arg
                165                 170                 175

Leu Lys Lys Asp Gly Glu Val Arg Gly Ser Ile Asn Arg Phe Lys Thr
            180                 185                 190

Ser Asp Tyr Val Lys Glu Ala Lys Gln Leu Leu Lys Val Gln Lys Ala
        195                 200                 205

Tyr His Gln Leu Asp Gln Ser Phe Ile Asp Thr Tyr Ile Asp Leu Leu
    210                 215                 220

Glu Thr Arg Arg Thr Tyr Tyr Glu Gly Pro Gly Glu Gly Ser Pro Phe
225                 230                 235                 240

Gly Trp Lys Asp Ile Lys Glu Trp Tyr Glu Met Leu Met Gly His Cys
                245                 250                 255

Thr Tyr Phe Pro Glu Glu Leu Arg Ser Val Lys Tyr Ala Tyr Asn Ala
            260                 265                 270

Asp Leu Tyr Asn Ala Leu Asn Asp Leu Asn Asn Leu Val Ile Thr Arg
        275                 280                 285

Asp Glu Asn Glu Lys Leu Glu Tyr Tyr Glu Lys Phe Gln Ile Ile Glu
    290                 295                 300

Asn Val Phe Lys Gln Lys Lys Lys Pro Thr Leu Lys Gln Ile Ala Lys
305                 310                 315                 320

Glu Ile Leu Val Asn Glu Glu Asp Ile Lys Gly Tyr Arg Val Thr Ser
                325                 330                 335
```

```
Thr Gly Lys Pro Glu Phe Thr Asn Leu Lys Val Tyr His Asp Ile Lys
            340                 345                 350

Asp Ile Thr Ala Arg Lys Glu Ile Ile Glu Asn Ala Glu Leu Leu Asp
        355                 360                 365

Gln Ile Ala Lys Ile Leu Thr Ile Tyr Gln Ser Ser Glu Asp Ile Gln
    370                 375                 380

Glu Glu Leu Thr Asn Leu Asn Ser Glu Leu Thr Gln Glu Glu Ile Glu
385                 390                 395                 400

Gln Ile Ser Asn Leu Lys Gly Tyr Thr Gly Thr His Asn Leu Ser Leu
                405                 410                 415

Lys Ala Ile Asn Leu Ile Leu Asp Glu Leu Trp His Thr Asn Asp Asn
            420                 425                 430

Gln Ile Ala Ile Phe Asn Arg Leu Lys Leu Val Pro Lys Lys Val Asp
        435                 440                 445

Leu Ser Gln Gln Lys Glu Ile Pro Thr Thr Leu Val Asp Asp Phe Ile
    450                 455                 460

Leu Ser Pro Val Val Lys Arg Ser Phe Ile Gln Ser Ile Lys Val Ile
465                 470                 475                 480

Asn Ala Ile Ile Lys Lys Tyr Gly Leu Pro Asn Asp Ile Ile Ile Glu
                485                 490                 495

Leu Ala Arg Glu Lys Asn Ser Lys Asp Ala Gln Lys Met Ile Asn Glu
            500                 505                 510

Met Gln Lys Arg Asn Arg Gln Thr Asn Glu Arg Ile Glu Glu Ile Ile
        515                 520                 525

Arg Thr Thr Gly Lys Glu Asn Ala Lys Tyr Leu Ile Glu Lys Ile Lys
    530                 535                 540
```

```
Leu His Asp Met Gln Glu Gly Lys Cys Leu Tyr Ser Leu Glu Ala Ile
545                 550                 555                 560


Pro Leu Glu Asp Leu Leu Asn Asn Pro Phe Asn Tyr Glu Val Asp His
                565                 570                 575


Ile Ile Pro Arg Ser Val Ser Phe Asp Asn Ser Phe Asn Asn Lys Val
            580                 585                 590


Leu Val Lys Gln Glu Glu Asn Ser Lys Lys Gly Asn Arg Thr Pro Phe
        595                 600                 605


Gln Tyr Leu Ser Ser Ser Asp Ser Lys Ile Ser Tyr Glu Thr Phe Lys
    610                 615                 620


Lys His Ile Leu Asn Leu Ala Lys Gly Lys Gly Arg Ile Ser Lys Thr
625                 630                 635                 640


Lys Lys Glu Tyr Leu Leu Glu Glu Arg Asp Ile Asn Arg Phe Ser Val
                645                 650                 655


Gln Lys Asp Phe Ile Asn Arg Asn Leu Val Asp Thr Arg Tyr Ala Thr
            660                 665                 670


Arg Gly Leu Met Asn Leu Leu Arg Ser Tyr Phe Arg Val Asn Asn Leu
        675                 680                 685


Asp Val Lys Val Lys Ser Ile Asn Gly Gly Phe Thr Ser Phe Leu Arg
    690                 695                 700


Arg Lys Trp Lys Phe Lys Lys Glu Arg Asn Lys Gly Tyr Lys His His
705                 710                 715                 720


Ala Glu Asp Ala Leu Ile Ile Ala Asn Ala Asp Phe Ile Phe Lys Glu
                725                 730                 735


Trp Lys Lys Leu Asp Lys Ala Lys Lys Val Met Glu Asn Gln Met Phe
            740                 745                 750
```

Glu Glu Lys Gln Ala Glu Cys Leu Ser Tyr Glu Thr Glu Ile Leu Thr
        755   760   765

Val Glu Tyr Gly Leu Leu Pro Ile Gly Lys Ile Val Glu Lys Arg Ile
    770   775   780

Glu Cys Thr Val Tyr Ser Val Asp Asn Asn Gly Asn Ile Tyr Thr Gln
785   790   795   800

Pro Val Ala Gln Trp His Asp Arg Gly Glu Gln Glu Val Phe Glu Tyr
                805   810   815

Cys Leu Glu Asp Gly Ser Leu Ile Arg Ala Thr Lys Asp His Lys Phe
            820   825   830

Met Thr Val Asp Gly Gln Met Leu Pro Ile Asp Glu Ile Phe Glu Arg
        835   840   845

Glu Leu Asp Leu Met Arg Val Asp Asn Leu Pro Asn Ser Gly Gly Ser
    850   855   860

Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Pro Lys Lys Lys Arg Lys
865   870   875   880

Val

<210> 459

<400> 459
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<210> 460
<211> 739
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 460

Gly Lys Arg Asn Tyr Ile Leu Gly Leu Ala Ile Gly Ile Thr Ser Val
1   5   10   15

```
Gly Tyr Gly Ile Ile Asp Tyr Glu Thr Arg Asp Val Ile Asp Ala Gly
            20                  25                  30

Val Arg Leu Phe Lys Glu Ala Asn Val Glu Asn Asn Glu Gly Arg Arg
        35                  40                  45

Ser Lys Arg Gly Ala Arg Arg Leu Lys Arg Arg Arg Arg His Arg Ile
    50                  55                  60

Gln Arg Val Lys Lys Leu Leu Phe Asp Tyr Asn Leu Leu Thr Asp His
65                  70                  75                  80

Ser Glu Leu Ser Gly Ile Asn Pro Tyr Glu Ala Arg Val Lys Gly Leu
                85                  90                  95

Ser Gln Lys Leu Ser Glu Glu Glu Phe Ser Ala Ala Leu Leu His Leu
            100                 105                 110

Ala Lys Arg Arg Gly Val His Asn Val Asn Glu Val Glu Glu Asp Thr
        115                 120                 125

Gly Asn Glu Leu Ser Thr Lys Glu Gln Ile Ser Arg Asn Ser Lys Ala
    130                 135                 140

Leu Glu Glu Lys Tyr Val Ala Glu Leu Gln Leu Glu Arg Leu Lys Lys
145                 150                 155                 160

Asp Gly Glu Val Arg Gly Ser Ile Asn Arg Phe Lys Thr Ser Asp Tyr
                165                 170                 175

Val Lys Glu Ala Lys Gln Leu Leu Lys Val Gln Lys Ala Tyr His Gln
            180                 185                 190

Leu Asp Gln Ser Phe Ile Asp Thr Tyr Ile Asp Leu Leu Glu Thr Arg
        195                 200                 205

Arg Thr Tyr Tyr Glu Gly Pro Gly Glu Gly Ser Pro Phe Gly Trp Lys
    210                 215                 220
```

```
Asp Ile Lys Glu Trp Tyr Glu Met Leu Met Gly His Cys Thr Tyr Phe
225                 230                 235                 240

Pro Glu Glu Leu Arg Ser Val Lys Tyr Ala Tyr Asn Ala Asp Leu Tyr
                245                 250                 255

Asn Ala Leu Asn Asp Leu Asn Asn Leu Val Ile Thr Arg Asp Glu Asn
            260                 265                 270

Glu Lys Leu Glu Tyr Tyr Glu Lys Phe Gln Ile Ile Glu Asn Val Phe
        275                 280                 285

Lys Gln Lys Lys Lys Pro Thr Leu Lys Gln Ile Ala Lys Glu Ile Leu
    290                 295                 300

Val Asn Glu Glu Asp Ile Lys Gly Tyr Arg Val Thr Ser Thr Gly Lys
305                 310                 315                 320

Pro Glu Phe Thr Asn Leu Lys Val Tyr His Asp Ile Lys Asp Ile Thr
                325                 330                 335

Ala Arg Lys Glu Ile Ile Glu Asn Ala Glu Leu Leu Asp Gln Ile Ala
            340                 345                 350

Lys Ile Leu Thr Ile Tyr Gln Ser Ser Glu Asp Ile Gln Glu Glu Leu
        355                 360                 365

Thr Asn Leu Asn Ser Glu Leu Thr Gln Glu Glu Ile Glu Gln Ile Ser
    370                 375                 380

Asn Leu Lys Gly Tyr Thr Gly Thr His Asn Leu Ser Leu Lys Ala Ile
385                 390                 395                 400

Asn Leu Ile Leu Asp Glu Leu Trp His Thr Asn Asp Asn Gln Ile Ala
                405                 410                 415

Ile Phe Asn Arg Leu Lys Leu Val Pro Lys Lys Val Asp Leu Ser Gln
            420                 425                 430
```

```
Gln Lys Glu Ile Pro Thr Thr Leu Val Asp Asp Phe Ile Leu Ser Pro
        435                 440                 445

Val Val Lys Arg Ser Phe Ile Gln Ser Ile Lys Val Ile Asn Ala Ile
    450                 455                 460

Ile Lys Lys Tyr Gly Leu Pro Asn Asp Ile Ile Ile Glu Leu Ala Arg
465                 470                 475                 480

Glu Lys Asn Ser Lys Asp Ala Gln Lys Met Ile Asn Glu Met Gln Lys
                485                 490                 495

Arg Asn Arg Gln Thr Asn Glu Arg Ile Glu Glu Ile Ile Arg Thr Thr
            500                 505                 510

Gly Lys Glu Asn Ala Lys Tyr Leu Ile Glu Lys Ile Lys Leu His Asp
        515                 520                 525

Met Gln Glu Gly Lys Cys Leu Tyr Ser Leu Glu Ala Ile Pro Leu Glu
    530                 535                 540

Asp Leu Leu Asn Asn Pro Phe Asn Tyr Glu Val Asp His Ile Ile Pro
545                 550                 555                 560

Arg Ser Val Ser Phe Asp Asn Ser Phe Asn Asn Lys Val Leu Val Lys
                565                 570                 575

Gln Glu Glu Asn Ser Lys Lys Gly Asn Arg Thr Pro Phe Gln Tyr Leu
            580                 585                 590

Ser Ser Ser Asp Ser Lys Ile Ser Tyr Glu Thr Phe Lys Lys His Ile
        595                 600                 605

Leu Asn Leu Ala Lys Gly Lys Gly Arg Ile Ser Lys Thr Lys Lys Glu
    610                 615                 620

Tyr Leu Leu Glu Glu Arg Asp Ile Asn Arg Phe Ser Val Gln Lys Asp
625                 630                 635                 640

Phe Ile Asn Arg Asn Leu Val Asp Thr Arg Tyr Ala Thr Arg Gly Leu
```

645 650 655

Met Asn Leu Leu Arg Ser Tyr Phe Arg Val Asn Asn Leu Asp Val Lys
660 665 670

Val Lys Ser Ile Asn Gly Gly Phe Thr Ser Phe Leu Arg Arg Lys Trp
675 680 685

Lys Phe Lys Lys Glu Arg Asn Lys Gly Tyr Lys His His Ala Glu Asp
690 695 700

Ala Leu Ile Ile Ala Asn Ala Asp Phe Ile Phe Lys Glu Trp Lys Lys
705 710 715 720

Leu Asp Lys Ala Lys Lys Val Met Glu Asn Gln Met Phe Glu Glu Lys
725 730 735

Gln Ala Glu

<210> 461

<400> 461
000

<210> 462
<211> 102
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 462

Cys Leu Ser Tyr Glu Thr Glu Ile Leu Thr Val Glu Tyr Gly Leu Leu
1 5 10 15

Pro Ile Gly Lys Ile Val Glu Lys Arg Ile Glu Cys Thr Val Tyr Ser
20 25 30

Val Asp Asn Asn Gly Asn Ile Tyr Thr Gln Pro Val Ala Gln Trp His
35 40 45

Asp Arg Gly Glu Gln Glu Val Phe Glu Tyr Cys Leu Glu Asp Gly Ser
    50   55   60

Leu Ile Arg Ala Thr Lys Asp His Lys Phe Met Thr Val Asp Gly Gln
65   70   75   80

Met Leu Pro Ile Asp Glu Ile Phe Glu Arg Glu Leu Asp Leu Met Arg
                85   90   95

Val Asp Asn Leu Pro Asn
            100

<210> 463

<400> 463
000

<210> 464

<400> 464
000

<210> 465
<211> 1099
<212> PRT
<213> S. AUREUS

<400> 465

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1   5   10   15

Arg Lys Val Ile Lys Ile Ala Thr Arg Lys Tyr Leu Gly Lys Gln Asn
            20   25   30

Val Tyr Asp Ile Gly Val Glu Arg Asp His Asn Phe Ala Leu Lys Asn
        35   40   45

Gly Phe Ile Ala Ser Asn Cys Phe Asn Glu Ile Glu Thr Glu Gln Glu
    50   55   60

Tyr Lys Glu Ile Phe Ile Thr Pro His Gln Ile Lys His Ile Lys Asp
65   70   75   80

```
Phe Lys Asp Tyr Lys Tyr Ser His Arg Val Asp Lys Lys Pro Asn Arg
                85                  90                  95

Lys Leu Ile Asn Asp Thr Leu Tyr Ser Thr Arg Lys Asp Asp Lys Gly
            100                 105                 110

Asn Thr Leu Ile Val Asn Asn Leu Asn Gly Leu Tyr Asp Lys Asp Asn
        115                 120                 125

Asp Lys Leu Lys Lys Leu Ile Asn Lys Ser Pro Glu Lys Leu Leu Met
    130                 135                 140

Tyr His His Asp Pro Gln Thr Tyr Gln Lys Leu Lys Leu Ile Met Glu
145                 150                 155                 160

Gln Tyr Gly Asp Glu Lys Asn Pro Leu Tyr Lys Tyr Tyr Glu Glu Thr
                165                 170                 175

Gly Asn Tyr Leu Thr Lys Tyr Ser Lys Lys Asp Asn Gly Pro Val Ile
            180                 185                 190

Lys Lys Ile Lys Tyr Tyr Gly Asn Lys Leu Asn Ala His Leu Asp Ile
        195                 200                 205

Thr Asp Asp Tyr Pro Asn Ser Arg Asn Lys Val Val Lys Leu Ser Leu
    210                 215                 220

Lys Pro Tyr Arg Phe Asp Val Tyr Leu Asp Asn Gly Val Tyr Lys Phe
225                 230                 235                 240

Val Thr Val Lys Asn Leu Asp Val Ile Lys Lys Glu Asn Tyr Tyr Glu
                245                 250                 255

Val Asn Ser Lys Cys Tyr Glu Glu Ala Lys Lys Leu Lys Lys Ile Ser
            260                 265                 270

Asn Gln Ala Glu Phe Ile Ala Ser Phe Tyr Lys Asn Asp Leu Ile Lys
        275                 280                 285
```

```
Ile Asn Gly Glu Leu Tyr Arg Val Ile Gly Val Asn Asn Asp Leu Leu
    290                 295                 300

Asn Arg Ile Glu Val Asn Met Ile Asp Ile Thr Tyr Arg Glu Tyr Leu
305                 310                 315                 320

Glu Asn Met Asn Asp Lys Arg Pro Pro His Ile Ile Lys Thr Ile Ala
                325                 330                 335

Ser Lys Thr Gln Ser Ile Lys Lys Tyr Ser Thr Asp Ile Leu Gly Asn
            340                 345                 350

Leu Tyr Glu Val Lys Ser Lys Lys His Pro Gln Ile Ile Lys Lys Gly
        355                 360                 365

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Ser Glu Thr Pro Gly Thr
    370                 375                 380

Ser Glu Ser Ala Thr Pro Glu Ser Ser Gly Gly Ser Ser Gly Gly Ser
385                 390                 395                 400

Ser Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys
                405                 410                 415

Glu Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln
            420                 425                 430

Ala Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro
        435                 440                 445

Leu Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln
    450                 455                 460

Tyr Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln
465                 470                 475                 480

Arg Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn
                485                 490                 495

Thr Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro
```

```
            500                 505                 510

Val Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro
        515                 520                 525

Thr Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His
    530                 535                 540

Gln Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg
545                 550                 555                 560

Leu His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro
                565                 570                 575

Glu Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly
            580                 585                 590

Phe Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu
        595                 600                 605

Ala Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val
    610                 615                 620

Asp Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly
625                 630                 635                 640

Thr Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser
                645                 650                 655

Ala Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr
            660                 665                 670

Leu Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr
        675                 680                 685

Val Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe
    690                 695                 700

Leu Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu
705                 710                 715                 720
```

```
Met Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn
                725                 730                 735

Trp Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu
            740                 745                 750

Leu Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu
        755                 760                 765

Leu Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln
    770                 775                 780

Lys Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu
785                 790                 795                 800

Asp Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala
                805                 810                 815

Ile Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro
            820                 825                 830

Leu Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro
        835                 840                 845

Pro Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu
    850                 855                 860

Leu Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn
865                 870                 875                 880

Pro Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys
                885                 890                 895

Leu Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp
            900                 905                 910

Gln Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser
        915                 920                 925
```

```
Leu Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu
    930                 935                 940

Thr Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln
945                 950                 955                 960

Arg Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly
                965                 970                 975

Lys Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala
            980                 985                 990

His Ile His Gly Glu Ile Tyr Arg  Arg Arg Gly Leu Leu  Thr Ser Glu
        995                 1000                1005

Gly Lys  Glu Ile Lys Asn Lys  Asp Glu Ile Leu Ala  Leu Leu Lys
    1010                1015                1020

Ala Leu  Phe Leu Pro Lys Arg  Leu Ser Ile Ile His  Cys Pro Gly
    1025                1030                1035

His Gln  Lys Gly His Ser Ala  Glu Ala Arg Gly Asn  Arg Met Ala
    1040                1045                1050

Asp Gln  Ala Ala Arg Lys Ala  Ala Ile Thr Glu Thr  Pro Asp Thr
    1055                1060                1065

Ser Thr  Leu Leu Ile Glu Asn  Ser Ser Pro Ser Gly  Gly Ser Lys
    1070                1075                1080

Arg Thr  Ala Asp Gly Ser Glu  Phe Glu Pro Lys Lys  Lys Arg Lys
    1085                1090                1095

Val
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<210> 466

<400> 466
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<210> 467
<211> 310
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 467

Ile Glu Thr Glu Gln Glu Tyr Lys Glu Ile Phe Ile Thr Pro His Gln
1 5 10 15

Ile Lys His Ile Lys Asp Phe Lys Asp Tyr Lys Tyr Ser His Arg Val
20 25 30

Asp Lys Lys Pro Asn Arg Lys Leu Ile Asn Asp Thr Leu Tyr Ser Thr
35 40 45

Arg Lys Asp Asp Lys Gly Asn Thr Leu Ile Val Asn Asn Leu Asn Gly
50 55 60

Leu Tyr Asp Lys Asp Asn Asp Lys Leu Lys Lys Leu Ile Asn Lys Ser
65 70 75 80

Pro Glu Lys Leu Leu Met Tyr His His Asp Pro Gln Thr Tyr Gln Lys
85 90 95

Leu Lys Leu Ile Met Glu Gln Tyr Gly Asp Glu Lys Asn Pro Leu Tyr
100 105 110

Lys Tyr Tyr Glu Glu Thr Gly Asn Tyr Leu Thr Lys Tyr Ser Lys Lys
115 120 125

Asp Asn Gly Pro Val Ile Lys Lys Ile Lys Tyr Tyr Gly Asn Lys Leu
130 135 140

Asn Ala His Leu Asp Ile Thr Asp Asp Tyr Pro Asn Ser Arg Asn Lys
145 150 155 160

Val Val Lys Leu Ser Leu Lys Pro Tyr Arg Phe Asp Val Tyr Leu Asp
165 170 175

```
Asn Gly Val Tyr Lys Phe Val Thr Val Lys Asn Leu Asp Val Ile Lys
            180                 185                 190

Lys Glu Asn Tyr Tyr Glu Val Asn Ser Lys Cys Tyr Glu Glu Ala Lys
        195                 200                 205

Lys Leu Lys Lys Ile Ser Asn Gln Ala Glu Phe Ile Ala Ser Phe Tyr
    210                 215                 220

Lys Asn Asp Leu Ile Lys Ile Asn Gly Glu Leu Tyr Arg Val Ile Gly
225                 230                 235                 240

Val Asn Asn Asp Leu Leu Asn Arg Ile Glu Val Asn Met Ile Asp Ile
                245                 250                 255

Thr Tyr Arg Glu Tyr Leu Glu Asn Met Asn Asp Lys Arg Pro Pro His
            260                 265                 270

Ile Ile Lys Thr Ile Ala Ser Lys Thr Gln Ser Ile Lys Lys Tyr Ser
        275                 280                 285

Thr Asp Ile Leu Gly Asn Leu Tyr Glu Val Lys Ser Lys Lys His Pro
    290                 295                 300

Gln Ile Ile Lys Lys Gly
305                 310
```

<210> 468

<400> 468
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<210> 469

<400> 469
000

<210> 470

<400> 470
000

<210> 471
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 471

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

```
Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380
```

```
Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
```

595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

<210> 472
<211> 413
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 472

Cys Leu Ala Glu Gly Thr Arg Ile Phe Asp Pro Val Thr Gly Thr Thr
1 5 10 15

His Arg Ile Glu Asp Val Val Asp Gly Arg Lys Pro Ile His Val Val
20 25 30

Ala Ala Ala Lys Asp Gly Thr Leu Leu Ala Arg Pro Val Val Ser Trp
35 40 45

Phe Asp Gln Gly Thr Arg Asp Val Ile Gly Leu Arg Ile Ala Gly Gly
50 55 60

Ala Ile Val Trp Ala Thr Pro Asp His Lys Val Leu Thr Glu Tyr Gly
65 70 75 80

```
Trp Arg Ala Ala Gly Glu Leu Arg Lys Gly Asp Arg Val Ala Gly Pro
                85                  90                  95

Gly Gly Ser Gly Asn Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met
            100                 105                 110

Val Ser Ala Leu Leu Asp Ala Glu Pro Pro Ile Leu Tyr Ser Glu Tyr
        115                 120                 125

Asp Pro Thr Ser Pro Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr
    130                 135                 140

Asn Leu Ala Asp Arg Glu Leu Val His Met Ile Asn Trp Ala Lys Arg
145                 150                 155                 160

Val Pro Gly Phe Val Asp Leu Thr Leu His Asp Gln Ala His Leu Leu
                165                 170                 175

Glu Cys Ala Trp Leu Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser
            180                 185                 190

Met Glu His Pro Gly Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp
        195                 200                 205

Arg Asn Gln Gly Lys Cys Val Glu Gly Met Val Glu Ile Phe Asp Met
    210                 215                 220

Leu Leu Ala Thr Ser Ser Arg Phe Arg Met Met Asn Leu Gln Gly Glu
225                 230                 235                 240

Glu Phe Val Cys Leu Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr
                245                 250                 255

Thr Phe Leu Ser Ser Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile
            260                 265                 270

His Arg Ala Leu Asp Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala
        275                 280                 285

Lys Ala Gly Leu Thr Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu
```

290 295 300

Leu Leu Ile Leu Ser His Ile Arg His Met Ser Asn Lys Gly Met Glu
305 310 315 320

His Leu Tyr Ser Met Lys Tyr Lys Asn Val Val Pro Leu Tyr Asp Leu
325 330 335

Leu Leu Glu Met Leu Asp Ala His Arg Leu His Ala Gly Gly Ser Gly
340 345 350

Ala Ser Arg Val Gln Ala Phe Ala Asp Ala Leu Asp Asp Lys Phe Leu
355 360 365

His Asp Met Leu Ala Glu Glu Leu Arg Tyr Ser Val Ile Arg Glu Val
370 375 380

Leu Pro Thr Arg Arg Ala Arg Thr Phe Asp Leu Glu Val Glu Glu Leu
385 390 395 400

His Thr Leu Val Ala Glu Gly Val Val Val His Asn Cys
405 410

<210> 473
<211> 413
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 473

Cys Leu Ala Glu Gly Thr Arg Ile Phe Asp Pro Val Thr Gly Thr Thr
1 5 10 15

His Arg Ile Glu Asp Val Val Asp Gly Arg Lys Pro Ile His Val Val
20 25 30

Ala Val Ala Lys Asp Gly Thr Leu Leu Ala Arg Pro Val Val Ser Trp
35 40 45

```
Phe Asp Gln Gly Thr Arg Asp Val Ile Gly Leu Arg Ile Ala Gly Gly
    50                  55                  60

Ala Ile Val Trp Ala Thr Pro Asp His Lys Val Leu Thr Glu Tyr Gly
65                  70                  75                  80

Trp Arg Ala Ala Gly Glu Leu Arg Lys Gly Asp Arg Val Ala Gly Pro
                85                  90                  95

Gly Gly Ser Gly Asn Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met
            100                 105                 110

Val Ser Ala Leu Leu Asp Ala Glu Pro Pro Ile Leu Tyr Ser Glu Tyr
        115                 120                 125

Asp Pro Thr Ser Pro Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr
    130                 135                 140

Asn Leu Ala Asp Arg Glu Leu Val His Met Ile Asn Trp Ala Lys Arg
145                 150                 155                 160

Val Pro Gly Phe Val Asp Leu Thr Leu His Asp Gln Ala His Leu Leu
                165                 170                 175

Glu Cys Ala Trp Leu Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser
            180                 185                 190

Met Glu His Pro Gly Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp
        195                 200                 205

Arg Asn Gln Gly Lys Cys Val Glu Gly Met Val Glu Ile Phe Asp Met
    210                 215                 220

Leu Leu Ala Thr Ser Ser Arg Phe Arg Met Met Asn Leu Gln Gly Glu
225                 230                 235                 240

Glu Phe Val Cys Leu Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr
                245                 250                 255

Thr Phe Leu Ser Ser Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile
```

```
            260                 265                 270

His Arg Ala Leu Asp Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala
        275                 280                 285

Lys Ala Gly Leu Thr Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu
    290                 295                 300

Leu Leu Ile Leu Ser His Ile Arg His Met Ser Asn Lys Gly Met Glu
305                 310                 315                 320

His Leu Tyr Ser Met Lys Tyr Thr Asn Val Val Pro Leu Tyr Asp Leu
                325                 330                 335

Leu Leu Glu Met Leu Asp Ala His Arg Leu His Ala Gly Gly Ser Gly
            340                 345                 350

Ala Ser Arg Val Gln Ala Phe Ala Asp Ala Leu Asp Asp Lys Phe Leu
        355                 360                 365

His Asp Met Leu Ala Glu Glu Leu Arg Tyr Ser Val Ile Arg Glu Val
    370                 375                 380

Leu Pro Thr Arg Arg Ala Arg Thr Phe Asp Leu Glu Val Glu Glu Leu
385                 390                 395                 400

His Thr Leu Val Ala Glu Gly Val Val Val His Asn Cys
                405                 410
```

<210> 474
<211> 413
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 474

```
Cys Leu Ala Glu Gly Thr Arg Ile Phe Asp Pro Val Thr Gly Thr Thr
1               5                   10                  15
```

```
His Arg Ile Glu Asp Val Val Asp Gly Arg Lys Pro Ile His Val Val
            20                  25                  30

Ala Ala Ala Lys Asp Gly Thr Leu Leu Ala Arg Pro Val Val Ser Trp
        35                  40                  45

Phe Asp Gln Gly Thr Arg Asp Val Ile Gly Leu Arg Ile Ala Gly Gly
    50                  55                  60

Ala Thr Val Trp Ala Thr Pro Asp His Lys Val Leu Thr Glu Tyr Gly
65                  70                  75                  80

Trp Arg Ala Ala Gly Glu Leu Arg Lys Gly Asp Arg Val Ala Gly Pro
                85                  90                  95

Gly Gly Ser Gly Asn Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met
            100                 105                 110

Val Ser Ala Leu Leu Asp Ala Glu Pro Pro Ile Pro Tyr Ser Glu Tyr
        115                 120                 125

Asp Pro Thr Ser Pro Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr
    130                 135                 140

Asn Leu Ala Asp Arg Glu Leu Val His Met Ile Asn Trp Ala Lys Arg
145                 150                 155                 160

Val Pro Gly Phe Val Asp Leu Thr Leu His Asp Gln Ala His Leu Leu
                165                 170                 175

Glu Cys Ala Trp Leu Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser
            180                 185                 190

Met Glu His Pro Gly Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp
        195                 200                 205

Arg Asn Gln Gly Lys Cys Val Glu Gly Met Val Glu Ile Phe Asp Met
    210                 215                 220

Leu Leu Ala Thr Ser Ser Arg Phe Arg Met Met Asn Leu Gln Gly Glu
```

225 230 235 240

Glu Phe Val Cys Leu Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr
245 250 255

Thr Phe Leu Ser Ser Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile
260 265 270

His Arg Ala Leu Asp Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala
275 280 285

Lys Ala Gly Leu Thr Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu
290 295 300

Leu Leu Ile Leu Ser His Ile Arg His Met Ser Asn Lys Gly Met Glu
305 310 315 320

His Leu Tyr Ser Met Lys Tyr Lys Asn Val Val Pro Leu Tyr Asp Leu
325 330 335

Leu Leu Glu Met Leu Asp Ala His Arg Leu His Ala Gly Gly Ser Gly
340 345 350

Ala Ser Arg Val Gln Ala Phe Ala Asp Ala Leu Asp Asp Lys Phe Leu
355 360 365

His Asp Met Leu Ala Glu Gly Leu Arg Tyr Ser Val Ile Arg Glu Val
370 375 380

Leu Pro Thr Arg Arg Ala Arg Thr Phe Asp Leu Glu Val Glu Glu Leu
385 390 395 400

His Thr Leu Val Ala Glu Gly Val Val Val His Asn Cys
405 410

<210> 475
<211> 413
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 475

```
Cys Leu Ala Glu Gly Thr Arg Ile Phe Asp Pro Val Thr Gly Thr Thr
1               5                  10                  15


His Arg Ile Glu Asp Val Val Asp Gly Arg Lys Pro Ile His Val Val
            20                  25                  30


Ala Ala Ala Lys Asp Gly Thr Leu Leu Ala Arg Pro Val Val Ser Trp
        35                  40                  45


Phe Asp Gln Gly Thr Arg Asp Val Ile Gly Leu Arg Ile Ala Gly Gly
    50                  55                  60


Ala Thr Val Trp Ala Thr Pro Asp His Lys Val Leu Thr Glu Tyr Gly
65                  70                  75                  80


Trp Arg Ala Ala Gly Glu Leu Arg Lys Gly Asp Arg Val Ala Gly Pro
                85                  90                  95


Gly Gly Ser Gly Asn Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met
            100                 105                 110


Val Ser Ala Leu Leu Asp Ala Glu Pro Pro Ile Leu Tyr Ser Glu Tyr
        115                 120                 125


Asp Pro Thr Ser Pro Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr
    130                 135                 140


Asn Leu Ala Asp Arg Glu Leu Val His Met Ile Asn Trp Ala Lys Arg
145                 150                 155                 160


Val Pro Gly Phe Val Asp Leu Thr Leu His Asp Gln Ala His Leu Leu
                165                 170                 175


Glu Cys Ala Trp Leu Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser
            180                 185                 190


Met Glu His Pro Gly Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp
```

```
        195                 200                 205

Arg Asn Gln Gly Lys Cys Val Glu Gly Met Val Glu Ile Phe Asp Met
    210                 215                 220

Leu Leu Ala Thr Ser Ser Arg Phe Arg Met Met Asn Leu Gln Gly Glu
225                 230                 235                 240

Glu Phe Val Cys Leu Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr
                245                 250                 255

Thr Phe Leu Ser Ser Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile
            260                 265                 270

His Arg Ala Leu Asp Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala
        275                 280                 285

Lys Ala Gly Leu Thr Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu
    290                 295                 300

Leu Leu Ile Leu Ser His Ile Arg His Met Ser Asn Lys Gly Met Glu
305                 310                 315                 320

His Leu Tyr Ser Met Lys Tyr Lys Asn Val Val Pro Leu Tyr Asp Leu
                325                 330                 335

Leu Leu Glu Met Leu Asp Ala His Arg Leu His Ala Gly Gly Ser Gly
            340                 345                 350

Ala Ser Arg Val Gln Ala Phe Ala Asp Ala Leu Asp Asp Lys Phe Leu
        355                 360                 365

His Asp Met Leu Ala Glu Glu Leu Arg Tyr Ser Val Ile Arg Glu Val
    370                 375                 380

Leu Pro Thr Arg Arg Ala Arg Thr Phe Asp Leu Glu Val Glu Glu Leu
385                 390                 395                 400

His Thr Leu Val Ala Glu Gly Val Val Val His Asn Cys
                405                 410
```

<210> 476
<211> 413
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 476

Cys Leu Ala Glu Gly Thr Arg Ile Phe Asp Pro Val Thr Gly Thr Thr
1 5 10 15

His Arg Ile Glu Asp Val Val Asp Gly Arg Lys Pro Ile His Val Val
20 25 30

Ala Ala Ala Lys Asp Gly Thr Leu Leu Ala Arg Pro Val Val Ser Trp
35 40 45

Phe Asp Gln Gly Thr Arg Asp Val Ile Gly Leu Arg Ile Ala Gly Gly
50 55 60

Ala Thr Val Trp Ala Thr Pro Asp His Lys Val Leu Thr Glu Tyr Gly
65 70 75 80

Trp Arg Ala Ala Gly Glu Leu Arg Lys Gly Asp Arg Val Ala Gly Pro
85 90 95

Gly Gly Ser Gly Asn Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met
100 105 110

Val Ser Ala Leu Leu Asp Ala Glu Pro Pro Ile Pro Tyr Ser Glu Tyr
115 120 125

Asp Pro Thr Ser Pro Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr
130 135 140

Asn Leu Ala Asp Arg Glu Leu Val His Met Ile Asn Trp Ala Lys Arg
145 150 155 160

Val Pro Gly Phe Val Asp Leu Thr Leu His Asp Gln Ala His Leu Leu

```
                165                 170                 175

Glu Cys Ala Trp Leu Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser
            180                 185                 190

Met Glu His Pro Gly Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp
        195                 200                 205

Arg Asn Gln Gly Lys Cys Val Glu Gly Met Val Glu Ile Phe Asp Met
    210                 215                 220

Leu Leu Ala Thr Ser Ser Arg Phe Arg Met Met Asn Leu Gln Gly Glu
225                 230                 235                 240

Glu Phe Val Cys Leu Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr
                245                 250                 255

Thr Phe Leu Ser Ser Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile
            260                 265                 270

His Arg Ala Leu Asp Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala
        275                 280                 285

Lys Ala Gly Leu Thr Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu
    290                 295                 300

Leu Leu Ile Leu Ser His Ile Arg His Met Ser Asn Lys Gly Met Glu
305                 310                 315                 320

His Leu Tyr Ser Met Lys Tyr Lys Asn Val Val Pro Leu Tyr Asp Leu
                325                 330                 335

Leu Leu Glu Met Leu Asp Ala His Arg Leu His Ala Gly Gly Ser Gly
            340                 345                 350

Ala Ser Arg Val Gln Ala Phe Ala Asp Ala Leu Asp Asp Lys Phe Leu
        355                 360                 365

His Asp Met Leu Ala Glu Glu Leu Arg Tyr Ser Val Ile Arg Glu Val
    370                 375                 380
```

```
Leu Pro Thr Arg Arg Ala Arg Thr Phe Asp Leu Glu Val Glu Glu Leu
385                 390                 395                 400


His Thr Leu Val Ala Glu Gly Val Val Val His Asn Cys
                405                 410


<210>  477
<211>  413
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  477

Cys Leu Ala Glu Gly Thr Arg Ile Phe Asp Pro Val Thr Gly Thr Thr
1               5                   10                  15


His Arg Ile Glu Asp Val Val Asp Gly Arg Lys Pro Ile His Val Val
            20                  25                  30


Ala Ala Ala Lys Asp Gly Thr Leu Leu Ala Arg Pro Val Val Ser Trp
        35                  40                  45


Phe Asp Gln Gly Thr Arg Asp Val Ile Gly Leu Arg Ile Ala Gly Gly
    50                  55                  60


Ala Thr Val Trp Ala Thr Pro Asp His Lys Val Leu Thr Glu Tyr Gly
65                  70                  75                  80


Trp Arg Ala Ala Gly Glu Leu Arg Lys Gly Asp Arg Val Ala Gly Pro
                85                  90                  95


Gly Gly Ser Gly Asn Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met
            100                 105                 110


Val Ser Ala Leu Leu Asp Ala Glu Pro Pro Ile Leu Tyr Ser Glu Tyr
        115                 120                 125


Asn Pro Thr Ser Pro Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr
```

```
    130                 135                 140

Asn Leu Ala Asp Arg Glu Leu Val His Met Ile Asn Trp Ala Lys Arg
145                 150                 155                 160

Val Pro Gly Phe Val Asp Leu Thr Leu His Asp Gln Ala His Leu Leu
                165                 170                 175

Glu Arg Ala Trp Leu Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser
            180                 185                 190

Met Glu His Pro Gly Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp
        195                 200                 205

Arg Asn Gln Gly Lys Cys Val Glu Gly Met Val Glu Ile Phe Asp Met
    210                 215                 220

Leu Leu Ala Thr Ser Ser Arg Phe Arg Met Met Asn Leu Gln Gly Glu
225                 230                 235                 240

Glu Phe Val Cys Leu Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr
                245                 250                 255

Thr Phe Leu Ser Ser Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile
            260                 265                 270

His Arg Ala Leu Asp Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala
        275                 280                 285

Lys Ala Gly Leu Thr Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu
    290                 295                 300

Leu Leu Ile Leu Ser His Ile Arg His Met Ser Asn Lys Gly Met Glu
305                 310                 315                 320

His Leu Tyr Ser Met Lys Tyr Lys Asn Val Val Pro Leu Tyr Asp Leu
                325                 330                 335

Leu Leu Glu Met Leu Asp Ala His Arg Leu His Ala Gly Gly Ser Gly
            340                 345                 350
```

Ala Ser Arg Val Gln Ala Phe Ala Asp Ala Leu Asp Asp Lys Phe Leu
        355   360   365

His Asp Met Leu Ala Glu Gly Leu Arg Tyr Ser Val Ile Arg Glu Val
    370   375   380

Leu Pro Thr Arg Arg Ala Arg Thr Phe Asp Leu Glu Val Glu Glu Leu
385   390   395   400

His Thr Leu Val Ala Glu Gly Val Val Val His Asn Cys
                405   410

<210> 478
<211> 413
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 478

Cys Leu Ala Glu Gly Thr Arg Ile Phe Asp Pro Val Thr Gly Thr Thr
1   5   10   15

His Arg Ile Glu Asp Val Val Asp Gly Arg Lys Pro Ile His Val Val
            20   25   30

Ala Ala Ala Lys Asp Gly Thr Leu Leu Ala Arg Pro Val Val Ser Trp
        35   40   45

Phe Asp Gln Gly Thr Arg Asp Val Ile Gly Leu Arg Ile Ala Gly Gly
    50   55   60

Ala Ile Val Trp Ala Thr Pro Asp His Lys Val Leu Thr Glu Tyr Gly
65   70   75   80

Trp Arg Ala Ala Gly Glu Leu Arg Lys Gly Asp Arg Val Ala Gly Pro
                85   90   95

Gly Gly Ser Gly Asn Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met

```
            100                 105                 110

Val Ser Ala Leu Leu Asp Ala Glu Pro Pro Ile Leu Tyr Ser Glu Tyr
        115                 120                 125

Asp Pro Thr Ser Pro Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr
    130                 135                 140

Asn Leu Ala Asp Arg Glu Leu Val His Met Ile Asn Trp Ala Lys Arg
145                 150                 155                 160

Val Pro Gly Phe Val Asp Leu Thr Leu His Asp Gln Ala His Leu Leu
                165                 170                 175

Glu Arg Ala Trp Leu Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser
            180                 185                 190

Met Glu His Pro Gly Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp
        195                 200                 205

Arg Asn Gln Gly Lys Cys Val Glu Gly Met Val Glu Ile Phe Asp Met
    210                 215                 220

Leu Leu Ala Thr Ser Ser Arg Phe Arg Met Met Asn Leu Gln Gly Glu
225                 230                 235                 240

Glu Phe Val Cys Leu Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr
                245                 250                 255

Thr Phe Leu Ser Ser Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile
            260                 265                 270

His Arg Ala Leu Asp Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala
        275                 280                 285

Lys Ala Gly Leu Thr Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu
    290                 295                 300

Leu Leu Ile Leu Ser His Ile Arg His Met Ser Asn Lys Gly Met Glu
305                 310                 315                 320
```

```
His Leu Tyr Ser Met Lys Tyr Lys Asn Val Val Pro Leu Tyr Asp Leu
                325                 330                 335

Leu Leu Glu Met Leu Asp Ala His Arg Leu His Ala Gly Gly Ser Gly
            340                 345                 350

Ala Ser Arg Val Gln Ala Phe Ala Asp Ala Leu Asp Asp Lys Phe Leu
        355                 360                 365

His Asp Met Leu Ala Glu Gly Leu Arg Tyr Ser Val Ile Arg Glu Val
    370                 375                 380

Leu Pro Thr Arg Arg Ala Arg Thr Phe Asp Leu Glu Val Glu Glu Leu
385                 390                 395                 400

His Thr Leu Val Ala Glu Gly Val Val Val His Asn Cys
                405                 410
```

<210> 479
<211> 413
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 479

```
Cys Leu Ala Glu Gly Thr Arg Ile Phe Asp Pro Val Thr Gly Thr Thr
1               5                   10                  15

His Arg Ile Glu Asp Val Val Asp Gly Arg Lys Pro Ile His Val Val
            20                  25                  30

Ala Val Ala Lys Asp Gly Thr Leu Leu Ala Arg Pro Val Val Ser Trp
        35                  40                  45

Phe Asp Gln Gly Thr Arg Asp Val Ile Gly Leu Arg Ile Ala Gly Gly
    50                  55                  60

Ala Thr Val Trp Ala Thr Pro Asp His Lys Val Leu Thr Glu Tyr Gly
```

```
65                  70                  75                  80

Trp Arg Ala Ala Gly Glu Leu Arg Lys Gly Asp Arg Val Ala Gly Pro
                85                  90                  95

Gly Gly Ser Gly Asn Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met
            100                 105                 110

Val Ser Ala Leu Leu Asp Ala Glu Pro Pro Ile Leu Tyr Ser Glu Tyr
        115                 120                 125

Asp Pro Thr Ser Pro Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr
    130                 135                 140

Asn Leu Ala Asp Arg Glu Leu Val His Met Ile Asn Trp Ala Lys Arg
145                 150                 155                 160

Val Pro Gly Phe Val Asp Leu Thr Leu His Asp Gln Ala His Leu Leu
                165                 170                 175

Glu Arg Ala Trp Leu Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser
            180                 185                 190

Met Glu His Pro Gly Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp
        195                 200                 205

Arg Asn Gln Gly Lys Cys Val Glu Gly Met Val Glu Ile Phe Asp Met
    210                 215                 220

Leu Leu Ala Thr Ser Ser Arg Phe Arg Met Met Asn Leu Gln Gly Glu
225                 230                 235                 240

Glu Phe Val Cys Leu Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr
                245                 250                 255

Thr Phe Leu Ser Ser Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile
            260                 265                 270

His Arg Ala Leu Asp Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala
        275                 280                 285
```

Lys Ala Gly Leu Thr Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu
290 295 300

Leu Leu Ile Leu Ser His Ile Arg His Met Ser Asn Lys Gly Met Glu
305 310 315 320

His Leu Tyr Ser Met Lys Tyr Lys Asn Val Val Pro Leu Tyr Asp Leu
325 330 335

Leu Leu Glu Met Leu Asp Ala His Arg Leu His Ala Gly Gly Ser Gly
340 345 350

Ala Ser Arg Val Gln Ala Phe Ala Asp Ala Leu Asp Asp Lys Phe Leu
355 360 365

His Asp Met Leu Ala Glu Glu Leu Arg Tyr Ser Val Ile Arg Glu Val
370 375 380

Leu Pro Thr Arg Arg Ala Arg Thr Phe Asp Leu Glu Val Glu Glu Leu
385 390 395 400

His Thr Leu Val Ala Glu Gly Val Val Val His Asn Cys
405 410

<210> 480

<400> 480
000

<210> 481

<400> 481
000

<210> 482
<211> 1053
<212> PRT
<213> Staphylococcus aureus

<400> 482

Met Gly Lys Arg Asn Tyr Ile Leu Gly Leu Asp Ile Gly Ile Thr Ser
1 5 10 15

```
Val Gly Tyr Gly Ile Ile Asp Tyr Glu Thr Arg Asp Val Ile Asp Ala
            20                  25                  30

Gly Val Arg Leu Phe Lys Glu Ala Asn Val Glu Asn Asn Glu Gly Arg
        35                  40                  45

Arg Ser Lys Arg Gly Ala Arg Arg Leu Lys Arg Arg Arg Arg His Arg
    50                  55                  60

Ile Gln Arg Val Lys Lys Leu Leu Phe Asp Tyr Asn Leu Leu Thr Asp
65                  70                  75                  80

His Ser Glu Leu Ser Gly Ile Asn Pro Tyr Glu Ala Arg Val Lys Gly
                85                  90                  95

Leu Ser Gln Lys Leu Ser Glu Glu Glu Phe Ser Ala Ala Leu Leu His
            100                 105                 110

Leu Ala Lys Arg Arg Gly Val His Asn Val Asn Glu Val Glu Glu Asp
        115                 120                 125

Thr Gly Asn Glu Leu Ser Thr Lys Glu Gln Ile Ser Arg Asn Ser Lys
    130                 135                 140

Ala Leu Glu Glu Lys Tyr Val Ala Glu Leu Gln Leu Glu Arg Leu Lys
145                 150                 155                 160

Lys Asp Gly Glu Val Arg Gly Ser Ile Asn Arg Phe Lys Thr Ser Asp
                165                 170                 175

Tyr Val Lys Glu Ala Lys Gln Leu Leu Lys Val Gln Lys Ala Tyr His
            180                 185                 190

Gln Leu Asp Gln Ser Phe Ile Asp Thr Tyr Ile Asp Leu Leu Glu Thr
        195                 200                 205

Arg Arg Thr Tyr Tyr Glu Gly Pro Gly Glu Gly Ser Pro Phe Gly Trp
    210                 215                 220
```

```
Lys Asp Ile Lys Glu Trp Tyr Glu Met Leu Met Gly His Cys Thr Tyr
225                 230                 235                 240

Phe Pro Glu Glu Leu Arg Ser Val Lys Tyr Ala Tyr Asn Ala Asp Leu
                245                 250                 255

Tyr Asn Ala Leu Asn Asp Leu Asn Asn Leu Val Ile Thr Arg Asp Glu
            260                 265                 270

Asn Glu Lys Leu Glu Tyr Tyr Glu Lys Phe Gln Ile Ile Glu Asn Val
        275                 280                 285

Phe Lys Gln Lys Lys Lys Pro Thr Leu Lys Gln Ile Ala Lys Glu Ile
    290                 295                 300

Leu Val Asn Glu Glu Asp Ile Lys Gly Tyr Arg Val Thr Ser Thr Gly
305                 310                 315                 320

Lys Pro Glu Phe Thr Asn Leu Lys Val Tyr His Asp Ile Lys Asp Ile
                325                 330                 335

Thr Ala Arg Lys Glu Ile Ile Glu Asn Ala Glu Leu Leu Asp Gln Ile
            340                 345                 350

Ala Lys Ile Leu Thr Ile Tyr Gln Ser Ser Glu Asp Ile Gln Glu Glu
        355                 360                 365

Leu Thr Asn Leu Asn Ser Glu Leu Thr Gln Glu Glu Ile Glu Gln Ile
    370                 375                 380

Ser Asn Leu Lys Gly Tyr Thr Gly Thr His Asn Leu Ser Leu Lys Ala
385                 390                 395                 400

Ile Asn Leu Ile Leu Asp Glu Leu Trp His Thr Asn Asp Asn Gln Ile
                405                 410                 415

Ala Ile Phe Asn Arg Leu Lys Leu Val Pro Lys Lys Val Asp Leu Ser
            420                 425                 430
```

```
Gln Gln Lys Glu Ile Pro Thr Thr Leu Val Asp Asp Phe Ile Leu Ser
        435                 440                 445

Pro Val Val Lys Arg Ser Phe Ile Gln Ser Ile Lys Val Ile Asn Ala
    450                 455                 460

Ile Ile Lys Lys Tyr Gly Leu Pro Asn Asp Ile Ile Ile Glu Leu Ala
465                 470                 475                 480

Arg Glu Lys Asn Ser Lys Asp Ala Gln Lys Met Ile Asn Glu Met Gln
                485                 490                 495

Lys Arg Asn Arg Gln Thr Asn Glu Arg Ile Glu Glu Ile Ile Arg Thr
            500                 505                 510

Thr Gly Lys Glu Asn Ala Lys Tyr Leu Ile Glu Lys Ile Lys Leu His
        515                 520                 525

Asp Met Gln Glu Gly Lys Cys Leu Tyr Ser Leu Glu Ala Ile Pro Leu
    530                 535                 540

Glu Asp Leu Leu Asn Asn Pro Phe Asn Tyr Glu Val Asp His Ile Ile
545                 550                 555                 560

Pro Arg Ser Val Ser Phe Asp Asn Ser Phe Asn Asn Lys Val Leu Val
                565                 570                 575

Lys Gln Glu Glu Asn Ser Lys Lys Gly Asn Arg Thr Pro Phe Gln Tyr
            580                 585                 590

Leu Ser Ser Ser Asp Ser Lys Ile Ser Tyr Glu Thr Phe Lys Lys His
        595                 600                 605

Ile Leu Asn Leu Ala Lys Gly Lys Gly Arg Ile Ser Lys Thr Lys Lys
    610                 615                 620

Glu Tyr Leu Leu Glu Glu Arg Asp Ile Asn Arg Phe Ser Val Gln Lys
625                 630                 635                 640

Asp Phe Ile Asn Arg Asn Leu Val Asp Thr Arg Tyr Ala Thr Arg Gly
```

```
               645                 650                 655

Leu Met Asn Leu Leu Arg Ser Tyr Phe Arg Val Asn Asn Leu Asp Val
            660                 665                 670

Lys Val Lys Ser Ile Asn Gly Gly Phe Thr Ser Phe Leu Arg Arg Lys
        675                 680                 685

Trp Lys Phe Lys Lys Glu Arg Asn Lys Gly Tyr Lys His His Ala Glu
    690                 695                 700

Asp Ala Leu Ile Ile Ala Asn Ala Asp Phe Ile Phe Lys Glu Trp Lys
705                 710                 715                 720

Lys Leu Asp Lys Ala Lys Lys Val Met Glu Asn Gln Met Phe Glu Glu
                725                 730                 735

Lys Gln Ala Glu Ser Met Pro Glu Ile Glu Thr Glu Gln Glu Tyr Lys
            740                 745                 750

Glu Ile Phe Ile Thr Pro His Gln Ile Lys His Ile Lys Asp Phe Lys
        755                 760                 765

Asp Tyr Lys Tyr Ser His Arg Val Asp Lys Lys Pro Asn Arg Lys Leu
    770                 775                 780

Ile Asn Asp Thr Leu Tyr Ser Thr Arg Lys Asp Asp Lys Gly Asn Thr
785                 790                 795                 800

Leu Ile Val Asn Asn Leu Asn Gly Leu Tyr Asp Lys Asp Asn Asp Lys
                805                 810                 815

Leu Lys Lys Leu Ile Asn Lys Ser Pro Glu Lys Leu Leu Met Tyr His
            820                 825                 830

His Asp Pro Gln Thr Tyr Gln Lys Leu Lys Leu Ile Met Glu Gln Tyr
        835                 840                 845

Gly Asp Glu Lys Asn Pro Leu Tyr Lys Tyr Tyr Glu Glu Thr Gly Asn
    850                 855                 860
```

```
Tyr Leu Thr Lys Tyr Ser Lys Lys Asp Asn Gly Pro Val Ile Lys Lys
865                 870                 875                 880

Ile Lys Tyr Tyr Gly Asn Lys Leu Asn Ala His Leu Asp Ile Thr Asp
                885                 890                 895

Asp Tyr Pro Asn Ser Arg Asn Lys Val Val Lys Leu Ser Leu Lys Pro
            900                 905                 910

Tyr Arg Phe Asp Val Tyr Leu Asp Asn Gly Val Tyr Lys Phe Val Thr
        915                 920                 925

Val Lys Asn Leu Asp Val Ile Lys Lys Glu Asn Tyr Tyr Glu Val Asn
    930                 935                 940

Ser Lys Cys Tyr Glu Glu Ala Lys Lys Leu Lys Lys Ile Ser Asn Gln
945                 950                 955                 960

Ala Glu Phe Ile Ala Ser Phe Tyr Lys Asn Asp Leu Ile Lys Ile Asn
                965                 970                 975

Gly Glu Leu Tyr Arg Val Ile Gly Val Asn Asn Asp Leu Leu Asn Arg
            980                 985                 990

Ile Glu Val Asn Met Ile Asp Ile  Thr Tyr Arg Glu Tyr  Leu Glu Asn
        995                 1000                1005

Met Asn  Asp Lys Arg Pro Pro  His Ile Ile Lys Thr  Ile Ala Ser
    1010                1015                1020

Lys Thr  Gln Ser Ile Lys Lys  Tyr Ser Thr Asp Ile  Leu Gly Asn
    1025                1030                1035

Leu Tyr  Glu Val Lys Ser Lys  Lys His Pro Gln Ile  Ile Lys Lys
    1040                1045                1050

<210>  483
<211>  1082
<212>  PRT
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<213> N. meningitidis

<400> 483

```
Met Ala Ala Phe Lys Pro Asn Ser Ile Asn Tyr Ile Leu Gly Leu Asp
1               5                  10                  15


Ile Gly Ile Ala Ser Val Gly Trp Ala Met Val Glu Ile Asp Glu Glu
            20                  25                  30


Glu Asn Pro Ile Arg Leu Ile Asp Leu Gly Val Arg Val Phe Glu Arg
        35                  40                  45


Ala Glu Val Pro Lys Thr Gly Asp Ser Leu Ala Met Ala Arg Arg Leu
    50                  55                  60


Ala Arg Ser Val Arg Arg Leu Thr Arg Arg Arg Ala His Arg Leu Leu
65                  70                  75                  80


Arg Thr Arg Arg Leu Leu Lys Arg Glu Gly Val Leu Gln Ala Ala Asn
                85                  90                  95


Phe Asp Glu Asn Gly Leu Ile Lys Ser Leu Pro Asn Thr Pro Trp Gln
            100                 105                 110


Leu Arg Ala Ala Ala Leu Asp Arg Lys Leu Thr Pro Leu Glu Trp Ser
        115                 120                 125


Ala Val Leu Leu His Leu Ile Lys His Arg Gly Tyr Leu Ser Gln Arg
    130                 135                 140


Lys Asn Glu Gly Glu Thr Ala Asp Lys Glu Leu Gly Ala Leu Leu Lys
145                 150                 155                 160


Gly Val Ala Gly Asn Ala His Ala Leu Gln Thr Gly Asp Phe Arg Thr
                165                 170                 175


Pro Ala Glu Leu Ala Leu Asn Lys Phe Glu Lys Glu Ser Gly His Ile
            180                 185                 190


Arg Asn Gln Arg Ser Asp Tyr Ser His Thr Phe Ser Arg Lys Asp Leu
```

```
        195                 200                 205

Gln Ala Glu Leu Ile Leu Leu Phe Glu Lys Gln Lys Glu Phe Gly Asn
    210                 215                 220

Pro His Val Ser Gly Gly Leu Lys Glu Gly Ile Glu Thr Leu Leu Met
225                 230                 235                 240

Thr Gln Arg Pro Ala Leu Ser Gly Asp Ala Val Gln Lys Met Leu Gly
                245                 250                 255

His Cys Thr Phe Glu Pro Ala Glu Pro Lys Ala Ala Lys Asn Thr Tyr
            260                 265                 270

Thr Ala Glu Arg Phe Ile Trp Leu Thr Lys Leu Asn Asn Leu Arg Ile
        275                 280                 285

Leu Glu Gln Gly Ser Glu Arg Pro Leu Thr Asp Thr Glu Arg Ala Thr
    290                 295                 300

Leu Met Asp Glu Pro Tyr Arg Lys Ser Lys Leu Thr Tyr Ala Gln Ala
305                 310                 315                 320

Arg Lys Leu Leu Gly Leu Glu Asp Thr Ala Phe Phe Lys Gly Leu Arg
                325                 330                 335

Tyr Gly Lys Asp Asn Ala Glu Ala Ser Thr Leu Met Glu Met Lys Ala
            340                 345                 350

Tyr His Ala Ile Ser Arg Ala Leu Glu Lys Glu Gly Leu Lys Asp Lys
        355                 360                 365

Lys Ser Pro Leu Asn Leu Ser Pro Glu Leu Gln Asp Glu Ile Gly Thr
    370                 375                 380

Ala Phe Ser Leu Phe Lys Thr Asp Glu Asp Ile Thr Gly Arg Leu Lys
385                 390                 395                 400

Asp Arg Ile Gln Pro Glu Ile Leu Glu Ala Leu Leu Lys His Ile Ser
                405                 410                 415
```

```
Phe Asp Lys Phe Val Gln Ile Ser Leu Lys Ala Leu Arg Arg Ile Val
            420                 425                 430

Pro Leu Met Glu Gln Gly Lys Arg Tyr Asp Glu Ala Cys Ala Glu Ile
        435                 440                 445

Tyr Gly Asp His Tyr Gly Lys Lys Asn Thr Glu Glu Lys Ile Tyr Leu
    450                 455                 460

Pro Pro Ile Pro Ala Asp Glu Ile Arg Asn Pro Val Val Leu Arg Ala
465                 470                 475                 480

Leu Ser Gln Ala Arg Lys Val Ile Asn Gly Val Val Arg Arg Tyr Gly
                485                 490                 495

Ser Pro Ala Arg Ile His Ile Glu Thr Ala Arg Glu Val Gly Lys Ser
            500                 505                 510

Phe Lys Asp Arg Lys Glu Ile Glu Lys Arg Gln Glu Glu Asn Arg Lys
        515                 520                 525

Asp Arg Glu Lys Ala Ala Ala Lys Phe Arg Glu Tyr Phe Pro Asn Phe
    530                 535                 540

Val Gly Glu Pro Lys Ser Lys Asp Ile Leu Lys Leu Arg Leu Tyr Glu
545                 550                 555                 560

Gln Gln His Gly Lys Cys Leu Tyr Ser Gly Lys Glu Ile Asn Leu Gly
                565                 570                 575

Arg Leu Asn Glu Lys Gly Tyr Val Glu Ile Asp Ala Ala Leu Pro Phe
            580                 585                 590

Ser Arg Thr Trp Asp Asp Ser Phe Asn Asn Lys Val Leu Val Leu Gly
        595                 600                 605

Ser Glu Asn Gln Asn Lys Gly Asn Gln Thr Pro Tyr Glu Tyr Phe Asn
    610                 615                 620
```

```
Gly Lys Asp Asn Ser Arg Glu Trp Gln Glu Phe Lys Ala Arg Val Glu
625                 630                 635                 640

Thr Ser Arg Phe Pro Arg Ser Lys Lys Gln Arg Ile Leu Leu Gln Lys
                645                 650                 655

Phe Asp Glu Asp Gly Phe Lys Glu Arg Asn Leu Asn Asp Thr Arg Tyr
            660                 665                 670

Val Asn Arg Phe Leu Cys Gln Phe Val Ala Asp Arg Met Arg Leu Thr
        675                 680                 685

Gly Lys Gly Lys Lys Arg Val Phe Ala Ser Asn Gly Gln Ile Thr Asn
    690                 695                 700

Leu Leu Arg Gly Phe Trp Gly Leu Arg Lys Val Arg Ala Glu Asn Asp
705                 710                 715                 720

Arg His His Ala Leu Asp Ala Val Val Val Ala Cys Ser Thr Val Ala
                725                 730                 735

Met Gln Gln Lys Ile Thr Arg Phe Val Arg Tyr Lys Glu Met Asn Ala
            740                 745                 750

Phe Asp Gly Lys Thr Ile Asp Lys Glu Thr Gly Glu Val Leu His Gln
        755                 760                 765

Lys Thr His Phe Pro Gln Pro Trp Glu Phe Phe Ala Gln Glu Val Met
    770                 775                 780

Ile Arg Val Phe Gly Lys Pro Asp Gly Lys Pro Glu Phe Glu Glu Ala
785                 790                 795                 800

Asp Thr Leu Glu Lys Leu Arg Thr Leu Leu Ala Glu Lys Leu Ser Ser
                805                 810                 815

Arg Pro Glu Ala Val His Glu Tyr Val Thr Pro Leu Phe Val Ser Arg
            820                 825                 830
```

```
Ala Pro Asn Arg Lys Met Ser Gly Gln Gly His Met Glu Thr Val Lys
        835                 840                 845

Ser Ala Lys Arg Leu Asp Glu Gly Val Ser Val Leu Arg Val Pro Leu
    850                 855                 860

Thr Gln Leu Lys Leu Lys Asp Leu Glu Lys Met Val Asn Arg Glu Arg
865                 870                 875                 880

Glu Pro Lys Leu Tyr Glu Ala Leu Lys Ala Arg Leu Glu Ala His Lys
                885                 890                 895

Asp Asp Pro Ala Lys Ala Phe Ala Glu Pro Phe Tyr Lys Tyr Asp Lys
            900                 905                 910

Ala Gly Asn Arg Thr Gln Gln Val Lys Ala Val Arg Val Glu Gln Val
        915                 920                 925

Gln Lys Thr Gly Val Trp Val Arg Asn His Asn Gly Ile Ala Asp Asn
    930                 935                 940

Ala Thr Met Val Arg Val Asp Val Phe Glu Lys Gly Asp Lys Tyr Tyr
945                 950                 955                 960

Leu Val Pro Ile Tyr Ser Trp Gln Val Ala Lys Gly Ile Leu Pro Asp
                965                 970                 975

Arg Ala Val Val Gln Gly Lys Asp Glu Glu Asp Trp Gln Leu Ile Asp
            980                 985                 990

Asp Ser Phe Asn Phe Lys Phe Ser  Leu His Pro Asn Asp  Leu Val Glu
        995                 1000                1005

Val Ile  Thr Lys Lys Ala Arg  Met Phe Gly Tyr Phe  Ala Ser Cys
    1010                1015                1020

His Arg  Gly Thr Gly Asn Ile  Asn Ile Arg Ile His  Asp Leu Asp
    1025                1030                1035

His Lys  Ile Gly Lys Asn Gly  Ile Leu Glu Gly Ile  Gly Val Lys
```

1040 1045 1050

Thr Ala Leu Ser Phe Gln Lys Tyr Gln Ile Asp Glu Leu Gly Lys
1055 1060 1065

Glu Ile Arg Pro Cys Arg Leu Lys Lys Arg Pro Pro Val Arg
1070 1075 1080

<210> 484
<211> 984
<212> PRT
<213> C. jejuni

<400> 484

Met Ala Arg Ile Leu Ala Phe Asp Ile Gly Ile Ser Ser Ile Gly Trp
1 5 10 15

Ala Phe Ser Glu Asn Asp Glu Leu Lys Asp Cys Gly Val Arg Ile Phe
20 25 30

Thr Lys Val Glu Asn Pro Lys Thr Gly Glu Ser Leu Ala Leu Pro Arg
35 40 45

Arg Leu Ala Arg Ser Ala Arg Lys Arg Leu Ala Arg Arg Lys Ala Arg
50 55 60

Leu Asn His Leu Lys His Leu Ile Ala Asn Glu Phe Lys Leu Asn Tyr
65 70 75 80

Glu Asp Tyr Gln Ser Phe Asp Glu Ser Leu Ala Lys Ala Tyr Lys Gly
85 90 95

Ser Leu Ile Ser Pro Tyr Glu Leu Arg Phe Arg Ala Leu Asn Glu Leu
100 105 110

Leu Ser Lys Gln Asp Phe Ala Arg Val Ile Leu His Ile Ala Lys Arg
115 120 125

Arg Gly Tyr Asp Asp Ile Lys Asn Ser Asp Asp Lys Glu Lys Gly Ala
130 135 140

```
Ile Leu Lys Ala Ile Lys Gln Asn Glu Glu Lys Leu Ala Asn Tyr Gln
145                 150                 155                 160

Ser Val Gly Glu Tyr Leu Tyr Lys Glu Tyr Phe Gln Lys Phe Lys Glu
                165                 170                 175

Asn Ser Lys Glu Phe Thr Asn Val Arg Asn Lys Lys Glu Ser Tyr Glu
            180                 185                 190

Arg Cys Ile Ala Gln Ser Phe Leu Lys Asp Glu Leu Lys Leu Ile Phe
        195                 200                 205

Lys Lys Gln Arg Glu Phe Gly Phe Ser Phe Ser Lys Lys Phe Glu Glu
    210                 215                 220

Glu Val Leu Ser Val Ala Phe Tyr Lys Arg Ala Leu Lys Asp Phe Ser
225                 230                 235                 240

His Leu Val Gly Asn Cys Ser Phe Phe Thr Asp Glu Lys Arg Ala Pro
                245                 250                 255

Lys Asn Ser Pro Leu Ala Phe Met Phe Val Ala Leu Thr Arg Ile Ile
            260                 265                 270

Asn Leu Leu Asn Asn Leu Lys Asn Thr Glu Gly Ile Leu Tyr Thr Lys
        275                 280                 285

Asp Asp Leu Asn Ala Leu Leu Asn Glu Val Leu Lys Asn Gly Thr Leu
    290                 295                 300

Thr Tyr Lys Gln Thr Lys Lys Leu Leu Gly Leu Ser Asp Asp Tyr Glu
305                 310                 315                 320

Phe Lys Gly Glu Lys Gly Thr Tyr Phe Ile Glu Phe Lys Lys Tyr Lys
                325                 330                 335

Glu Phe Ile Lys Ala Leu Gly Glu His Asn Leu Ser Gln Asp Asp Leu
            340                 345                 350
```

```
Asn Glu Ile Ala Lys Asp Ile Thr Leu Ile Lys Asp Glu Ile Lys Leu
        355                 360                 365

Lys Lys Ala Leu Ala Lys Tyr Asp Leu Asn Gln Asn Gln Ile Asp Ser
    370                 375                 380

Leu Ser Lys Leu Glu Phe Lys Asp His Leu Asn Ile Ser Phe Lys Ala
385                 390                 395                 400

Leu Lys Leu Val Thr Pro Leu Met Leu Glu Gly Lys Lys Tyr Asp Glu
                405                 410                 415

Ala Cys Asn Glu Leu Asn Leu Lys Val Ala Ile Asn Glu Asp Lys Lys
            420                 425                 430

Asp Phe Leu Pro Ala Phe Asn Glu Thr Tyr Tyr Lys Asp Glu Val Thr
        435                 440                 445

Asn Pro Val Val Leu Arg Ala Ile Lys Glu Tyr Arg Lys Val Leu Asn
    450                 455                 460

Ala Leu Leu Lys Lys Tyr Gly Lys Val His Lys Ile Asn Ile Glu Leu
465                 470                 475                 480

Ala Arg Glu Val Gly Lys Asn His Ser Gln Arg Ala Lys Ile Glu Lys
                485                 490                 495

Glu Gln Asn Glu Asn Tyr Lys Ala Lys Lys Asp Ala Glu Leu Glu Cys
            500                 505                 510

Glu Lys Leu Gly Leu Lys Ile Asn Ser Lys Asn Ile Leu Lys Leu Arg
        515                 520                 525

Leu Phe Lys Glu Gln Lys Glu Phe Cys Ala Tyr Ser Gly Glu Lys Ile
    530                 535                 540

Lys Ile Ser Asp Leu Gln Asp Glu Lys Met Leu Glu Ile Asp His Ile
545                 550                 555                 560

Tyr Pro Tyr Ser Arg Ser Phe Asp Asp Ser Tyr Met Asn Lys Val Leu
```

```
                565                 570                 575

Val Phe Thr Lys Gln Asn Gln Glu Lys Leu Asn Gln Thr Pro Phe Glu
            580                 585                 590

Ala Phe Gly Asn Asp Ser Ala Lys Trp Gln Lys Ile Glu Val Leu Ala
        595                 600                 605

Lys Asn Leu Pro Thr Lys Lys Gln Lys Arg Ile Leu Asp Lys Asn Tyr
    610                 615                 620

Lys Asp Lys Glu Gln Lys Asn Phe Lys Asp Arg Asn Leu Asn Asp Thr
625                 630                 635                 640

Arg Tyr Ile Ala Arg Leu Val Leu Asn Tyr Thr Lys Asp Tyr Leu Asp
                645                 650                 655

Phe Leu Pro Leu Ser Asp Asp Glu Asn Thr Lys Leu Asn Asp Thr Gln
            660                 665                 670

Lys Gly Ser Lys Val His Val Glu Ala Lys Ser Gly Met Leu Thr Ser
        675                 680                 685

Ala Leu Arg His Thr Trp Gly Phe Ser Ala Lys Asp Arg Asn Asn His
    690                 695                 700

Leu His His Ala Ile Asp Ala Val Ile Ile Ala Tyr Ala Asn Asn Ser
705                 710                 715                 720

Ile Val Lys Ala Phe Ser Asp Phe Lys Lys Glu Gln Glu Ser Asn Ser
                725                 730                 735

Ala Glu Leu Tyr Ala Lys Lys Ile Ser Glu Leu Asp Tyr Lys Asn Lys
            740                 745                 750

Arg Lys Phe Phe Glu Pro Phe Ser Gly Phe Arg Gln Lys Val Leu Asp
        755                 760                 765

Lys Ile Asp Glu Ile Phe Val Ser Lys Pro Glu Arg Lys Lys Pro Ser
    770                 775                 780
```

```
Gly Ala Leu His Glu Glu Thr Phe Arg Lys Glu Glu Glu Phe Tyr Gln
785                 790                 795                 800

Ser Tyr Gly Gly Lys Glu Gly Val Leu Lys Ala Leu Glu Leu Gly Lys
                805                 810                 815

Ile Arg Lys Val Asn Gly Lys Ile Val Lys Asn Gly Asp Met Phe Arg
            820                 825                 830

Val Asp Ile Phe Lys His Lys Lys Thr Asn Lys Phe Tyr Ala Val Pro
        835                 840                 845

Ile Tyr Thr Met Asp Phe Ala Leu Lys Val Leu Pro Asn Lys Ala Val
    850                 855                 860

Ala Arg Ser Lys Lys Gly Glu Ile Lys Asp Trp Ile Leu Met Asp Glu
865                 870                 875                 880

Asn Tyr Glu Phe Cys Phe Ser Leu Tyr Lys Asp Ser Leu Ile Leu Ile
                885                 890                 895

Gln Thr Lys Asp Met Gln Glu Pro Glu Phe Val Tyr Tyr Asn Ala Phe
            900                 905                 910

Thr Ser Ser Thr Val Ser Leu Ile Val Ser Lys His Asp Asn Lys Phe
        915                 920                 925

Glu Thr Leu Ser Lys Asn Gln Lys Ile Leu Phe Lys Asn Ala Asn Glu
    930                 935                 940

Lys Glu Val Ile Ala Lys Ser Ile Gly Ile Gln Asn Leu Lys Val Phe
945                 950                 955                 960

Glu Lys Tyr Ile Val Ser Ala Leu Gly Glu Val Thr Lys Ala Glu Phe
                965                 970                 975

Arg Gln Arg Glu Asp Phe Lys Lys
            980
```

<210> 485
<211> 1087
<212> PRT
<213> G. stearothermophilus

<400> 485

Met Arg Tyr Lys Ile Gly Leu Asp Ile Gly Ile Thr Ser Val Gly Trp
1 5 10 15

Ala Val Met Asn Leu Asp Ile Pro Arg Ile Glu Asp Leu Gly Val Arg
20 25 30

Ile Phe Asp Arg Ala Glu Asn Pro Gln Thr Gly Glu Ser Leu Ala Leu
35 40 45

Pro Arg Arg Leu Ala Arg Ser Ala Arg Arg Arg Leu Arg Arg Arg Lys
50 55 60

His Arg Leu Glu Arg Ile Arg Arg Leu Val Ile Arg Glu Gly Ile Leu
65 70 75 80

Thr Lys Glu Glu Leu Asp Lys Leu Phe Glu Glu Lys His Glu Ile Asp
85 90 95

Val Trp Gln Leu Arg Val Glu Ala Leu Asp Arg Lys Leu Asn Asn Asp
100 105 110

Glu Leu Ala Arg Val Leu Leu His Leu Ala Lys Arg Arg Gly Phe Lys
115 120 125

Ser Asn Arg Lys Ser Glu Arg Ser Asn Lys Glu Asn Ser Thr Met Leu
130 135 140

Lys His Ile Glu Glu Asn Arg Ala Ile Leu Ser Ser Tyr Arg Thr Val
145 150 155 160

Gly Glu Met Ile Val Lys Asp Pro Lys Phe Ala Leu His Lys Arg Asn
165 170 175

Lys Gly Glu Asn Tyr Thr Asn Thr Ile Ala Arg Asp Asp Leu Glu Arg

```
            180                 185                 190

Glu Ile Arg Leu Ile Phe Ser Lys Gln Arg Glu Phe Gly Asn Met Ser
        195                 200                 205

Cys Thr Glu Glu Phe Glu Asn Glu Tyr Ile Thr Ile Trp Ala Ser Gln
    210                 215                 220

Arg Pro Val Ala Ser Lys Asp Asp Ile Glu Lys Lys Val Gly Phe Cys
225                 230                 235                 240

Thr Phe Glu Pro Lys Glu Lys Arg Ala Pro Lys Ala Thr Tyr Thr Phe
                245                 250                 255

Gln Ser Phe Ile Ala Trp Glu His Ile Asn Lys Leu Arg Leu Ile Ser
            260                 265                 270

Pro Ser Gly Ala Arg Gly Leu Thr Asp Glu Glu Arg Arg Leu Leu Tyr
        275                 280                 285

Glu Gln Ala Phe Gln Lys Asn Lys Ile Thr Tyr His Asp Ile Arg Thr
    290                 295                 300

Leu Leu His Leu Pro Asp Asp Thr Tyr Phe Lys Gly Ile Val Tyr Asp
305                 310                 315                 320

Arg Gly Glu Ser Arg Lys Gln Asn Glu Asn Ile Arg Phe Leu Glu Leu
                325                 330                 335

Asp Ala Tyr His Gln Ile Arg Lys Ala Val Asp Lys Val Tyr Gly Lys
            340                 345                 350

Gly Lys Ser Ser Ser Phe Leu Pro Ile Asp Phe Asp Thr Phe Gly Tyr
        355                 360                 365

Ala Leu Thr Leu Phe Lys Asp Asp Ala Asp Ile His Ser Tyr Leu Arg
    370                 375                 380

Asn Glu Tyr Glu Gln Asn Gly Lys Arg Met Pro Asn Leu Ala Asn Lys
385                 390                 395                 400
```

```
Val Tyr Asp Asn Glu Leu Ile Glu Glu Leu Leu Asn Leu Ser Phe Thr
                405                 410                 415

Lys Phe Gly His Leu Ser Leu Lys Ala Leu Arg Ser Ile Leu Pro Tyr
            420                 425                 430

Met Glu Gln Gly Glu Val Tyr Ser Ser Ala Cys Glu Arg Ala Gly Tyr
        435                 440                 445

Thr Phe Thr Gly Pro Lys Lys Lys Gln Lys Thr Met Leu Leu Pro Asn
    450                 455                 460

Ile Pro Pro Ile Ala Asn Pro Val Val Met Arg Ala Leu Thr Gln Ala
465                 470                 475                 480

Arg Lys Val Val Asn Ala Ile Ile Lys Lys Tyr Gly Ser Pro Val Ser
                485                 490                 495

Ile His Ile Glu Leu Ala Arg Asp Leu Ser Gln Thr Phe Asp Glu Arg
            500                 505                 510

Arg Lys Thr Lys Lys Glu Gln Asp Glu Asn Arg Lys Lys Asn Glu Thr
        515                 520                 525

Ala Ile Arg Gln Leu Met Glu Tyr Gly Leu Thr Leu Asn Pro Thr Gly
    530                 535                 540

His Asp Ile Val Lys Phe Lys Leu Trp Ser Glu Gln Asn Gly Arg Cys
545                 550                 555                 560

Ala Tyr Ser Leu Gln Pro Ile Glu Ile Glu Arg Leu Leu Glu Pro Gly
                565                 570                 575

Tyr Val Glu Val Asp His Val Ile Pro Tyr Ser Arg Ser Leu Asp Asp
            580                 585                 590

Ser Tyr Thr Asn Lys Val Leu Val Leu Thr Arg Glu Asn Arg Glu Lys
        595                 600                 605
```

```
Gly Asn Arg Ile Pro Ala Glu Tyr Leu Gly Val Gly Thr Glu Arg Trp
    610                 615                 620

Gln Gln Phe Glu Thr Phe Val Leu Thr Asn Lys Gln Phe Ser Lys Lys
625                 630                 635                 640

Lys Arg Asp Arg Leu Leu Arg Leu His Tyr Asp Glu Asn Glu Glu Thr
                645                 650                 655

Glu Phe Lys Asn Arg Asn Leu Asn Asp Thr Arg Tyr Ile Ser Arg Phe
            660                 665                 670

Phe Ala Asn Phe Ile Arg Glu His Leu Lys Phe Ala Glu Ser Asp Asp
        675                 680                 685

Lys Gln Lys Val Tyr Thr Val Asn Gly Arg Val Thr Ala His Leu Arg
    690                 695                 700

Ser Arg Trp Glu Phe Asn Lys Asn Arg Glu Glu Ser Asp Leu His His
705                 710                 715                 720

Ala Val Asp Ala Val Ile Val Ala Cys Thr Thr Pro Ser Asp Ile Ala
                725                 730                 735

Lys Val Thr Ala Phe Tyr Gln Arg Arg Glu Gln Asn Lys Glu Leu Ala
            740                 745                 750

Lys Lys Thr Glu Pro His Phe Pro Gln Pro Trp Pro His Phe Ala Asp
        755                 760                 765

Glu Leu Arg Ala Arg Leu Ser Lys His Pro Lys Glu Ser Ile Lys Ala
    770                 775                 780

Leu Asn Leu Gly Asn Tyr Asp Asp Gln Lys Leu Glu Ser Leu Gln Pro
785                 790                 795                 800

Val Phe Val Ser Arg Met Pro Lys Arg Ser Val Thr Gly Ala Ala His
                805                 810                 815
```

```
Gln Glu Thr Leu Arg Arg Tyr Val Gly Ile Asp Glu Arg Ser Gly Lys
            820                 825                 830

Ile Gln Thr Val Val Lys Thr Lys Leu Ser Glu Ile Lys Leu Asp Ala
        835                 840                 845

Ser Gly His Phe Pro Met Tyr Gly Lys Glu Ser Asp Pro Arg Thr Tyr
    850                 855                 860

Glu Ala Ile Arg Gln Arg Leu Leu Glu His Asn Asn Asp Pro Lys Lys
865                 870                 875                 880

Ala Phe Gln Glu Pro Leu Tyr Lys Pro Lys Lys Asn Gly Glu Pro Gly
                885                 890                 895

Pro Val Ile Arg Thr Val Lys Ile Ile Asp Thr Lys Asn Gln Val Ile
            900                 905                 910

Pro Leu Asn Asp Gly Lys Thr Val Ala Tyr Asn Ser Asn Ile Val Arg
        915                 920                 925

Val Asp Val Phe Glu Lys Asp Gly Lys Tyr Tyr Cys Val Pro Val Tyr
    930                 935                 940

Thr Met Asp Ile Met Lys Gly Ile Leu Pro Asn Lys Ala Ile Glu Pro
945                 950                 955                 960

Asn Lys Pro Tyr Ser Glu Trp Lys Glu Met Thr Glu Asp Tyr Thr Phe
                965                 970                 975

Arg Phe Ser Leu Tyr Pro Asn Asp Leu Ile Arg Ile Glu Leu Pro Arg
            980                 985                 990

Glu Lys Thr Val Lys Thr Ala Ala  Gly Glu Glu Ile Asn  Val Lys Asp
        995                 1000                1005

Val Phe  Val Tyr Tyr Lys Thr  Ile Asp Ser Ala Asn  Gly Gly Leu
    1010                1015                1020

Glu Leu  Ile Ser His Asp His  Arg Phe Ser Leu Arg  Gly Val Gly
```

```
    1025                1030                1035

Ser Arg  Thr Leu Lys Arg Phe  Glu Lys Tyr Gln Val  Asp Val Leu
    1040                1045                1050

Gly Asn  Ile Tyr Lys Val Arg  Gly Glu Lys Arg Val  Gly Leu Ala
    1055                1060                1065

Ser Ser  Ala His Ser Lys Pro  Gly Lys Thr Ile Arg  Pro Leu Gln
    1070                1075                1080

Ser Thr  Arg Asp
    1085
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<210> 486
<211> 1228
<212> PRT
<213> Unknown

<220>
<223> L. bacterium

<400> 486

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Met Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr
1               5                   10                  15

Leu Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp
            20                  25                  30

Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys
        35                  40                  45

Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp
    50                  55                  60

Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu
65                  70                  75                  80

Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn
                85                  90                  95
```

```
Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn
            100                 105                 110

Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu
        115                 120                 125

Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe
    130                 135                 140

Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn
145                 150                 155                 160

Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile
                165                 170                 175

Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys
            180                 185                 190

Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys
        195                 200                 205

Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe
    210                 215                 220

Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile
225                 230                 235                 240

Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn
                245                 250                 255

Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys
            260                 265                 270

Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser
        275                 280                 285

Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe
    290                 295                 300

Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys
```

```
305                 310                 315                 320

Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile
                325                 330                 335

Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe
            340                 345                 350

Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp
        355                 360                 365

Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp
    370                 375                 380

Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu
385                 390                 395                 400

Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu
                405                 410                 415

Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser
            420                 425                 430

Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys
        435                 440                 445

Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys
    450                 455                 460

Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr
465                 470                 475                 480

Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile
                485                 490                 495

Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr
            500                 505                 510

Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro
        515                 520                 525
```

```
Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala
    530                 535                 540

Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys
545                 550                 555                 560

Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly
                565                 570                 575

Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met
            580                 585                 590

Leu Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro
        595                 600                 605

Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly
    610                 615                 620

Asp Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys
625                 630                 635                 640

Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn
                645                 650                 655

Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu
            660                 665                 670

Val Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys
        675                 680                 685

Glu Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile
    690                 695                 700

Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His
705                 710                 715                 720

Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile
                725                 730                 735
```

```
Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys
            740                 745                 750

Lys Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys
        755                 760                 765

Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr
    770                 775                 780

Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile
785                 790                 795                 800

Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val
                805                 810                 815

Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Asp
            820                 825                 830

Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly
        835                 840                 845

Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn
    850                 855                 860

Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu
865                 870                 875                 880

Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile
                885                 890                 895

Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys
            900                 905                 910

Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu Asn
        915                 920                 925

Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val Tyr Gln
    930                 935                 940
```

```
Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val Asp Lys
945                 950                 955                 960


Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly Tyr Gln Ile
                965                 970                 975


Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser Thr Gln Asn Gly Phe
            980                 985                 990


Ile Phe Tyr Ile Pro Ala Trp Leu  Thr Ser Lys Ile Asp  Pro Ser Thr
        995                 1000                1005


Gly Phe  Val Asn Leu Leu Lys  Thr Lys Tyr Thr Ser  Ile Ala Asp
    1010                1015                1020


Ser Lys  Lys Phe Ile Ser Ser  Phe Asp Arg Ile Met  Tyr Val Pro
    1025                1030                1035


Glu Glu  Asp Leu Phe Glu Phe  Ala Leu Asp Tyr Lys  Asn Phe Ser
    1040                1045                1050


Arg Thr  Asp Ala Asp Tyr Ile  Lys Lys Trp Lys Leu  Tyr Ser Tyr
    1055                1060                1065


Gly Asn  Arg Ile Arg Ile Phe  Arg Asn Pro Lys Lys  Asn Asn Val
    1070                1075                1080


Phe Asp  Trp Glu Glu Val Cys  Leu Thr Ser Ala Tyr  Lys Glu Leu
    1085                1090                1095


Phe Asn  Lys Tyr Gly Ile Asn  Tyr Gln Gln Gly Asp  Ile Arg Ala
    1100                1105                1110


Leu Leu  Cys Glu Gln Ser Asp  Lys Ala Phe Tyr Ser  Ser Phe Met
    1115                1120                1125


Ala Leu  Met Ser Leu Met Leu  Gln Met Arg Asn Ser  Ile Thr Gly
    1130                1135                1140


Arg Thr  Asp Val Asp Phe Leu  Ile Ser Pro Val Lys  Asn Ser Asp
```

```
    1145                1150                1155

Gly Ile  Phe Tyr Asp Ser Arg  Asn Tyr Glu Ala Gln  Glu Asn Ala
    1160                1165                1170

Ile Leu  Pro Lys Asn Ala Asp  Ala Asn Gly Ala Tyr  Asn Ile Ala
    1175                1180                1185

Arg Lys  Val Leu Trp Ala Ile  Gly Gln Phe Lys Lys  Ala Glu Asp
    1190                1195                1200

Glu Lys  Leu Asp Lys Val Lys  Ile Ala Ile Ser Asn  Lys Glu Trp
    1205                1210                1215

Leu Glu  Tyr Ala Gln Thr Ser  Val Lys His
    1220                1225
```

<210> 487
<211> 1108
<212> PRT
<213> B. hisashii

<400> 487

```
Met Ala Thr Arg Ser Phe Ile Leu Lys Ile Glu Pro Asn Glu Glu Val
1               5                   10                  15

Lys Lys Gly Leu Trp Lys Thr His Glu Val Leu Asn His Gly Ile Ala
            20                  25                  30

Tyr Tyr Met Asn Ile Leu Lys Leu Ile Arg Gln Glu Ala Ile Tyr Glu
        35                  40                  45

His His Glu Gln Asp Pro Lys Asn Pro Lys Lys Val Ser Lys Ala Glu
    50                  55                  60

Ile Gln Ala Glu Leu Trp Asp Phe Val Leu Lys Met Gln Lys Cys Asn
65                  70                  75                  80

Ser Phe Thr His Glu Val Asp Lys Asp Glu Val Phe Asn Ile Leu Arg
                85                  90                  95
```

```
Glu Leu Tyr Glu Glu Leu Val Pro Ser Ser Val Glu Lys Lys Gly Glu
            100                 105                 110

Ala Asn Gln Leu Ser Asn Lys Phe Leu Tyr Pro Leu Val Asp Pro Asn
        115                 120                 125

Ser Gln Ser Gly Lys Gly Thr Ala Ser Ser Gly Arg Lys Pro Arg Trp
    130                 135                 140

Tyr Asn Leu Lys Ile Ala Gly Asp Pro Ser Trp Glu Glu Glu Lys Lys
145                 150                 155                 160

Lys Trp Glu Glu Asp Lys Lys Lys Asp Pro Leu Ala Lys Ile Leu Gly
                165                 170                 175

Lys Leu Ala Glu Tyr Gly Leu Ile Pro Leu Phe Ile Pro Tyr Thr Asp
            180                 185                 190

Ser Asn Glu Pro Ile Val Lys Glu Ile Lys Trp Met Glu Lys Ser Arg
        195                 200                 205

Asn Gln Ser Val Arg Arg Leu Asp Lys Asp Met Phe Ile Gln Ala Leu
    210                 215                 220

Glu Arg Phe Leu Ser Trp Glu Ser Trp Asn Leu Lys Val Lys Glu Glu
225                 230                 235                 240

Tyr Glu Lys Val Glu Lys Glu Tyr Lys Thr Leu Glu Glu Arg Ile Lys
                245                 250                 255

Glu Asp Ile Gln Ala Leu Lys Ala Leu Glu Gln Tyr Glu Lys Glu Arg
            260                 265                 270

Gln Glu Gln Leu Leu Arg Asp Thr Leu Asn Thr Asn Glu Tyr Arg Leu
        275                 280                 285

Ser Lys Arg Gly Leu Arg Gly Trp Arg Glu Ile Ile Gln Lys Trp Leu
    290                 295                 300
```

```
Lys Met Asp Glu Asn Glu Pro Ser Glu Lys Tyr Leu Glu Val Phe Lys
305                 310                 315                 320

Asp Tyr Gln Arg Lys His Pro Arg Glu Ala Gly Asp Tyr Ser Val Tyr
                325                 330                 335

Glu Phe Leu Ser Lys Lys Glu Asn His Phe Ile Trp Arg Asn His Pro
            340                 345                 350

Glu Tyr Pro Tyr Leu Tyr Ala Thr Phe Cys Glu Ile Asp Lys Lys Lys
        355                 360                 365

Lys Asp Ala Lys Gln Gln Ala Thr Phe Thr Leu Ala Asp Pro Ile Asn
    370                 375                 380

His Pro Leu Trp Val Arg Phe Glu Glu Arg Ser Gly Ser Asn Leu Asn
385                 390                 395                 400

Lys Tyr Arg Ile Leu Thr Glu Gln Leu His Thr Glu Lys Leu Lys Lys
                405                 410                 415

Lys Leu Thr Val Gln Leu Asp Arg Leu Ile Tyr Pro Thr Glu Ser Gly
            420                 425                 430

Gly Trp Glu Glu Lys Gly Lys Val Asp Ile Val Leu Leu Pro Ser Arg
        435                 440                 445

Gln Phe Tyr Asn Gln Ile Phe Leu Asp Ile Glu Glu Lys Gly Lys His
    450                 455                 460

Ala Phe Thr Tyr Lys Asp Glu Ser Ile Lys Phe Pro Leu Lys Gly Thr
465                 470                 475                 480

Leu Gly Gly Ala Arg Val Gln Phe Asp Arg Asp His Leu Arg Arg Tyr
                485                 490                 495

Pro His Lys Val Glu Ser Gly Asn Val Gly Arg Ile Tyr Phe Asn Met
            500                 505                 510

Thr Val Asn Ile Glu Pro Thr Glu Ser Pro Val Ser Lys Ser Leu Lys
```

```
        515                 520                 525

Ile His Arg Asp Asp Phe Pro Lys Val Val Asn Phe Lys Pro Lys Glu
    530                 535                 540

Leu Thr Glu Trp Ile Lys Asp Ser Lys Gly Lys Lys Leu Lys Ser Gly
545                 550                 555                 560

Ile Glu Ser Leu Glu Ile Gly Leu Arg Val Met Ser Ile Asp Leu Gly
                565                 570                 575

Gln Arg Gln Ala Ala Ala Ala Ser Ile Phe Glu Val Val Asp Gln Lys
            580                 585                 590

Pro Asp Ile Glu Gly Lys Leu Phe Phe Pro Ile Lys Gly Thr Glu Leu
        595                 600                 605

Tyr Ala Val His Arg Ala Ser Phe Asn Ile Lys Leu Pro Gly Glu Thr
    610                 615                 620

Leu Val Lys Ser Arg Glu Val Leu Arg Lys Ala Arg Glu Asp Asn Leu
625                 630                 635                 640

Lys Leu Met Asn Gln Lys Leu Asn Phe Leu Arg Asn Val Leu His Phe
                645                 650                 655

Gln Gln Phe Glu Asp Ile Thr Glu Arg Glu Lys Arg Val Thr Lys Trp
            660                 665                 670

Ile Ser Arg Gln Glu Asn Ser Asp Val Pro Leu Val Tyr Gln Asp Glu
        675                 680                 685

Leu Ile Gln Ile Arg Glu Leu Met Tyr Lys Pro Tyr Lys Asp Trp Val
    690                 695                 700

Ala Phe Leu Lys Gln Leu His Lys Arg Leu Glu Val Glu Ile Gly Lys
705                 710                 715                 720

Glu Val Lys His Trp Arg Lys Ser Leu Ser Asp Gly Arg Lys Gly Leu
                725                 730                 735
```

```
Tyr Gly Ile Ser Leu Lys Asn Ile Asp Glu Ile Asp Arg Thr Arg Lys
            740                 745                 750

Phe Leu Leu Arg Trp Ser Leu Arg Pro Thr Glu Pro Gly Glu Val Arg
        755                 760                 765

Arg Leu Glu Pro Gly Gln Arg Phe Ala Ile Asp Gln Leu Asn His Leu
    770                 775                 780

Asn Ala Leu Lys Glu Asp Arg Leu Lys Lys Met Ala Asn Thr Ile Ile
785                 790                 795                 800

Met His Ala Leu Gly Tyr Cys Tyr Asp Val Arg Lys Lys Lys Trp Gln
                805                 810                 815

Ala Lys Asn Pro Ala Cys Gln Ile Ile Leu Phe Glu Asp Leu Ser Asn
            820                 825                 830

Tyr Asn Pro Tyr Glu Glu Arg Ser Arg Phe Glu Asn Ser Lys Leu Met
        835                 840                 845

Lys Trp Ser Arg Arg Glu Ile Pro Arg Gln Val Ala Leu Gln Gly Glu
    850                 855                 860

Ile Tyr Gly Leu Gln Val Gly Glu Val Gly Ala Gln Phe Ser Ser Arg
865                 870                 875                 880

Phe His Ala Lys Thr Gly Ser Pro Gly Ile Arg Cys Ser Val Val Thr
                885                 890                 895

Lys Glu Lys Leu Gln Asp Asn Arg Phe Phe Lys Asn Leu Gln Arg Glu
            900                 905                 910

Gly Arg Leu Thr Leu Asp Lys Ile Ala Val Leu Lys Glu Gly Asp Leu
        915                 920                 925

Tyr Pro Asp Lys Gly Gly Glu Lys Phe Ile Ser Leu Ser Lys Asp Arg
    930                 935                 940
```

```
Lys Cys Val Thr Thr His Ala Asp Ile Asn Ala Ala Gln Asn Leu Gln
945                 950                 955                 960


Lys Arg Phe Trp Thr Arg Thr His Gly Phe Tyr Lys Val Tyr Cys Lys
                965                 970                 975


Ala Tyr Gln Val Asp Gly Gln Thr Val Tyr Ile Pro Glu Ser Lys Asp
            980                 985                 990


Gln Lys Gln Lys Ile Ile Glu Glu  Phe Gly Glu Gly Tyr  Phe Ile Leu
        995                 1000                1005


Lys Asp  Gly Val Tyr Glu Trp  Val Asn Ala Gly Lys  Leu Lys Ile
    1010                1015                1020


Lys Lys  Gly Ser Ser Lys Gln  Ser Ser Ser Glu Leu  Val Asp Ser
    1025                1030                1035


Asp Ile  Leu Lys Asp Ser Phe  Asp Leu Ala Ser Glu  Leu Lys Gly
    1040                1045                1050


Glu Lys  Leu Met Leu Tyr Arg  Asp Pro Ser Gly Asn  Val Phe Pro
    1055                1060                1065


Ser Asp  Lys Trp Met Ala Ala  Gly Val Phe Phe Gly  Lys Leu Glu
    1070                1075                1080


Arg Ile  Leu Ile Ser Lys Leu  Thr Asn Gln Tyr Ser  Ile Ser Thr
    1085                1090                1095


Ile Glu  Asp Asp Ser Ser Lys  Gln Ser Met
    1100                1105


<210>  488
<211>  108
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic
```

<400> 488

Met Gly Val Gln Val Glu Thr Ile Ser Pro Gly Asp Gly Arg Thr Phe
1 5 10 15

Pro Lys Arg Gly Gln Thr Cys Val Val His Tyr Thr Gly Met Leu Glu
20 25 30

Asp Gly Lys Lys Phe Asp Ser Ser Arg Asp Arg Asn Lys Pro Phe Lys
35 40 45

Phe Met Leu Gly Lys Gln Glu Val Ile Arg Gly Trp Glu Glu Gly Val
50 55 60

Ala Gln Met Ser Val Gly Gln Arg Ala Lys Leu Thr Ile Ser Pro Asp
65 70 75 80

Tyr Ala Tyr Gly Ala Thr Gly His Pro Gly Ile Ile Pro Pro His Ala
85 90 95

Thr Leu Val Phe Asp Val Glu Leu Leu Lys Leu Glu
100 105

<210> 489
<211> 108
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 489

Met Gly Val Gln Val Glu Thr Ile Ser Pro Gly Asp Gly Arg Thr Phe
1 5 10 15

Pro Lys Arg Gly Gln Thr Cys Val Val His Tyr Thr Gly Met Leu Glu
20 25 30

Asp Gly Lys Lys Val Asp Ser Ser Arg Asp Arg Asn Lys Pro Phe Lys
35 40 45

Phe Met Leu Gly Lys Gln Glu Val Ile Arg Gly Trp Glu Glu Gly Val

```
    50                  55                  60

Ala Gln Met Ser Val Gly Gln Arg Ala Lys Leu Thr Ile Ser Pro Asp
65                  70                  75                  80

Tyr Ala Tyr Gly Ala Thr Gly His Pro Gly Ile Ile Pro Pro His Ala
                85                  90                  95

Thr Leu Val Phe Asp Val Glu Leu Leu Lys Leu Glu
            100                 105
```

<210> 490
<211> 165
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 490

```
Met Val Asn Pro Thr Val Phe Phe Asp Ile Ala Val Asp Gly Glu Pro
1               5                   10                  15

Leu Gly Arg Val Ser Phe Glu Leu Phe Ala Asp Lys Val Pro Lys Thr
            20                  25                  30

Ala Glu Asn Phe Arg Ala Leu Ser Thr Gly Glu Lys Gly Phe Gly Tyr
        35                  40                  45

Lys Gly Ser Cys Phe His Arg Ile Ile Pro Gly Phe Met Cys Gln Gly
    50                  55                  60

Gly Asp Phe Thr Arg His Asn Gly Thr Gly Gly Lys Ser Ile Tyr Gly
65                  70                  75                  80

Glu Lys Phe Glu Asp Glu Asn Phe Ile Leu Lys His Thr Gly Pro Gly
                85                  90                  95

Ile Leu Ser Met Ala Asn Ala Gly Pro Asn Thr Asn Gly Ser Gln Phe
            100                 105                 110
```

```
Phe Ile Cys Thr Ala Lys Thr Glu Trp Leu Asp Gly Lys His Val Val
        115                 120                 125


Phe Gly Lys Val Lys Glu Gly Met Asn Ile Val Glu Ala Met Glu Arg
    130                 135                 140


Phe Gly Ser Arg Asn Gly Lys Thr Ser Lys Lys Ile Thr Ile Ala Asp
145                 150                 155                 160


Cys Gly Gln Leu Glu
                165


<210>  491
<211>  108
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  491

Met Gly Val Gln Val Glu Thr Ile Ser Pro Gly Asp Gly Arg Thr Phe
1               5                   10                  15


Pro Lys Arg Gly Gln Thr Cys Val Val His Tyr Thr Gly Met Leu Glu
            20                  25                  30


Asp Gly Lys Lys Phe Asp Ser Ser Arg Asp Arg Asn Lys Pro Phe Lys
        35                  40                  45


Phe Met Leu Gly Lys Gln Glu Val Ile Arg Gly Trp Glu Glu Gly Val
    50                  55                  60


Ala Gln Met Ser Val Gly Gln Arg Ala Lys Leu Thr Ile Ser Pro Asp
65                  70                  75                  80


Tyr Ala Tyr Gly Ala Thr Gly His Pro Gly Ile Ile Pro Pro His Ala
                85                  90                  95


Thr Leu Val Phe Asp Val Glu Leu Leu Lys Leu Glu
            100                 105
```

<210> 492

<400> 492
000

<210> 493
<211> 216
<212> PRT
<213> Homo sapiens

<400> 493

Met Leu Arg Leu Ser Glu Arg Asn Met Lys Val Leu Leu Ala Ala Ala
1   5   10   15

Leu Ile Ala Gly Ser Val Phe Phe Leu Leu Leu Pro Gly Pro Ser Ala
            20   25   30

Ala Asp Glu Lys Lys Lys Gly Pro Lys Val Thr Val Lys Val Tyr Phe
        35   40   45

Asp Leu Arg Ile Gly Asp Glu Asp Val Gly Arg Val Ile Phe Gly Leu
    50   55   60

Phe Gly Lys Thr Val Pro Lys Thr Val Asp Asn Phe Val Ala Leu Ala
65   70   75   80

Thr Gly Glu Lys Gly Phe Gly Tyr Lys Asn Ser Lys Phe His Arg Val
                85   90   95

Ile Lys Asp Phe Met Ile Gln Gly Gly Asp Phe Thr Arg Gly Asp Gly
            100   105   110

Thr Gly Gly Lys Ser Ile Tyr Gly Glu Arg Phe Pro Asp Glu Asn Phe
        115   120   125

Lys Leu Lys His Tyr Gly Pro Gly Trp Val Ser Met Ala Asn Ala Gly
    130   135   140

Lys Asp Thr Asn Gly Ser Gln Phe Phe Ile Thr Thr Val Lys Thr Ala
145   150   155   160

```
Trp Leu Asp Gly Lys His Val Val Phe Gly Lys Val Leu Glu Gly Met
                165                 170                 175

Glu Val Val Arg Lys Val Glu Ser Thr Lys Thr Asp Ser Arg Asp Lys
            180                 185                 190

Pro Leu Lys Asp Val Ile Ile Ala Asp Cys Gly Lys Ile Glu Val Glu
        195                 200                 205

Lys Pro Phe Ala Ile Ala Lys Glu
    210                 215
```

<210> 494
<211> 212
<212> PRT
<213> murine cyclophilin

<400> 494

```
Met Ser Pro Gly Pro Arg Leu Leu Leu Pro Ala Val Leu Cys Leu Gly
1               5                   10                  15

Leu Gly Ala Leu Val Ser Ser Ser Gly Ser Ser Gly Val Arg Lys Arg
            20                  25                  30

Gly Pro Ser Val Thr Asp Lys Val Phe Phe Asp Val Arg Ile Gly Asp
        35                  40                  45

Lys Asp Val Gly Arg Ile Val Ile Gly Leu Phe Gly Asn Val Val Pro
    50                  55                  60

Lys Thr Val Glu Asn Phe Val Ala Leu Ala Thr Gly Glu Lys Gly Tyr
65                  70                  75                  80

Gly Tyr Lys Gly Ser Ile Phe His Arg Val Ile Lys Asp Phe Met Ile
                85                  90                  95

Gln Gly Gly Asp Phe Thr Ala Arg Asp Gly Thr Gly Gly Met Ser Ile
            100                 105                 110

Tyr Gly Glu Thr Phe Pro Asp Glu Asn Phe Lys Leu Lys His Tyr Gly
        115                 120                 125
```

```
Ile Gly Trp Val Ser Met Ala Asn Ala Gly Pro Asp Thr Asn Gly Ser
    130                 135                 140

Gln Phe Phe Ile Thr Leu Thr Lys Pro Thr Trp Leu Asp Gly Lys His
145                 150                 155                 160

Val Val Phe Gly Lys Val Leu Asp Gly Met Thr Val Val His Ser Ile
                165                 170                 175

Glu Leu Gln Ala Thr Asp Gly His Asp Arg Pro Leu Thr Asp Cys Thr
            180                 185                 190

Ile Val Asn Ser Gly Lys Ile Asp Val Lys Thr Pro Phe Val Val Glu
        195                 200                 205

Val Pro Asp Trp
    210
```

<210> 495
<211> 108
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 495

```
Met Gly Val Gln Val Glu Thr Ile Ser Pro Gly Asp Gly Arg Thr Phe
1               5                   10                  15

Pro Lys Arg Gly Gln Thr Cys Val Val His Tyr Thr Gly Met Leu Glu
            20                  25                  30

Asp Gly Lys Lys Val Asp Ser Ser Arg Asp Arg Asn Lys Pro Phe Lys
        35                  40                  45

Phe Met Leu Gly Lys Gln Glu Val Ile Arg Gly Trp Glu Glu Gly Val
    50                  55                  60

Ala Gln Met Ser Val Gly Gln Arg Ala Lys Leu Thr Ile Ser Pro Asp
```

65 70 75 80

Tyr Ala Tyr Gly Ala Thr Gly His Pro Gly Ile Ile Pro Pro His Ala
85 90 95

Thr Leu Val Phe Asp Val Glu Leu Leu Lys Leu Glu
100 105

<210> 496
<211> 187
<212> PRT
<213> Homo sapiens

<400> 496

Met Val Gly Ser Leu Asn Cys Ile Val Ala Val Ser Gln Asn Met Gly
1 5 10 15

Ile Gly Lys Asn Gly Asp Leu Pro Trp Pro Pro Leu Arg Asn Glu Phe
20 25 30

Arg Tyr Phe Gln Arg Met Thr Thr Thr Ser Ser Val Glu Gly Lys Gln
35 40 45

Asn Leu Val Ile Met Gly Lys Lys Thr Trp Phe Ser Ile Pro Glu Lys
50 55 60

Asn Arg Pro Leu Lys Gly Arg Ile Asn Leu Val Leu Ser Arg Glu Leu
65 70 75 80

Lys Glu Pro Pro Gln Gly Ala His Phe Leu Ser Arg Ser Leu Asp Asp
85 90 95

Ala Leu Lys Leu Thr Glu Gln Pro Glu Leu Ala Asn Lys Val Asp Met
100 105 110

Val Trp Ile Val Gly Gly Ser Ser Val Tyr Lys Glu Ala Met Asn His
115 120 125

Pro Gly His Leu Lys Leu Phe Val Thr Arg Ile Met Gln Asp Phe Glu
130 135 140

Ser Asp Thr Phe Phe Pro Glu Ile Asp Leu Glu Lys Tyr Lys Leu Leu
145 150 155 160

Pro Glu Tyr Pro Gly Val Leu Ser Asp Val Gln Glu Glu Lys Gly Ile
165 170 175

Lys Tyr Lys Phe Glu Val Tyr Glu Lys Asn Asp
180 185

<210> 497
<211> 159
<212> PRT
<213> E. coli

<400> 497

Met Ile Ser Leu Ile Ala Ala Leu Ala Val Asp Arg Val Ile Gly Met
1 5 10 15

Glu Asn Ala Met Pro Trp Asn Leu Pro Ala Asp Leu Ala Trp Phe Lys
20 25 30

Arg Asn Thr Leu Asn Lys Pro Val Ile Met Gly Arg His Thr Trp Glu
35 40 45

Ser Ile Gly Arg Pro Leu Pro Gly Arg Lys Asn Ile Ile Leu Ser Ser
50 55 60

Gln Pro Gly Thr Asp Asp Arg Val Thr Trp Val Lys Ser Val Asp Glu
65 70 75 80

Ala Ile Ala Ala Cys Gly Asp Val Pro Glu Ile Met Val Ile Gly Gly
85 90 95

Gly Arg Val Tyr Glu Gln Phe Leu Pro Lys Ala Gln Lys Leu Tyr Leu
100 105 110

Thr His Ile Asp Ala Glu Val Glu Gly Asp Thr His Phe Pro Asp Tyr
115 120 125

Glu Pro Asp Asp Trp Glu Ser Val Phe Ser Glu Phe His Asp Ala Asp

130 135 140

Ala Gln Asn Ser His Ser Tyr Cys Phe Glu Ile Leu Glu Arg Arg
145 150 155

<210> 498
<211> 777
<212> PRT
<213> Homo sapiens

<400> 498

Met Asp Ser Lys Glu Ser Leu Thr Pro Gly Arg Glu Glu Asn Pro Ser
1 5 10 15

Ser Val Leu Ala Gln Glu Arg Gly Asp Val Met Asp Phe Tyr Lys Thr
20 25 30

Leu Arg Gly Gly Ala Thr Val Lys Val Ser Ala Ser Ser Pro Ser Leu
35 40 45

Ala Val Ala Ser Gln Ser Asp Ser Lys Gln Arg Arg Leu Leu Val Asp
50 55 60

Phe Pro Lys Gly Ser Val Ser Asn Ala Gln Gln Pro Asp Leu Ser Lys
65 70 75 80

Ala Val Ser Leu Ser Met Gly Leu Tyr Met Gly Glu Thr Glu Thr Lys
85 90 95

Val Met Gly Asn Asp Leu Gly Phe Pro Gln Gln Gly Gln Ile Ser Leu
100 105 110

Ser Ser Gly Glu Thr Asp Leu Lys Leu Leu Glu Glu Ser Ile Ala Asn
115 120 125

Leu Asn Arg Ser Thr Ser Val Pro Glu Asn Pro Lys Ser Ser Ala Ser
130 135 140

Thr Ala Val Ser Ala Ala Pro Thr Glu Lys Glu Phe Pro Lys Thr His
145 150 155 160

```
Ser Asp Val Ser Ser Glu Gln Gln His Leu Lys Gly Gln Thr Gly Thr
                165                 170                 175

Asn Gly Gly Asn Val Lys Leu Tyr Thr Thr Asp Gln Ser Thr Phe Asp
            180                 185                 190

Ile Leu Gln Asp Leu Glu Phe Ser Ser Gly Ser Pro Gly Lys Glu Thr
        195                 200                 205

Asn Glu Ser Pro Trp Arg Ser Asp Leu Leu Ile Asp Glu Asn Cys Leu
    210                 215                 220

Leu Ser Pro Leu Ala Gly Glu Asp Asp Ser Phe Leu Leu Glu Gly Asn
225                 230                 235                 240

Ser Asn Glu Asp Cys Lys Pro Leu Ile Leu Pro Asp Thr Lys Pro Lys
                245                 250                 255

Ile Lys Asp Asn Gly Asp Leu Val Leu Ser Ser Pro Ser Asn Val Thr
            260                 265                 270

Leu Pro Gln Val Lys Thr Glu Lys Glu Asp Phe Ile Glu Leu Cys Thr
        275                 280                 285

Pro Gly Val Ile Lys Gln Glu Lys Leu Gly Thr Val Tyr Cys Gln Ala
    290                 295                 300

Ser Phe Pro Gly Ala Asn Ile Ile Gly Asn Lys Met Ser Ala Ile Ser
305                 310                 315                 320

Val His Gly Val Ser Thr Ser Gly Gly Gln Met Tyr His Tyr Asp Met
                325                 330                 335

Asn Thr Ala Ser Leu Ser Gln Gln Gln Asp Gln Lys Pro Ile Phe Asn
            340                 345                 350

Val Ile Pro Pro Ile Pro Val Gly Ser Glu Asn Trp Asn Arg Cys Gln
        355                 360                 365
```

```
Gly Ser Gly Asp Asp Asn Leu Thr Ser Leu Gly Thr Leu Asn Phe Pro
    370                 375                 380

Gly Arg Thr Val Phe Ser Asn Gly Tyr Ser Ser Pro Ser Met Arg Pro
385                 390                 395                 400

Asp Val Ser Ser Pro Pro Ser Ser Ser Ser Thr Ala Thr Thr Gly Pro
                405                 410                 415

Pro Pro Lys Leu Cys Leu Val Cys Ser Asp Glu Ala Ser Gly Cys His
            420                 425                 430

Tyr Gly Val Leu Thr Cys Gly Ser Cys Lys Val Phe Phe Lys Arg Ala
        435                 440                 445

Val Glu Gly Gln His Asn Tyr Leu Cys Ala Gly Arg Asn Asp Cys Ile
    450                 455                 460

Ile Asp Lys Ile Arg Arg Lys Asn Cys Pro Ala Cys Arg Tyr Arg Lys
465                 470                 475                 480

Cys Leu Gln Ala Gly Met Asn Leu Glu Ala Arg Lys Thr Lys Lys Lys
                485                 490                 495

Ile Lys Gly Ile Gln Gln Ala Thr Thr Gly Val Ser Gln Glu Thr Ser
            500                 505                 510

Glu Asn Pro Gly Asn Lys Thr Ile Val Pro Ala Thr Leu Pro Gln Leu
        515                 520                 525

Thr Pro Thr Leu Val Ser Leu Leu Glu Val Ile Glu Pro Glu Val Leu
    530                 535                 540

Tyr Ala Gly Tyr Asp Ser Ser Val Pro Asp Ser Thr Trp Arg Ile Met
545                 550                 555                 560

Thr Thr Leu Asn Met Leu Gly Gly Arg Gln Val Ile Ala Ala Val Lys
                565                 570                 575

Trp Ala Lys Ala Ile Pro Gly Phe Arg Asn Leu His Leu Asp Asp Gln
```

```
            580                 585                 590

Met Thr Leu Leu Gln Tyr Ser Trp Met Phe Leu Met Ala Phe Ala Leu
        595                 600                 605

Gly Trp Arg Ser Tyr Arg Gln Ser Ser Ala Asn Leu Leu Cys Phe Ala
    610                 615                 620

Pro Asp Leu Ile Ile Asn Glu Gln Arg Met Thr Leu Pro Cys Met Tyr
625                 630                 635                 640

Asp Gln Cys Lys His Met Leu Tyr Val Ser Ser Glu Leu His Arg Leu
                645                 650                 655

Gln Val Ser Tyr Glu Glu Tyr Leu Cys Met Lys Thr Leu Leu Leu Leu
            660                 665                 670

Ser Ser Val Pro Lys Asp Gly Leu Lys Ser Gln Glu Leu Phe Asp Glu
        675                 680                 685

Ile Arg Met Thr Tyr Ile Lys Glu Leu Gly Lys Ala Ile Val Lys Arg
    690                 695                 700

Glu Gly Asn Ser Ser Gln Asn Trp Gln Arg Phe Tyr Gln Leu Thr Lys
705                 710                 715                 720

Leu Leu Asp Ser Met His Glu Val Val Glu Asn Leu Leu Asn Tyr Cys
                725                 730                 735

Phe Gln Thr Phe Leu Asp Lys Thr Met Ser Ile Glu Phe Pro Glu Met
            740                 745                 750

Leu Ala Glu Ile Ile Thr Asn Gln Ile Pro Lys Tyr Ser Asn Gly Asn
        755                 760                 765

Ile Lys Lys Leu Leu Phe His Gln Lys
    770                 775

<210>  499
<211>  452
```

<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 499
cacgguaggc acuguuagga guuuuagagc uagaaauagc aaguuaaaau aaggcuaguc 60

cguuaucaac uugaaaaagu ggcaccgagu cggugcuugc cucgguccaa uccuuccgga 120

gugcaggugg aaaccaucuc cccaggagac gggcgcaccu uccccaagcg cggccagacc 180

ugcguggugc acuacaccgg gaugcuugaa gauggaaaga aauuugauuc cucccgggac 240

agaaacaagc ccuuuaaguu uaugcuaggc aagcaggagg ugauccgagg cugggaagaa 300

gggguugccc agaugagugu gggucagaga gccaaacuga cuauaucucc agauuaugcc 360

uauggugcca cugggcaccc aggcaucauc ccaccacaug ccacucucgu cuucgaugug 420

gagcuucuaa aacuggaaua acagugccua cc 452

<210> 500
<211> 464
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 500
ggcccagact gagcacgtga gttttagagc tagaaatagc aagttaaaat aaggctagtc 60

cgttatcaac ttgaaaaagt ggcaccgagt cggtgctgga ggaagcaggg cttcctttcc 120

tctgccatca ttccagtttt agaagctcca catcgaagac gagagtggca tgtggtggga 180

tgatgcctgg gtgcccagtg gcaccatagg cataatctgg agatatagtc agtttggctc 240

tctgacccac actcatctgg gcaacccctt cttcccagcc tcggatcacc tcctgcttgc 300

ctagcataaa cttaaagggc ttgtttctgt cccgggagga atcaaatttc tttccatctt 360

caagcatccc ggtgtagtgc accacgcagg tctggccgcg cttggggaag gtgcgcccgt 420

ctcctgggga gatggtttcc acctgcactc ccgtgctcag tctg 464

<210> 501
<211> 905
<212> DNA

<213> Artificial Sequence

<220>
<223> Synthetic

<400> 501
tagttattaa tagtaatcaa ttacggggtc attagttcat agcccatata tggagttccg 60

cgttacataa cttacggtaa atggcccgcc tggctgaccg cccaacgacc cccgcccatt 120

gacgtcaata atgacgtatg ttcccatagt aacgccaata gggactttcc attgacgtca 180

atgggtggag tatttacggt aaactgccca cttggcagta catcaagtgt atcatatgcc 240

aagtacgccc cctattgacg tcaatgacgg taaatggccc gcctggcatt atgcccagta 300

catgacctta tgggactttc ctacttggca gtacatctac gtattagtca tcgctattac 360

catggtgatg cggttttggc agtacatcaa tgggcgtgga tagcggtttg actcacgggg 420

atttccaagt ctccacccca ttgacgtcaa tgggagtttg ttttggcacc aaaatcaacg 480

ggactttcca aaatgtcgta acaactccgc cccattgacg caaatgggcg gtaggcgtgt 540

acggtgggag gtctatataa gcagagctgg tttagtgaac cgtcagatcg ttcactgccg 600

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aggctagtcc gttatcaact tgaaaaagtg ggaccgagtc ggtcctctgc catcaaagcg 720

tgctcagtct gttttagggt catgaaggtt tttcttttcc tgagaaaaca acacgtattg 780

ttttctcagg ttttgctttt tggccttttt ctagcttaaa aaaaaaaaaa gcaaaagatg 840

ctggtggttg gcactcctgg tttccaggac ggggttcaaa tccctgcggc gtctttgctt 900

tgact 905

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<211> 942
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<220>
<223> Synthetic

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gacgtcaata atgacgtatg ttcccatagt aacgccaata gggactttcc attgacgtca 180

atgggtggag tatttacggt aaactgccca cttggcagta catcaagtgt atcatatgcc 240

aagtacgccc cctattgacg tcaatgacgg taaatggccc gcctggcatt atgcccagta 300

catgacctta tgggactttc ctacttggca gtacatctac gtattagtca tcgctattac 360

catggtgatg cggttttggc agtacatcaa tgggcgtgga tagcggtttg actcacgggg 420

atttccaagt ctccacccca ttgacgtcaa tgggagtttg ttttggcacc aaaatcaacg 480

ggactttcca aaatgtcgta acaactccgc cccattgacg caaatgggcg gtaggcgtgt 540

acggtgggag gtctatataa gcagagctgg tttagtgaac cgtcagatcg ttcactgccg 600

tataggcagg gcccagactg agcacgtgag ttttagagct agaaatagca agttaaaata 660

aggctagtcc gttatcaact tgaaaaagtg ggaccgagtc ggtcctctgc catcaaagcg 720

tgctcagtct gttttgtttt ggctgggttt ttccttgttc gcaccggaca cctccagtga 780

ccagacggca aggtttttat cccagtgtat attggaaaaa catgttatac ttttgacaat 840

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ataaaggtca atgtttaatc cataaaaaaa aaaaaaaaaa aa 942

<210> 503
<211> 1370
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 503
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cgttacataa cttacggtaa atggcccgcc tggctgaccg cccaacgacc cccgcccatt 120

gacgtcaata atgacgtatg ttcccatagt aacgccaata gggactttcc attgacgtca 180

atgggtggag tatttacggt aaactgccca cttggcagta catcaagtgt atcatatgcc 240

aagtacgccc cctattgacg tcaatgacgg taaatggccc gcctggcatt atgcccagta 300

catgacctta tgggactttc ctacttggca gtacatctac gtattagtca tcgctattac 360

catggtgatg cggttttggc agtacatcaa tgggcgtgga tagcggtttg actcacgggg 420

atttccaagt ctccacccca ttgacgtcaa tgggagtttg ttttggcacc aaaatcaacg 480

ggactttcca aaatgtcgta acaactccgc cccattgacg caaatgggcg gtaggcgtgt 540

acggtgggag gtctatataa gcagagctgg tttagtgaac cgtcagatcg ttcactgccg 600

tataggcagg gcccagactg agcacgtgag ttttagagct agaaatagca agttaaaata 660

aggctagtcc gttatcaact tgaaaaagtg ggaccgagtc ggtcctctgc catcaaagcg 720

tgctcagtct gttttgtttt ggctgggttt ttccttgttc gcaccggaca cctccagtga 780

ccagacggca aggtttttat cccagtgtat attggaaaaa catgttatac ttttgacaat 840

ttaacgtgcc tagagctcaa attaaactaa taccataacg taatgcaact tacaacataa 900

ataaaggtca atgtttaatc cataaaaaaa aaaaaaaaaa aaacacactg ttttggctgg 960

gtttttcctt gttcgcaccg gacacctcca gtgaccagac ggcaaggttt ttatcccagt 1020

gtatattgga aaaacatgtt atacttttga caatttaacg tgcctagagc tcaaattaaa 1080

ctaataccat aacgtaatgc aacttacaac ataaataaag gtcaatgttt aatccataaa 1140

aaaaaaaaaa aaaaaatctc tctgttttgg ctgggttttt ccttgttcgc accggacacc 1200

tccagtgacc agacggcaag gtttttatcc cagtgtatat tggaaaaaca tgttatactt 1260

ttgacaattt aacgtgccta gagctcaaat taaactaata ccataacgta atgcaactta 1320

caacataaat aaaggtcaat gtttaatcca taaaaaaaaa aaaaaaaaaa 1370

<210> 504
<211> 807
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 504
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cgttacataa cttacggtaa atggcccgcc tggctgaccg cccaacgacc cccgcccatt 120

gacgtcaata atgacgtatg ttcccatagt aacgccaata gggactttcc attgacgtca 180

atgggtggag tatttacggt aaactgccca cttggcagta catcaagtgt atcatatgcc 240

aagtacgccc cctattgacg tcaatgacgg taaatggccc gcctggcatt atgcccagta 300

catgacctta tgggactttc ctacttggca gtacatctac gtattagtca tcgctattac 360

catggtgatg cggttttggc agtacatcaa tgggcgtgga tagcggtttg actcacgggg 420

atttccaagt ctccacccca ttgacgtcaa tgggagtttg ttttggcacc aaaatcaacg 480

ggactttcca aaatgtcgta acaactccgc cccattgacg caaatgggcg gtaggcgtgt 540

acggtgggag gtctatataa gcagagctgg tttagtgaac cgtcagatcg ttcactgccg 600

tataggcagg gcccagactg agcacgtgag ttttagagct agaaatagca agttaaaata 660

aggctagtcc gttatcaact tgaaaaagtg ggaccgagtc ggtcctctgc catcaaagcg 720

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ggtttgtgtc ttggttggcg tcttaaa 807

<210> 505
<211> 743
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 505
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cagacgtcac ttccccttgg cggctctggc agcagattgg tcggttgagt ggcagaaagg 120

cagacgggga ctgggcaagg cactgtcggt gacatcacgg acagggcgac ttctatgtag 180

atgaggcagc gcagaggctg ctgcttcgcc acttgctgct tcaccacgaa ggagttcccg 240

tgccctggga gcgggttcag gaccgctgat cggaagtgag aatcccagct gtgtgtcagg 300

gctggaaagg gctcgggagt gcgcggggca agtgaccgtg tgtgtaaaga gtgaggcgta 360

tgaggctgtg tcggggcaga ggcccaagat ctcagttcac tgccgtatag gcagggccca 420

gactgagcac gtgagtttta gagctagaaa tagcaagtta aaataaggct agtccgttat 480

caacttgaaa aagtgggacc gagtcggtcc tctgccatca aagcgtgctc agtctgtttc 540

agcaagttca gagaaatctg aacttgctgg atttttggag cagggagatg gaataggagc 600

ttgctccgtc cactccacgc atcgacctgg tattgcagta cctccaggaa cggtgcaccc 660

actttctgga gtttcaaaag tagactgtac gctaagggtc atatcttttt ttgtttggtt 720

tgtgtcttgg ttggcgtctt aaa 743

<210> 506

<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 506
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<210> 507
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 507
ggcccagact gagcacgtga 20

<210> 508
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
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<400> 508
ggcccagact gagcacgtga 20

<210> 509
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<220>
<223> Synthetic

<400> 509
ggcccagact gagcacgtga 20

<210> 510
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<223> Synthetic

<400> 510
ggcccagact gagcacgtga 20

<210> 511
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<400> 511
ggcactgcgg ctggaggtgg 20

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<400> 512
gagtccgagc agaagaagaa 20

<210> 513
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<212> DNA
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<220>
<223> Synthetic

<400> 513
ggaatccctt ctgcagcacc 20

<210> 514
<211> 1803
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 514

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys

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Arg Lys Val Gly Lys Arg Asn Tyr Ile Leu Gly Leu Asp Ile Gly Ile
            20                  25                  30

Thr Ser Val Gly Tyr Gly Ile Ile Asp Tyr Glu Thr Arg Asp Val Ile
        35                  40                  45

Asp Ala Gly Val Arg Leu Phe Lys Glu Ala Asn Val Glu Asn Asn Glu
    50                  55                  60

Gly Arg Arg Ser Lys Arg Gly Ala Arg Arg Leu Lys Arg Arg Arg Arg
65                  70                  75                  80

His Arg Ile Gln Arg Val Lys Lys Leu Leu Phe Asp Tyr Asn Leu Leu
                85                  90                  95

Thr Asp His Ser Glu Leu Ser Gly Ile Asn Pro Tyr Glu Ala Arg Val
            100                 105                 110

Lys Gly Leu Ser Gln Lys Leu Ser Glu Glu Glu Phe Ser Ala Ala Leu
        115                 120                 125

Leu His Leu Ala Lys Arg Arg Gly Val His Asn Val Asn Glu Val Glu
    130                 135                 140

Glu Asp Thr Gly Asn Glu Leu Ser Thr Lys Glu Gln Ile Ser Arg Asn
145                 150                 155                 160

Ser Lys Ala Leu Glu Glu Lys Tyr Val Ala Glu Leu Gln Leu Glu Arg
                165                 170                 175

Leu Lys Lys Asp Gly Glu Val Arg Gly Ser Ile Asn Arg Phe Lys Thr
            180                 185                 190

Ser Asp Tyr Val Lys Glu Ala Lys Gln Leu Leu Lys Val Gln Lys Ala
        195                 200                 205

Tyr His Gln Leu Asp Gln Ser Phe Ile Asp Thr Tyr Ile Asp Leu Leu
    210                 215                 220
```

```
Glu Thr Arg Arg Thr Tyr Tyr Glu Gly Pro Gly Glu Gly Ser Pro Phe
225                 230                 235                 240

Gly Trp Lys Asp Ile Lys Glu Trp Tyr Glu Met Leu Met Gly His Cys
                245                 250                 255

Thr Tyr Phe Pro Glu Glu Leu Arg Ser Val Lys Tyr Ala Tyr Asn Ala
            260                 265                 270

Asp Leu Tyr Asn Ala Leu Asn Asp Leu Asn Asn Leu Val Ile Thr Arg
        275                 280                 285

Asp Glu Asn Glu Lys Leu Glu Tyr Tyr Glu Lys Phe Gln Ile Ile Glu
    290                 295                 300

Asn Val Phe Lys Gln Lys Lys Lys Pro Thr Leu Lys Gln Ile Ala Lys
305                 310                 315                 320

Glu Ile Leu Val Asn Glu Glu Asp Ile Lys Gly Tyr Arg Val Thr Ser
                325                 330                 335

Thr Gly Lys Pro Glu Phe Thr Asn Leu Lys Val Tyr His Asp Ile Lys
            340                 345                 350

Asp Ile Thr Ala Arg Lys Glu Ile Ile Glu Asn Ala Glu Leu Leu Asp
        355                 360                 365

Gln Ile Ala Lys Ile Leu Thr Ile Tyr Gln Ser Ser Glu Asp Ile Gln
    370                 375                 380

Glu Glu Leu Thr Asn Leu Asn Ser Glu Leu Thr Gln Glu Glu Ile Glu
385                 390                 395                 400

Gln Ile Ser Asn Leu Lys Gly Tyr Thr Gly Thr His Asn Leu Ser Leu
                405                 410                 415

Lys Ala Ile Asn Leu Ile Leu Asp Glu Leu Trp His Thr Asn Asp Asn
            420                 425                 430
```

```
Gln Ile Ala Ile Phe Asn Arg Leu Lys Leu Val Pro Lys Lys Val Asp
        435                 440                 445

Leu Ser Gln Gln Lys Glu Ile Pro Thr Thr Leu Val Asp Asp Phe Ile
    450                 455                 460

Leu Ser Pro Val Val Lys Arg Ser Phe Ile Gln Ser Ile Lys Val Ile
465                 470                 475                 480

Asn Ala Ile Ile Lys Lys Tyr Gly Leu Pro Asn Asp Ile Ile Ile Glu
                485                 490                 495

Leu Ala Arg Glu Lys Asn Ser Lys Asp Ala Gln Lys Met Ile Asn Glu
            500                 505                 510

Met Gln Lys Arg Asn Arg Gln Thr Asn Glu Arg Ile Glu Glu Ile Ile
        515                 520                 525

Arg Thr Thr Gly Lys Glu Asn Ala Lys Tyr Leu Ile Glu Lys Ile Lys
    530                 535                 540

Leu His Asp Met Gln Glu Gly Lys Cys Leu Tyr Ser Leu Glu Ala Ile
545                 550                 555                 560

Pro Leu Glu Asp Leu Leu Asn Asn Pro Phe Asn Tyr Glu Val Asp His
                565                 570                 575

Ile Ile Pro Arg Ser Val Ser Phe Asp Asn Ser Phe Asn Asn Lys Val
            580                 585                 590

Leu Val Lys Gln Glu Glu Ala Ser Lys Lys Gly Asn Arg Thr Pro Phe
        595                 600                 605

Gln Tyr Leu Ser Ser Ser Asp Ser Lys Ile Ser Tyr Glu Thr Phe Lys
    610                 615                 620

Lys His Ile Leu Asn Leu Ala Lys Gly Lys Gly Arg Ile Ser Lys Thr
625                 630                 635                 640
```

```
Lys Lys Glu Tyr Leu Leu Glu Glu Arg Asp Ile Asn Arg Phe Ser Val
               645                 650                 655

Gln Lys Asp Phe Ile Asn Arg Asn Leu Val Asp Thr Arg Tyr Ala Thr
            660                 665                 670

Arg Gly Leu Met Asn Leu Leu Arg Ser Tyr Phe Arg Val Asn Asn Leu
        675                 680                 685

Asp Val Lys Val Lys Ser Ile Asn Gly Gly Phe Thr Ser Phe Leu Arg
    690                 695                 700

Arg Lys Trp Lys Phe Lys Lys Glu Arg Asn Lys Gly Tyr Lys His His
705                 710                 715                 720

Ala Glu Asp Ala Leu Ile Ile Ala Asn Ala Asp Phe Ile Phe Lys Glu
               725                 730                 735

Trp Lys Lys Leu Asp Lys Ala Lys Lys Val Met Glu Asn Gln Met Phe
            740                 745                 750

Glu Glu Lys Gln Ala Glu Ser Met Pro Glu Ile Glu Thr Glu Gln Glu
        755                 760                 765

Tyr Lys Glu Ile Phe Ile Thr Pro His Gln Ile Lys His Ile Lys Asp
    770                 775                 780

Phe Lys Asp Tyr Lys Tyr Ser His Arg Val Asp Lys Lys Pro Asn Arg
785                 790                 795                 800

Glu Leu Ile Asn Asp Thr Leu Tyr Ser Thr Arg Lys Asp Asp Lys Gly
               805                 810                 815

Asn Thr Leu Ile Val Asn Asn Leu Asn Gly Leu Tyr Asp Lys Asp Asn
            820                 825                 830

Asp Lys Leu Lys Lys Leu Ile Asn Lys Ser Pro Glu Lys Leu Leu Met
        835                 840                 845

Tyr His His Asp Pro Gln Thr Tyr Gln Lys Leu Lys Leu Ile Met Glu
```

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    850                 855                 860

Gln Tyr Gly Asp Glu Lys Asn Pro Leu Tyr Lys Tyr Tyr Glu Glu Thr
865                 870                 875                 880

Gly Asn Tyr Leu Thr Lys Tyr Ser Lys Lys Asp Asn Gly Pro Val Ile
                885                 890                 895

Lys Lys Ile Lys Tyr Tyr Gly Asn Lys Leu Asn Ala His Leu Asp Ile
            900                 905                 910

Thr Asp Asp Tyr Pro Asn Ser Arg Asn Lys Val Val Lys Leu Ser Leu
        915                 920                 925

Lys Pro Tyr Arg Phe Asp Val Tyr Leu Asp Asn Gly Val Tyr Lys Phe
    930                 935                 940

Val Thr Val Lys Asn Leu Asp Val Ile Lys Lys Glu Asn Tyr Tyr Glu
945                 950                 955                 960

Val Asn Ser Lys Cys Tyr Glu Glu Ala Lys Lys Leu Lys Lys Ile Ser
                965                 970                 975

Asn Gln Ala Glu Phe Ile Ala Ser Phe Tyr Asn Asn Asp Leu Ile Lys
            980                 985                 990

Ile Asn Gly Glu Leu Tyr Arg Val  Ile Gly Val Asn Asn  Asp Leu Leu
        995                 1000                1005

Asn Arg  Ile Glu Val Asn Met  Ile Asp Ile Thr Tyr  Arg Glu Tyr
    1010                1015                1020

Leu Glu  Asn Met Asn Asp Lys  Arg Pro Pro Arg Ile  Ile Lys Thr
    1025                1030                1035

Ile Ala  Ser Lys Thr Gln Ser  Ile Lys Lys Tyr Ser  Thr Asp Ile
    1040                1045                1050

Leu Gly  Asn Leu Tyr Glu Val  Lys Ser Lys Lys His  Pro Gln Ile
    1055                1060                1065
```

```
Ile Lys  Lys Gly Ser Gly Gly  Ser Ser Gly Gly Ser  Ser Gly Ser
    1070                1075                1080

Glu Thr  Pro Gly Thr Ser Glu  Ser Ala Thr Pro Glu  Ser Ser Gly
    1085                1090                1095

Gly Ser  Ser Gly Gly Ser Ser  Thr Leu Asn Ile Glu  Asp Glu Tyr
    1100                1105                1110

Arg Leu  His Glu Thr Ser Lys  Glu Pro Asp Val Ser  Leu Gly Ser
    1115                1120                1125

Thr Trp  Leu Ser Asp Phe Pro  Gln Ala Trp Ala Glu  Thr Gly Gly
    1130                1135                1140

Met Gly  Leu Ala Val Arg Gln  Ala Pro Leu Ile Ile  Pro Leu Lys
    1145                1150                1155

Ala Thr  Ser Thr Pro Val Ser  Ile Lys Gln Tyr Pro  Met Ser Gln
    1160                1165                1170

Glu Ala  Arg Leu Gly Ile Lys  Pro His Ile Gln Arg  Leu Leu Asp
    1175                1180                1185

Gln Gly  Ile Leu Val Pro Cys  Gln Ser Pro Trp Asn  Thr Pro Leu
    1190                1195                1200

Leu Pro  Val Lys Lys Pro Gly  Thr Asn Asp Tyr Arg  Pro Val Gln
    1205                1210                1215

Asp Leu  Arg Glu Val Asn Lys  Arg Val Glu Asp Ile  His Pro Thr
    1220                1225                1230

Val Pro  Asn Pro Tyr Asn Leu  Leu Ser Gly Leu Pro  Pro Ser His
    1235                1240                1245

Gln Trp  Tyr Thr Val Leu Asp  Leu Lys Asp Ala Phe  Phe Cys Leu
    1250                1255                1260
```

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Arg Leu  His Pro Thr Ser Gln  Pro Leu Phe Ala Phe  Glu Trp Arg
    1265                1270                1275

Asp Pro  Glu Met Gly Ile Ser  Gly Gln Leu Thr Trp  Thr Arg Leu
    1280                1285                1290

Pro Gln  Gly Phe Lys Asn Ser  Pro Thr Leu Phe Asp  Glu Ala Leu
    1295                1300                1305

His Arg  Asp Leu Ala Asp Phe  Arg Ile Gln His Pro  Asp Leu Ile
    1310                1315                1320

Leu Leu  Gln Tyr Val Asp Asp  Leu Leu Leu Ala Ala  Thr Ser Glu
    1325                1330                1335

Leu Asp  Cys Gln Gln Gly Thr  Arg Ala Leu Leu Gln  Thr Leu Gly
    1340                1345                1350

Asn Leu  Gly Tyr Arg Ala Ser  Ala Lys Lys Ala Gln  Ile Cys Gln
    1355                1360                1365

Lys Gln  Val Lys Tyr Leu Gly  Tyr Leu Leu Lys Glu  Gly Gln Arg
    1370                1375                1380

Trp Leu  Thr Glu Ala Arg Lys  Glu Thr Val Met Gly  Gln Pro Thr
    1385                1390                1395

Pro Lys  Thr Pro Arg Gln Leu  Arg Glu Phe Leu Gly  Thr Ala Gly
    1400                1405                1410

Phe Cys  Arg Leu Trp Ile Pro  Gly Phe Ala Glu Met  Ala Ala Pro
    1415                1420                1425

Leu Tyr  Pro Leu Thr Lys Thr  Gly Thr Leu Phe Asn  Trp Gly Pro
    1430                1435                1440

Asp Gln  Gln Lys Ala Tyr Gln  Glu Ile Lys Gln Ala  Leu Leu Thr
    1445                1450                1455
```

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Ala Pro  Ala Leu Gly Leu Pro  Asp Leu Thr Lys Pro  Phe Glu Leu
    1460                1465                1470

Phe Val  Asp Glu Lys Gln Gly  Tyr Ala Lys Gly Val  Leu Thr Gln
    1475                1480                1485

Lys Leu  Gly Pro Trp Arg Arg  Pro Val Ala Tyr Leu  Ser Lys Lys
    1490                1495                1500

Leu Asp  Pro Val Ala Ala Gly  Trp Pro Pro Cys Leu  Arg Met Val
    1505                1510                1515

Ala Ala  Ile Ala Val Leu Thr  Lys Asp Ala Gly Lys  Leu Thr Met
    1520                1525                1530

Gly Gln  Pro Leu Val Ile Leu  Ala Pro His Ala Val  Glu Ala Leu
    1535                1540                1545

Val Lys  Gln Pro Pro Asp Arg  Trp Leu Ser Asn Ala  Arg Met Thr
    1550                1555                1560

His Tyr  Gln Ala Leu Leu Leu  Asp Thr Asp Arg Val  Gln Phe Gly
    1565                1570                1575

Pro Val  Val Ala Leu Asn Pro  Ala Thr Leu Leu Pro  Leu Pro Glu
    1580                1585                1590

Glu Gly  Leu Gln His Asn Cys  Leu Asp Ile Leu Ala  Glu Ala His
    1595                1600                1605

Gly Thr  Arg Pro Asp Leu Thr  Asp Gln Pro Leu Pro  Asp Ala Asp
    1610                1615                1620

His Thr  Trp Tyr Thr Asp Gly  Ser Ser Leu Leu Gln  Glu Gly Gln
    1625                1630                1635

Arg Lys  Ala Gly Ala Ala Val  Thr Thr Glu Thr Glu  Val Ile Trp
    1640                1645                1650

Ala Lys  Ala Leu Pro Ala Gly  Thr Ser Ala Gln Arg  Ala Glu Leu
```

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    1655                1660                1665

Ile Ala  Leu Thr Gln Ala Leu  Lys Met Ala Glu Gly  Lys Lys Leu
    1670                1675                1680

Asn Val  Tyr Thr Asp Ser Arg  Tyr Ala Phe Ala Thr  Ala His Ile
    1685                1690                1695

His Gly  Glu Ile Tyr Arg Arg  Arg Gly Leu Leu Thr  Ser Glu Gly
    1700                1705                1710

Lys Glu  Ile Lys Asn Lys Asp  Glu Ile Leu Ala Leu  Leu Lys Ala
    1715                1720                1725

Leu Phe  Leu Pro Lys Arg Leu  Ser Ile Ile His Cys  Pro Gly His
    1730                1735                1740

Gln Lys  Gly His Ser Ala Glu  Ala Arg Gly Asn Arg  Met Ala Asp
    1745                1750                1755

Gln Ala  Ala Arg Lys Ala Ala  Ile Thr Glu Thr Pro  Asp Thr Ser
    1760                1765                1770

Thr Leu  Leu Ile Glu Asn Ser  Ser Pro Ser Gly Gly  Ser Lys Arg
    1775                1780                1785

Thr Ala  Asp Gly Ser Glu Phe  Glu Pro Lys Lys Lys  Arg Lys Val
    1790                1795                1800


<210>  515
<211>  2117
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  515

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1               5                  10                  15
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Arg Lys Val Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn
            20                  25                  30

Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys
        35                  40                  45

Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn
    50                  55                  60

Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr
65                  70                  75                  80

Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg
                85                  90                  95

Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp
            100                 105                 110

Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp
        115                 120                 125

Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val
    130                 135                 140

Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu
145                 150                 155                 160

Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu
                165                 170                 175

Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu
            180                 185                 190

Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln
        195                 200                 205

Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val
    210                 215                 220

Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu
```

```
225                 230                 235                 240

Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe
                245                 250                 255

Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser
            260                 265                 270

Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr
        275                 280                 285

Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr
    290                 295                 300

Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu
305                 310                 315                 320

Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser
                325                 330                 335

Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu
            340                 345                 350

Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile
        355                 360                 365

Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly
    370                 375                 380

Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys
385                 390                 395                 400

Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu
                405                 410                 415

Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile
            420                 425                 430

His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr
        435                 440                 445
```

```
Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe
    450                 455                 460

Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe
465                 470                 475                 480

Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe
                485                 490                 495

Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg
            500                 505                 510

Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys
        515                 520                 525

His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys
    530                 535                 540

Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly
545                 550                 555                 560

Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys
                565                 570                 575

Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys
            580                 585                 590

Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser
        595                 600                 605

Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe
    610                 615                 620

Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr
625                 630                 635                 640

Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr
                645                 650                 655
```

```
Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg
            660                 665                 670

Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile
        675                 680                 685

Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp
    690                 695                 700

Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu
705                 710                 715                 720

Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp
                725                 730                 735

Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys
            740                 745                 750

Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val
        755                 760                 765

Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu
    770                 775                 780

Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys
785                 790                 795                 800

Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu
                805                 810                 815

His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr
            820                 825                 830

Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile
        835                 840                 845

Asn Arg Leu Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe
    850                 855                 860
```

```
Leu Lys Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys
865                 870                 875                 880


Asn Arg Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys
                885                 890                 895


Met Lys Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln
            900                 905                 910


Arg Lys Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu
        915                 920                 925


Leu Asp Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln
    930                 935                 940


Ile Thr Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys
945                 950                 955                 960


Tyr Asp Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu
                965                 970                 975


Lys Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
            980                 985                 990


Val Arg Glu Ile Asn Asn Tyr His  His Ala His Asp Ala  Tyr Leu Asn
        995                 1000                1005


Ala Val  Val Gly Thr Ala Leu  Ile Lys Lys Tyr Pro  Lys Leu Glu
    1010                1015                1020


Ser Glu  Phe Val Tyr Gly Asp  Tyr Lys Val Tyr Asp  Val Arg Lys
    1025                1030                1035


Met Ile  Ala Lys Ser Glu Gln  Glu Ile Gly Lys Ala  Thr Ala Lys
    1040                1045                1050


Tyr Phe  Phe Tyr Ser Asn Ile  Met Asn Phe Phe Lys  Thr Glu Ile
    1055                1060                1065


Thr Leu  Ala Asn Gly Glu Ile  Arg Lys Arg Pro Leu  Ile Glu Thr
```

```
    1070                1075                1080

Asn Gly  Glu Thr Gly Glu Ile  Val Trp Asp Lys Gly  Arg Asp Phe
    1085                1090                1095

Ala Thr  Val Arg Lys Val Leu  Ser Met Pro Gln Val  Asn Ile Val
    1100                1105                1110

Lys Lys  Thr Glu Val Gln Thr  Gly Gly Phe Ser Lys  Glu Ser Ile
    1115                1120                1125

Leu Pro  Lys Arg Asn Ser Asp  Lys Leu Ile Ala Arg  Lys Lys Asp
    1130                1135                1140

Trp Asp  Pro Lys Lys Tyr Gly  Gly Phe Val Ser Pro  Thr Val Ala
    1145                1150                1155

Tyr Ser  Val Leu Val Val Ala  Lys Val Glu Lys Gly  Lys Ser Lys
    1160                1165                1170

Lys Leu  Lys Ser Val Lys Glu  Leu Leu Gly Ile Thr  Ile Met Glu
    1175                1180                1185

Arg Ser  Ser Phe Glu Lys Asn  Pro Ile Asp Phe Leu  Glu Ala Lys
    1190                1195                1200

Gly Tyr  Lys Glu Val Lys Lys  Asp Leu Ile Ile Lys  Leu Pro Lys
    1205                1210                1215

Tyr Ser  Leu Phe Glu Leu Glu  Asn Gly Arg Lys Arg  Met Leu Ala
    1220                1225                1230

Ser Ala  Arg Glu Leu Gln Lys  Gly Asn Glu Leu Ala  Leu Pro Ser
    1235                1240                1245

Lys Tyr  Val Asn Phe Leu Tyr  Leu Ala Ser His Tyr  Glu Lys Leu
    1250                1255                1260

Lys Gly  Ser Pro Glu Asp Asn  Glu Gln Lys Gln Leu  Phe Val Glu
    1265                1270                1275
```

```
Gln His  Lys His Tyr Leu Asp  Glu Ile Ile Glu Gln  Ile Ser Glu
    1280                1285                1290

Phe Ser  Lys Arg Val Ile Leu  Ala Asp Ala Asn Leu  Asp Lys Val
    1295                1300                1305

Leu Ser  Ala Tyr Asn Lys His  Arg Asp Lys Pro Ile  Arg Glu Gln
    1310                1315                1320

Ala Glu  Asn Ile Ile His Leu  Phe Thr Leu Thr Asn  Leu Gly Ala
    1325                1330                1335

Pro Ala  Ala Phe Lys Tyr Phe  Asp Thr Thr Ile Asp  Arg Lys Gln
    1340                1345                1350

Tyr Arg  Ser Thr Lys Glu Val  Leu Asp Ala Thr Leu  Ile His Gln
    1355                1360                1365

Ser Ile  Thr Gly Leu Tyr Glu  Thr Arg Ile Asp Leu  Ser Gln Leu
    1370                1375                1380

Gly Gly  Asp Ser Gly Gly Ser  Ser Gly Gly Ser Ser  Gly Ser Glu
    1385                1390                1395

Thr Pro  Gly Thr Ser Glu Ser  Ala Thr Pro Glu Ser  Ser Gly Gly
    1400                1405                1410

Ser Ser  Gly Gly Ser Ser Thr  Leu Asn Ile Glu Asp  Glu Tyr Arg
    1415                1420                1425

Leu His  Glu Thr Ser Lys Glu  Pro Asp Val Ser Leu  Gly Ser Thr
    1430                1435                1440

Trp Leu  Ser Asp Phe Pro Gln  Ala Trp Ala Glu Thr  Gly Gly Met
    1445                1450                1455

Gly Leu  Ala Val Arg Gln Ala  Pro Leu Ile Ile Pro  Leu Lys Ala
    1460                1465                1470
```

```
Thr Ser  Thr Pro Val Ser Ile  Lys Gln Tyr Pro Met  Ser Gln Glu
    1475                1480                1485

Ala Arg  Leu Gly Ile Lys Pro  His Ile Gln Arg Leu  Leu Asp Gln
    1490                1495                1500

Gly Ile  Leu Val Pro Cys Gln  Ser Pro Trp Asn Thr  Pro Leu Leu
    1505                1510                1515

Pro Val  Lys Lys Pro Gly Thr  Asn Asp Tyr Arg Pro  Val Gln Asp
    1520                1525                1530

Leu Arg  Glu Val Asn Lys Arg  Val Glu Asp Ile His  Pro Thr Val
    1535                1540                1545

Pro Asn  Pro Tyr Asn Leu Leu  Ser Gly Leu Pro Pro  Ser His Gln
    1550                1555                1560

Trp Tyr  Thr Val Leu Asp Leu  Lys Asp Ala Phe Phe  Cys Leu Arg
    1565                1570                1575

Leu His  Pro Thr Ser Gln Pro  Leu Phe Ala Phe Glu  Trp Arg Asp
    1580                1585                1590

Pro Glu  Met Gly Ile Ser Gly  Gln Leu Thr Trp Thr  Arg Leu Pro
    1595                1600                1605

Gln Gly  Phe Lys Asn Ser Pro  Thr Leu Phe Asn Glu  Ala Leu His
    1610                1615                1620

Arg Asp  Leu Ala Asp Phe Arg  Ile Gln His Pro Asp  Leu Ile Leu
    1625                1630                1635

Leu Gln  Tyr Val Asp Asp Leu  Leu Leu Ala Ala Thr  Ser Glu Leu
    1640                1645                1650

Asp Cys  Gln Gln Gly Thr Arg  Ala Leu Leu Gln Thr  Leu Gly Asn
    1655                1660                1665
```

```
Leu Gly  Tyr Arg Ala Ser Ala  Lys Lys Ala Gln Ile  Cys Gln Lys
    1670                1675                1680

Gln Val  Lys Tyr Leu Gly Tyr  Leu Leu Lys Glu Gly  Gln Arg Trp
    1685                1690                1695

Leu Thr  Glu Ala Arg Lys Glu  Thr Val Met Gly Gln  Pro Thr Pro
    1700                1705                1710

Lys Thr  Pro Arg Gln Leu Arg  Glu Phe Leu Gly Lys  Ala Gly Phe
    1715                1720                1725

Cys Arg  Leu Phe Ile Pro Gly  Phe Ala Glu Met Ala  Ala Pro Leu
    1730                1735                1740

Tyr Pro  Leu Thr Lys Pro Gly  Thr Leu Phe Asn Trp  Gly Pro Asp
    1745                1750                1755

Gln Gln  Lys Ala Tyr Gln Glu  Ile Lys Gln Ala Leu  Leu Thr Ala
    1760                1765                1770

Pro Ala  Leu Gly Leu Pro Asp  Leu Thr Lys Pro Phe  Glu Leu Phe
    1775                1780                1785

Val Asp  Glu Lys Gln Gly Tyr  Ala Lys Gly Val Leu  Thr Gln Lys
    1790                1795                1800

Leu Gly  Pro Trp Arg Arg Pro  Val Ala Tyr Leu Ser  Lys Lys Leu
    1805                1810                1815

Asp Pro  Val Ala Ala Gly Trp  Pro Pro Cys Leu Arg  Met Val Ala
    1820                1825                1830

Ala Ile  Ala Val Leu Thr Lys  Asp Ala Gly Lys Leu  Thr Met Gly
    1835                1840                1845

Gln Pro  Leu Val Ile Leu Ala  Pro His Ala Val Glu  Ala Leu Val
    1850                1855                1860

Lys Gln  Pro Pro Asp Arg Trp  Leu Ser Asn Ala Arg  Met Thr His
```

```
    1865                1870                1875

Tyr Gln  Ala Leu Leu Leu Asp  Thr Asp Arg Val Gln  Phe Gly Pro
    1880                1885                1890

Val Val  Ala Leu Asn Pro Ala  Thr Leu Leu Pro Leu  Pro Glu Glu
    1895                1900                1905

Gly Leu  Gln His Asn Cys Leu  Asp Ile Leu Ala Glu  Ala His Gly
    1910                1915                1920

Thr Arg  Pro Asp Leu Thr Asp  Gln Pro Leu Pro Asp  Ala Asp His
    1925                1930                1935

Thr Trp  Tyr Thr Asp Gly Ser  Ser Leu Leu Gln Glu  Gly Gln Arg
    1940                1945                1950

Lys Ala  Gly Ala Ala Val Thr  Thr Glu Thr Glu Val  Ile Trp Ala
    1955                1960                1965

Lys Ala  Leu Pro Ala Gly Thr  Ser Ala Gln Arg Ala  Glu Leu Ile
    1970                1975                1980

Ala Leu  Thr Gln Ala Leu Lys  Met Ala Glu Gly Lys  Lys Leu Asn
    1985                1990                1995

Val Tyr  Thr Asp Ser Arg Tyr  Ala Phe Ala Thr Ala  His Ile His
    2000                2005                2010

Gly Glu  Ile Tyr Arg Arg Arg  Gly Trp Leu Thr Ser  Glu Gly Lys
    2015                2020                2025

Glu Ile  Lys Asn Lys Asp Glu  Ile Leu Ala Leu Leu  Lys Ala Leu
    2030                2035                2040

Phe Leu  Pro Lys Arg Leu Ser  Ile Ile His Cys Pro  Gly His Gln
    2045                2050                2055

Lys Gly  His Ser Ala Glu Ala  Arg Gly Asn Arg Met  Ala Asp Gln
    2060                2065                2070
```

Ala Ala Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr
    2075   2080   2085

Leu Leu Ile Glu Asn Ser Ser Pro Ser Gly Gly Ser Lys Arg Thr
    2090   2095   2100

Ala Asp Gly Ser Glu Phe Glu Pro Lys Lys Lys Arg Lys Val
    2105   2110   2115

<210> 516
<211> 2117
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 516

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1   5   10   15

Arg Lys Val Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn
            20   25   30

Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys
        35   40   45

Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn
    50   55   60

Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr
65   70   75   80

Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg
                85   90   95

Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp
            100   105   110

Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp

```
        115                 120                 125

Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val
    130                 135                 140

Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu
145                 150                 155                 160

Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu
                165                 170                 175

Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu
            180                 185                 190

Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln
        195                 200                 205

Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val
    210                 215                 220

Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu
225                 230                 235                 240

Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe
                245                 250                 255

Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser
            260                 265                 270

Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr
        275                 280                 285

Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr
    290                 295                 300

Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu
305                 310                 315                 320

Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser
                325                 330                 335
```

```
Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu
            340                 345                 350

Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile
        355                 360                 365

Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly
    370                 375                 380

Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys
385                 390                 395                 400

Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu
                405                 410                 415

Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile
            420                 425                 430

His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr
        435                 440                 445

Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe
    450                 455                 460

Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe
465                 470                 475                 480

Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe
                485                 490                 495

Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg
            500                 505                 510

Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys
        515                 520                 525

His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys
    530                 535                 540
```

```
Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly
545                 550                 555                 560

Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys
                565                 570                 575

Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys
            580                 585                 590

Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser
        595                 600                 605

Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe
    610                 615                 620

Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr
625                 630                 635                 640

Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr
                645                 650                 655

Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg
            660                 665                 670

Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile
        675                 680                 685

Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp
    690                 695                 700

Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu
705                 710                 715                 720

Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp
                725                 730                 735

Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys
            740                 745                 750
```

```
Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val
        755                 760                 765

Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu
    770                 775                 780

Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys
785                 790                 795                 800

Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu
                805                 810                 815

His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr
            820                 825                 830

Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile
        835                 840                 845

Asn Arg Leu Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe
    850                 855                 860

Leu Lys Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys
865                 870                 875                 880

Asn Arg Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys
                885                 890                 895

Met Lys Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln
            900                 905                 910

Arg Lys Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu
        915                 920                 925

Leu Asp Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln
    930                 935                 940

Ile Thr Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys
945                 950                 955                 960

Tyr Asp Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu
```

965 970 975

Lys Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
980 985 990

Val Arg Glu Ile Asn Asn Tyr His His Ala His Asp Ala Tyr Leu Asn
995 1000 1005

Ala Val Val Gly Thr Ala Leu Ile Lys Lys Tyr Pro Lys Leu Glu
1010 1015 1020

Ser Glu Phe Val Tyr Gly Asp Tyr Lys Val Tyr Asp Val Arg Lys
1025 1030 1035

Met Ile Ala Lys Ser Glu Gln Glu Ile Gly Lys Ala Thr Ala Lys
1040 1045 1050

Tyr Phe Phe Tyr Ser Asn Ile Met Asn Phe Phe Lys Thr Glu Ile
1055 1060 1065

Thr Leu Ala Asn Gly Glu Ile Arg Lys Arg Pro Leu Ile Glu Thr
1070 1075 1080

Asn Gly Glu Thr Gly Glu Ile Val Trp Asp Lys Gly Arg Asp Phe
1085 1090 1095

Ala Thr Val Arg Lys Val Leu Ser Met Pro Gln Val Asn Ile Val
1100 1105 1110

Lys Lys Thr Glu Val Gln Thr Gly Gly Phe Ser Lys Glu Ser Ile
1115 1120 1125

Leu Pro Lys Arg Asn Ser Asp Lys Leu Ile Ala Arg Lys Lys Asp
1130 1135 1140

Trp Asp Pro Lys Lys Tyr Gly Gly Phe Val Ser Pro Thr Val Ala
1145 1150 1155

Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys Gly Lys Ser Lys
1160 1165 1170

```
Lys Leu  Lys Ser Val Lys Glu  Leu Leu Gly Ile Thr  Ile Met Glu
    1175                1180                1185

Arg Ser  Ser Phe Glu Lys Asn  Pro Ile Asp Phe Leu  Glu Ala Lys
    1190                1195                1200

Gly Tyr  Lys Glu Val Lys Lys  Asp Leu Ile Ile Lys  Leu Pro Lys
    1205                1210                1215

Tyr Ser  Leu Phe Glu Leu Glu  Asn Gly Arg Lys Arg  Met Leu Ala
    1220                1225                1230

Ser Ala  Arg Glu Leu Gln Lys  Gly Asn Glu Leu Ala  Leu Pro Ser
    1235                1240                1245

Lys Tyr  Val Asn Phe Leu Tyr  Leu Ala Ser His Tyr  Glu Lys Leu
    1250                1255                1260

Lys Gly  Ser Pro Glu Asp Asn  Glu Gln Lys Gln Leu  Phe Val Glu
    1265                1270                1275

Gln His  Lys His Tyr Leu Asp  Glu Ile Ile Glu Gln  Ile Ser Glu
    1280                1285                1290

Phe Ser  Lys Arg Val Ile Leu  Ala Asp Ala Asn Leu  Asp Lys Val
    1295                1300                1305

Leu Ser  Ala Tyr Asn Lys His  Arg Asp Lys Pro Ile  Arg Glu Gln
    1310                1315                1320

Ala Glu  Asn Ile Ile His Leu  Phe Thr Leu Thr Asn  Leu Gly Ala
    1325                1330                1335

Pro Ala  Ala Phe Lys Tyr Phe  Asp Thr Thr Ile Asp  Arg Lys Glu
    1340                1345                1350

Tyr Arg  Ser Thr Lys Glu Val  Leu Asp Ala Thr Leu  Ile His Gln
    1355                1360                1365
```

```
Ser Ile  Thr Gly Leu Tyr Glu  Thr Arg Ile Asp Leu  Ser Gln Leu
    1370                1375                1380

Gly Gly  Asp Ser Gly Gly Ser  Ser Gly Gly Ser Ser  Gly Ser Glu
    1385                1390                1395

Thr Pro  Gly Thr Ser Glu Ser  Ala Thr Pro Glu Ser  Ser Gly Gly
    1400                1405                1410

Ser Ser  Gly Gly Ser Ser Thr  Leu Asn Ile Glu Asp  Glu Tyr Arg
    1415                1420                1425

Leu His  Glu Thr Ser Lys Glu  Pro Asp Val Ser Leu  Gly Ser Thr
    1430                1435                1440

Trp Leu  Ser Asp Phe Pro Gln  Ala Trp Ala Glu Thr  Gly Gly Met
    1445                1450                1455

Gly Leu  Ala Val Arg Gln Ala  Pro Leu Ile Ile Pro  Leu Lys Ala
    1460                1465                1470

Thr Ser  Thr Pro Val Ser Ile  Lys Gln Tyr Pro Met  Ser Gln Glu
    1475                1480                1485

Ala Arg  Leu Gly Ile Lys Pro  His Ile Gln Arg Leu  Leu Asp Gln
    1490                1495                1500

Gly Ile  Leu Val Pro Cys Gln  Ser Pro Trp Asn Thr  Pro Leu Leu
    1505                1510                1515

Pro Val  Lys Lys Pro Gly Thr  Asn Asp Tyr Arg Pro  Val Gln Asp
    1520                1525                1530

Leu Arg  Glu Val Asn Lys Arg  Val Glu Asp Ile His  Pro Thr Val
    1535                1540                1545

Pro Asn  Pro Tyr Asn Leu Leu  Ser Gly Leu Pro Pro  Ser His Gln
    1550                1555                1560
```

```
Trp Tyr  Thr Val Leu Asp Leu  Lys Asp Ala Phe Phe  Cys Leu Arg
    1565                1570                1575

Leu His  Pro Thr Ser Gln Pro  Leu Phe Ala Phe Glu  Trp Arg Asp
    1580                1585                1590

Pro Glu  Met Gly Ile Ser Gly  Gln Leu Thr Trp Thr  Arg Leu Pro
    1595                1600                1605

Gln Gly  Phe Lys Asn Ser Pro  Thr Leu Phe Asn Glu  Ala Leu His
    1610                1615                1620

Arg Asp  Leu Ala Asp Phe Arg  Ile Gln His Pro Asp  Leu Ile Leu
    1625                1630                1635

Leu Gln  Tyr Val Asp Asp Leu  Leu Leu Ala Ala Thr  Ser Glu Leu
    1640                1645                1650

Asp Cys  Gln Gln Gly Thr Arg  Ala Leu Leu Gln Thr  Leu Gly Asn
    1655                1660                1665

Leu Gly  Tyr Arg Ala Ser Ala  Lys Lys Ala Gln Ile  Cys Gln Lys
    1670                1675                1680

Gln Val  Lys Tyr Leu Gly Tyr  Leu Leu Lys Glu Gly  Gln Arg Trp
    1685                1690                1695

Leu Thr  Glu Ala Arg Lys Glu  Thr Val Met Gly Gln  Pro Thr Pro
    1700                1705                1710

Lys Thr  Pro Arg Gln Leu Arg  Glu Phe Leu Gly Lys  Ala Gly Phe
    1715                1720                1725

Cys Arg  Leu Phe Ile Pro Gly  Phe Ala Glu Met Ala  Ala Pro Leu
    1730                1735                1740

Tyr Pro  Leu Thr Lys Pro Gly  Thr Leu Phe Asn Trp  Gly Pro Asp
    1745                1750                1755

Gln Gln  Lys Ala Tyr Gln Glu  Ile Lys Gln Ala Leu  Leu Thr Ala
```

```
    1760                1765                1770

Pro Ala  Leu Gly Leu Pro Asp  Leu Thr Lys Pro Phe  Glu Leu Phe
    1775                1780                1785

Val Asp  Glu Lys Gln Gly Tyr  Ala Lys Gly Val Leu  Thr Gln Lys
    1790                1795                1800

Leu Gly  Pro Trp Arg Arg Pro  Val Ala Tyr Leu Ser  Lys Lys Leu
    1805                1810                1815

Asp Pro  Val Ala Ala Gly Trp  Pro Pro Cys Leu Arg  Met Val Ala
    1820                1825                1830

Ala Ile  Ala Val Leu Thr Lys  Asp Ala Gly Lys Leu  Thr Met Gly
    1835                1840                1845

Gln Pro  Leu Val Ile Leu Ala  Pro His Ala Val Glu  Ala Leu Val
    1850                1855                1860

Lys Gln  Pro Pro Asp Arg Trp  Leu Ser Asn Ala Arg  Met Thr His
    1865                1870                1875

Tyr Gln  Ala Leu Leu Leu Asp  Thr Asp Arg Val Gln  Phe Gly Pro
    1880                1885                1890

Val Val  Ala Leu Asn Pro Ala  Thr Leu Leu Pro Leu  Pro Glu Glu
    1895                1900                1905

Gly Leu  Gln His Asn Cys Leu  Asp Ile Leu Ala Glu  Ala His Gly
    1910                1915                1920

Thr Arg  Pro Asp Leu Thr Asp  Gln Pro Leu Pro Asp  Ala Asp His
    1925                1930                1935

Thr Trp  Tyr Thr Asp Gly Ser  Ser Leu Leu Gln Glu  Gly Gln Arg
    1940                1945                1950

Lys Ala  Gly Ala Ala Val Thr  Thr Glu Thr Glu Val  Ile Trp Ala
    1955                1960                1965
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Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg Ala Glu Leu Ile
1970 1975 1980

Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys Lys Leu Asn
1985 1990 1995

Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His Ile His
2000 2005 2010

Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly Lys
2015 2020 2025

Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
2030 2035 2040

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln
2045 2050 2055

Lys Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln
2060 2065 2070

Ala Ala Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr
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Leu Leu Ile Glu Asn Ser Ser Pro Ser Gly Gly Ser Lys Arg Thr
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gtcaaccagt atcccggtgc 20

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gatgtacaga gagcccaggg c 21

<210> 621
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<400> 621
ggggtcccag gtgctgacgt 20

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Phe Cys Pro Phe
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taggagcttg ctccgtccac tccacgcatc gacctggtat tgcagtacct ccaggaacgg 120

tgcacccact ttctggagtt tcaaaagtag actgtacgct aagggtcata tctttttttg 180

ttt 183

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<400> 626
gccttgatac caacctgccc a 21

<210> 627

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<220>
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<400> 627
gctggaactg gtcaccaagg c 21

<210> 628
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<400> 628
gtacctgaac cgtatatcct a 21

<210> 629
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<400> 629
gtacctgaac cgtatatctt a 21

<210> 630
<211> 535
<212> PRT
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<400> 630

Gly Ala Asp Asp Val Val Asp Ser Ser Lys Ser Phe Val Met Glu Asn
1 5 10 15

Phe Ser Ser Tyr His Gly Thr Lys Pro Gly Tyr Val Asp Ser Ile Gln
20 25 30

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Lys Gly Ile Gln Lys Pro Lys Ser Gly Thr Gln Gly Asn Tyr Asp Asp
        35                  40                  45

Asp Trp Lys Glu Phe Tyr Ser Thr Asp Asn Lys Tyr Asp Ala Ala Gly
    50                  55                  60

Tyr Ser Val Asp Asn Glu Asn Pro Leu Ser Gly Lys Ala Gly Gly Val
65                  70                  75                  80

Val Lys Val Thr Tyr Pro Gly Leu Thr Lys Val Leu Ala Leu Lys Val
                85                  90                  95

Asp Asn Ala Glu Thr Ile Lys Lys Glu Leu Gly Leu Ser Leu Thr Glu
            100                 105                 110

Pro Leu Met Glu Gln Val Gly Thr Glu Glu Phe Ile Lys Arg Phe Gly
        115                 120                 125

Asp Gly Ala Ser Arg Val Val Leu Ser Leu Pro Phe Ala Glu Gly Ser
    130                 135                 140

Ser Ser Val Glu Tyr Ile Asn Asn Trp Glu Gln Ala Lys Ala Leu Ser
145                 150                 155                 160

Val Glu Leu Glu Ile Asn Phe Glu Thr Arg Gly Lys Arg Gly Gln Asp
                165                 170                 175

Ala Met Tyr Glu Tyr Met Ala Gln Ala Cys Ala Gly Asn Arg Val Arg
            180                 185                 190

Arg Ser Val Gly Ser Ser Leu Ser Cys Ile Asn Leu Asp Trp Asp Val
        195                 200                 205

Ile Arg Asp Lys Thr Lys Thr Lys Ile Glu Ser Leu Lys Glu His Gly
    210                 215                 220

Pro Ile Lys Asn Lys Met Ser Glu Ser Pro Asn Lys Thr Val Ser Glu
225                 230                 235                 240

Glu Lys Ala Lys Gln Tyr Leu Glu Glu Phe His Gln Thr Ala Leu Glu
```

```
               245                 250                 255

His Pro Glu Leu Ser Glu Leu Lys Thr Val Thr Gly Thr Asn Pro Val
            260                 265                 270

Phe Ala Gly Ala Asn Tyr Ala Ala Trp Ala Val Asn Val Ala Gln Val
        275                 280                 285

Ile Asp Ser Glu Thr Ala Asp Asn Leu Glu Lys Thr Thr Ala Ala Leu
    290                 295                 300

Ser Ile Leu Pro Gly Ile Gly Ser Val Met Gly Ile Ala Asp Gly Ala
305                 310                 315                 320

Val His His Asn Thr Glu Glu Ile Val Ala Gln Ser Ile Ala Leu Ser
                325                 330                 335

Ser Leu Met Val Ala Gln Ala Ile Pro Leu Val Gly Glu Leu Val Asp
            340                 345                 350

Ile Gly Phe Ala Ala Tyr Asn Phe Val Glu Ser Ile Ile Asn Leu Phe
        355                 360                 365

Gln Val Val His Asn Ser Tyr Asn Arg Pro Ala Tyr Ser Pro Gly His
    370                 375                 380

Lys Thr Gln Pro Phe Leu His Asp Gly Tyr Ala Val Ser Trp Asn Thr
385                 390                 395                 400

Val Glu Asp Ser Ile Ile Arg Thr Gly Phe Gln Gly Glu Ser Gly His
                405                 410                 415

Asp Ile Lys Ile Thr Ala Glu Asn Thr Pro Leu Pro Ile Ala Gly Val
            420                 425                 430

Leu Leu Pro Thr Ile Pro Gly Lys Leu Asp Val Asn Lys Ser Lys Thr
        435                 440                 445

His Ile Ser Val Asn Gly Arg Lys Ile Arg Met Arg Cys Arg Ala Ile
    450                 455                 460
```

```
Asp Gly Asp Val Thr Phe Cys Arg Pro Lys Ser Pro Val Tyr Val Gly
465                 470                 475                 480

Asn Gly Val His Ala Asn Leu His Val Ala Phe His Arg Ser Ser Ser
                485                 490                 495

Glu Lys Ile His Ser Asn Glu Ile Ser Ser Asp Ser Ile Gly Val Leu
            500                 505                 510

Gly Tyr Gln Lys Thr Val Asp His Thr Lys Val Asn Ser Lys Leu Ser
        515                 520                 525

Leu Phe Phe Glu Ile Lys Ser
    530                 535
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<211> 1605
<212> DNA
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<223> Synthetic

<400> 631

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cacggcacca agcccggcta cgtggacagc atccagaagg gcatccagaa gcccaagagc      120

ggcacccagg gcaactacga cgacgactgg aaggagttct acagcaccga caacaagtac      180

gacgccgccg gctacagcgt ggacaacgag aacccccctga gcggcaaggc cggcggcgtg      240

gtgaaggtga cctaccccgg cctgaccaag gtgctggccc tgaaggtgga caacgccgag      300

accatcaaga aggagctggg cctgagcctg accgagcccc tgatggagca ggtgggcacc      360

gaggagttca tcaagaggtt cggcgacggc gccagcaggg tggtgctgag cctgcccttc      420

gccgagggca gcagcagcgt ggagtacatc aacaactggg agcaggccaa ggccctgagc      480

gtggagctgg agatcaactt cgagaccagg ggcaagaggg gccaggacgc catgtacgag      540

tacatggccc aggcctgcgc cggcaacagg gtgaggagga gcgtgggcag cagcctgagc      600

tgcatcaacc tggactggga cgtgatcagg gacaagacca agaccaagat cgagagcctg      660
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aaggagcacg gccccatcaa gaacaagatg agcgagagcc ccaacaagac cgtgagcgag 720

gagaaggcca agcagtacct ggaggagttc caccagaccg ccctggagca ccccgagctg 780

agcgagctga agaccgtgac cggcaccaac cccgtgttcg ccggcgccaa ctacgccgcc 840

tgggccgtga acgtggccca ggtgatcgac agcgagaccg ccgacaacct ggagaagacc 900

accgccgccc tgagcatcct gcccggcatc ggcagcgtga tgggcatcgc cgacggcgcc 960

gtgcaccaca acaccgagga gatcgtggcc cagagcatcg ccctgagcag cctgatggtg 1020

gcccaggcca tccccctggt gggcgagctg gtggacatcg gcttcgccgc ctacaacttc 1080

gtggagagca tcatcaacct gttccaggtg gtgcacaaca gctacaacag gcccgcctac 1140

agccccggcc acaagaccca gcccttcctg cacgacggct acgccgtgag ctggaacacc 1200

gtggaggaca gcatcatcag gaccggcttc cagggcgaga gcggccacga catcaagatc 1260

accgccgaga acacccccct gcccatcgcc ggcgtgctgc tgcccaccat ccccggcaag 1320

ctggacgtga acaagagcaa gacccacatc agcgtgaacg gcaggaagat caggatgagg 1380

tgcagggcca tcgacggcga cgtgaccttc tgcaggccca agagccccgt gtacgtgggc 1440

aacggcgtgc acgccaacct gcacgtggcc ttccacagga gcagcagcga gaagatccac 1500

agcaacgaga tcagcagcga cagcatcggc gtgctgggct accagaagac cgtggaccac 1560

accaaggtga acagcaagct gagcctgttc ttcgagatca agagc 1605

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<213> Artificial Sequence

<220>
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ggcccagact gagcacgtga 20

<210> 633
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 633
ggcccagact gagcacgtga 20

<210> 634
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 634
ggcccagact gagcacgtga 20

<210> 635
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 635
ggcccagact gagcacgtga 20

<210> 636
<211> 20
<212> DNA
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<220>
<223> Synthetic

<400> 636
ggcccagact gagcacgtga 20

<210> 637
<211> 20
<212> DNA
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gtcatcttag tcattacctg 20

<210> 638

<211> 20
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<220>
<223> Synthetic

<400> 638
gtcatcttag tcattacctg 20

<210> 639
<211> 20
<212> DNA
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<400> 639
gtcatcttag tcattacctg 20

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<400> 640
gcatggtgca cctgactcct g 21

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<220>
<223> Synthetic

<400> 641
tctgccatcc cgtgctcagt ctg 23

<210> 642
<211> 23
<212> DNA
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<223> Synthetic

<400> 642
tctgccagca cgtgctcagt ctg 23

<210> 643
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<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 643
tctgccaaca cgtgctcagt ctg 23

<210> 644
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<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 644
tggaggaagc agggcttcct ttcctctgaa aacacgtgct cagtctg 47

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<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 645
tctgccatca aagcgtgctc agtctg 26

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<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 646
aacgaacacc tcatgtaatg actaagatg 29

<210> 647
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 647
aacgaacacc tcacgtaatg actaagatg 29

<210> 648
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 648
aacgaacacc tcagtacgta atgactaaga tg 32

<210> 649
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 649
agacttctcc acaggagtca ggtgcac 27

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<400> 650
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<210> 651

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<211> 1803
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 660

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1 5 10 15

Arg Lys Val Gly Lys Arg Asn Tyr Ile Leu Gly Leu Asp Ile Gly Ile
20 25 30

Thr Ser Val Gly Tyr Gly Ile Ile Asp Tyr Glu Thr Arg Asp Val Ile

```
        35                  40                  45

Asp Ala Gly Val Arg Leu Phe Lys Glu Ala Asn Val Glu Asn Asn Glu
    50                  55                  60

Gly Arg Arg Ser Lys Arg Gly Ala Arg Arg Leu Lys Arg Arg Arg Arg
65                  70                  75                  80

His Arg Ile Gln Arg Val Lys Lys Leu Leu Phe Asp Tyr Asn Leu Leu
                85                  90                  95

Thr Asp His Ser Glu Leu Ser Gly Ile Asn Pro Tyr Glu Ala Arg Val
            100                 105                 110

Lys Gly Leu Ser Gln Lys Leu Ser Glu Glu Glu Phe Ser Ala Ala Leu
        115                 120                 125

Leu His Leu Ala Lys Arg Arg Gly Val His Asn Val Asn Glu Val Glu
    130                 135                 140

Glu Asp Thr Gly Asn Glu Leu Ser Thr Lys Glu Gln Ile Ser Arg Asn
145                 150                 155                 160

Ser Lys Ala Leu Glu Glu Lys Tyr Val Ala Glu Leu Gln Leu Glu Arg
                165                 170                 175

Leu Lys Lys Asp Gly Glu Val Arg Gly Ser Ile Asn Arg Phe Lys Thr
            180                 185                 190

Ser Asp Tyr Val Lys Glu Ala Lys Gln Leu Leu Lys Val Gln Lys Ala
        195                 200                 205

Tyr His Gln Leu Asp Gln Ser Phe Ile Asp Thr Tyr Ile Asp Leu Leu
    210                 215                 220

Glu Thr Arg Arg Thr Tyr Tyr Glu Gly Pro Gly Glu Gly Ser Pro Phe
225                 230                 235                 240

Gly Trp Lys Asp Ile Lys Glu Trp Tyr Glu Met Leu Met Gly His Cys
                245                 250                 255
```

```
Thr Tyr Phe Pro Glu Glu Leu Arg Ser Val Lys Tyr Ala Tyr Asn Ala
            260                 265                 270

Asp Leu Tyr Asn Ala Leu Asn Asp Leu Asn Asn Leu Val Ile Thr Arg
        275                 280                 285

Asp Glu Asn Glu Lys Leu Glu Tyr Tyr Glu Lys Phe Gln Ile Ile Glu
    290                 295                 300

Asn Val Phe Lys Gln Lys Lys Lys Pro Thr Leu Lys Gln Ile Ala Lys
305                 310                 315                 320

Glu Ile Leu Val Asn Glu Glu Asp Ile Lys Gly Tyr Arg Val Thr Ser
                325                 330                 335

Thr Gly Lys Pro Glu Phe Thr Asn Leu Lys Val Tyr His Asp Ile Lys
            340                 345                 350

Asp Ile Thr Ala Arg Lys Glu Ile Ile Glu Asn Ala Glu Leu Leu Asp
        355                 360                 365

Gln Ile Ala Lys Ile Leu Thr Ile Tyr Gln Ser Ser Glu Asp Ile Gln
    370                 375                 380

Glu Glu Leu Thr Asn Leu Asn Ser Glu Leu Thr Gln Glu Glu Ile Glu
385                 390                 395                 400

Gln Ile Ser Asn Leu Lys Gly Tyr Thr Gly Thr His Asn Leu Ser Leu
                405                 410                 415

Lys Ala Ile Asn Leu Ile Leu Asp Glu Leu Trp His Thr Asn Asp Asn
            420                 425                 430

Gln Ile Ala Ile Phe Asn Arg Leu Lys Leu Val Pro Lys Lys Val Asp
        435                 440                 445

Leu Ser Gln Gln Lys Glu Ile Pro Thr Thr Leu Val Asp Asp Phe Ile
    450                 455                 460
```

```
Leu Ser Pro Val Val Lys Arg Ser Phe Ile Gln Ser Ile Lys Val Ile
465                 470                 475                 480

Asn Ala Ile Ile Lys Lys Tyr Gly Leu Pro Asn Asp Ile Ile Ile Glu
                485                 490                 495

Leu Ala Arg Glu Lys Asn Ser Lys Asp Ala Gln Lys Met Ile Asn Glu
            500                 505                 510

Met Gln Lys Arg Asn Arg Gln Thr Asn Glu Arg Ile Glu Glu Ile Ile
        515                 520                 525

Arg Thr Thr Gly Lys Glu Asn Ala Lys Tyr Leu Ile Glu Lys Ile Lys
    530                 535                 540

Leu His Asp Met Gln Glu Gly Lys Cys Leu Tyr Ser Leu Glu Ala Ile
545                 550                 555                 560

Pro Leu Glu Asp Leu Leu Asn Asn Pro Phe Asn Tyr Glu Val Asp His
                565                 570                 575

Ile Ile Pro Arg Ser Val Ser Phe Asp Asn Ser Phe Asn Asn Lys Val
            580                 585                 590

Leu Val Lys Gln Glu Glu Ala Ser Lys Lys Gly Asn Arg Thr Pro Phe
        595                 600                 605

Gln Tyr Leu Ser Ser Ser Asp Ser Lys Ile Ser Tyr Glu Thr Phe Lys
    610                 615                 620

Lys His Ile Leu Asn Leu Ala Lys Gly Lys Gly Arg Ile Ser Lys Thr
625                 630                 635                 640

Lys Lys Glu Tyr Leu Leu Glu Glu Arg Asp Ile Asn Arg Phe Ser Val
                645                 650                 655

Gln Lys Asp Phe Ile Asn Arg Asn Leu Val Asp Thr Arg Tyr Ala Thr
            660                 665                 670
```

```
Arg Gly Leu Met Asn Leu Leu Arg Ser Tyr Phe Arg Val Asn Asn Leu
        675                 680                 685

Asp Val Lys Val Lys Ser Ile Asn Gly Gly Phe Thr Ser Phe Leu Arg
    690                 695                 700

Arg Lys Trp Lys Phe Lys Lys Glu Arg Asn Lys Gly Tyr Lys His His
705                 710                 715                 720

Ala Glu Asp Ala Leu Ile Ile Ala Asn Ala Asp Phe Ile Phe Lys Glu
                725                 730                 735

Trp Lys Lys Leu Asp Lys Ala Lys Lys Val Met Glu Asn Gln Met Phe
            740                 745                 750

Glu Glu Lys Gln Ala Glu Ser Met Pro Glu Ile Glu Thr Glu Gln Glu
        755                 760                 765

Tyr Lys Glu Ile Phe Ile Thr Pro His Gln Ile Lys His Ile Lys Asp
    770                 775                 780

Phe Lys Asp Tyr Lys Tyr Ser His Arg Val Asp Lys Lys Pro Asn Arg
785                 790                 795                 800

Glu Leu Ile Asn Asp Thr Leu Tyr Ser Thr Arg Lys Asp Asp Lys Gly
                805                 810                 815

Asn Thr Leu Ile Val Asn Asn Leu Asn Gly Leu Tyr Asp Lys Asp Asn
            820                 825                 830

Asp Lys Leu Lys Lys Leu Ile Asn Lys Ser Pro Glu Lys Leu Leu Met
        835                 840                 845

Tyr His His Asp Pro Gln Thr Tyr Gln Lys Leu Lys Leu Ile Met Glu
    850                 855                 860

Gln Tyr Gly Asp Glu Lys Asn Pro Leu Tyr Lys Tyr Tyr Glu Glu Thr
865                 870                 875                 880

Gly Asn Tyr Leu Thr Lys Tyr Ser Lys Lys Asp Asn Gly Pro Val Ile
```

```
               885                 890                 895

Lys Lys Ile Lys Tyr Tyr Gly Asn Lys Leu Asn Ala His Leu Asp Ile
            900                 905                 910

Thr Asp Asp Tyr Pro Asn Ser Arg Asn Lys Val Val Lys Leu Ser Leu
        915                 920                 925

Lys Pro Tyr Arg Phe Asp Val Tyr Leu Asp Asn Gly Val Tyr Lys Phe
    930                 935                 940

Val Thr Val Lys Asn Leu Asp Val Ile Lys Lys Glu Asn Tyr Tyr Glu
945                 950                 955                 960

Val Asn Ser Lys Cys Tyr Glu Glu Ala Lys Lys Leu Lys Lys Ile Ser
               965                 970                 975

Asn Gln Ala Glu Phe Ile Ala Ser Phe Tyr Asn Asn Asp Leu Ile Lys
            980                 985                 990

Ile Asn Gly Glu Leu Tyr Arg Val  Ile Gly Val Asn Asn  Asp Leu Leu
        995                 1000                1005

Asn Arg  Ile Glu Val Asn Met  Ile Asp Ile Thr Tyr  Arg Glu Tyr
    1010                1015                1020

Leu Glu  Asn Met Asn Asp Lys  Arg Pro Pro Arg Ile  Ile Lys Thr
    1025                1030                1035

Ile Ala  Ser Lys Thr Gln Ser  Ile Lys Lys Tyr Ser  Thr Asp Ile
    1040                1045                1050

Leu Gly  Asn Leu Tyr Glu Val  Lys Ser Lys Lys His  Pro Gln Ile
    1055                1060                1065

Ile Lys  Lys Gly Ser Gly Gly  Ser Ser Gly Gly Ser  Ser Gly Ser
    1070                1075                1080

Glu Thr  Pro Gly Thr Ser Glu  Ser Ala Thr Pro Glu  Ser Ser Gly
    1085                1090                1095
```

```
Gly Ser  Ser Gly Gly Ser Ser  Thr Leu Asn Ile Glu  Asp Glu Tyr
    1100                1105                1110

Arg Leu  His Glu Thr Ser Lys  Glu Pro Asp Val Ser  Leu Gly Ser
    1115                1120                1125

Thr Trp  Leu Ser Asp Phe Pro  Gln Ala Trp Ala Glu  Thr Gly Gly
    1130                1135                1140

Met Gly  Leu Ala Val Arg Gln  Ala Pro Leu Ile Ile  Pro Leu Lys
    1145                1150                1155

Ala Thr  Ser Thr Pro Val Ser  Ile Lys Gln Tyr Pro  Met Ser Gln
    1160                1165                1170

Glu Ala  Arg Leu Gly Ile Lys  Pro His Ile Gln Arg  Leu Leu Asp
    1175                1180                1185

Gln Gly  Ile Leu Val Pro Cys  Gln Ser Pro Trp Asn  Thr Pro Leu
    1190                1195                1200

Leu Pro  Val Lys Lys Pro Gly  Thr Asn Asp Tyr Arg  Pro Val Gln
    1205                1210                1215

Asp Leu  Arg Glu Val Asn Lys  Arg Val Glu Asp Ile  His Pro Thr
    1220                1225                1230

Val Pro  Asn Pro Tyr Asn Leu  Leu Ser Gly Leu Pro  Pro Ser His
    1235                1240                1245

Gln Trp  Tyr Thr Val Leu Asp  Leu Lys Asp Ala Phe  Phe Cys Leu
    1250                1255                1260

Arg Leu  His Pro Thr Ser Gln  Pro Leu Phe Ala Phe  Glu Trp Arg
    1265                1270                1275

Asp Pro  Glu Met Gly Ile Ser  Gly Gln Leu Thr Trp  Thr Arg Leu
    1280                1285                1290
```

```
Pro Gln  Gly Phe Lys Asn Ser  Pro Thr Leu Phe Asp  Glu Ala Leu
    1295                1300                1305

His Arg  Asp Leu Ala Asp Phe  Arg Ile Gln His Pro  Asp Leu Ile
    1310                1315                1320

Leu Leu  Gln Tyr Val Asp Asp  Leu Leu Leu Ala Ala  Thr Ser Glu
    1325                1330                1335

Leu Asp  Cys Gln Gln Gly Thr  Arg Ala Leu Leu Gln  Thr Leu Gly
    1340                1345                1350

Asn Leu  Gly Tyr Arg Ala Ser  Ala Lys Lys Ala Gln  Ile Cys Gln
    1355                1360                1365

Lys Gln  Val Lys Tyr Leu Gly  Tyr Leu Leu Lys Glu  Gly Gln Arg
    1370                1375                1380

Trp Leu  Thr Glu Ala Arg Lys  Glu Thr Val Met Gly  Gln Pro Thr
    1385                1390                1395

Pro Lys  Thr Pro Arg Gln Leu  Arg Glu Phe Leu Gly  Thr Ala Gly
    1400                1405                1410

Phe Cys  Arg Leu Trp Ile Pro  Gly Phe Ala Glu Met  Ala Ala Pro
    1415                1420                1425

Leu Tyr  Pro Leu Thr Lys Thr  Gly Thr Leu Phe Asn  Trp Gly Pro
    1430                1435                1440

Asp Gln  Gln Lys Ala Tyr Gln  Glu Ile Lys Gln Ala  Leu Leu Thr
    1445                1450                1455

Ala Pro  Ala Leu Gly Leu Pro  Asp Leu Thr Lys Pro  Phe Glu Leu
    1460                1465                1470

Phe Val  Asp Glu Lys Gln Gly  Tyr Ala Lys Gly Val  Leu Thr Gln
    1475                1480                1485
```

```
Lys Leu  Gly Pro Trp Arg Arg  Pro Val Ala Tyr Leu  Ser Lys Lys
    1490                 1495                 1500

Leu Asp  Pro Val Ala Ala Gly  Trp Pro Pro Cys Leu  Arg Met Val
    1505                 1510                 1515

Ala Ala  Ile Ala Val Leu Thr  Lys Asp Ala Gly Lys  Leu Thr Met
    1520                 1525                 1530

Gly Gln  Pro Leu Val Ile Leu  Ala Pro His Ala Val  Glu Ala Leu
    1535                 1540                 1545

Val Lys  Gln Pro Pro Asp Arg  Trp Leu Ser Asn Ala  Arg Met Thr
    1550                 1555                 1560

His Tyr  Gln Ala Leu Leu Leu  Asp Thr Asp Arg Val  Gln Phe Gly
    1565                 1570                 1575

Pro Val  Val Ala Leu Asn Pro  Ala Thr Leu Leu Pro  Leu Pro Glu
    1580                 1585                 1590

Glu Gly  Leu Gln His Asn Cys  Leu Asp Ile Leu Ala  Glu Ala His
    1595                 1600                 1605

Gly Thr  Arg Pro Asp Leu Thr  Asp Gln Pro Leu Pro  Asp Ala Asp
    1610                 1615                 1620

His Thr  Trp Tyr Thr Asp Gly  Ser Ser Leu Leu Gln  Glu Gly Gln
    1625                 1630                 1635

Arg Lys  Ala Gly Ala Ala Val  Thr Thr Glu Thr Glu  Val Ile Trp
    1640                 1645                 1650

Ala Lys  Ala Leu Pro Ala Gly  Thr Ser Ala Gln Arg  Ala Glu Leu
    1655                 1660                 1665

Ile Ala  Leu Thr Gln Ala Leu  Lys Met Ala Glu Gly  Lys Lys Leu
    1670                 1675                 1680

Asn Val  Tyr Thr Asp Ser Arg  Tyr Ala Phe Ala Thr  Ala His Ile
```

1685 1690 1695

His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
1700 1705 1710

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala
1715 1720 1725

Leu Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His
1730 1735 1740

Gln Lys Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp
1745 1750 1755

Gln Ala Ala Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser
1760 1765 1770

Thr Leu Leu Ile Glu Asn Ser Ser Pro Ser Gly Gly Ser Lys Arg
1775 1780 1785

Thr Ala Asp Gly Ser Glu Phe Glu Pro Lys Lys Lys Arg Lys Val
1790 1795 1800

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<211> 2117
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 661

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1 5 10 15

Arg Lys Val Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn
20 25 30

Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys
35 40 45

```
Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn
    50                  55                  60

Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr
65                  70                  75                  80

Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg
                85                  90                  95

Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp
            100                 105                 110

Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp
        115                 120                 125

Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val
    130                 135                 140

Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu
145                 150                 155                 160

Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu
                165                 170                 175

Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu
            180                 185                 190

Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln
        195                 200                 205

Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val
    210                 215                 220

Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu
225                 230                 235                 240

Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe
                245                 250                 255

Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser
```

```
            260                 265                 270

Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr
        275                 280                 285

Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr
    290                 295                 300

Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu
305                 310                 315                 320

Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser
                325                 330                 335

Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu
            340                 345                 350

Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile
        355                 360                 365

Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly
    370                 375                 380

Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys
385                 390                 395                 400

Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu
                405                 410                 415

Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile
            420                 425                 430

His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr
        435                 440                 445

Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe
    450                 455                 460

Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe
465                 470                 475                 480
```

```
Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe
                485                 490                 495

Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg
            500                 505                 510

Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys
        515                 520                 525

His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys
    530                 535                 540

Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly
545                 550                 555                 560

Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys
                565                 570                 575

Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys
            580                 585                 590

Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser
        595                 600                 605

Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe
    610                 615                 620

Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr
625                 630                 635                 640

Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr
                645                 650                 655

Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg
            660                 665                 670

Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile
        675                 680                 685
```

```
Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp
    690                 695                 700

Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu
705                 710                 715                 720

Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp
                725                 730                 735

Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys
            740                 745                 750

Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val
        755                 760                 765

Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu
    770                 775                 780

Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys
785                 790                 795                 800

Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu
                805                 810                 815

His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr
            820                 825                 830

Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile
        835                 840                 845

Asn Arg Leu Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe
    850                 855                 860

Leu Lys Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys
865                 870                 875                 880

Asn Arg Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys
                885                 890                 895
```

```
Met Lys Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln
            900                 905                 910

Arg Lys Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu
        915                 920                 925

Leu Asp Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln
    930                 935                 940

Ile Thr Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys
945                 950                 955                 960

Tyr Asp Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu
                965                 970                 975

Lys Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
            980                 985                 990

Val Arg Glu Ile Asn Asn Tyr His  His Ala His Asp Ala  Tyr Leu Asn
        995                 1000                1005

Ala Val  Val Gly Thr Ala Leu  Ile Lys Lys Tyr Pro  Lys Leu Glu
    1010                1015                1020

Ser Glu  Phe Val Tyr Gly Asp  Tyr Lys Val Tyr Asp  Val Arg Lys
    1025                1030                1035

Met Ile  Ala Lys Ser Glu Gln  Glu Ile Gly Lys Ala  Thr Ala Lys
    1040                1045                1050

Tyr Phe  Phe Tyr Ser Asn Ile  Met Asn Phe Phe Lys  Thr Glu Ile
    1055                1060                1065

Thr Leu  Ala Asn Gly Glu Ile  Arg Lys Arg Pro Leu  Ile Glu Thr
    1070                1075                1080

Asn Gly  Glu Thr Gly Glu Ile  Val Trp Asp Lys Gly  Arg Asp Phe
    1085                1090                1095

Ala Thr  Val Arg Lys Val Leu  Ser Met Pro Gln Val  Asn Ile Val
```

```
    1100                1105                1110

Lys Lys  Thr Glu Val Gln Thr  Gly Gly Phe Ser Lys  Glu Ser Ile
    1115                1120                1125

Leu Pro  Lys Arg Asn Ser Asp  Lys Leu Ile Ala Arg  Lys Lys Asp
    1130                1135                1140

Trp Asp  Pro Lys Lys Tyr Gly  Gly Phe Val Ser Pro  Thr Val Ala
    1145                1150                1155

Tyr Ser  Val Leu Val Val Ala  Lys Val Glu Lys Gly  Lys Ser Lys
    1160                1165                1170

Lys Leu  Lys Ser Val Lys Glu  Leu Leu Gly Ile Thr  Ile Met Glu
    1175                1180                1185

Arg Ser  Ser Phe Glu Lys Asn  Pro Ile Asp Phe Leu  Glu Ala Lys
    1190                1195                1200

Gly Tyr  Lys Glu Val Lys Lys  Asp Leu Ile Ile Lys  Leu Pro Lys
    1205                1210                1215

Tyr Ser  Leu Phe Glu Leu Glu  Asn Gly Arg Lys Arg  Met Leu Ala
    1220                1225                1230

Ser Ala  Arg Glu Leu Gln Lys  Gly Asn Glu Leu Ala  Leu Pro Ser
    1235                1240                1245

Lys Tyr  Val Asn Phe Leu Tyr  Leu Ala Ser His Tyr  Glu Lys Leu
    1250                1255                1260

Lys Gly  Ser Pro Glu Asp Asn  Glu Gln Lys Gln Leu  Phe Val Glu
    1265                1270                1275

Gln His  Lys His Tyr Leu Asp  Glu Ile Ile Glu Gln  Ile Ser Glu
    1280                1285                1290

Phe Ser  Lys Arg Val Ile Leu  Ala Asp Ala Asn Leu  Asp Lys Val
    1295                1300                1305
```

```
Leu Ser  Ala Tyr Asn Lys His  Arg Asp Lys Pro Ile  Arg Glu Gln
    1310                1315                1320

Ala Glu  Asn Ile Ile His Leu  Phe Thr Leu Thr Asn  Leu Gly Ala
    1325                1330                1335

Pro Ala  Ala Phe Lys Tyr Phe  Asp Thr Thr Ile Asp  Arg Lys Gln
    1340                1345                1350

Tyr Arg  Ser Thr Lys Glu Val  Leu Asp Ala Thr Leu  Ile His Gln
    1355                1360                1365

Ser Ile  Thr Gly Leu Tyr Glu  Thr Arg Ile Asp Leu  Ser Gln Leu
    1370                1375                1380

Gly Gly  Asp Ser Gly Gly Ser  Ser Gly Gly Ser Ser  Gly Ser Glu
    1385                1390                1395

Thr Pro  Gly Thr Ser Glu Ser  Ala Thr Pro Glu Ser  Ser Gly Gly
    1400                1405                1410

Ser Ser  Gly Gly Ser Ser Thr  Leu Asn Ile Glu Asp  Glu Tyr Arg
    1415                1420                1425

Leu His  Glu Thr Ser Lys Glu  Pro Asp Val Ser Leu  Gly Ser Thr
    1430                1435                1440

Trp Leu  Ser Asp Phe Pro Gln  Ala Trp Ala Glu Thr  Gly Gly Met
    1445                1450                1455

Gly Leu  Ala Val Arg Gln Ala  Pro Leu Ile Ile Pro  Leu Lys Ala
    1460                1465                1470

Thr Ser  Thr Pro Val Ser Ile  Lys Gln Tyr Pro Met  Ser Gln Glu
    1475                1480                1485

Ala Arg  Leu Gly Ile Lys Pro  His Ile Gln Arg Leu  Leu Asp Gln
    1490                1495                1500
```

```
Gly Ile  Leu Val Pro Cys Gln  Ser Pro Trp Asn Thr  Pro Leu Leu
    1505                1510                1515

Pro Val  Lys Lys Pro Gly Thr  Asn Asp Tyr Arg Pro  Val Gln Asp
    1520                1525                1530

Leu Arg  Glu Val Asn Lys Arg  Val Glu Asp Ile His  Pro Thr Val
    1535                1540                1545

Pro Asn  Pro Tyr Asn Leu Leu  Ser Gly Leu Pro Pro  Ser His Gln
    1550                1555                1560

Trp Tyr  Thr Val Leu Asp Leu  Lys Asp Ala Phe Phe  Cys Leu Arg
    1565                1570                1575

Leu His  Pro Thr Ser Gln Pro  Leu Phe Ala Phe Glu  Trp Arg Asp
    1580                1585                1590

Pro Glu  Met Gly Ile Ser Gly  Gln Leu Thr Trp Thr  Arg Leu Pro
    1595                1600                1605

Gln Gly  Phe Lys Asn Ser Pro  Thr Leu Phe Asn Glu  Ala Leu His
    1610                1615                1620

Arg Asp  Leu Ala Asp Phe Arg  Ile Gln His Pro Asp  Leu Ile Leu
    1625                1630                1635

Leu Gln  Tyr Val Asp Asp Leu  Leu Leu Ala Ala Thr  Ser Glu Leu
    1640                1645                1650

Asp Cys  Gln Gln Gly Thr Arg  Ala Leu Leu Gln Thr  Leu Gly Asn
    1655                1660                1665

Leu Gly  Tyr Arg Ala Ser Ala  Lys Lys Ala Gln Ile  Cys Gln Lys
    1670                1675                1680

Gln Val  Lys Tyr Leu Gly Tyr  Leu Leu Lys Glu Gly  Gln Arg Trp
    1685                1690                1695
```

```
Leu Thr  Glu Ala Arg Lys Glu  Thr Val Met Gly Gln  Pro Thr Pro
    1700                1705                1710

Lys Thr  Pro Arg Gln Leu Arg  Glu Phe Leu Gly Lys  Ala Gly Phe
    1715                1720                1725

Cys Arg  Leu Phe Ile Pro Gly  Phe Ala Glu Met Ala  Ala Pro Leu
    1730                1735                1740

Tyr Pro  Leu Thr Lys Pro Gly  Thr Leu Phe Asn Trp  Gly Pro Asp
    1745                1750                1755

Gln Gln  Lys Ala Tyr Gln Glu  Ile Lys Gln Ala Leu  Leu Thr Ala
    1760                1765                1770

Pro Ala  Leu Gly Leu Pro Asp  Leu Thr Lys Pro Phe  Glu Leu Phe
    1775                1780                1785

Val Asp  Glu Lys Gln Gly Tyr  Ala Lys Gly Val Leu  Thr Gln Lys
    1790                1795                1800

Leu Gly  Pro Trp Arg Arg Pro  Val Ala Tyr Leu Ser  Lys Lys Leu
    1805                1810                1815

Asp Pro  Val Ala Ala Gly Trp  Pro Pro Cys Leu Arg  Met Val Ala
    1820                1825                1830

Ala Ile  Ala Val Leu Thr Lys  Asp Ala Gly Lys Leu  Thr Met Gly
    1835                1840                1845

Gln Pro  Leu Val Ile Leu Ala  Pro His Ala Val Glu  Ala Leu Val
    1850                1855                1860

Lys Gln  Pro Pro Asp Arg Trp  Leu Ser Asn Ala Arg  Met Thr His
    1865                1870                1875

Tyr Gln  Ala Leu Leu Leu Asp  Thr Asp Arg Val Gln  Phe Gly Pro
    1880                1885                1890

Val Val  Ala Leu Asn Pro Ala  Thr Leu Leu Pro Leu  Pro Glu Glu
```

```
    1895                1900                1905

Gly Leu  Gln His Asn Cys Leu  Asp Ile Leu Ala Glu  Ala His Gly
    1910                1915                1920

Thr Arg  Pro Asp Leu Thr Asp  Gln Pro Leu Pro Asp  Ala Asp His
    1925                1930                1935

Thr Trp  Tyr Thr Asp Gly Ser  Ser Leu Leu Gln Glu  Gly Gln Arg
    1940                1945                1950

Lys Ala  Gly Ala Ala Val Thr  Thr Glu Thr Glu Val  Ile Trp Ala
    1955                1960                1965

Lys Ala  Leu Pro Ala Gly Thr  Ser Ala Gln Arg Ala  Glu Leu Ile
    1970                1975                1980

Ala Leu  Thr Gln Ala Leu Lys  Met Ala Glu Gly Lys  Lys Leu Asn
    1985                1990                1995

Val Tyr  Thr Asp Ser Arg Tyr  Ala Phe Ala Thr Ala  His Ile His
    2000                2005                2010

Gly Glu  Ile Tyr Arg Arg Arg  Gly Trp Leu Thr Ser  Glu Gly Lys
    2015                2020                2025

Glu Ile  Lys Asn Lys Asp Glu  Ile Leu Ala Leu Leu  Lys Ala Leu
    2030                2035                2040

Phe Leu  Pro Lys Arg Leu Ser  Ile Ile His Cys Pro  Gly His Gln
    2045                2050                2055

Lys Gly  His Ser Ala Glu Ala  Arg Gly Asn Arg Met  Ala Asp Gln
    2060                2065                2070

Ala Ala  Arg Lys Ala Ala Ile  Thr Glu Thr Pro Asp  Thr Ser Thr
    2075                2080                2085

Leu Leu  Ile Glu Asn Ser Ser  Pro Ser Gly Gly Ser  Lys Arg Thr
    2090                2095                2100
```

Ala Asp Gly Ser Glu Phe Glu Pro Lys Lys Lys Arg Lys Val
    2105   2110   2115

<210> 662
<211> 2117
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 662

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1   5   10   15

Arg Lys Val Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn
            20   25   30

Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys
        35   40   45

Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn
    50   55   60

Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr
65   70   75   80

Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg
                85   90   95

Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp
            100   105   110

Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp
        115   120   125

Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val
    130   135   140

Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu

145 150 155 160

Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu
165 170 175

Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu
180 185 190

Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln
195 200 205

Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val
210 215 220

Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu
225 230 235 240

Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe
245 250 255

Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser
260 265 270

Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr
275 280 285

Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr
290 295 300

Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu
305 310 315 320

Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser
325 330 335

Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu
340 345 350

Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile
355 360 365

```
Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly
    370                 375                 380

Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys
385                 390                 395                 400

Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu
                405                 410                 415

Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile
            420                 425                 430

His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr
        435                 440                 445

Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe
    450                 455                 460

Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe
465                 470                 475                 480

Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe
                485                 490                 495

Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg
            500                 505                 510

Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys
        515                 520                 525

His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys
    530                 535                 540

Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly
545                 550                 555                 560

Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys
                565                 570                 575
```

```
Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys
            580                 585                 590

Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser
        595                 600                 605

Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe
    610                 615                 620

Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr
625                 630                 635                 640

Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr
                645                 650                 655

Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg
            660                 665                 670

Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile
        675                 680                 685

Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp
    690                 695                 700

Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu
705                 710                 715                 720

Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp
                725                 730                 735

Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys
            740                 745                 750

Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val
        755                 760                 765

Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu
    770                 775                 780
```

```
Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys
785                 790                 795                 800


Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu
                805                 810                 815


His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr
            820                 825                 830


Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile
        835                 840                 845


Asn Arg Leu Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe
    850                 855                 860


Leu Lys Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys
865                 870                 875                 880


Asn Arg Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys
                885                 890                 895


Met Lys Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln
            900                 905                 910


Arg Lys Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu
        915                 920                 925


Leu Asp Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln
    930                 935                 940


Ile Thr Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys
945                 950                 955                 960


Tyr Asp Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu
                965                 970                 975


Lys Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
            980                 985                 990


Val Arg Glu Ile Asn Asn Tyr His  His Ala His Asp Ala  Tyr Leu Asn
```

995 1000 1005

Ala Val Val Gly Thr Ala Leu Ile Lys Lys Tyr Pro Lys Leu Glu
1010 1015 1020

Ser Glu Phe Val Tyr Gly Asp Tyr Lys Val Tyr Asp Val Arg Lys
1025 1030 1035

Met Ile Ala Lys Ser Glu Gln Glu Ile Gly Lys Ala Thr Ala Lys
1040 1045 1050

Tyr Phe Phe Tyr Ser Asn Ile Met Asn Phe Phe Lys Thr Glu Ile
1055 1060 1065

Thr Leu Ala Asn Gly Glu Ile Arg Lys Arg Pro Leu Ile Glu Thr
1070 1075 1080

Asn Gly Glu Thr Gly Glu Ile Val Trp Asp Lys Gly Arg Asp Phe
1085 1090 1095

Ala Thr Val Arg Lys Val Leu Ser Met Pro Gln Val Asn Ile Val
1100 1105 1110

Lys Lys Thr Glu Val Gln Thr Gly Gly Phe Ser Lys Glu Ser Ile
1115 1120 1125

Leu Pro Lys Arg Asn Ser Asp Lys Leu Ile Ala Arg Lys Lys Asp
1130 1135 1140

Trp Asp Pro Lys Lys Tyr Gly Gly Phe Val Ser Pro Thr Val Ala
1145 1150 1155

Tyr Ser Val Leu Val Val Ala Lys Val Glu Lys Gly Lys Ser Lys
1160 1165 1170

Lys Leu Lys Ser Val Lys Glu Leu Leu Gly Ile Thr Ile Met Glu
1175 1180 1185

Arg Ser Ser Phe Glu Lys Asn Pro Ile Asp Phe Leu Glu Ala Lys
1190 1195 1200

```
Gly Tyr  Lys Glu Val Lys Lys  Asp Leu Ile Ile Lys  Leu Pro Lys
    1205                1210                1215

Tyr Ser  Leu Phe Glu Leu Glu  Asn Gly Arg Lys Arg  Met Leu Ala
    1220                1225                1230

Ser Ala  Arg Glu Leu Gln Lys  Gly Asn Glu Leu Ala  Leu Pro Ser
    1235                1240                1245

Lys Tyr  Val Asn Phe Leu Tyr  Leu Ala Ser His Tyr  Glu Lys Leu
    1250                1255                1260

Lys Gly  Ser Pro Glu Asp Asn  Glu Gln Lys Gln Leu  Phe Val Glu
    1265                1270                1275

Gln His  Lys His Tyr Leu Asp  Glu Ile Ile Glu Gln  Ile Ser Glu
    1280                1285                1290

Phe Ser  Lys Arg Val Ile Leu  Ala Asp Ala Asn Leu  Asp Lys Val
    1295                1300                1305

Leu Ser  Ala Tyr Asn Lys His  Arg Asp Lys Pro Ile  Arg Glu Gln
    1310                1315                1320

Ala Glu  Asn Ile Ile His Leu  Phe Thr Leu Thr Asn  Leu Gly Ala
    1325                1330                1335

Pro Ala  Ala Phe Lys Tyr Phe  Asp Thr Thr Ile Asp  Arg Lys Glu
    1340                1345                1350

Tyr Arg  Ser Thr Lys Glu Val  Leu Asp Ala Thr Leu  Ile His Gln
    1355                1360                1365

Ser Ile  Thr Gly Leu Tyr Glu  Thr Arg Ile Asp Leu  Ser Gln Leu
    1370                1375                1380

Gly Gly  Asp Ser Gly Gly Ser  Ser Gly Gly Ser Ser  Gly Ser Glu
    1385                1390                1395
```

```
Thr Pro  Gly Thr Ser Glu Ser  Ala Thr Pro Glu Ser  Ser Gly Gly
    1400                1405                1410

Ser Ser  Gly Gly Ser Ser Thr  Leu Asn Ile Glu Asp  Glu Tyr Arg
    1415                1420                1425

Leu His  Glu Thr Ser Lys Glu  Pro Asp Val Ser Leu  Gly Ser Thr
    1430                1435                1440

Trp Leu  Ser Asp Phe Pro Gln  Ala Trp Ala Glu Thr  Gly Gly Met
    1445                1450                1455

Gly Leu  Ala Val Arg Gln Ala  Pro Leu Ile Ile Pro  Leu Lys Ala
    1460                1465                1470

Thr Ser  Thr Pro Val Ser Ile  Lys Gln Tyr Pro Met  Ser Gln Glu
    1475                1480                1485

Ala Arg  Leu Gly Ile Lys Pro  His Ile Gln Arg Leu  Leu Asp Gln
    1490                1495                1500

Gly Ile  Leu Val Pro Cys Gln  Ser Pro Trp Asn Thr  Pro Leu Leu
    1505                1510                1515

Pro Val  Lys Lys Pro Gly Thr  Asn Asp Tyr Arg Pro  Val Gln Asp
    1520                1525                1530

Leu Arg  Glu Val Asn Lys Arg  Val Glu Asp Ile His  Pro Thr Val
    1535                1540                1545

Pro Asn  Pro Tyr Asn Leu Leu  Ser Gly Leu Pro Pro  Ser His Gln
    1550                1555                1560

Trp Tyr  Thr Val Leu Asp Leu  Lys Asp Ala Phe Phe  Cys Leu Arg
    1565                1570                1575

Leu His  Pro Thr Ser Gln Pro  Leu Phe Ala Phe Glu  Trp Arg Asp
    1580                1585                1590
```

```
Pro Glu  Met Gly Ile Ser Gly  Gln Leu Thr Trp Thr  Arg Leu Pro
    1595                 1600                 1605

Gln Gly  Phe Lys Asn Ser Pro  Thr Leu Phe Asn Glu  Ala Leu His
    1610                 1615                 1620

Arg Asp  Leu Ala Asp Phe Arg  Ile Gln His Pro Asp  Leu Ile Leu
    1625                 1630                 1635

Leu Gln  Tyr Val Asp Asp Leu  Leu Leu Ala Ala Thr  Ser Glu Leu
    1640                 1645                 1650

Asp Cys  Gln Gln Gly Thr Arg  Ala Leu Leu Gln Thr  Leu Gly Asn
    1655                 1660                 1665

Leu Gly  Tyr Arg Ala Ser Ala  Lys Lys Ala Gln Ile  Cys Gln Lys
    1670                 1675                 1680

Gln Val  Lys Tyr Leu Gly Tyr  Leu Leu Lys Glu Gly  Gln Arg Trp
    1685                 1690                 1695

Leu Thr  Glu Ala Arg Lys Glu  Thr Val Met Gly Gln  Pro Thr Pro
    1700                 1705                 1710

Lys Thr  Pro Arg Gln Leu Arg  Glu Phe Leu Gly Lys  Ala Gly Phe
    1715                 1720                 1725

Cys Arg  Leu Phe Ile Pro Gly  Phe Ala Glu Met Ala  Ala Pro Leu
    1730                 1735                 1740

Tyr Pro  Leu Thr Lys Pro Gly  Thr Leu Phe Asn Trp  Gly Pro Asp
    1745                 1750                 1755

Gln Gln  Lys Ala Tyr Gln Glu  Ile Lys Gln Ala Leu  Leu Thr Ala
    1760                 1765                 1770

Pro Ala  Leu Gly Leu Pro Asp  Leu Thr Lys Pro Phe  Glu Leu Phe
    1775                 1780                 1785

Val Asp  Glu Lys Gln Gly Tyr  Ala Lys Gly Val Leu  Thr Gln Lys
```

```
    1790                1795                1800

Leu Gly  Pro Trp Arg Arg Pro  Val Ala Tyr Leu Ser  Lys Lys Leu
    1805                1810                1815

Asp Pro  Val Ala Ala Gly Trp  Pro Pro Cys Leu Arg  Met Val Ala
    1820                1825                1830

Ala Ile  Ala Val Leu Thr Lys  Asp Ala Gly Lys Leu  Thr Met Gly
    1835                1840                1845

Gln Pro  Leu Val Ile Leu Ala  Pro His Ala Val Glu  Ala Leu Val
    1850                1855                1860

Lys Gln  Pro Pro Asp Arg Trp  Leu Ser Asn Ala Arg  Met Thr His
    1865                1870                1875

Tyr Gln  Ala Leu Leu Leu Asp  Thr Asp Arg Val Gln  Phe Gly Pro
    1880                1885                1890

Val Val  Ala Leu Asn Pro Ala  Thr Leu Leu Pro Leu  Pro Glu Glu
    1895                1900                1905

Gly Leu  Gln His Asn Cys Leu  Asp Ile Leu Ala Glu  Ala His Gly
    1910                1915                1920

Thr Arg  Pro Asp Leu Thr Asp  Gln Pro Leu Pro Asp  Ala Asp His
    1925                1930                1935

Thr Trp  Tyr Thr Asp Gly Ser  Ser Leu Leu Gln Glu  Gly Gln Arg
    1940                1945                1950

Lys Ala  Gly Ala Ala Val Thr  Thr Glu Thr Glu Val  Ile Trp Ala
    1955                1960                1965

Lys Ala  Leu Pro Ala Gly Thr  Ser Ala Gln Arg Ala  Glu Leu Ile
    1970                1975                1980

Ala Leu  Thr Gln Ala Leu Lys  Met Ala Glu Gly Lys  Lys Leu Asn
    1985                1990                1995
```

Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His Ile His
2000 2005 2010

Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly Lys
2015 2020 2025

Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
2030 2035 2040

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln
2045 2050 2055

Lys Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln
2060 2065 2070

Ala Ala Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr
2075 2080 2085

Leu Leu Ile Glu Asn Ser Ser Pro Ser Gly Gly Ser Lys Arg Thr
2090 2095 2100

Ala Asp Gly Ser Glu Phe Glu Pro Lys Lys Lys Arg Lys Val
2105 2110 2115

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<220>
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<210> 664
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<212> DNA
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<220>
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<400> 664
ggcccagact gagcacgtga 20

<210> 665
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<212> DNA
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ggcccagact gagcacgtga 20

<210> 666
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
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<400> 666
ggcccagact gagcacgtga 20

<210> 667
<211> 20
<212> DNA
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<220>
<223> Synthetic

<400> 667
ggcactgcgg ctggaggtgg 20

<210> 668
<211> 20
<212> DNA
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<220>
<223> Synthetic

<400> 668
ggcactgcgg ctggaggtgg 20

<210> 669
<211> 20
<212> DNA
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<220>
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<400> 669
ggcactgcgg ctggaggtgg 20

<210> 670
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<212> DNA
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<220>
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<400> 670
ggcactgcgg ctggaggtgg 20

<210> 671
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<212> DNA
<213> Artificial Sequence

<220>
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<400> 671
gagtccgagc agaagaagaa 20

<210> 672
<211> 20
<212> DNA
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<220>
<223> Synthetic

<400> 672
gagtccgagc agaagaagaa 20

<210> 673
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
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<400> 673
gagtccgagc agaagaagaa 20

<210> 674
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<212> DNA
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<220>
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<400> 674
gagtccgagc agaagaagaa 20

<210> 675
<211> 20
<212> DNA
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<220>
<223> Synthetic

<400> 675
ggaatccctt ctgcagcacc 20

<210> 676
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<212> DNA
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<220>
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<400> 676
ggaatccctt ctgcagcacc 20

<210> 677
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 677
ggaatccctt ctgcagcacc 20

<210> 678
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<400> 678
tctgccatct cgtgctcagt ctg 23

<210> 679
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<212> DNA
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<220>
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<400> 679
tctgccatca aagcgtgctc agtctg 26

<210> 680
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<212> DNA
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<220>
<223> Synthetic

<400> 680
tctgccatcc gtgctcagtc tg 22

<210> 681
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<212> DNA
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<220>
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<400> 681
tctgcgatca cgtgctcagt ctg 23

<210> 682
<211> 19
<212> DNA

<213> Artificial Sequence

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<400> 682
ttaacgccca cctccagcc 19

<210> 683
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<220>
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<400> 683
ttaacccccc cctccagcc 19

<210> 684
<211> 22
<212> DNA
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<220>
<223> Synthetic

<400> 684
ttaacccctt acacctccag cc 22

<210> 685
<211> 18
<212> DNA
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<220>
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<400> 685
ttaacccccc ctccagcc 18

<210> 686
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<212> DNA
<213> Artificial Sequence

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<223> Synthetic

<400> 686
gtgatgggag cacttcttct tctgctcgga 30

<210> 687
<211> 30
<212> DNA
<213> Artificial Sequence

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<223> Synthetic

<400> 687
gtgatgggag ccctgcttct tctgctcgga 30

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<213> Artificial Sequence

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<223> Synthetic

<400> 688
gtgatgggag cccttcgcat tcttctgctc gga 33

<210> 689
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 689
gtgatgggag ttcttcttct gctcgga 27

<210> 690
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 690
ggaaaagcga tgcaggtgct gcagaaggga t 31

<210> 691

<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 691
ggaaaagcga tccaggcgct gcagaaggga t 31

<210> 692
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<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 692
ggaaaagcga tccaatcggt gctgcagaag ggat 34

<210> 693

<400> 693
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<210> 694

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<210> 700
<211> 677
<212> PRT
<213> Unknown

<220>
<223> MURINE LEUKEMIA VIRUS

<400> 700

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1   5   10   15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20   25   30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35   40   45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50   55   60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65   70   75   80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85   90   95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100   105   110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115   120   125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130   135   140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145   150   155   160

```
His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365
```

```
Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575
```

```
Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675
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<210> 701
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 701

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Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60
```

```
Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270
```

```
Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
```

485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

<210> 702
<211> 677

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 702

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe

```
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400
```

```
Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
               405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
               485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
               565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605
```

```
Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675
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<210> 703
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 703

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Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
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Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Lys Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95
```

```
Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300
```

```
Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510
```

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

<210> 704
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 704

```
Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205
```

```
Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Arg Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
```

420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625 630 635 640

```
Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655


Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670


Glu Asn Ser Ser Pro
        675


<210>  705
<211>  677
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  705

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15


Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30


Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45


Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60


Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80


Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95


Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110


Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
```

```
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335
```

```
Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540
```

```
Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560


Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575


Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590


Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Lys Gly
        595                 600                 605


Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620


Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640


Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655


Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670


Glu Asn Ser Ser Pro
        675


<210>  706
<211>  677
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  706

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15


Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30
```

```
Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Pro Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240
```

```
Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445
```

```
Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
```

660 665 670

Glu Asn Ser Ser Pro
675

<210> 707
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 707

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

```
Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
```

```
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Gly Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575
```

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580   585   590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595   600   605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610   615   620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625   630   635   640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645   650   655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660   665   670

Glu Asn Ser Ser Pro
        675

<210> 708
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 708

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1   5   10   15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20   25   30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35   40   45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr

```
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270
```

```
Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Lys Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480
```

```
Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675
```

<210> 709
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 709

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

```
Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Lys Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380
```

```
Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
```

595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

<210> 710
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 710

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

```
Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
```

```
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Phe Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510
```

```
Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675
```

<210> 711
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 711

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
195 200 205

```
Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415
```

```
Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Gln Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asn Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620
```

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

<210> 712
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 712

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

```
Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Arg Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Phe Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320
```

```
Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
```

```
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675


<210>  713
<211>  677
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  713

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15
```

```
Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Pro Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
```

225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

```
Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Lys Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655
```

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

<210> 714
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 714

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Leu Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Lys Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

```
Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Ala Leu Phe Asp Glu Ala Leu Arg Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Lys Phe Leu
    290                 295                 300

Gly Thr Ala Gly Asn Cys Arg Leu Phe Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350
```

```
Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Gly Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Lys Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560
```

```
Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575


Lys Leu Asn Val Tyr Thr Asn Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590


Ile Gln Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605


Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620


Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640


Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asn Gln Ala Ala
                645                 650                 655


Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670


Glu Asn Ser Ser Pro
        675


<210>  715
<211>  677
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  715

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15


Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30


Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45
```

```
Ile Ile Leu Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Lys Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Ala Leu Phe Asn Glu Ala Leu Arg Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255
```

```
Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Lys Phe Leu
    290                 295                 300

Gly Thr Ala Gly Asn Cys Arg Leu Phe Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Gly Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Lys Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
```

```
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
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Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
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Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
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Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
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Lys Leu Asn Val Tyr Thr Asn Ser Arg Tyr Ala Phe Ala Thr Ala His
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Ile Gln Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
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Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asn Gln Ala Ala
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Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
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Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
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Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
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Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
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Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
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Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
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His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu

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Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
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Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
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Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
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Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
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Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
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Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
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Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
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Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
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Gly Lys Ala Gly Phe Cys Arg Leu Phe Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
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Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
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Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
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Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
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Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
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Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
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Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
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Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
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Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
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Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
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Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
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Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
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Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
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Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
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Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
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Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
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Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
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Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
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Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
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aaactcattt gcaccactgc tgtgccttgg aatgctagtt ggagtaataa atctctggaa 8160

cagatttgga atcacacgac ctggatggag tgggacagag aaattaacaa ttacacaagc 8220

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<210> 739
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 739

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1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

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His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
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    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590
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Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

<210> 740
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 740

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg

65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

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Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495
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Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675
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<210> 741
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 741

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1   5   10   15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20   25   30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35   40   45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50   55   60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65   70   75   80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85   90   95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100   105   110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115   120   125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130   135   140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145   150   155   160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165   170   175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180   185   190

```
Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Lys Ala Gly Phe Cys Arg Leu Phe Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400
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Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
```

610 615 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro
675

<210> 742
<211> 677
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 742

Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

```
Pro Leu Leu Pro Val Lys Leu Pro Gly Thr Asn Asp Tyr Ser Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
```

```
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525
```

```
Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro
        675
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<210> 743
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 743
cgtatcggta actgatccga tggaaagcca gttcagaacc g 41

<210> 744
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 744
cgtatcggta actgatccga tggaatgcca ggtcagaacc g 41

<210> 745
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 745
cgtatcggta actgatccga tggaatgcca ggtcaaaacg g 41

<210> 746
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 746
cgtatcggta actgatccga tggaaagcca gttcagaacc g 41

<210> 747
<211> 38
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<220>
<223> Synthetic

<400> 747
cgtatcggta actgatccga tgggccagtt cagaaccg 38

<210> 748
<211> 35
<212> DNA
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<220>
<223> Synthetic

<400> 748
cgtatcggta actgatccga tggagttcag aaccg 35

<210> 749
<211> 23
<212> DNA
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<220>
<223> Synthetic

<400> 749
cgtatcgtat cgtatcgtat tgg 23

<210> 750
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 750
cgtatcgtat cgtatcgtat cgtattgg 28

<210> 751
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 751
cgtatcgtat cgtatcgtat cgtatcgtat tgg 33

<210> 752
<211> 26
<212> DNA
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<400> 752

cgtatcggta actgatccga tggaaa 26

<210> 753
<211> 53
<212> DNA
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<220>
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<400> 753
gcgtatcggt aactgatccg atttccatcg gggccaggag atcagttacc gat 53

<210> 754
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 754
cgtatcggta actgaatctc ctggccccga tggaaa 36

<210> 755
<211> 53
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 755
gcgtatcggt aactgatctc cgggccagga tttccatcgg atcagttacc gat 53

<210> 756
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
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<400> 756
cgtatcggta actgatccga tggaaatcct ggccccgatg gaaa 44

<210> 757
<211> 905

<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 757
tagttattaa tagtaatcaa ttacggggtc attagttcat agcccatata tggagttccg 60

cgttacataa cttacggtaa atggcccgcc tggctgaccg cccaacgacc cccgcccatt 120

gacgtcaata atgacgtatg ttcccatagt aacgccaata gggactttcc attgacgtca 180

atgggtggag tatttacggt aaactgccca cttggcagta catcaagtgt atcatatgcc 240

aagtacgccc cctattgacg tcaatgacgg taaatggccc gcctggcatt atgcccagta 300

catgacctta tgggactttc ctacttggca gtacatctac gtattagtca tcgctattac 360

catggtgatg cggttttggc agtacatcaa tgggcgtgga tagcggtttg actcacgggg 420

atttccaagt ctccacccca ttgacgtcaa tgggagtttg ttttggcacc aaaatcaacg 480

ggactttcca aaatgtcgta acaactccgc cccattgacg caaatgggcg gtaggcgtgt 540

acggtgggag gtctatataa gcagagctgg tttagtgaac cgtcagatcg ttcactgccg 600

tataggcagg gcccagactg agcacgtgag ttttagagct agaaatagca agttaaaata 660

aggctagtcc gttatcaact tgaaaaagtg ggaccgagtc ggtcctctgc catcaaagcg 720

tgctcagtct gttttagggt catgaaggtt tttcttttcc tgagaaaaca acacgtattg 780

ttttctcagg ttttgctttt tggccttttt ctagcttaaa aaaaaaaaaa gcaaaagatg 840

ctggtggttg gcactcctgg tttccaggac ggggttcaaa tccctgcggc gtctttgctt 900

tgact 905

<210> 758
<211> 942
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 758
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cgttacataa cttacggtaa atggcccgcc tggctgaccg cccaacgacc cccgcccatt 120

gacgtcaata atgacgtatg ttcccatagt aacgccaata gggactttcc attgacgtca 180

atgggtggag tatttacggt aaactgccca cttggcagta catcaagtgt atcatatgcc 240

aagtacgccc cctattgacg tcaatgacgg taaatggccc gcctggcatt atgcccagta 300

catgacctta tgggactttc ctacttggca gtacatctac gtattagtca tcgctattac 360

catggtgatg cggttttggc agtacatcaa tgggcgtgga tagcggtttg actcacgggg 420

atttccaagt ctccacccca ttgacgtcaa tgggagtttg ttttggcacc aaaatcaacg 480

ggactttcca aaatgtcgta acaactccgc cccattgacg caaatgggcg gtaggcgtgt 540

acggtgggag gtctatataa gcagagctgg tttagtgaac cgtcagatcg ttcactgccg 600

tataggcagg gcccagactg agcacgtgag ttttagagct agaaatagca agttaaaata 660

aggctagtcc gttatcaact tgaaaaagtg ggaccgagtc ggtcctctgc catcaaagcg 720

tgctcagtct gttttgtttt ggctgggttt ttccttgttc gcaccggaca cctccagtga 780

ccagacggca aggtttttat cccagtgtat attggaaaaa catgttatac ttttgacaat 840

ttaacgtgcc tagagctcaa attaaactaa taccataacg taatgcaact tacaacataa 900

ataaaggtca atgtttaatc cataaaaaaa aaaaaaaaaa aa 942

<210> 759
<211> 1370
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 759
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cgttacataa cttacggtaa atggcccgcc tggctgaccg cccaacgacc cccgcccatt 120

gacgtcaata atgacgtatg ttcccatagt aacgccaata gggactttcc attgacgtca 180

atgggtggag tatttacggt aaactgccca cttggcagta catcaagtgt atcatatgcc 240

aagtacgccc cctattgacg tcaatgacgg taaatggccc gcctggcatt atgcccagta 300

catgacctta tgggactttc ctacttggca gtacatctac gtattagtca tcgctattac 360

catggtgatg cggttttggc agtacatcaa tgggcgtgga tagcggtttg actcacgggg 420

atttccaagt ctccacccca ttgacgtcaa tgggagtttg ttttggcacc aaaatcaacg 480

ggactttcca aaatgtcgta acaactccgc cccattgacg caaatgggcg gtaggcgtgt 540

acggtgggag gtctatataa gcagagctgg tttagtgaac cgtcagatcg ttcactgccg 600

tataggcagg gcccagactg agcacgtgag ttttagagct agaaatagca agttaaaata 660

aggctagtcc gttatcaact tgaaaaagtg ggaccgagtc ggtcctctgc catcaaagcg 720

tgctcagtct gttttgtttt ggctgggttt ttccttgttc gcaccggaca cctccagtga 780

ccagacggca aggtttttat cccagtgtat attggaaaaa catgttatac ttttgacaat 840

ttaacgtgcc tagagctcaa attaaactaa taccataacg taatgcaact tacaacataa 900

ataaaggtca atgtttaatc cataaaaaaa aaaaaaaaaa aaacacactg ttttggctgg 960

gtttttcctt gttcgcaccg gacacctcca gtgaccagac ggcaaggttt ttatcccagt 1020

gtatattgga aaaacatgtt atacttttga caatttaacg tgcctagagc tcaaattaaa 1080

ctaataccat aacgtaatgc aacttacaac ataaataaag gtcaatgttt aatccataaa 1140

aaaaaaaaaa aaaaaatctc tctgttttgg ctgggttttt ccttgttcgc accggacacc 1200

tccagtgacc agacggcaag gtttttatcc cagtgtatat tggaaaaaca tgttatactt 1260

ttgacaattt aacgtgccta gagctcaaat taaactaata ccataacgta atgcaactta 1320

caacataaat aaaggtcaat gtttaatcca taaaaaaaaa aaaaaaaaaa 1370

<210> 760
<211> 807
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 760
tagttattaa tagtaatcaa ttacggggtc attagttcat agcccatata tggagttccg 60

cgttacataa cttacggtaa atggcccgcc tggctgaccg cccaacgacc cccgcccatt 120

gacgtcaata atgacgtatg ttcccatagt aacgccaata gggactttcc attgacgtca 180

atgggtggag tatttacggt aaactgccca cttggcagta catcaagtgt atcatatgcc 240

aagtacgccc cctattgacg tcaatgacgg taaatggccc gcctggcatt atgcccagta 300

catgacctta tgggactttc ctacttggca gtacatctac gtattagtca tcgctattac 360

catggtgatg cggttttggc agtacatcaa tgggcgtgga tagcggtttg actcacgggg 420

atttccaagt ctccacccca ttgacgtcaa tgggagtttg ttttggcacc aaaatcaacg 480

ggactttcca aaatgtcgta acaactccgc cccattgacg caaatgggcg gtaggcgtgt 540

acggtgggag gtctatataa gcagagctgg tttagtgaac cgtcagatcg ttcactgccg 600

tataggcagg gcccagactg agcacgtgag ttttagagct agaaatagca agttaaaata 660

aggctagtcc gttatcaact tgaaaaagtg ggaccgagtc ggtcctctgc catcaaagcg 720

tgctcagtct gtttgtttca aaagtagact gtacgctaag ggtcatatct ttttttgttt 780

ggtttgtgtc ttggttggcg tcttaaa 807

<210> 761
<211> 743
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 761
ctaaggacca gcttctttgg gagagaacag acgcaggggc gggagggaaa aagggagagg 60

cagacgtcac ttccccttgg cggctctggc agcagattgg tcggttgagt ggcagaaagg 120

cagacgggga ctgggcaagg cactgtcggt gacatcacgg acagggcgac ttctatgtag 180

atgaggcagc gcagaggctg ctgcttcgcc acttgctgct tcaccacgaa ggagttcccg 240

tgccctggga gcgggttcag gaccgctgat cggaagtgag aatcccagct gtgtgtcagg 300

gctggaaagg gctcgggagt gcgcggggca agtgaccgtg tgtgtaaaga gtgaggcgta 360

tgaggctgtg tcggggcaga ggcccaagat ctcagttcac tgccgtatag gcagggccca 420

gactgagcac gtgagtttta gagctagaaa tagcaagtta aaataaggct agtccgttat 480

caacttgaaa aagtgggacc gagtcggtcc tctgccatca aagcgtgctc agtctgtttc 540

agcaagttca gagaaatctg aacttgctgg atttttggag cagggagatg gaataggagc 600

ttgctccgtc cactccacgc atcgacctgg tattgcagta cctccaggaa cggtgcaccc 660

actttctgga gtttcaaaag tagactgtac gctaagggtc atatcttttt ttgtttggtt 720

tgtgtcttgg ttggcgtctt aaa 743

<210> 762
<211> 98
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 762
gccaacatga ggatcaccca tgtctgcagg gcctggagga agcagggctt cctttcctct 60

gccatcaatg atggtgatga tggtgcgtgc tcagtctg 98

<210> 763
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 763
gccaacatga ggatcaccca tgtctgcagg gcc 33

<210> 764
<211> 131
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 764

Gly Ser Ala Ser Asn Phe Thr Gln Phe Val Leu Val Asp Asn Gly Gly
1 5 10 15

Thr Gly Asp Val Thr Val Ala Pro Ser Asn Phe Ala Asn Gly Val Ala
20 25 30

Glu Trp Ile Ser Ser Asn Ser Arg Ser Gln Ala Tyr Lys Val Thr Cys
35 40 45

Ser Val Arg Gln Ser Ser Ala Gln Asn Arg Lys Tyr Thr Ile Lys Val
50 55 60

Glu Val Pro Lys Val Ala Thr Gln Thr Val Gly Gly Glu Glu Leu Pro

65 70 75 80

Val Ala Gly Trp Arg Ser Tyr Leu Asn Met Glu Leu Thr Ile Pro Ile
85 90 95

Phe Ala Thr Asn Ser Asp Cys Glu Leu Ile Val Lys Ala Met Gln Gly
100 105 110

Leu Leu Lys Asp Gly Asn Pro Ile Pro Ser Ala Ile Ala Ala Asn Ser
115 120 125

Gly Ile Tyr
130

<210> 765
<211> 1943
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 765

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1 5 10 15

Arg Lys Val Asp Lys Lys Tyr Ser Ile Gly Leu Asp Ile Gly Thr Asn
20 25 30

Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys
35 40 45

Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser Ile Lys Lys Asn
50 55 60

Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr
65 70 75 80

Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg
85 90 95

```
Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met Ala Lys Val Asp
            100                 105                 110

Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu Val Glu Glu Asp
        115                 120                 125

Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile Val Asp Glu Val
    130                 135                 140

Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu Arg Lys Lys Leu
145                 150                 155                 160

Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu
                165                 170                 175

Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile Glu Gly Asp Leu
            180                 185                 190

Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile Gln Leu Val Gln
        195                 200                 205

Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn Ala Ser Gly Val
    210                 215                 220

Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu
225                 230                 235                 240

Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe
                245                 250                 255

Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser
            260                 265                 270

Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr
        275                 280                 285

Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr
    290                 295                 300

Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu
```

305 310 315 320

Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser
325 330 335

Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln Asp Leu Thr Leu
340 345 350

Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile
355 360 365

Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly
370 375 380

Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys
385 390 395 400

Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn Arg Glu Asp Leu
405 410 415

Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile Pro His Gln Ile
420 425 430

His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr
435 440 445

Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe
450 455 460

Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe
465 470 475 480

Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe
485 490 495

Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg
500 505 510

Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys Val Leu Pro Lys
515 520 525

```
His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys
    530                 535                 540

Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala Phe Leu Ser Gly
545                 550                 555                 560

Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys Thr Asn Arg Lys
                565                 570                 575

Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys
            580                 585                 590

Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg Phe Asn Ala Ser
        595                 600                 605

Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe
    610                 615                 620

Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp Ile Val Leu Thr
625                 630                 635                 640

Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu Arg Leu Lys Thr
                645                 650                 655

Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln Leu Lys Arg Arg
            660                 665                 670

Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile
        675                 680                 685

Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp
    690                 695                 700

Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His Asp Asp Ser Leu
705                 710                 715                 720

Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser Gly Gln Gly Asp
                725                 730                 735
```

```
Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys
            740                 745                 750

Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu Leu Val Lys Val
        755                 760                 765

Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu Met Ala Arg Glu
    770                 775                 780

Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg Glu Arg Met Lys
785                 790                 795                 800

Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln Ile Leu Lys Glu
                805                 810                 815

His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu Lys Leu Tyr Leu Tyr
            820                 825                 830

Tyr Leu Gln Asn Gly Arg Asp Met Tyr Val Asp Gln Glu Leu Asp Ile
        835                 840                 845

Asn Arg Leu Ser Asp Tyr Asp Val Asp Ala Ile Val Pro Gln Ser Phe
    850                 855                 860

Leu Lys Asp Asp Ser Ile Asp Asn Lys Val Leu Thr Arg Ser Asp Lys
865                 870                 875                 880

Asn Arg Gly Lys Ser Asp Asn Val Pro Ser Glu Glu Val Val Lys Lys
                885                 890                 895

Met Lys Asn Tyr Trp Arg Gln Leu Leu Asn Ala Lys Leu Ile Thr Gln
            900                 905                 910

Arg Lys Phe Asp Asn Leu Thr Lys Ala Glu Arg Gly Gly Leu Ser Glu
        915                 920                 925

Leu Asp Lys Ala Gly Phe Ile Lys Arg Gln Leu Val Glu Thr Arg Gln
    930                 935                 940
```

```
Ile Thr Lys His Val Ala Gln Ile Leu Asp Ser Arg Met Asn Thr Lys
945                 950                 955                 960


Tyr Asp Glu Asn Asp Lys Leu Ile Arg Glu Val Lys Val Ile Thr Leu
                965                 970                 975


Lys Ser Lys Leu Val Ser Asp Phe Arg Lys Asp Phe Gln Phe Tyr Lys
            980                 985                 990


Val Arg Glu Ile Asn Asn Tyr His  His Ala His Asp Ala  Tyr Leu Asn
        995                 1000                1005


Ala Val  Val Gly Thr Ala Leu  Ile Lys Lys Tyr Pro  Lys Leu Glu
    1010                1015                1020


Ser Glu  Phe Val Tyr Gly Asp  Tyr Lys Val Tyr Asp  Val Arg Lys
    1025                1030                1035


Met Ile  Ala Lys Ser Glu Gln  Glu Ile Gly Lys Ala  Thr Ala Lys
    1040                1045                1050


Tyr Phe  Phe Tyr Ser Asn Ile  Met Asn Phe Phe Lys  Thr Glu Ile
    1055                1060                1065


Thr Leu  Ala Asn Gly Glu Ile  Arg Lys Arg Pro Leu  Ile Glu Thr
    1070                1075                1080


Asn Gly  Glu Thr Gly Glu Ile  Val Trp Asp Lys Gly  Arg Asp Phe
    1085                1090                1095


Ala Thr  Val Arg Lys Val Leu  Ser Met Pro Gln Val  Asn Ile Val
    1100                1105                1110


Lys Lys  Thr Glu Val Gln Thr  Gly Gly Phe Ser Lys  Glu Ser Ile
    1115                1120                1125


Leu Pro  Lys Arg Asn Ser Asp  Lys Leu Ile Ala Arg  Lys Lys Asp
    1130                1135                1140


Trp Asp  Pro Lys Lys Tyr Gly  Gly Phe Asp Ser Pro  Thr Val Ala
```

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    1145                1150                1155

Tyr Ser  Val Leu Val Val Ala  Lys Val Glu Lys Gly  Lys Ser Lys
    1160                1165                1170

Lys Leu  Lys Ser Val Lys Glu  Leu Leu Gly Ile Thr  Ile Met Glu
    1175                1180                1185

Arg Ser  Ser Phe Glu Lys Asn  Pro Ile Asp Phe Leu  Glu Ala Lys
    1190                1195                1200

Gly Tyr  Lys Glu Val Lys Lys  Asp Leu Ile Ile Lys  Leu Pro Lys
    1205                1210                1215

Tyr Ser  Leu Phe Glu Leu Glu  Asn Gly Arg Lys Arg  Met Leu Ala
    1220                1225                1230

Ser Ala  Gly Glu Leu Gln Lys  Gly Asn Glu Leu Ala  Leu Pro Ser
    1235                1240                1245

Lys Tyr  Val Asn Phe Leu Tyr  Leu Ala Ser His Tyr  Glu Lys Leu
    1250                1255                1260

Lys Gly  Ser Pro Glu Asp Asn  Glu Gln Lys Gln Leu  Phe Val Glu
    1265                1270                1275

Gln His  Lys His Tyr Leu Asp  Glu Ile Ile Glu Gln  Ile Ser Glu
    1280                1285                1290

Phe Ser  Lys Arg Val Ile Leu  Ala Asp Ala Asn Leu  Asp Lys Val
    1295                1300                1305

Leu Ser  Ala Tyr Asn Lys His  Arg Asp Lys Pro Ile  Arg Glu Gln
    1310                1315                1320

Ala Glu  Asn Ile Ile His Leu  Phe Thr Leu Thr Asn  Leu Gly Ala
    1325                1330                1335

Pro Ala  Ala Phe Lys Tyr Phe  Asp Thr Thr Ile Asp  Arg Lys Arg
    1340                1345                1350
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Tyr Thr  Ser Thr Lys Glu Val  Leu Asp Ala Thr Leu  Ile His Gln
    1355                1360                1365

Ser Ile  Thr Gly Leu Tyr Glu  Thr Arg Ile Asp Leu  Ser Gln Leu
    1370                1375                1380

Gly Gly  Asp Ser Gly Gly Ser  Ser Gly Gly Ser Ser  Gly Ser Glu
    1385                1390                1395

Thr Pro  Gly Thr Ser Glu Ser  Ala Thr Pro Glu Ser  Ser Gly Gly
    1400                1405                1410

Ser Ser  Gly Gly Ser Ser Thr  Leu Asn Ile Glu Asp  Glu Tyr Arg
    1415                1420                1425

Leu His  Glu Thr Ser Lys Glu  Pro Asp Val Ser Leu  Gly Ser Thr
    1430                1435                1440

Trp Leu  Ser Asp Phe Pro Gln  Ala Trp Ala Glu Thr  Gly Gly Met
    1445                1450                1455

Gly Leu  Ala Val Arg Gln Ala  Pro Leu Ile Ile Pro  Leu Lys Ala
    1460                1465                1470

Thr Ser  Thr Pro Val Ser Ile  Lys Gln Tyr Pro Met  Ser Gln Glu
    1475                1480                1485

Ala Arg  Leu Gly Ile Lys Pro  His Ile Gln Arg Leu  Leu Asp Gln
    1490                1495                1500

Gly Ile  Leu Val Pro Cys Gln  Ser Pro Trp Asn Thr  Pro Leu Leu
    1505                1510                1515

Pro Val  Lys Lys Pro Gly Thr  Asn Asp Tyr Arg Pro  Val Gln Asp
    1520                1525                1530

Leu Arg  Glu Val Asn Lys Arg  Val Glu Asp Ile His  Pro Thr Val
    1535                1540                1545
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Pro Asn  Pro Tyr Asn Leu Leu  Ser Gly Leu Pro Pro  Ser His Gln
    1550                1555                1560

Trp Tyr  Thr Val Leu Asp Leu  Lys Asp Ala Phe Phe  Cys Leu Arg
    1565                1570                1575

Leu His  Pro Thr Ser Gln Pro  Leu Phe Ala Phe Glu  Trp Arg Asp
    1580                1585                1590

Pro Glu  Met Gly Ile Ser Gly  Gln Leu Thr Trp Thr  Arg Leu Pro
    1595                1600                1605

Gln Gly  Phe Lys Asn Ser Pro  Thr Leu Phe Asn Glu  Ala Leu His
    1610                1615                1620

Arg Asp  Leu Ala Asp Phe Arg  Ile Gln His Pro Asp  Leu Ile Leu
    1625                1630                1635

Leu Gln  Tyr Val Asp Asp Leu  Leu Leu Ala Ala Thr  Ser Glu Leu
    1640                1645                1650

Asp Cys  Gln Gln Gly Thr Arg  Ala Leu Leu Gln Thr  Leu Gly Asn
    1655                1660                1665

Leu Gly  Tyr Arg Ala Ser Ala  Lys Lys Ala Gln Ile  Cys Gln Lys
    1670                1675                1680

Gln Val  Lys Tyr Leu Gly Tyr  Leu Leu Lys Glu Gly  Gln Arg Trp
    1685                1690                1695

Leu Thr  Glu Ala Arg Lys Glu  Thr Val Met Gly Gln  Pro Thr Pro
    1700                1705                1710

Lys Thr  Pro Arg Gln Leu Arg  Glu Phe Leu Gly Lys  Ala Gly Phe
    1715                1720                1725

Cys Arg  Leu Phe Ile Pro Gly  Phe Ala Glu Met Ala  Ala Pro Leu
    1730                1735                1740
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Tyr Pro  Leu Thr Lys Pro Gly  Thr Leu Phe Asn Trp  Gly Pro Asp
    1745                1750                1755

Gln Gln  Lys Ala Tyr Gln Glu  Ile Lys Gln Ala Leu  Leu Thr Ala
    1760                1765                1770

Pro Ala  Leu Gly Leu Pro Asp  Leu Thr Lys Pro Phe  Glu Leu Phe
    1775                1780                1785

Val Asp  Glu Lys Gln Gly Tyr  Ala Lys Gly Val Leu  Thr Gln Lys
    1790                1795                1800

Leu Gly  Pro Trp Arg Arg Pro  Val Ala Tyr Leu Ser  Lys Lys Leu
    1805                1810                1815

Asp Pro  Val Ala Ala Gly Trp  Pro Pro Cys Leu Arg  Met Val Ala
    1820                1825                1830

Ala Ile  Ala Val Leu Thr Lys  Asp Ala Gly Lys Leu  Thr Met Gly
    1835                1840                1845

Gln Pro  Leu Val Ile Leu Ala  Pro His Ala Val Glu  Ala Leu Val
    1850                1855                1860

Lys Gln  Pro Pro Asp Arg Trp  Leu Ser Asn Ala Arg  Met Thr His
    1865                1870                1875

Tyr Gln  Ala Leu Leu Leu Asp  Thr Asp Arg Val Gln  Phe Gly Pro
    1880                1885                1890

Val Val  Ala Leu Asn Pro Ala  Thr Leu Leu Pro Leu  Pro Glu Glu
    1895                1900                1905

Gly Leu  Gln His Asn Cys Leu  Asp Asn Ser Arg Leu  Ile Asn Ser
    1910                1915                1920

Gly Gly  Ser Lys Arg Thr Ala  Asp Gly Ser Glu Phe  Glu Pro Lys
    1925                1930                1935

Lys Lys  Arg Lys Val
```

1940

<210> 766
<211> 503
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 766

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Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15


Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30


Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45


Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60


Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80


Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95


Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110


Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125


Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140


Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160
```

```
His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Lys Ala Gly Phe Cys Arg Leu Phe Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
```

```
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Asn Ser Arg Leu Ile Asn
            500


<210>  767
<211>  3
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  767

Gly Gly Ser
1


<210>  768
<211>  6
<212>  PRT
<213>  Artificial Sequence
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<220>
<223> Synthetic

<400> 768

Gly Gly Ser Gly Gly Ser
1   5

<210> 769
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 769

Gly Gly Ser Gly Gly Ser Gly Gly Ser
1   5

<210> 770

<400> 770
000

<210> 771

<400> 771
000

<210> 772

<400> 772
000

<210> 773
<211> 102
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 773
gccaacatga ggatcaccca tgtctgcagg gcctggagga agcagggctt cctttcctct   60

gccatcaatg atggtgatga tggtgcgtgc tcagtctggg cc   102

<210> 774
<211> 112
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 774
ggaggaagca gggcttcctt tcctctgcca tcaatgatgg tgatgatggt gcgtgctcag 60

tctgaaatta acaaatcaag ccaacatgag gatcacccat gtctgcaggg cc 112

<210> 775
<211> 116
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 775
ggaggaagca gggcttcctt tcctctgcca tcaatgatgg tgatgatggt gcgtgctcag 60

tctgggccaa attaacaaat caagccaaca tgaggatcac ccatgtctgc agggcc 116

<210> 776
<211> 148
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 776
ggcccagact gagcacgtga gttttagagc taggccaaca tgaggatcac ccatgtctgc 60

agggcctagc aagttaaaat aaggctagtc cgttatcaac ttgaaaaagt gggaccgagt 120

cggtcctctg ccatctcgtg ctcagtct 148

<210> 777
<211> 148
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 777

ggcccagact gagcacgtga gttttagagc tagaaatagc aagttaaaat aaggctagtc 60

cgttatcaac ttggccaaca tgaggatcac ccatgtctgc agggccaagt gggaccgagt 120

cggtcctctg ccatctcgtg ctcagtct 148

<210> 778
<211> 2281
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 778

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1 5 10 15

Arg Lys Val Gly Ser Ala Ser Asn Phe Thr Gln Phe Val Leu Val Asp
20 25 30

Asn Gly Gly Thr Gly Asp Val Thr Val Ala Pro Ser Asn Phe Ala Asn
35 40 45

Gly Val Ala Glu Trp Ile Ser Ser Asn Ser Arg Ser Gln Ala Tyr Lys
50 55 60

Val Thr Cys Ser Val Arg Gln Ser Ser Ala Gln Asn Arg Lys Tyr Thr
65 70 75 80

Ile Lys Val Glu Val Pro Lys Val Ala Thr Gln Thr Val Gly Gly Glu
85 90 95

Glu Leu Pro Val Ala Gly Trp Arg Ser Tyr Leu Asn Met Glu Leu Thr
100 105 110

Ile Pro Ile Phe Ala Thr Asn Ser Asp Cys Glu Leu Ile Val Lys Ala
115 120 125

Met Gln Gly Leu Leu Lys Asp Gly Asn Pro Ile Pro Ser Ala Ile Ala
130 135 140

```
Ala Asn Ser Gly Ile Tyr Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly
145                 150                 155                 160


Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Ser Gly
                165                 170                 175


Gly Ser Ser Gly Gly Ser Ser Asp Lys Lys Tyr Ser Ile Gly Leu Asp
            180                 185                 190


Ile Gly Thr Asn Ser Val Gly Trp Ala Val Ile Thr Asp Glu Tyr Lys
        195                 200                 205


Val Pro Ser Lys Lys Phe Lys Val Leu Gly Asn Thr Asp Arg His Ser
    210                 215                 220


Ile Lys Lys Asn Leu Ile Gly Ala Leu Leu Phe Asp Ser Gly Glu Thr
225                 230                 235                 240


Ala Glu Ala Thr Arg Leu Lys Arg Thr Ala Arg Arg Arg Tyr Thr Arg
                245                 250                 255


Arg Lys Asn Arg Ile Cys Tyr Leu Gln Glu Ile Phe Ser Asn Glu Met
            260                 265                 270


Ala Lys Val Asp Asp Ser Phe Phe His Arg Leu Glu Glu Ser Phe Leu
        275                 280                 285


Val Glu Glu Asp Lys Lys His Glu Arg His Pro Ile Phe Gly Asn Ile
    290                 295                 300


Val Asp Glu Val Ala Tyr His Glu Lys Tyr Pro Thr Ile Tyr His Leu
305                 310                 315                 320


Arg Lys Lys Leu Val Asp Ser Thr Asp Lys Ala Asp Leu Arg Leu Ile
                325                 330                 335


Tyr Leu Ala Leu Ala His Met Ile Lys Phe Arg Gly His Phe Leu Ile
            340                 345                 350


Glu Gly Asp Leu Asn Pro Asp Asn Ser Asp Val Asp Lys Leu Phe Ile
```

```
        355                 360                 365

Gln Leu Val Gln Thr Tyr Asn Gln Leu Phe Glu Glu Asn Pro Ile Asn
    370                 375                 380

Ala Ser Gly Val Asp Ala Lys Ala Ile Leu Ser Ala Arg Leu Ser Lys
385                 390                 395                 400

Ser Arg Arg Leu Glu Asn Leu Ile Ala Gln Leu Pro Gly Glu Lys Lys
                405                 410                 415

Asn Gly Leu Phe Gly Asn Leu Ile Ala Leu Ser Leu Gly Leu Thr Pro
            420                 425                 430

Asn Phe Lys Ser Asn Phe Asp Leu Ala Glu Asp Ala Lys Leu Gln Leu
        435                 440                 445

Ser Lys Asp Thr Tyr Asp Asp Asp Leu Asp Asn Leu Leu Ala Gln Ile
    450                 455                 460

Gly Asp Gln Tyr Ala Asp Leu Phe Leu Ala Ala Lys Asn Leu Ser Asp
465                 470                 475                 480

Ala Ile Leu Leu Ser Asp Ile Leu Arg Val Asn Thr Glu Ile Thr Lys
                485                 490                 495

Ala Pro Leu Ser Ala Ser Met Ile Lys Arg Tyr Asp Glu His His Gln
            500                 505                 510

Asp Leu Thr Leu Leu Lys Ala Leu Val Arg Gln Gln Leu Pro Glu Lys
        515                 520                 525

Tyr Lys Glu Ile Phe Phe Asp Gln Ser Lys Asn Gly Tyr Ala Gly Tyr
    530                 535                 540

Ile Asp Gly Gly Ala Ser Gln Glu Glu Phe Tyr Lys Phe Ile Lys Pro
545                 550                 555                 560

Ile Leu Glu Lys Met Asp Gly Thr Glu Glu Leu Leu Val Lys Leu Asn
                565                 570                 575
```

```
Arg Glu Asp Leu Leu Arg Lys Gln Arg Thr Phe Asp Asn Gly Ser Ile
            580                 585                 590

Pro His Gln Ile His Leu Gly Glu Leu His Ala Ile Leu Arg Arg Gln
        595                 600                 605

Glu Asp Phe Tyr Pro Phe Leu Lys Asp Asn Arg Glu Lys Ile Glu Lys
    610                 615                 620

Ile Leu Thr Phe Arg Ile Pro Tyr Tyr Val Gly Pro Leu Ala Arg Gly
625                 630                 635                 640

Asn Ser Arg Phe Ala Trp Met Thr Arg Lys Ser Glu Glu Thr Ile Thr
                645                 650                 655

Pro Trp Asn Phe Glu Glu Val Val Asp Lys Gly Ala Ser Ala Gln Ser
            660                 665                 670

Phe Ile Glu Arg Met Thr Asn Phe Asp Lys Asn Leu Pro Asn Glu Lys
        675                 680                 685

Val Leu Pro Lys His Ser Leu Leu Tyr Glu Tyr Phe Thr Val Tyr Asn
    690                 695                 700

Glu Leu Thr Lys Val Lys Tyr Val Thr Glu Gly Met Arg Lys Pro Ala
705                 710                 715                 720

Phe Leu Ser Gly Glu Gln Lys Lys Ala Ile Val Asp Leu Leu Phe Lys
                725                 730                 735

Thr Asn Arg Lys Val Thr Val Lys Gln Leu Lys Glu Asp Tyr Phe Lys
            740                 745                 750

Lys Ile Glu Cys Phe Asp Ser Val Glu Ile Ser Gly Val Glu Asp Arg
        755                 760                 765

Phe Asn Ala Ser Leu Gly Thr Tyr His Asp Leu Leu Lys Ile Ile Lys
    770                 775                 780
```

```
Asp Lys Asp Phe Leu Asp Asn Glu Glu Asn Glu Asp Ile Leu Glu Asp
785                 790                 795                 800

Ile Val Leu Thr Leu Thr Leu Phe Glu Asp Arg Glu Met Ile Glu Glu
                805                 810                 815

Arg Leu Lys Thr Tyr Ala His Leu Phe Asp Asp Lys Val Met Lys Gln
            820                 825                 830

Leu Lys Arg Arg Arg Tyr Thr Gly Trp Gly Arg Leu Ser Arg Lys Leu
        835                 840                 845

Ile Asn Gly Ile Arg Asp Lys Gln Ser Gly Lys Thr Ile Leu Asp Phe
    850                 855                 860

Leu Lys Ser Asp Gly Phe Ala Asn Arg Asn Phe Met Gln Leu Ile His
865                 870                 875                 880

Asp Asp Ser Leu Thr Phe Lys Glu Asp Ile Gln Lys Ala Gln Val Ser
                885                 890                 895

Gly Gln Gly Asp Ser Leu His Glu His Ile Ala Asn Leu Ala Gly Ser
            900                 905                 910

Pro Ala Ile Lys Lys Gly Ile Leu Gln Thr Val Lys Val Val Asp Glu
        915                 920                 925

Leu Val Lys Val Met Gly Arg His Lys Pro Glu Asn Ile Val Ile Glu
    930                 935                 940

Met Ala Arg Glu Asn Gln Thr Thr Gln Lys Gly Gln Lys Asn Ser Arg
945                 950                 955                 960

Glu Arg Met Lys Arg Ile Glu Glu Gly Ile Lys Glu Leu Gly Ser Gln
                965                 970                 975

Ile Leu Lys Glu His Pro Val Glu Asn Thr Gln Leu Gln Asn Glu Lys
            980                 985                 990
```

```
Leu Tyr Leu Tyr Tyr Leu Gln Asn  Gly Arg Asp Met Tyr  Val Asp Gln
        995                 1000                1005


Glu Leu  Asp Ile Asn Arg Leu  Ser Asp Tyr Asp Val  Asp Ala Ile
    1010                1015                1020


Val Pro  Gln Ser Phe Leu Lys  Asp Asp Ser Ile Asp  Asn Lys Val
    1025                1030                1035


Leu Thr  Arg Ser Asp Lys Asn  Arg Gly Lys Ser Asp  Asn Val Pro
    1040                1045                1050


Ser Glu  Glu Val Val Lys Lys  Met Lys Asn Tyr Trp  Arg Gln Leu
    1055                1060                1065


Leu Asn  Ala Lys Leu Ile Thr  Gln Arg Lys Phe Asp  Asn Leu Thr
    1070                1075                1080


Lys Ala  Glu Arg Gly Gly Leu  Ser Glu Leu Asp Lys  Ala Gly Phe
    1085                1090                1095


Ile Lys  Arg Gln Leu Val Glu  Thr Arg Gln Ile Thr  Lys His Val
    1100                1105                1110


Ala Gln  Ile Leu Asp Ser Arg  Met Asn Thr Lys Tyr  Asp Glu Asn
    1115                1120                1125


Asp Lys  Leu Ile Arg Glu Val  Lys Val Ile Thr Leu  Lys Ser Lys
    1130                1135                1140


Leu Val  Ser Asp Phe Arg Lys  Asp Phe Gln Phe Tyr  Lys Val Arg
    1145                1150                1155


Glu Ile  Asn Asn Tyr His His  Ala His Asp Ala Tyr  Leu Asn Ala
    1160                1165                1170


Val Val  Gly Thr Ala Leu Ile  Lys Lys Tyr Pro Lys  Leu Glu Ser
    1175                1180                1185


Glu Phe  Val Tyr Gly Asp Tyr  Lys Val Tyr Asp Val  Arg Lys Met
```

```
    1190                1195                1200

Ile Ala  Lys Ser Glu Gln Glu  Ile Gly Lys Ala Thr  Ala Lys Tyr
    1205                1210                1215

Phe Phe  Tyr Ser Asn Ile Met  Asn Phe Phe Lys Thr  Glu Ile Thr
    1220                1225                1230

Leu Ala  Asn Gly Glu Ile Arg  Lys Arg Pro Leu Ile  Glu Thr Asn
    1235                1240                1245

Gly Glu  Thr Gly Glu Ile Val  Trp Asp Lys Gly Arg  Asp Phe Ala
    1250                1255                1260

Thr Val  Arg Lys Val Leu Ser  Met Pro Gln Val Asn  Ile Val Lys
    1265                1270                1275

Lys Thr  Glu Val Gln Thr Gly  Gly Phe Ser Lys Glu  Ser Ile Leu
    1280                1285                1290

Pro Lys  Arg Asn Ser Asp Lys  Leu Ile Ala Arg Lys  Lys Asp Trp
    1295                1300                1305

Asp Pro  Lys Lys Tyr Gly Gly  Phe Asp Ser Pro Thr  Val Ala Tyr
    1310                1315                1320

Ser Val  Leu Val Val Ala Lys  Val Glu Lys Gly Lys  Ser Lys Lys
    1325                1330                1335

Leu Lys  Ser Val Lys Glu Leu  Leu Gly Ile Thr Ile  Met Glu Arg
    1340                1345                1350

Ser Ser  Phe Glu Lys Asn Pro  Ile Asp Phe Leu Glu  Ala Lys Gly
    1355                1360                1365

Tyr Lys  Glu Val Lys Lys Asp  Leu Ile Ile Lys Leu  Pro Lys Tyr
    1370                1375                1380

Ser Leu  Phe Glu Leu Glu Asn  Gly Arg Lys Arg Met  Leu Ala Ser
    1385                1390                1395
```

```
Ala Gly  Glu Leu Gln Lys Gly  Asn Glu Leu Ala Leu  Pro Ser Lys
    1400                1405                1410

Tyr Val  Asn Phe Leu Tyr Leu  Ala Ser His Tyr Glu  Lys Leu Lys
    1415                1420                1425

Gly Ser  Pro Glu Asp Asn Glu  Gln Lys Gln Leu Phe  Val Glu Gln
    1430                1435                1440

His Lys  His Tyr Leu Asp Glu  Ile Ile Glu Gln Ile  Ser Glu Phe
    1445                1450                1455

Ser Lys  Arg Val Ile Leu Ala  Asp Ala Asn Leu Asp  Lys Val Leu
    1460                1465                1470

Ser Ala  Tyr Asn Lys His Arg  Asp Lys Pro Ile Arg  Glu Gln Ala
    1475                1480                1485

Glu Asn  Ile Ile His Leu Phe  Thr Leu Thr Asn Leu  Gly Ala Pro
    1490                1495                1500

Ala Ala  Phe Lys Tyr Phe Asp  Thr Thr Ile Asp Arg  Lys Arg Tyr
    1505                1510                1515

Thr Ser  Thr Lys Glu Val Leu  Asp Ala Thr Leu Ile  His Gln Ser
    1520                1525                1530

Ile Thr  Gly Leu Tyr Glu Thr  Arg Ile Asp Leu Ser  Gln Leu Gly
    1535                1540                1545

Gly Asp  Ser Gly Gly Ser Ser  Gly Gly Ser Ser Gly  Ser Glu Thr
    1550                1555                1560

Pro Gly  Thr Ser Glu Ser Ala  Thr Pro Glu Ser Ser  Gly Gly Ser
    1565                1570                1575

Ser Gly  Gly Ser Ser Thr Leu  Asn Ile Glu Asp Glu  Tyr Arg Leu
    1580                1585                1590
```

```
His Glu  Thr Ser Lys Glu Pro  Asp Val Ser Leu Gly  Ser Thr Trp
    1595                1600                1605

Leu Ser  Asp Phe Pro Gln Ala  Trp Ala Glu Thr Gly  Gly Met Gly
    1610                1615                1620

Leu Ala  Val Arg Gln Ala Pro  Leu Ile Ile Pro Leu  Lys Ala Thr
    1625                1630                1635

Ser Thr  Pro Val Ser Ile Lys  Gln Tyr Pro Met Ser  Gln Glu Ala
    1640                1645                1650

Arg Leu  Gly Ile Lys Pro His  Ile Gln Arg Leu Leu  Asp Gln Gly
    1655                1660                1665

Ile Leu  Val Pro Cys Gln Ser  Pro Trp Asn Thr Pro  Leu Leu Pro
    1670                1675                1680

Val Lys  Lys Pro Gly Thr Asn  Asp Tyr Arg Pro Val  Gln Asp Leu
    1685                1690                1695

Arg Glu  Val Asn Lys Arg Val  Glu Asp Ile His Pro  Thr Val Pro
    1700                1705                1710

Asn Pro  Tyr Asn Leu Leu Ser  Gly Leu Pro Pro Ser  His Gln Trp
    1715                1720                1725

Tyr Thr  Val Leu Asp Leu Lys  Asp Ala Phe Phe Cys  Leu Arg Leu
    1730                1735                1740

His Pro  Thr Ser Gln Pro Leu  Phe Ala Phe Glu Trp  Arg Asp Pro
    1745                1750                1755

Glu Met  Gly Ile Ser Gly Gln  Leu Thr Trp Thr Arg  Leu Pro Gln
    1760                1765                1770

Gly Phe  Lys Asn Ser Pro Thr  Leu Phe Asn Glu Ala  Leu His Arg
    1775                1780                1785
```

```
Asp Leu  Ala Asp Phe Arg Ile  Gln His Pro Asp Leu  Ile Leu Leu
    1790                1795                1800

Gln Tyr  Val Asp Asp Leu Leu  Leu Ala Ala Thr Ser  Glu Leu Asp
    1805                1810                1815

Cys Gln  Gln Gly Thr Arg Ala  Leu Leu Gln Thr Leu  Gly Asn Leu
    1820                1825                1830

Gly Tyr  Arg Ala Ser Ala Lys  Lys Ala Gln Ile Cys  Gln Lys Gln
    1835                1840                1845

Val Lys  Tyr Leu Gly Tyr Leu  Leu Lys Glu Gly Gln  Arg Trp Leu
    1850                1855                1860

Thr Glu  Ala Arg Lys Glu Thr  Val Met Gly Gln Pro  Thr Pro Lys
    1865                1870                1875

Thr Pro  Arg Gln Leu Arg Glu  Phe Leu Gly Lys Ala  Gly Phe Cys
    1880                1885                1890

Arg Leu  Phe Ile Pro Gly Phe  Ala Glu Met Ala Ala  Pro Leu Tyr
    1895                1900                1905

Pro Leu  Thr Lys Pro Gly Thr  Leu Phe Asn Trp Gly  Pro Asp Gln
    1910                1915                1920

Gln Lys  Ala Tyr Gln Glu Ile  Lys Gln Ala Leu Leu  Thr Ala Pro
    1925                1930                1935

Ala Leu  Gly Leu Pro Asp Leu  Thr Lys Pro Phe Glu  Leu Phe Val
    1940                1945                1950

Asp Glu  Lys Gln Gly Tyr Ala  Lys Gly Val Leu Thr  Gln Lys Leu
    1955                1960                1965

Gly Pro  Trp Arg Arg Pro Val  Ala Tyr Leu Ser Lys  Lys Leu Asp
    1970                1975                1980

Pro Val  Ala Ala Gly Trp Pro  Pro Cys Leu Arg Met  Val Ala Ala
```

```
    1985                1990                1995

Ile Ala  Val Leu Thr Lys Asp  Ala Gly Lys Leu Thr  Met Gly Gln
    2000                2005                2010

Pro Leu  Val Ile Leu Ala Pro  His Ala Val Glu Ala  Leu Val Lys
    2015                2020                2025

Gln Pro  Pro Asp Arg Trp Leu  Ser Asn Ala Arg Met  Thr His Tyr
    2030                2035                2040

Gln Ala  Leu Leu Leu Asp Thr  Asp Arg Val Gln Phe  Gly Pro Val
    2045                2050                2055

Val Ala  Leu Asn Pro Ala Thr  Leu Leu Pro Leu Pro  Glu Glu Gly
    2060                2065                2070

Leu Gln  His Asn Cys Leu Asp  Ile Leu Ala Glu Ala  His Gly Thr
    2075                2080                2085

Arg Pro  Asp Leu Thr Asp Gln  Pro Leu Pro Asp Ala  Asp His Thr
    2090                2095                2100

Trp Tyr  Thr Asp Gly Ser Ser  Leu Leu Gln Glu Gly  Gln Arg Lys
    2105                2110                2115

Ala Gly  Ala Ala Val Thr Thr  Glu Thr Glu Val Ile  Trp Ala Lys
    2120                2125                2130

Ala Leu  Pro Ala Gly Thr Ser  Ala Gln Arg Ala Glu  Leu Ile Ala
    2135                2140                2145

Leu Thr  Gln Ala Leu Lys Met  Ala Glu Gly Lys Lys  Leu Asn Val
    2150                2155                2160

Tyr Thr  Asp Ser Arg Tyr Ala  Phe Ala Thr Ala His  Ile His Gly
    2165                2170                2175

Glu Ile  Tyr Arg Arg Arg Gly  Trp Leu Thr Ser Glu  Gly Lys Glu
    2180                2185                2190
```

```
Ile Lys  Asn Lys Asp Glu Ile  Leu Ala Leu Leu Lys  Ala Leu Phe
    2195                2200                2205


Leu Pro  Lys Arg Leu Ser Ile  Ile His Cys Pro Gly  His Gln Lys
    2210                2215                2220


Gly His  Ser Ala Glu Ala Arg  Gly Asn Arg Met Ala  Asp Gln Ala
    2225                2230                2235


Ala Arg  Lys Ala Ala Ile Thr  Glu Thr Pro Asp Thr  Ser Thr Leu
    2240                2245                2250


Leu Ile  Glu Asn Ser Ser Pro  Ser Gly Gly Ser Lys  Arg Thr Ala
    2255                2260                2265


Asp Gly  Ser Glu Phe Glu Pro  Lys Lys Lys Arg Lys  Val
    2270                2275                2280


<210>  779
<211>  881
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  779

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1               5                   10                  15


Arg Lys Val Gly Ser Ala Ser Asn Phe Thr Gln Phe Val Leu Val Asp
            20                  25                  30


Asn Gly Gly Thr Gly Asp Val Thr Val Ala Pro Ser Asn Phe Ala Asn
        35                  40                  45


Gly Val Ala Glu Trp Ile Ser Ser Asn Ser Arg Ser Gln Ala Tyr Lys
    50                  55                  60


Val Thr Cys Ser Val Arg Gln Ser Ser Ala Gln Asn Arg Lys Tyr Thr
```

65 70 75 80

Ile Lys Val Glu Val Pro Lys Val Ala Thr Gln Thr Val Gly Gly Glu
85 90 95

Glu Leu Pro Val Ala Gly Trp Arg Ser Tyr Leu Asn Met Glu Leu Thr
100 105 110

Ile Pro Ile Phe Ala Thr Asn Ser Asp Cys Glu Leu Ile Val Lys Ala
115 120 125

Met Gln Gly Leu Leu Lys Asp Gly Asn Pro Ile Pro Ser Ala Ile Ala
130 135 140

Ala Asn Ser Gly Ile Tyr Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly
145 150 155 160

Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Ser Gly
165 170 175

Gly Ser Ser Gly Gly Ser Ser Thr Leu Asn Ile Glu Asp Glu Tyr Arg
180 185 190

Leu His Glu Thr Ser Lys Glu Pro Asp Val Ser Leu Gly Ser Thr Trp
195 200 205

Leu Ser Asp Phe Pro Gln Ala Trp Ala Glu Thr Gly Gly Met Gly Leu
210 215 220

Ala Val Arg Gln Ala Pro Leu Ile Ile Pro Leu Lys Ala Thr Ser Thr
225 230 235 240

Pro Val Ser Ile Lys Gln Tyr Pro Met Ser Gln Glu Ala Arg Leu Gly
245 250 255

Ile Lys Pro His Ile Gln Arg Leu Leu Asp Gln Gly Ile Leu Val Pro
260 265 270

Cys Gln Ser Pro Trp Asn Thr Pro Leu Leu Pro Val Lys Lys Pro Gly
275 280 285

```
Thr Asn Asp Tyr Arg Pro Val Gln Asp Leu Arg Glu Val Asn Lys Arg
    290                 295                 300

Val Glu Asp Ile His Pro Thr Val Pro Asn Pro Tyr Asn Leu Leu Ser
305                 310                 315                 320

Gly Leu Pro Pro Ser His Gln Trp Tyr Thr Val Leu Asp Leu Lys Asp
                325                 330                 335

Ala Phe Phe Cys Leu Arg Leu His Pro Thr Ser Gln Pro Leu Phe Ala
            340                 345                 350

Phe Glu Trp Arg Asp Pro Glu Met Gly Ile Ser Gly Gln Leu Thr Trp
        355                 360                 365

Thr Arg Leu Pro Gln Gly Phe Lys Asn Ser Pro Thr Leu Phe Asp Glu
    370                 375                 380

Ala Leu His Arg Asp Leu Ala Asp Phe Arg Ile Gln His Pro Asp Leu
385                 390                 395                 400

Ile Leu Leu Gln Tyr Val Asp Asp Leu Leu Leu Ala Ala Thr Ser Glu
                405                 410                 415

Leu Asp Cys Gln Gln Gly Thr Arg Ala Leu Leu Gln Thr Leu Gly Asn
            420                 425                 430

Leu Gly Tyr Arg Ala Ser Ala Lys Lys Ala Gln Ile Cys Gln Lys Gln
        435                 440                 445

Val Lys Tyr Leu Gly Tyr Leu Leu Lys Glu Gly Gln Arg Trp Leu Thr
    450                 455                 460

Glu Ala Arg Lys Glu Thr Val Met Gly Gln Pro Thr Pro Lys Thr Pro
465                 470                 475                 480

Arg Gln Leu Arg Glu Phe Leu Gly Thr Ala Gly Phe Cys Arg Leu Trp
                485                 490                 495
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Ile Pro Gly Phe Ala Glu Met Ala Ala Pro Leu Tyr Pro Leu Thr Lys
            500                 505                 510

Thr Gly Thr Leu Phe Asn Trp Gly Pro Asp Gln Gln Lys Ala Tyr Gln
        515                 520                 525

Glu Ile Lys Gln Ala Leu Leu Thr Ala Pro Ala Leu Gly Leu Pro Asp
    530                 535                 540

Leu Thr Lys Pro Phe Glu Leu Phe Val Asp Glu Lys Gln Gly Tyr Ala
545                 550                 555                 560

Lys Gly Val Leu Thr Gln Lys Leu Gly Pro Trp Arg Arg Pro Val Ala
                565                 570                 575

Tyr Leu Ser Lys Lys Leu Asp Pro Val Ala Ala Gly Trp Pro Pro Cys
            580                 585                 590

Leu Arg Met Val Ala Ala Ile Ala Val Leu Thr Lys Asp Ala Gly Lys
        595                 600                 605

Leu Thr Met Gly Gln Pro Leu Val Ile Leu Ala Pro His Ala Val Glu
    610                 615                 620

Ala Leu Val Lys Gln Pro Pro Asp Arg Trp Leu Ser Asn Ala Arg Met
625                 630                 635                 640

Thr His Tyr Gln Ala Leu Leu Leu Asp Thr Asp Arg Val Gln Phe Gly
                645                 650                 655

Pro Val Val Ala Leu Asn Pro Ala Thr Leu Leu Pro Leu Pro Glu Glu
            660                 665                 670

Gly Leu Gln His Asn Cys Leu Asp Ile Leu Ala Glu Ala His Gly Thr
        675                 680                 685

Arg Pro Asp Leu Thr Asp Gln Pro Leu Pro Asp Ala Asp His Thr Trp
    690                 695                 700
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Tyr Thr Asp Gly Ser Ser Leu Leu Gln Glu Gly Gln Arg Lys Ala Gly
705                 710                 715                 720

Ala Ala Val Thr Thr Glu Thr Glu Val Ile Trp Ala Lys Ala Leu Pro
                725                 730                 735

Ala Gly Thr Ser Ala Gln Arg Ala Glu Leu Ile Ala Leu Thr Gln Ala
            740                 745                 750

Leu Lys Met Ala Glu Gly Lys Lys Leu Asn Val Tyr Thr Asp Ser Arg
        755                 760                 765

Tyr Ala Phe Ala Thr Ala His Ile His Gly Glu Ile Tyr Arg Arg Arg
    770                 775                 780

Gly Leu Leu Thr Ser Glu Gly Lys Glu Ile Lys Asn Lys Asp Glu Ile
785                 790                 795                 800

Leu Ala Leu Leu Lys Ala Leu Phe Leu Pro Lys Arg Leu Ser Ile Ile
                805                 810                 815

His Cys Pro Gly His Gln Lys Gly His Ser Ala Glu Ala Arg Gly Asn
            820                 825                 830

Arg Met Ala Asp Gln Ala Ala Arg Lys Ala Ala Ile Thr Glu Thr Pro
        835                 840                 845

Asp Thr Ser Thr Leu Leu Ile Glu Asn Ser Ser Pro Ser Gly Gly Ser
    850                 855                 860

Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Pro Lys Lys Lys Arg Lys
865                 870                 875                 880

Val
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<210> 780
<211> 881
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 780

Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
1   5   10   15

Arg Lys Val Thr Leu Asn Ile Glu Asp Glu Tyr Arg Leu His Glu Thr
            20   25   30

Ser Lys Glu Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe
        35   40   45

Pro Gln Ala Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln
    50   55   60

Ala Pro Leu Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile
65   70   75   80

Lys Gln Tyr Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His
                85   90   95

Ile Gln Arg Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro
            100   105   110

Trp Asn Thr Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr
        115   120   125

Arg Pro Val Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile
    130   135   140

His Pro Thr Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro
145   150   155   160

Ser His Gln Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys
                165   170   175

Leu Arg Leu His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg
            180   185   190

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Asp Pro Glu Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro
        195                 200                 205

Gln Gly Phe Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg
    210                 215                 220

Asp Leu Ala Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln
225                 230                 235                 240

Tyr Val Asp Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln
                245                 250                 255

Gln Gly Thr Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg
            260                 265                 270

Ala Ser Ala Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu
        275                 280                 285

Gly Tyr Leu Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys
    290                 295                 300

Glu Thr Val Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg
305                 310                 315                 320

Glu Phe Leu Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe
                325                 330                 335

Ala Glu Met Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu
            340                 345                 350

Phe Asn Trp Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln
        355                 360                 365

Ala Leu Leu Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro
    370                 375                 380

Phe Glu Leu Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu
385                 390                 395                 400

Thr Gln Lys Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys
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405 410 415

Lys Leu Asp Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val
420 425 430

Ala Ala Ile Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly
435 440 445

Gln Pro Leu Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys
450 455 460

Gln Pro Pro Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln
465 470 475 480

Ala Leu Leu Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala
485 490 495

Leu Asn Pro Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His
500 505 510

Asn Cys Leu Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu
515 520 525

Thr Asp Gln Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly
530 535 540

Ser Ser Leu Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr
545 550 555 560

Thr Glu Thr Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser
565 570 575

Ala Gln Arg Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala
580 585 590

Glu Gly Lys Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala
595 600 605

Thr Ala His Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr
610 615 620

```
Ser Glu Gly Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu
625                 630                 635                 640

Lys Ala Leu Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly
                645                 650                 655

His Gln Lys Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp
            660                 665                 670

Gln Ala Ala Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr
        675                 680                 685

Leu Leu Ile Glu Asn Ser Ser Pro Ser Gly Gly Ser Ser Gly Gly Ser
    690                 695                 700

Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser
705                 710                 715                 720

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Ser Ala Ser Asn Phe Thr
                725                 730                 735

Gln Phe Val Leu Val Asp Asn Gly Gly Thr Gly Asp Val Thr Val Ala
            740                 745                 750

Pro Ser Asn Phe Ala Asn Gly Val Ala Glu Trp Ile Ser Ser Asn Ser
        755                 760                 765

Arg Ser Gln Ala Tyr Lys Val Thr Cys Ser Val Arg Gln Ser Ser Ala
    770                 775                 780

Gln Asn Arg Lys Tyr Thr Ile Lys Val Glu Val Pro Lys Val Ala Thr
785                 790                 795                 800

Gln Thr Val Gly Gly Glu Glu Leu Pro Val Ala Gly Trp Arg Ser Tyr
                805                 810                 815

Leu Asn Met Glu Leu Thr Ile Pro Ile Phe Ala Thr Asn Ser Asp Cys
            820                 825                 830
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Glu Leu Ile Val Lys Ala Met Gln Gly Leu Leu Lys Asp Gly Asn Pro
835 840 845

Ile Pro Ser Ala Ile Ala Ala Asn Ser Gly Ile Tyr Ser Gly Gly Ser
850 855 860

Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Pro Lys Lys Lys Arg Lys
865 870 875 880

Val

<210> 781
<211> 48
<212> DNA
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<220>
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<400> 781
aggaaccccg ggtctgactc gtgcactacc gtctcctttc ctctgcag 48

<210> 782
<211> 8
<212> PRT
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<220>
<223> Synthetic

<400> 782

Ser Leu Gly Pro Arg Leu Ser Thr
1 5

<210> 783
<211> 45
<212> DNA
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<220>
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<400> 783
aaccccgggt ctgactcgtg cactaccgtc tcgtgtcctc tgcag 45

<210> 784
<211> 7
<212> PRT
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<220>
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<400> 784

Leu Gly Pro Arg Leu Ser Thr
1 5

<210> 785
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
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<400> 785
tccttggggc ccagactgag cacgtgatgg cagaggaaag gagacgtc 48

<210> 786
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
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<400> 786
tccttggggc ccagactgag cacgagatgg cagaggaaag gagacgtc 48

<210> 787
<211> 45
<212> DNA
<213> Artificial Sequence

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<400> 787
ttggggccca gactgagcac gtgatggcag agcacaggag acgtc 45

<210> 788

<211> 45
<212> DNA
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<400> 788
ttggggccca gactgagcac gagatggcag agcacaggag acgtc 45

<210> 789
<211> 297
<212> DNA
<213> Artificial Sequence

<220>
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<400> 789
atgtgggctg cctagaaagg catggatgag agaagcctgg agacagggat cccagggaaa 60

cgcccatgca attagtctat ttctgctgca agtaagcatg catttgtagg cttgatgctt 120

tttttctgct tctccagccc tggcctgggt caatccttgg ggcccagact gagcacgtga 180

tggcagagga aaggaagccc tgcttcctcc agagggcgtc gcaggacagc ttttcctaga 240

caggggctag tatgtgcagc tcctgcaccg ggatactggt tgacaagttt ggctggg 297

<210> 790
<211> 297
<212> DNA
<213> Artificial Sequence

<220>
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<400> 790
cccagccaaa cttgtcaacc agtatcccgg tgcaggagct gcacatacta gcccctgtct 60

aggaaaagct gtcctgcgac gccctctgga ggaagcaggg cttcctttcc tctgccatca 120

cgtgctcagt ctgggcccca aggattgacc caggccaggg ctggagaagc agaaaaaaag 180

catcaagcct acaaatgcat gcttacttgc agcagaaata gactaattgc atgggcgttt 240

ccctgggatc cctgtctcca ggcttctctc atccatgcct ttctaggcag cccacat 297

<210> 791
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<212> DNA
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<220>
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<400> 791
tggggcccag actgagcacg tgatggcaga ggaaaggaag 40

<210> 792
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<400> 792
tggggcccag actgagcacg tgatggcaaa ggaaaggaag 40

<210> 793
<211> 40
<212> DNA
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<400> 793
tggggcccag actgagcacg agatggcaga ggaaaggaag 40

<210> 794
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<212> DNA
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<400> 794
tggggcccag actgagcacg agatggcaaa ggaaaggaag 40

<210> 795
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<212> DNA
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<400> 795
ctgagcacgt gatggcagag gaaaggaag 29

<210> 796
<211> 19
<212> DNA
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<220>
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<400> 796
ctgagcacgg gaaaggaag 19

<210> 797
<211> 29
<212> DNA
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<220>
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<400> 797
ctgagcacgt gatggcaaag gaaaggaag 29

<210> 798
<211> 9
<212> DNA
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<400> 798
ctgagcacg 9

<210> 799
<211> 16
<212> DNA
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<220>
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<400> 799
ctgagcacgg gaaagg 16

<210> 800
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
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<400> 800
ctgagcacgt gatggcaggg gaaaggaag 29

<210> 801
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 801
gactgagcac gtgatggcag aggaaaggaa g 31

<210> 802
<211> 31
<212> DNA
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<220>
<223> Synthetic

<400> 802
gactgagcac gcaccatcat caccatcatt g 31

<210> 803
<211> 31
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<400> 803
gactgagcac gtgatggcaa aggaaaggaa g 31

<210> 804
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<400> 804
gactgagcac ggattacaag gatgacgacg a 31

<210> 805
<211> 7
<212> PRT
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<220>
<223> Synthetic

<400> 805

Gly Leu Gly Gly Thr Met Leu
1 5

<210> 806
<211> 21
<212> DNA
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<220>
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<400> 806
ggccttggcg gctacatgct g 21

<210> 807
<211> 21
<212> DNA
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<220>
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<400> 807
ggccttggcg tctacatgct g 21

<210> 808
<211> 7
<212> PRT
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<220>
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<400> 808

Gly Leu Gly Val Thr Met Leu
1 5

<210> 809
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 809
ggggcagtgg tgggggggcct tggcggctac atgctg 36

<210> 810
<211> 43
<212> DNA
<213> Artificial Sequence

<220>
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<400> 810
gcagtggtgg ggggccttgg atgtagacgc caaggccccc cac 43

<210> 811
<211> 25
<212> PRT
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<220>
<223> Synthetic

<400> 811

Asn Phe Lys Ile Arg His Asn Ile Glu Asp Gly Ser Val Gln Leu Ala
1 5 10 15

Asp His Tyr Gln Gln Asn Thr Pro Ile
20 25

<210> 812
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 812

Asn Phe Lys Ile His Asn Ile Glu Asp Gly Ser Val Gln Leu Ala Asp
1   5   10   15

His Tyr Gln Gln Asn Thr Pro Ile
            20

<210> 813
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 813

Asn Phe Lys Ile Arg Asn Ile Glu Asp Gly Ser Val Gln Leu Ala Asp
1   5   10   15

His Tyr Gln Gln Asn Thr Pro Ile
            20

<210> 814
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 814

Asn Phe Lys Ile Arg His Asn Glu Asp Gly Ser Val Gln Leu Ala Asp
1   5   10   15

His Tyr Gln Gln Asn Thr Pro Ile
            20

<210> 815
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 815

Asn Phe Lys Ile Arg His Asn Gln Leu Ala Asp His Tyr Gln Gln Asn
1   5   10   15

Thr Pro Ile

<210> 816
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 816

His Asn Ile Glu Asp Gly Ser Val Gln Leu Ala Asp His Tyr Gln Gln
1   5   10   15

Asn Thr Pro Ile
            20

<210> 817
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 817

Asn Phe Lys Ile Arg His Asn Ile Glu Asp Gly Ser Val Gln
1   5   10

<210> 818
<211> 12
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 818
actgcaagtg ca 12

<210> 819
<211> 12
<212> DNA
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<220>
<223> Synthetic

<400> 819
tgcagtgttc ac 12

<210> 820
<211> 122
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 820
ggcccagacu gagcacguga guuuuagagc uagaaauagc aaguuaaaau aaggcuaguc 60

cguuaucaac uugaaaaagu ggcaccgagu cggugcucug ccaucucgug cucagucugu 120

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<210> 821
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 821
ggcccagact gagcacgtga tggcagag 28

<210> 822
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 822
gagatggcag agcaggggg gggggggg 28

<210> 823
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 823
gagatggcag agcaaaaaaa aaaaaaaaaa a 31

<210> 824
<211> 32
<212> DNA
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<400> 824
ggcccagact gagcacgtga tggcagagca ca 32

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<400> 825
ggcccagact gagcacgaga tggcagagca ca 32

<210> 826
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<220>
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<400> 826
tccagatggc acattgtcag aggg 24

<210> 827

<211> 24
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<400> 827
tgacgggagg gcagaactag tcct 24

<210> 828
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<220>
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<400> 828
ttcagacagc atatttgagt catt 24

<210> 829
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<212> DNA
<213> Artificial Sequence

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<400> 829
tggggcccag actgagcacg tgatggcagc ggaaaggaag 40

<210> 830
<211> 40
<212> DNA
<213> Artificial Sequence

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<400> 830
tggggcccag actgagcacg ctttgatggc agaggaaagg 40

<210> 831
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<220>

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<400> 831
tggggcccag actgagcacg cttttgatgg cagaggaaag 40

<210> 832
<211> 39
<212> DNA
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<220>
<223> Synthetic

<400> 832
tggggcccag actgagcact gatggcagag gaaaggaag 39

<210> 833
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
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<400> 833
tggggcccag actgagcatg atggcagagg aaaggaag 38

<210> 834
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<212> DNA
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<220>
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<400> 834
tggggcccag actgagcacg atggcagagg aaaggaag 38

<210> 835
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<212> DNA
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<400> 835
tggggcccag actgagcacg gtgatggcag aggaaaggaa 40

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<211> 39
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<400> 836
tggggcccag actgagcacg gatggcagag gaaaggaag 39

<210> 837
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<212> DNA
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<220>
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<400> 837
tggggcccag actgagcacg ttgatggcag aggaaaggaa 40

<210> 838
<211> 32
<212> DNA
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<400> 838
tggggcccag actgatggca gaggaaagga ag 32

<210> 839
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<220>
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<400> 839
tggggcccag actgagcacg atgatggcag aggaaaggaa 40

<210> 840
<211> 34
<212> DNA
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<400> 840
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<210> 841
<211> 26
<212> DNA
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<220>
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<400> 841
tggggctgat ggcagaggaa aggaag 26

<210> 842
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<400> 842
tggggcccag actgagcaga ggaaaggaag 30

<210> 843
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<400> 843
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<210> 844
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<400> 844

tggggcctga tggcagagga aaggaag 27

<210> 845
<211> 25
<212> DNA
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<220>
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<400> 845
tggggtgatg gcagaggaaa ggaag 25

<210> 846
<211> 31
<212> DNA
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<220>
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<400> 846
tggggcccag actgagcacg aggaaaggaa g 31

<210> 847
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
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<400> 847
tggggcccag actgagcacg agaggaaagg aag 33

<210> 848
<211> 36
<212> DNA
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<220>
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<400> 848
tggggcccag actgagcacg ggcagaggaa aggaag 36

<210> 849
<211> 25

<212> DNA
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<400> 849
tggggcccag actgaggaaa ggaag 25

<210> 850
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
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<400> 850
tggggcagag gaaaggaag 19

<210> 851
<211> 29
<212> DNA
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<400> 851
tggggcccag actgagcacg gaaaggaag 29

<210> 852
<211> 28
<212> DNA
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<400> 852
tggggcccag atggcagagg aaaggaag 28

<210> 853
<211> 28
<212> DNA
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<220>
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<400> 853
tggggcccag actgagcacg aaaggaag 28

<210> 854
<211> 21
<212> DNA
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<220>
<223> Synthetic

<400> 854
tggatggcag aggaaaggaa g 21

<210> 855
<211> 39
<212> DNA
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<400> 855
tggggcccag actgagcttt gatggcagag gaaaggaag 39

<210> 856
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
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cgagtcg 67

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tgctatttct agctctaaaa cggtgctgca gaagggattc cggtg 105

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Ser Ser Arg Gly Arg Arg Arg Thr
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tctgggcccc aagga 75

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acattgctgg aaataaagaa g 201

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aaacatggga actcagttta tatgagttac aacgaacacc tcaggtaatg actaagatga 120

ctgccaaggg gcatatgaga cgtgtaaact gggatacatt tttagaacat gaaaacttaa 180

atagaacata gagtaataat a 201

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<400> 895
aacgaacacc gcaggtaatg actaagatg 29

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ggcaccgagt cggtgc 76

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uccguuauca acuugaaaaa guggcaccga guaggugcnn nnnnnnnnnn nnnnnnnnnn 120

nnnuuu 126

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<223> n is a, c, g, or u

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uccguuauca acuugaaaaa guggcaccga guaggugcnn nnnnnnnnnn nnnnnnnnnn 120

nnngaaannn nnuuu 135

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Lys Cys

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<212> PRT
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Ala Ala Leu Gly Val Ala Thr Ala Ala Gln Ile Thr Ala Gly Ile
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Glu Ser Asp Arg Ala Thr Ala Arg
20

<210> 905
<211> 15
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<400> 905

Ala Ala Gln Ser Phe Thr Gly Val Val Tyr Gly Thr His Thr Thr
1 5 10 15

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Ala Asp Asp Pro Leu Leu Arg Thr
1 5

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Ala Glu Met Ile Cys Asp Ile Asp Thr Tyr Ile Val Glu Ala Gly
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<210> 911
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1 5 10 15

Ala Ser Phe Ile
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<400> 912

Ala Glu Pro Leu Leu Ser Cys
1 5

<210> 913
<211> 15
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Ala Phe Val Ser Thr Ser Ser Ser Arg Arg Tyr Thr Glu Val Tyr
1   5   10   15

<210> 914
<211> 31
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<220>
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<400> 914

Ala Gly Phe Ile Tyr Arg Glu Thr Phe Cys Ile Thr Thr Ile Tyr Lys
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Thr Gly Gln Pro Ala Ala Asp His Tyr Tyr Ser Lys Val Thr Ala
            20   25   30

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<400> 915

Ala Gly Leu Leu Ala Cys Cys Ala Lys Cys Leu Tyr Tyr Leu Arg
1   5   10   15

<210> 916
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<212> PRT
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<400> 916

Ala His Thr Thr Ser Asp Pro Trp His Pro Pro Gly
1   5   10

<210> 917
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<400> 917

Ala Ile Ala Lys Leu Glu Asp Ala Lys Glu Leu Leu Glu Ser Ser
1 5 10 15

<210> 918
<211> 15
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<400> 918

Ala Ile Asp Asn Leu Arg Ala Ser Leu Glu Thr Thr Asn Gln Ala
1 5 10 15

<210> 919
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<212> PRT
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<400> 919

Ala Lys Gly Val Glu Phe Arg
1 5

<210> 920
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<400> 920

Ala Lys Trp Ala Val Pro Thr Thr Arg Thr Asp Asp Lys Leu Arg
1 5 10 15

<210> 921
<211> 10
<212> PRT
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<400> 921

Ala Leu Ala Glu Val Leu Lys Lys Pro Val
1 5 10

<210> 922
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<400> 922

Ala Leu Gly Val Ile Asn Thr Leu Glu Trp Ile Pro Arg Phe Lys
1 5 10 15

<210> 923
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Ala Leu His Gln Ser Met Leu Asn Ser Gln Ala Ile Asp Asn Leu
1 5 10 15

<210> 924
<211> 10
<212> PRT
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<400> 924

Ala Leu Ile Gly Ile Leu Ser Leu Phe Val

1 5 10

<210> 925
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Ala Leu Leu Asn Thr Pro Pro Pro Tyr Gln Val Ser Cys Gly Gly Glu
1 5 10 15

Ser Asp Arg Ala
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<210> 926
<211> 24
<212> PRT
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<220>
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<400> 926

Ala Leu Leu Asn Thr Pro Pro Pro Tyr Gln Val Ser Cys Gly Gly Glu
1 5 10 15

Ser Asp Arg Ala Ser Ala Arg Val
20

<210> 927
<211> 15
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<400> 927

Ala Leu Val Glu Gly Leu Ala Pro Gly Gly Gly Asn Cys His Leu
1 5 10 15

<210> 928
<211> 12
<212> PRT
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<400> 928

Ala Met Ala Ala Trp Ser Glu Arg Ala Gly Glu Ala
1 5 10

<210> 929
<211> 15
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<400> 929

Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Thr Thr Gly Thr
1 5 10 15

<210> 930
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<400> 930

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<210> 931
<211> 8
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<400> 931

Ala Pro Gly Pro Gly Glu Val Trp

1 5

<210> 932
<211> 23
<212> PRT
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<400> 932

Ala Pro Leu Pro Pro His Thr Thr Glu Arg Ile Glu Thr Arg Ser Ala
1 5 10 15

Arg His Pro Trp Arg Ile Arg
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<210> 933
<211> 27
<212> PRT
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<220>
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<400> 933

Ala Pro Pro Met Pro Pro Gln Pro Pro Arg Ala His Gly Gln His Tyr
1 5 10 15

Gly His His His His Gln Leu Pro Phe Leu Gly
20 25

<210> 934
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<212> PRT
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<400> 934

Ala Pro Pro Thr Leu Pro Gln Pro Pro Cys Ala His Gly Gln His Tyr
1 5 10 15

Gly His His His His Gln Leu Pro Phe Leu Gly
20 25

<210> 935
<211> 27
<212> PRT
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<400> 935

Ala Pro Pro Thr Leu Pro Gln Pro Pro Arg Ala His Gly Gln His Tyr
1 5 10 15

Gly His His His His Gln Leu Pro Phe Leu Gly
20 25

<210> 936
<211> 22
<212> PRT
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<400> 936

Ala Pro Gln Pro Gly Pro Gln Pro Pro Gln Pro Pro Gln Pro Gln Pro
1 5 10 15

Glu Ala Pro Ala Pro Gln
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<210> 937
<211> 15
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<400> 937

Ala Gln Leu Ala Ser Tyr Phe Asn Pro Gly Gly Ser Tyr Tyr Lys
1 5 10 15

<210> 938
<211> 13
<212> PRT
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<400> 938

Ala Arg Ala Ala His Leu Pro Thr Gly Thr Pro Leu Asp
1 5 10

<210> 939
<211> 15
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<213> Artificial Sequence

<220>
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<400> 939

Ala Arg Leu Val Ser Glu Ile Ala Met His Thr Thr Glu Asp Lys
1 5 10 15

<210> 940
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
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<400> 940

Ala Arg Leu Val Ser Glu Ile Ala Met His Thr Thr Glu Asp Lys Ile
1 5 10 15

Ser Arg Ala Val
20

<210> 941
<211> 17
<212> PRT
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<220>

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<400> 941

Ala Ser Asp Val Glu Thr Ala Glu Gly Gly Glu Ile His Glu Leu Leu
1 5 10 15

Arg

<210> 942
<211> 19
<212> PRT
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<220>
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<400> 942

Ala Ser Asp Val Glu Thr Ala Glu Gly Gly Glu Ile His Glu Leu Leu
1 5 10 15

Arg Leu Gln

<210> 943
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
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<400> 943

Ala Ser Asp Val Glu Thr Ala Glu Gly Gly Glu Ile His Glu Leu Leu
1 5 10 15

Arg Leu Gln Ser Arg
20

<210> 944
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
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<400> 944

Ala Ser Asp Val Glu Thr Ala Glu Gly Gly Glu Ile His Lys Leu Leu
1   5   10   15

Arg Leu Gln

<210> 945
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
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<400> 945

Ala Ser Asp Val Leu Pro Gly His Trp Leu Gln Gly
1   5   10

<210> 946
<211> 15
<212> PRT
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<220>
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<400> 946

Ala Ser Glu Leu Gly Ile Thr Ala Glu Asp Ala Arg Leu Val Ser
1   5   10   15

<210> 947
<211> 20
<212> PRT
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<400> 947

Ala Ser Glu Leu Gly Ile Thr Ala Glu Asp Ala Arg Leu Val Ser Glu
1   5   10   15

Ile Ala Met His
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<210> 948
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<220>
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<400> 948

Ala Ser Glu Ser Ser Gln Asp Pro Gln Asp Ser Arg Arg
1   5   10

<210> 949
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<220>
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<400> 949

Ala Ser Ile Leu Cys Lys Cys Tyr Thr Thr Gly Thr Ile Ile Asn
1   5   10   15

<210> 950
<211> 15
<212> PRT
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<220>
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<400> 950

Ala Ser Pro Val Cys Gln Arg His Ser Pro Asp Cys Ser Arg Leu
1   5   10   15

<210> 951
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<212> PRT
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<220>
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<400> 951

Ala Ser Gln Ala Arg Trp Thr Gly Ala Thr Arg Ala
1   5   10

<210> 952
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<212> PRT
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<400> 952

Ala Ser Tyr Phe Asn Pro Gly Gly Ser Tyr Tyr Lys Gln Tyr His Pro
1   5   10   15

Thr Ala Cys Glu Val Glu Pro Ala Phe Gly His Ser
            20   25

<210> 953
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 953

Ala Ser Tyr Lys Val Met Thr Arg Ser Ser His Gln Ser Leu Val
1   5   10   15

<210> 954
<211> 12
<212> PRT
<213> Artificial Sequence

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<400> 954

Ala Ser Tyr Val Lys Lys Pro Lys Glu Asp Val Asp
1   5   10

<210> 955
<211> 15
<212> PRT
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<400> 955

Ala Thr Ala Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser
1   5   10   15

<210> 956
<211> 8
<212> PRT
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<220>
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<400> 956

Ala Thr Pro Glu Arg Pro Arg Leu
1   5

<210> 957
<211> 15
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Ala Val Cys Leu Gly Gly Leu Ile Gly Ile Pro Ala Leu Ile Cys
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<400> 958

Ala Val Gly Pro Arg Gln Ala Gln Val Ser Phe
1 5 10

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<400> 959

Ala Val Asn Ala Tyr Ser Ser Gly Gly Tyr Ala Gln Leu Ala Ser
1 5 10 15

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<400> 960

Ala Val Ser Glu Thr Arg Gln Thr Trp Ala Glu Trp Ala Ala Ala
1 5 10 15

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<400> 961

Ala Val Thr Ala Pro Asp Thr Ala Ala Asp Ser Glu Leu Arg Arg
1 5 10 15

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<400> 962

Ala Val Thr Ala Pro Asp Thr Ala Ala Asp Ser Glu Leu Arg Arg Trp
1 5 10 15

Ile Lys Tyr Thr
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<211> 22
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<400> 963

Ala Tyr Gly Gly Ile Ile Lys Asp Ala Pro Pro Gly Ala Gly Phe Ile
1 5 10 15

Tyr Arg Glu Thr Phe Cys
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<210> 964
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<400> 964

Cys Ala Leu Pro Leu Ala Gly Leu Leu Ala Cys Cys Ala Lys Cys
1 5 10 15

<210> 965
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<220>
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<400> 965

Cys Ala Arg Ile Trp Asn Gly Thr Gln Arg Ala Cys Thr Phe Trp
1   5   10   15

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<400> 966

Cys Ala Arg Thr Leu Val Ser Gly Ser Phe Gly Asn Arg Phe Ile
1   5   10   15

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<400> 967

Cys Ala Ser Pro Tyr Glu Gly Arg Tyr Arg Asp Met Tyr Asp Ala Leu
1   5   10   15

Arg Asx Arg Leu Leu Tyr
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<400> 968

Cys Ala Val Phe Val Arg Ser Gly Gln Pro Val Ile Gly Ala
1   5   10

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<400> 969

Cys Cys Ala Lys Cys Leu Tyr Tyr Leu Arg Gly Ala Ile Ala Pro Arg
1 5 10 15

<210> 970
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<400> 970

Cys Cys Arg Gly Arg Cys Asn Lys Lys Gly Glu Gln Val Gly Met
1 5 10 15

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<400> 971

Cys Glu Ile Pro Thr Asp Val Ser Cys Glu Gly Leu Gly Ala Trp
1 5 10 15

<210> 972
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<400> 972

Cys Phe Gly Lys Asp Leu Lys Arg Pro Gly Ser Ser Pro Met Glu Val
1 5 10 15

<210> 973
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<400> 973

Cys Phe Gln Gln Ala Cys Lys Gly Lys Ile Gln Ala Leu Cys Glu
1 5 10 15

<210> 974
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<400> 974

Cys Phe Gln Gln Ala Cys Lys Gly Lys Ile Gln Ala Leu Cys Glu Asn
1 5 10 15

Pro Glu Trp Ala Pro Leu Lys Asp Asn Arg Ile Pro Ser
20 25

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<400> 975

Cys Gly Gly Glu Ser Asp Arg Ala Ser Ala Arg Val Ile Asp Pro
1 5 10 15

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<400> 976

Cys Ile Thr Thr Ile Tyr Lys Thr Gly Gln Pro Ala Ala Asp His Tyr
1 5 10 15

Tyr Ser Lys Val Thr Ala
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<213> Artificial Sequence

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<400> 977

Cys Lys Gly Lys Ile Gln Ala Leu Cys Glu Asn Pro Glu Trp Ala
1 5 10 15

<210> 978
<211> 13
<212> PRT
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<400> 978

Cys Lys Pro Trp Gln Glu Ser Arg Lys Asn Lys Ala Gln
1 5 10

<210> 979
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<400> 979

Cys Asn Lys Lys Gly Glu Gln Val Gly Met Ser Arg Pro Gly Leu
1 5 10 15

<210> 980
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<212> PRT
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<400> 980

Cys Asn Val Thr Thr Glu His Pro Phe Cys Asn Thr Pro His Gly
1 5 10 15

<210> 981
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<212> PRT
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<400> 981

Cys Gln Val Gly Ser Ser Asn Ser Ala Phe
1 5 10

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<220>
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<400> 982

Cys Ser Gly Pro Thr Thr Ile Arg Gly Gln Phe Ser
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<400> 983

Cys Thr Ser Pro Tyr Asp Gly Lys Tyr Trp Ser Met Tyr Ser Arg Leu
1   5   10   15

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<220>
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<400> 984

Cys Val Leu Ala Asp Ser Glu Ser Gly Gly His Ile Thr His Ser
1   5   10   15

<210> 985
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<220>
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<400> 985

Cys Tyr Thr Thr Gly Thr Ile Ile Asn Gln Asp Pro Asp Lys Ile Leu
1   5   10   15

Thr Tyr Ile Ala Ala Asp His Cys
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<220>
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<400> 986

Asp Ala Asp Asp Pro Leu Leu Arg
1   5

<210> 987
<211> 15
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<213> Artificial Sequence

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<400> 987

Asp Ala Arg Ala Ala His Leu Pro Thr Gly Thr Pro Leu Asp Ile
1 5 10 15

<210> 988
<211> 20
<212> PRT
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<220>
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<400> 988

Asp Ala Arg Ala Ala His Leu Pro Thr Gly Thr Pro Leu Asp Ile Asp
1 5 10 15

Thr Ala Ser Glu
20

<210> 989
<211> 15
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<213> Artificial Sequence

<220>
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<400> 989

Asp Cys His Ala Pro Thr Tyr Leu Pro Ala Glu Val Asp Gly Asp
1 5 10 15

<210> 990
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<213> Artificial Sequence

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<400> 990

Asp Cys Ser Arg Leu Val Gly Ala Thr Pro Glu Arg Pro Arg Leu
1   5   10   15

<210> 991
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<213> Artificial Sequence

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<400> 991

Asp Asp Lys Leu Arg Met Glu Thr Cys Phe Gln Gln Ala Cys Lys
1   5   10   15

<210> 992
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<400> 992

Asp Asp Pro Leu Leu Arg Thr Ala
1   5

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<400> 993

Asp Asp Pro Leu Leu Arg Thr Ala Pro Gly Pro Gly Glu Val Trp
1   5   10   15

<210> 994
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<212> PRT
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<220>
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<400> 994

Asp Asp Pro Pro Ala Thr Val Tyr Arg Tyr Asp
1 5 10

<210> 995
<211> 17
<212> PRT
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<220>
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<400> 995

Asp Asp Pro Pro Ala Thr Val Tyr Arg Tyr Asp Ser Arg Pro Pro Glu
1 5 10 15

Asp

<210> 996
<211> 18
<212> PRT
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<220>
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<400> 996

Asp Asp Pro Pro Ala Thr Val Tyr Arg Tyr Asp Ser Arg Pro Pro Glu
1 5 10 15

Asp Val

<210> 997
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 997

Asp Glu Val Gly Leu Arg Thr Pro Gln Arg Phe Thr Asp Leu Val
1 5 10 15

<210> 998
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<212> PRT
<213> Artificial Sequence

<220>
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<400> 998

Asp His Cys Pro Val Val Glu Val Asn Gly Val Thr Ile Gln Val
1 5 10 15

<210> 999
<211> 13
<212> PRT
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<220>
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<400> 999

Asp Ile Asp Thr Ala Ser Glu Ser Ser Gln Asp Pro Gln
1 5 10

<210> 1000
<211> 15
<212> PRT
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<400> 1000

Asp Ile Asn Lys Val Leu Glu Lys Leu Gly Tyr Ser Gly Gly Asp
1 5 10 15

<210> 1001
<211> 7
<212> PRT
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<400> 1001

Asp Leu Ile Ala Tyr Lys Gln
1 5

<210> 1002
<211> 15
<212> PRT
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<220>
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<400> 1002

Asp Leu Ile Gly Gln Lys Leu Gly Leu Lys Leu Leu Arg Tyr Tyr
1 5 10 15

<210> 1003
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1003

Asp Leu Gln Lys Ala Leu Glu Ala Gln Ser Arg Ala Leu Arg Ala Glu
1 5 10 15

Leu Ala Ala

<210> 1004
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1004

Asp Leu Gln Tyr Val Leu Ala Thr Tyr Asp Thr Ser Arg Val Glu
1 5 10 15

<210> 1005
<211> 9
<212> PRT
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<220>
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<400> 1005

Asp Leu Ser Leu Arg Arg Phe Met Val
1 5

<210> 1006
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1006

Asp Leu Ser Asn Cys Met Val Ala Leu Gly Glu Leu Lys Leu Ala
1 5 10 15

<210> 1007
<211> 24
<212> PRT
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<220>
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<400> 1007

Asp Leu Val Glu Tyr Ile Met Asn Tyr Thr Gly Asn Gln Gln Ser Arg
1 5 10 15

Trp Gly Leu Gly Ser Pro Asn Cys
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<210> 1008
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1008

Asp Leu Val Lys Phe Ile Ser Asp Lys Ile Lys Phe Leu Asn Pro
1 5 10 15

<210> 1009
<211> 15
<212> PRT
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<220>
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<400> 1009

Asp Leu Val Lys Phe Ile Ser Thr Lys Ile Lys Phe Leu Asn Pro
1 5 10 15

<210> 1010
<211> 10
<212> PRT
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<220>
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<400> 1010

Asp Leu Tyr Lys Ser Asn His Asn Asn Val
1 5 10

<210> 1011
<211> 10
<212> PRT
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<220>
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<400> 1011

Asp Asn Val Leu Asp His Leu Thr Gly Arg
1 5 10

<210> 1012
<211> 12
<212> PRT
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<220>
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<400> 1012

Asp Asn Val Leu Asp His Leu Thr Gly Arg Ser Cys
1   5   10

<210> 1013
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<212> PRT
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<400> 1013

Asp Asn Val Leu Asp His Leu Thr Gly Arg Ser Cys Gln
1   5   10

<210> 1014
<211> 11
<212> PRT
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<220>
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<400> 1014

Asp Pro Asp Lys Ile Leu Thr Tyr Ile Ala Ala
1   5   10

<210> 1015
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1015

Asp Pro Gly Asp Leu Val Glu Tyr Ile Met Asn Tyr Thr Gly Asn Gln
1   5   10   15

Gln Ser Arg

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<212> PRT
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<220>
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<400> 1016

Asp Pro Leu Leu Arg Thr Ala Pro
1   5

<210> 1017
<211> 22
<212> PRT
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<220>
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<400> 1017

Asp Pro Leu Leu Arg Thr Ala Pro Gly Pro Gly Glu Val Trp Val Thr
1   5   10   15

Pro Val Ile Gly Ser Gln
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<210> 1018
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<212> PRT
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<220>
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<400> 1018

Asp Pro Gln Asp Ser Arg Arg Ser Ala Glu Pro Leu Leu
1   5   10

<210> 1019
<211> 15
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<220>
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<400> 1019

Asp Pro Val Ile Asp Arg Leu Tyr Leu Ser Ser His Arg Gly Val
1   5   10   15

<210> 1020
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<212> PRT
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<400> 1020

Asp Gln Ile Leu Arg Ser Met Lys Gly Leu Ser Ser Thr Ser Ile
1   5   10   15

<210> 1021
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<400> 1021

Asp Gln Tyr Cys Ala Asp Val Ala Ala Glu Glu Leu Met Asn Ala
1   5   10   15

<210> 1022
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<400> 1022

Asp Ser Glu Ser Gly Gly His Ile Thr His
1   5   10

<210> 1023

<211> 13
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<220>
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<400> 1023

Asp Thr Ala Ser Glu Ser Ser Gln Asp Pro Gln Asp Ser
1   5   10

<210> 1024
<211> 15
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<213> Artificial Sequence

<220>
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<400> 1024

Asp Thr Val Met Ser Val Phe Ala Leu Ala Ser Tyr Val Gln His
1   5   10   15

<210> 1025
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<212> PRT
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<220>
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<400> 1025

Asp Val Phe Gln Asn Gly Phe Thr Ala Trp Gly Asn Asn Asp
1   5   10

<210> 1026
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<400> 1026

Asp Val Gly Ala Val Pro Pro Gly Lys Phe Val Thr Ala Ala Leu
1   5   10   15

<210> 1027
<211> 16
<212> PRT
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<400> 1027

Asp Val Asn Lys Ser Lys Thr His Ile Ser Val Asn Gly Arg Lys Ile
1 5 10 15

<210> 1028
<211> 15
<212> PRT
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<220>
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<400> 1028

Asp Val Ser Cys Glu Gly Leu Gly Ala Trp Val Pro Ala Ala Pro
1 5 10 15

<210> 1029
<211> 27
<212> PRT
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<220>
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<400> 1029

Asp Trp Ala Ser Pro Val Cys Gln Arg His Ser Pro Asp Cys Ser Arg
1 5 10 15

Leu Val Gly Ala Thr Pro Glu Arg Pro Arg Leu
20 25

<210> 1030
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<212> PRT
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<220>
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<400> 1030

Glu Ala Arg Glu Ser Tyr Arg Glu Thr Gly Pro Ser Arg
1   5   10

<210> 1031
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1031

Glu Ala Val Glu Ala Glu Arg Ala Gly Arg Gly Thr Gly
1   5   10

<210> 1032
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1032

Glu Asp Ala Lys Glu Leu Leu Glu Ser Ser Asp Gln Ile Leu Arg
1   5   10   15

<210> 1033
<211> 13
<212> PRT
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<220>
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<400> 1033

Glu Asp Arg Arg Val Lys Gln Ser Arg Gly Glu Ala Arg
1   5   10

<210> 1034
<211> 15

<212> PRT
<213> Artificial Sequence

<220>
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<400> 1034

Glu Asp Ser Ile Thr Ile Pro Tyr Gln Gly Ser Gly Lys Gly Val
1 5 10 15

<210> 1035
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<212> PRT
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<220>
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<400> 1035

Glu Glu Ala Phe Thr Tyr Leu Cys Thr Ala Pro Gly Cys Ala Thr
1 5 10 15

<210> 1036
<211> 15
<212> PRT
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<220>
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<400> 1036

Glu Gly Phe Asn Met Ile Leu Gly Thr Ile Leu Ala Gln Ile Trp
1 5 10 15

<210> 1037
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1037

Glu Gly Phe Asn Met Ile Leu Gly Thr Ile Leu Ala Gln Ile Trp Val
1 5 10 15

Leu Leu Ala Lys
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<210> 1038
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1038

Glu His Pro Phe Cys Asn Thr Pro His Gly Gln Leu Glu Val Gln
1   5   10   15

<210> 1039
<211> 15
<212> PRT
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<220>
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<400> 1039

Glu Ile Ser Asp Ile Glu Val Gln Asp Pro Glu Gly Phe Asn Met
1   5   10   15

<210> 1040
<211> 20
<212> PRT
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<220>
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<400> 1040

Glu Ile Ser Asp Ile Glu Val Gln Asp Pro Glu Gly Phe Asn Met Ile
1   5   10   15

Leu Gly Thr Ile
            20

<210> 1041
<211> 11

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1041

Glu Lys Pro Asn Leu Ser Ser Lys Arg Ser Glu
1 5 10

<210> 1042
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1042

Glu Leu Lys Leu Ala Ala Leu Cys His Gly Glu Asp Ser Ile Thr
1 5 10 15

<210> 1043
<211> 15
<212> PRT
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<220>
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<400> 1043

Glu Leu Met Asn Ala Leu Val Asn Ser Thr Leu Leu Glu Thr Arg
1 5 10 15

<210> 1044
<211> 5
<212> PRT
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<220>
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<400> 1044

Glu Leu Pro Arg Leu
1 5

<210> 1045
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1045

Glu Asn Pro Glu Trp Ala Pro Leu Lys Asp Asn Arg Ile Pro Ser Tyr
1 5 10 15

Gly Val Leu Ser Val Asp Leu
20

<210> 1046
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1046

Glu Pro Ile Arg Asp Ala Leu Asn Ala Met Thr Gln Asn Ile Arg
1 5 10 15

<210> 1047
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1047

Glu Gln Val Gly Met Ser Arg Pro Gly Leu Lys Pro Asp Leu Thr
1 5 10 15

<210> 1048
<211> 8
<212> PRT
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<220>

<223> Synthetic

<400> 1048

Glu Arg Pro Arg Leu Arg Leu Val
1   5

<210> 1049
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1049

Glu Arg Pro Arg Leu Arg Leu Val Asp Ala Asp Asp Pro Leu Leu
1   5   10   15

<210> 1050
<211> 17
<212> PRT
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<220>
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<400> 1050

Glu Ser Pro Gly Gln Leu Ile Gln Arg Ile Thr Asp Asp Pro Asp Val
1   5   10   15

Ser

<210> 1051
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1051

Glu Ser Arg Gly Ile Lys Ala Arg Ile Thr His Val Asp Thr Glu
1   5   10   15

<210> 1052
<211> 15
<212> PRT
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<220>
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<400> 1052

Glu Ser Ser Cys Thr Phe Met Pro Glu Gly Thr Val Cys Ser Gln
1 5 10 15

<210> 1053
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1053

Glu Ser Ser Gln Asp Pro Gln Asp Ser Arg Arg Ser Ala
1 5 10

<210> 1054
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1054

Glu Thr Arg Thr Thr Asn Gln Phe Leu Ala Val Ser Lys Gly Asn
1 5 10 15

<210> 1055
<211> 15
<212> PRT
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<220>
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<400> 1055

Glu Val Asp Gly Asp Val Lys Leu Ser Ser Asn Leu Val Ile Leu
1   5   10   15

<210> 1056
<211> 9
<212> PRT
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<400> 1056

Glu Val Asn Gly Val Thr Ile Gln Val
1   5

<210> 1057
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<220>
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<400> 1057

Glu Val Trp Val Thr Pro Val Ile
1   5

<210> 1058
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1058

Glu Val Trp Val Thr Pro Val Ile Gly Ser Gln Ala
1   5   10

<210> 1059
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<220>
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<400> 1059

Glu Trp Ala Ala Ala His Trp Trp Gln Leu Thr Leu Gly Ala Thr
1 5 10 15

<210> 1060
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1060

Glu Trp Ile Pro Arg Phe Lys Val Ser Pro Tyr Leu Phe Thr Val
1 5 10 15

<210> 1061
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1061

Phe Glu Tyr Val Asp Thr Tyr Gly Asp Asn Ala Gly
1 5 10

<210> 1062
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1062

Phe Gly Pro Leu Ile Thr His Gly Ser Gly Met Asp Leu Tyr Lys
1 5 10 15

<210> 1063
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1063

Phe Ile Phe Asp Ala Leu Ala Glu Val
1   5

<210> 1064
<211> 9
<212> PRT
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<220>
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<400> 1064

Phe Ile Ser Asp Lys Ile Lys Phe Leu
1   5

<210> 1065
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1065

Phe Lys Arg Asn Lys Asp Lys Pro Pro Ile Thr Ser Gly Ser Gly
1   5   10   15

<210> 1066
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<223> Synthetic

<400> 1066

Phe Lys Arg Asn Lys Asp Lys Pro Pro Ile Thr Ser Gly Ser Gly Gly
1   5   10   15

Ala Ile Arg Gly

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<210> 1067
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<400> 1067

Phe Lys Thr Val Arg Pro Val Ala Leu Pro Arg Thr Leu Ala Pro
1 5 10 15

<210> 1068
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1068

Phe Leu Met Asp Arg His Ile Ile Val
1 5

<210> 1069
<211> 15
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<220>
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<400> 1069

Phe Met Ala Val Leu Leu Thr Leu Gln Thr Pro Thr Gly Gln Ile
1 5 10 15

<210> 1070
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1070

Phe Met Pro Glu Gly Thr Val Cys Ser Gln Asn Ala Leu Tyr Pro
1 5 10 15

<210> 1071
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1071

Phe Met Tyr Met Ser Leu Leu Gly Val
1 5

<210> 1072
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1072

Phe Asn Val Pro Ile Lys Glu Ala Gly Glu Asp Cys His Ala Pro
1 5 10 15

<210> 1073
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1073

Phe Arg Asp Leu Thr Trp Cys Ile Asn Pro Pro Glu Arg Ile Lys
1 5 10 15

<210> 1074
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1074

Phe Ser His Asp Asp Pro Ile Ser Ser Asp Gln Ser Arg Phe Gly
1   5   10   15

<210> 1075
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1075

Phe Ser His Asp Asp Pro Ile Ser Ser Asp Gln Ser Arg Phe Gly Trp
1   5   10   15

Phe Glu Asn Lys
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<210> 1076
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1076

Phe Thr Asp Leu Val Lys Phe Ile Ser Asp Lys Ile Lys Phe Leu
1   5   10   15

<210> 1077
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1077

Phe Thr Trp Asp Gln Lys Leu Trp Cys Arg His Phe Cys Val Leu
1   5   10   15

<210> 1078
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1078

Phe Val Arg Asp Gly Gln Ser Val Ile Gly Ala Cys Ala Ser Pro Tyr
1 5 10 15

Glu Gly Arg Tyr Arg Asp Leu Tyr Asp Ala Leu Arg Arg Leu Leu Tyr
20 25 30

<210> 1079
<211> 33
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1079

Phe Val Arg Ser Gly Gln Pro Val Ile Gly Ala Cys Thr Ser Pro Tyr
1 5 10 15

Asp Gly Lys Tyr Trp Ser Ile Leu Tyr Ser Arg Leu Arg Lys Met Leu
20 25 30

Tyr

<210> 1080
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1080

Phe Tyr Lys Asp Asn Pro His Pro Lys Gly Ser Arg Ile Val Ile

1 5 10 15

<210> 1081
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1081

Gly Ala Ala Ser Ser Tyr Phe Glu Tyr Val Asp Thr Tyr Gly
1 5 10

<210> 1082
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1082

Gly Ala Phe Asp Leu Lys Thr Thr Phe Cys Ile Met Thr Thr Arg Asn
1 5 10 15

Thr Gly Gln Pro Ala
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<210> 1083
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1083

Gly Ala Leu Ile Gly Ile Leu Ser Leu Phe Val Glu Ser Pro Gly
1 5 10 15

<210> 1084
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1084

Gly Ala Leu Ile Gly Ile Leu Ser Leu Phe Val Glu Ser Pro Gly Gln
1   5   10   15

Leu Ile Gln Arg
            20

<210> 1085
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1085

Gly Ala Thr Pro Glu Arg Pro Arg
1   5

<210> 1086
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1086

Gly Ala Tyr Gly Arg Cys Pro Asn Gly Thr Arg Ala Leu Thr Val Ala
1   5   10   15

Glu Leu Arg Gly Asn Ala Glu Leu
            20

<210> 1087
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1087

Gly Cys Phe Ala Pro Trp Asp Leu Glu Ala Thr Gly Ala Cys Ile
1 5 10 15

<210> 1088
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1088

Gly Asp Ile Asn Lys Val Leu Glu Lys Leu Gly Tyr Ser
1 5 10

<210> 1089
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1089

Gly Asp Ile Asn Lys Val Leu Glu Lys Leu Gly Tyr Ser Gly Gly Asp
1 5 10 15

Leu Leu Gly

<210> 1090
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1090

Gly Asp Leu Arg Ala Val His His Arg Pro Val Pro Ala
1 5 10

<210> 1091
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1091

Gly Asp Leu Val Glu Tyr Ile Met Asn Tyr Thr Gly Asn Gln Gln
1 5 10 15

<210> 1092
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1092

Gly Asp Ser Ser Ile Thr Thr Arg Ser Arg Leu Leu Asp Arg Leu
1 5 10 15

<210> 1093
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1093

Gly Asp Ser Ser Ile Thr Thr Arg Ser Arg Leu Leu Asp Arg Leu Val
1 5 10 15

Arg Leu Ile Gly
20

<210> 1094
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1094

Gly Glu Asp Cys His Ala Pro Thr Tyr Leu Pro Ala Glu Val Asp
1 5 10 15

<210> 1095
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1095

Gly Glu Leu Ser Thr Leu Glu Ser Leu Met Asn Leu Tyr Gln Gln
1 5 10 15

<210> 1096
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1096

Gly Glu Leu Ser Thr Leu Glu Ser Leu Met Asn Leu Tyr Gln Gln Met
1 5 10 15

Gly Lys Pro Ala
20

<210> 1097
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1097

Gly Glu Gln Ala Arg Tyr Leu Ala Leu Leu Glu Ala
1 5 10

<210> 1098
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1098

Gly Glu Val Trp Val Thr
1 5

<210> 1099
<211> 8
<212> PRT
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<220>
<223> Synthetic

<400> 1099

Gly Glu Val Trp Val Thr Pro Val
1 5

<210> 1100
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1100

Gly Glu Val Trp Val Thr Pro Val Ile Gly Ser Gln Ala Arg
1 5 10

<210> 1101
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1101

Gly Glu Tyr Gly Gly Val Ile Lys Asp Gly Thr Pro Gly Gly Ala

1 5 10 15

<210> 1102
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1102

Gly Phe Leu Ser Gly Val Gly Pro Met Arg Leu Arg His Gly Ala Asp
1 5 10 15

Thr

<210> 1103
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1103

Gly Phe Arg Ala Ser Asp Val Glu Thr Ala Glu Gly Gly Glu Ile His
1 5 10 15

Glu Leu Leu Arg Leu Gln
20

<210> 1104
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1104

Gly Gly Ala Val Pro Gly Gly Ala Val Pro Gly Gly Ala Val Pro Gly
1 5 10 15

Gly Phe Gly Pro Gly Gly Phe Gly Pro
20 25

<210> 1105
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1105

Gly Gly Ala Val Pro Gly Gly Ala Val Pro Gly Gly Phe Gly Pro Gly
1 5 10 15

Gly Phe Gly Pro Gly Gly Phe Gly Pro
20 25

<210> 1106
<211> 30
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1106

Gly Gly Ala Val Pro Gly Gly Ala Val Pro Gly Gly Phe Gly Pro Gly
1 5 10 15

Gly Phe Gly Pro Gly Gly Phe Gly Pro Gly Gly Phe Gly Pro
20 25 30

<210> 1107
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1107

Gly Gly His Ile Thr His Ser Gly Met Val Gly Met Gly Val Ser
1 5 10 15

<210> 1108
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1108

Gly Ile Leu Glu Ser Arg Gly Ile Lys Ala Arg Ile Thr His Val Asp
1   5   10   15

Thr Glu Ser Tyr
            20

<210> 1109
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1109

Gly Ile Thr Gly Glu Thr Thr Thr Thr Glu Tyr Ser Asn Ala Arg Tyr
1   5   10   15

Val

<210> 1110
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1110

Gly Lys Glu Asp Arg Arg Val Lys Gln Ser Arg Gly Glu
1   5   10

<210> 1111
<211> 7

<212> PRT
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<220>
<223> Synthetic

<400> 1111

Gly Lys Val Thr Asn Gly Ser
1 5

<210> 1112
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1112

Gly Leu Gly Ala Trp Val Pro Ala Ala Pro Cys Ala Arg Ile Trp
1 5 10 15

<210> 1113
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1113

Gly Leu Ile Gly Ile Pro Ala Leu Ile Cys Cys Cys Arg Gly Arg
1 5 10 15

<210> 1114
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1114

Gly Leu Leu Ala Cys Cys Ala Lys Cys Leu Tyr Tyr Leu Arg Gly Ala
1 5 10 15

Ile Ala Pro Arg
            20

<210> 1115
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1115

Gly Leu Leu Ala Ile Ala Gly Ile Arg Leu His Arg Ala Ala Ile
1   5   10   15

<210> 1116
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1116

Gly Leu Gln Pro Arg Ala Asp Met Ala Ala Pro Pro Thr Leu Pro Gln
1   5   10   15

<210> 1117
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1117

Gly Met Gly Val Ser Cys Thr Val Thr Arg Glu Asp Gly Thr Asn Arg
1   5   10   15

Arg

<210> 1118
<211> 12

<212> PRT
<213> Artificial Sequence

<220>
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<400> 1118

Gly Met Tyr Gly Gly Thr Tyr Leu Val Glu Lys Pro
1 5 10

<210> 1119
<211> 28
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1119

Gly Asn Ala Glu Leu Gln Thr Tyr Leu Arg Gln Ile Thr Pro Gly Trp
1 5 10 15

Ser Ile Tyr Gly Leu Tyr Asp Gly Thr Tyr Leu Gly
20 25

<210> 1120
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1120

Gly Asn Cys His Leu Thr Val Asn Gly Glu Asp Val Gly Ala Val
1 5 10 15

<210> 1121
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1121

Gly Asn Asn Asp Asn Val Leu Asp His Leu Thr Gly Arg
1 5 10

<210> 1122
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1122

Gly Asn Asn Asp Asn Val Leu Asp His Leu Thr Gly Arg Ser Cys
1 5 10 15

<210> 1123
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1123

Gly Asn Arg Phe Ile Leu Ser Gln Gly Asn Leu Ile Ala Asn Cys
1 5 10 15

<210> 1124
<211> 34
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1124

Gly Asn Arg Gly Arg Gly Gln Arg Arg Asp Trp Ser Arg Ala Pro Pro
1 5 10 15

Pro Pro Glu Glu Arg Gln Glu Thr Arg Ser Gln Thr Pro Ala Pro Lys
20 25 30

Pro Ser

<210> 1125
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1125

Gly Pro Gly Glu Val Trp Val Thr
1 5

<210> 1126
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1126

Gly Pro Met Arg Leu Arg His Gly Ala Asp Thr Arg Cys Gly Arg Leu
1 5 10 15

Ile

<210> 1127
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1127

Gly Pro Asn His Thr Lys Val
1 5

<210> 1128
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1128

Gly Pro Arg Gln Ala Gln Val Ser Phe
1   5

<210> 1129
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1129

Gly Pro Arg Gln Ala Gln Val Ser Phe Leu Gln Gly Asp Gln Ser
1   5   10   15

<210> 1130
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1130

Gly Pro Arg Gln Ala Gln Val Ser Phe Leu Gln Gly Asp Gln Ser Glu
1   5   10   15

Asn Glu Leu Pro
            20

<210> 1131
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1131

Gly Arg Gly Tyr Asn Val Ser Ser Ile Val Thr Met Thr Ser Gln
1   5   10   15

<210> 1132
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1132

Gly Arg Thr Pro Phe Ile Ile
1 5

<210> 1133
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1133

Gly Ser Pro Asn Cys His Gly Pro Asp Trp Ala Ser Pro Val Cys
1 5 10 15

<210> 1134
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1134

Gly Ser Gln Ala Arg Lys Cys Gly Leu His Ile Arg Ala Gly Pro
1 5 10 15

<210> 1135
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1135

Gly Ser Ser Asn Ser Ala Phe Val Ser Thr Ser Ser Ser Arg Arg
1 5 10 15

<210> 1136
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1136

Gly Ser Thr Lys Ser Cys Ala Arg Thr Leu Val Ser Gly Ser Phe
1 5 10 15

<210> 1137
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1137

Gly Ser Tyr Tyr Lys Gln Tyr His Pro Thr Ala Cys Glu Val Glu
1 5 10 15

<210> 1138
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1138

Gly Thr His Thr Thr Ala Val Ser Glu Thr Arg Gln Thr Trp Ala
1 5 10 15

<210> 1139
<211> 15
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 1139

Gly Thr Ile Ile Asn Gln Asp Pro Asp Lys Ile Leu Thr Tyr Ile
1   5   10   15

<210> 1140
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1140

Gly Thr Leu Val Arg Met Ala Pro Val Ile Gly
1   5   10

<210> 1141
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1141

Gly Thr Pro Leu Asp Ile Asp Thr Ala Ser Glu Ser Ser
1   5   10

<210> 1142
<211> 28
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1142

Gly Thr Tyr Leu Gly Gln Ala Tyr Gly Gly Ile Ile Lys Asp Ala Pro
1   5   10   15

Pro Gly Ala Gly Phe Ile Tyr Arg Glu Thr Phe Cys
            20   25

<210> 1143
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1143

Gly Val Ala Thr Lys Gly Leu Gly Val His Ala Lys Ser Ser Asp Trp
1   5   10   15

Gly

<210> 1144
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1144

Gly Val Leu Leu Pro Thr Ile Pro Gly Lys Leu Asp Val Asn Lys Ser
1   5   10   15

Lys Thr His Ile
            20

<210> 1145
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1145

Gly Val Leu Ser Val Asp Leu Ser Leu Thr Val Glu Leu Lys Ile
1   5   10   15

<210> 1146
<211> 15

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1146

Gly Val Pro Ile Glu Leu Gln Val Glu Cys Phe Thr Trp Asp Gln
1 5 10 15

<210> 1147
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1147

Gly Val Ser Cys Thr Val Thr Arg Glu Asp Gly Thr Asn Arg Arg
1 5 10 15

<210> 1148
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1148

Gly Val Ser Tyr Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val
1 5 10 15

<210> 1149
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1149

Gly Tyr Asn Val Ser Ser Ile Val Thr Met Thr Ser Gln Gly Met
1 5 10 15

<210> 1150
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1150

His Phe Cys Val Leu Ala Asp Ser Glu Ser Gly Gly His Ile Thr
1 5 10 15

<210> 1151
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1151

His Gly Glu Asp Ser Ile Thr Ile Pro Tyr Gln Gly Ser Gly Lys
1 5 10 15

<210> 1152
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1152

His Gly Pro Asp Trp Ala Ser Pro
1 5

<210> 1153
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1153

His Gly Pro Asp Trp Ala Ser Pro Val Cys Gln Arg His Ser Pro
1   5   10   15

<210> 1154
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1154

His Gly Pro Asp Trp Ala Ser Pro Val Cys Gln Arg His Ser Pro Asp
1   5   10   15

Cys Ser Arg Leu Val Gly
            20

<210> 1155
<211> 33
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1155

His Gly Pro Asp Trp Ala Ser Pro Val Cys Gln Arg His Ser Pro Asp
1   5   10   15

Cys Ser Arg Leu Val Gly Ala Thr Pro Glu Arg Pro Arg Leu Arg Leu
            20   25   30

Val

<210> 1156
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1156

His Ile Thr His Ser Gly Met Glu Gly Met Gly Val Ser Cys Thr
1 5 10 15

<210> 1157
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1157

His Lys Ser Leu Ser Thr Asn Leu Asp Val Thr Asn Ser Ile Glu
1 5 10 15

<210> 1158
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1158

His Leu Met Ile Asp Arg Pro Tyr Val
1 5

<210> 1159
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1159

His Leu Pro Thr Gly Thr Pro Leu Asp Ile Asp Thr Ala
1 5 10

<210> 1160
<211> 24
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 1160

His Leu Pro Thr Gly Thr Pro Leu Asp Ile Asp Thr Ala Thr Glu Ser
1   5   10   15

Ser Gln Asp Pro Gln Asp Ser Arg
            20

<210> 1161
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1161

His Met Thr Asn Tyr Leu Glu Gln Pro Val Ser Asn Asp Leu Ser
1   5   10   15

<210> 1162
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1162

His Gln Ser Leu Val Ile Lys Leu Met Pro Asn Ile Thr Leu Leu
1   5   10   15

<210> 1163
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1163

His Arg Ala Ala Ile Tyr Thr Ala Glu Ile His Lys Ser Leu Ser
1   5   10   15

<210> 1164
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1164

His Arg Met Gln Glu Ala Val Glu Ala Glu Arg Ala Gly Arg Gly Thr
1 5 10 15

Gly His

<210> 1165
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1165

His Val Asp Thr Glu Ser Tyr Phe Ile Val Leu Ser Ile Ala Tyr
1 5 10 15

<210> 1166
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1166

His Trp Gly Asn Leu Ser Lys Ile Gly Val Val Gly Ile Gly Ser
1 5 10 15

<210> 1167
<211> 15
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 1167

His Trp Trp Gln Leu Thr Leu Gly Ala Thr Cys Ala Leu Pro Leu
1 5 10 15

<210> 1168
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1168

His Tyr Arg Asn Ala Ser Asp Val Leu Pro Gly His Trp Leu Gln Gly
1 5 10 15

Gly Trp Gly Cys Tyr Asn Leu
20

<210> 1169
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1169

Ile Asp Leu Gly Pro Pro Ile Ser Leu Glu Arg Leu Asp Val Gly
1 5 10 15

<210> 1170
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1170

Ile Glu Ala Ile Arg Gln Ala Gly Gln Glu Met Ile Leu Ala Val
1 5 10 15

<210> 1171
<211> 9
<212> PRT
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<220>
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<400> 1171

Ile Glu Thr Arg Ser Ala Arg His Pro
1 5

<210> 1172
<211> 15
<212> PRT
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<400> 1172

Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
1 5 10 15

<210> 1173
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<212> PRT
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<220>
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<400> 1173

Ile Lys Gly Val Ile Val His Arg Leu Glu Gly Val Ser Tyr Asn
1 5 10 15

<210> 1174
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1174

Ile Lys His Ile Ile Ile Val Pro Ile Pro Gly Asp Ser Ser Ile
1   5   10   15

<210> 1175
<211> 20
<212> PRT
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<220>
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<400> 1175

Ile Lys His Ile Ile Ile Val Pro Ile Pro Gly Asp Ser Ser Ile Thr
1   5   10   15

Thr Arg Ser Arg
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<210> 1176
<211> 7
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<400> 1176

Ile Lys Leu Lys Asp Cys Pro
1   5

<210> 1177
<211> 15
<212> PRT
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<220>
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<400> 1177

Ile Lys Leu Met Pro Asn Ile Thr Leu Leu Asn Asn Cys Thr Arg
1   5   10   15

<210> 1178
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<400> 1178

Ile Leu Leu Glu Arg Leu Asp Val Gly Thr
1 5 10

<210> 1179
<211> 10
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<400> 1179

Ile Leu Pro Gly Gln Asp Leu Gln Tyr Val
1 5 10

<210> 1180
<211> 15
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<400> 1180

Ile Leu Thr Tyr Ile Ala Ala Asp His Cys Pro Val Val Glu Val
1 5 10 15

<210> 1181
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<400> 1181

Ile Asn Gln Asp Pro Asp Lys Ile Leu Thr Tyr
1 5 10

<210> 1182
<211> 15
<212> PRT
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<400> 1182

Ile Pro Arg Phe Lys Val Ser Pro Tyr Leu Phe Asn Val Pro Ile
1   5   10   15

<210> 1183
<211> 15
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<400> 1183

Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly Asp Ile Asn Lys Val
1   5   10   15

<210> 1184
<211> 15
<212> PRT
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<220>
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<400> 1184

Ile Arg Ala Gly Pro Tyr Gly His Ala Thr Val Glu Met Pro Glu
1   5   10   15

<210> 1185
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<212> PRT
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<220>
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<400> 1185

Ile Arg Met Gly Thr Asp Lys

1 5

<210> 1186
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1186

Ile Ser Asn Phe Asp Glu Ser Ser Cys Thr Phe Met Pro Glu Gly
1 5 10 15

<210> 1187
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1187

Ile Thr Ala Gly Ile Ala Leu His Gln Ser Met Leu Asn Ser Gln
1 5 10 15

<210> 1188
<211> 15
<212> PRT
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<220>
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<400> 1188

Ile Thr Asp Asp Pro Asp Val Ser Ile Arg Leu Leu Glu Val Val
1 5 10 15

<210> 1189
<211> 20
<212> PRT
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<220>
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<400> 1189

Ile Thr Asp Asp Pro Asp Val Ser Ile Arg Leu Leu Glu Val Val Gln
1 5 10 15

Ser Asp Gln Ser
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<210> 1190
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<220>
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<400> 1190

Ile Thr Thr Tyr Val
1 5

<210> 1191
<211> 15
<212> PRT
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<220>
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<400> 1191

Ile Val Glu Ala Gly Leu Ala Ser Phe Ile Leu Thr Ile Lys Phe
1 5 10 15

<210> 1192
<211> 20
<212> PRT
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<220>
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<400> 1192

Ile Val Glu Ala Gly Leu Ala Ser Phe Ile Leu Thr Ile Lys Phe Gly
1 5 10 15

Ile Glu Thr Met

20

<210> 1193
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<212> PRT
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<220>
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<400> 1193

Ile Val Glu Ala Gly Leu Ala Ser Phe Ile Leu Thr Ile Lys Phe Gly
1 5 10 15

Ile Glu Thr Met Tyr Pro Ala Leu Gly
20 25

<210> 1194
<211> 16
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<220>
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<400> 1194

Lys Ala Leu Glu Ala Gln Ser Arg Ala Leu Arg Ala Glu Leu Ala Ala
1 5 10 15

<210> 1195
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1195

Lys Ala Arg Ile Thr His Val Asp Thr Glu Ser Tyr Phe Ile Val
1 5 10 15

<210> 1196
<211> 15
<212> PRT
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<220>
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<400> 1196

Lys Cys Gly Leu His Ile Arg Ala Gly Pro Tyr Gly His Ala Thr
1   5   10   15

<210> 1197
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1197

Lys Cys Tyr Thr Thr Gly Thr Ile Ile Asn Gln Asp Pro Asp Lys
1   5   10   15

<210> 1198
<211> 10
<212> PRT
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<220>
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<400> 1198

Lys Asp Asn Pro His Pro Lys Gly Ser Arg
1   5   10

<210> 1199
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1199

Lys Asp Asn Arg Ile Pro Ser Tyr Gly Val Leu Ser Val Asp Leu
1   5   10   15

<210> 1200

<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1200

Lys Phe Leu Asn Pro Asp Arg Glu Tyr Asp Phe Arg Asp Leu Thr
1   5   10   15

<210> 1201
<211> 9
<212> PRT
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<220>
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<400> 1201

Lys Phe Val Thr Ala Ala Leu Leu Asn
1   5

<210> 1202
<211> 11
<212> PRT
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<220>
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<400> 1202

Lys Gly Asn Cys Ser Gly Pro Thr Thr Ile Arg
1   5   10

<210> 1203
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1203

Lys Ile Lys Phe Leu Asn Pro Asp Arg Glu Tyr Asp Phe Arg Asp
1   5   10   15

<210> 1204
<211> 15
<212> PRT
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<220>
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<400> 1204

Lys Ile Val Asp Gly Gly Cys Phe Ala Pro Trp Asp Leu Glu Ala
1 5 10 15

<210> 1205
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1205

Lys Leu Gly Leu Lys Leu Leu Arg Tyr Tyr Thr Glu Ile Leu Ser
1 5 10 15

<210> 1206
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1206

Lys Leu Gly Val Trp Lys Ser Pro Thr Asp Met Gln Ser Trp Val
1 5 10 15

<210> 1207
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<220>
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<400> 1207

Lys Leu Lys Glu Cys Pro Gln
1 5

<210> 1208
<211> 9
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<220>
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<400> 1208

Lys Leu Leu Arg Tyr Tyr Thr Glu Ile
1 5

<210> 1209
<211> 10
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<220>
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<400> 1209

Lys Leu Met Pro Phe Ser Gly Asp Phe Val
1 5 10

<210> 1210
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<212> PRT
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<220>
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<400> 1210

Lys Leu Met Pro Asn Ile Thr Leu Leu
1 5

<210> 1211
<211> 26
<212> PRT
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<220>

<223> Synthetic

<400> 1211

Lys Leu Arg Met Glu Thr Cys Phe Gln Gln Ala Cys Lys Gly Lys Ile
1 5 10 15

Gln Ala Leu Cys Glu Asn Pro Glu Trp Ala
20 25

<210> 1212
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<212> PRT
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<220>
<223> Synthetic

<400> 1212

Lys Leu Trp Cys Arg His Phe Cys Val
1 5

<210> 1213
<211> 10
<212> PRT
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<220>
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<400> 1213

Lys Leu Trp Cys Arg His Phe Cys Val Leu
1 5 10

<210> 1214
<211> 9
<212> PRT
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<220>
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<400> 1214

Lys Leu Trp Glu Ser Pro Gln Glu Ile
1 5

<210> 1215
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1215

Lys Met Ser Ser Ala Val Gly Phe Val
1   5

<210> 1216
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1216

Lys Met Ser Ser Ala Val Gly Phe Val Pro Asp Thr Gly Pro Ala Ser
1   5   10   15

Arg

<210> 1217
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1217

Lys Met Val Tyr Ala Thr Asn
1   5

<210> 1218
<211> 15
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<220>

<223> Synthetic

<400> 1218

Lys Pro Asp Leu Thr Gly Thr Ser Lys Ser Tyr Val Arg Ser Leu
1   5   10   15

<210> 1219
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1219

Lys Pro Asn Leu Ser Ser Lys Arg Ser Glu Leu Ser Gln Leu Ser
1   5   10   15

<210> 1220
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1220

Lys Pro Asn Leu Ser Ser Lys Arg Ser Glu Leu Ser Gln Leu Ser Met
1   5   10   15

Tyr Arg Val Phe
            20

<210> 1221
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1221

Lys Gln Ser Arg Gly Glu Ala Arg Glu Ser Tyr Arg Glu Thr Gly
1   5   10   15

<210> 1222
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1222

Lys Gln Ser Arg Gly Glu Ala Arg Glu Ser Tyr Arg Glu Thr Gly Pro
1 5 10 15

Ser Arg Ala Ser
20

<210> 1223
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1223

Lys Arg Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val
1 5 10 15

<210> 1224
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1224

Lys Arg Thr Pro Gly Asn Lys Pro Arg Ile Ala Glu Met Ile Cys
1 5 10 15

<210> 1225
<211> 20
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 1225

Lys Arg Thr Pro Gly Asn Lys Pro Arg Ile Ala Glu Met Ile Cys Asp
1   5   10   15

Ile Asp Thr Tyr
            20

<210> 1226
<211> 26
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1226

Lys Ser Asn His Asn Asn Val Tyr Trp Leu Thr Ile Pro Pro Met Lys
1   5   10   15

Asn Leu Ala Leu Gly Val Ile Asn Thr Leu
            20   25

<210> 1227
<211> 9
<212> PRT
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<220>
<223> Synthetic

<400> 1227

Lys Val Ser Pro Tyr Leu Phe Asn Val
1   5

<210> 1228
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1228

Lys Val Val Gln Leu Pro Lys Ile Ser Lys Asn Ala Leu Lys Ala Asn
1 5 10 15

Gly

<210> 1229
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1229

Lys Val Val Gln Leu Pro Lys Ile Ser Lys Asn Ala Leu Arg Asn Asp
1 5 10 15

Gly

<210> 1230
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1230

Leu Ala His Arg Arg Ile Pro Pro Glu Asn Ile Arg
1 5 10

<210> 1231
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1231

Leu Ala Leu Ala Leu Trp Ala Gly Phe Ala Leu Ser
1 5 10

<210> 1232
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1232

Leu Ala Pro Gly Gly Gly Asn Cys His Leu Thr Val Asn Gly Glu
1 5 10 15

<210> 1233
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1233

Leu Ala Gln Ile Trp Val Leu Leu Ala Lys Ala Val Thr Ala Pro
1 5 10 15

<210> 1234
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1234

Leu Ala Gln Ile Trp Val Leu Leu Ala Lys Ala Val Thr Ala Pro Asp
1 5 10 15

Thr Ala Ala Asp
20

<210> 1235
<211> 29
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1235

Leu Ala Ser Tyr Phe Asn Pro Gly Gly Ser Tyr Tyr Lys Gln Tyr His
1   5   10   15

Pro Thr Ala Cys Glu Val Glu Pro Ala Phe Gly His Ser
            20   25

<210> 1236
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1236

Leu Ala Val Ser Lys Gly Asn Cys Ser Gly Pro Thr Thr Ile Arg
1   5   10   15

<210> 1237
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1237

Leu Cys Glu Asn Pro Glu Trp Ala Pro Leu Lys Asp Asn Arg Ile
1   5   10   15

<210> 1238
<211> 9
<212> PRT
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<220>
<223> Synthetic

<400> 1238

Leu Asp Arg Leu Val Arg Leu Ile Gly
1   5

<210> 1239
<211> 9
<212> PRT
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<220>
<223> Synthetic

<400> 1239

Leu Glu Glu Glu Gly Val Thr Pro Leu
1 5

<210> 1240
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1240

Leu Glu His Arg Met Gln Glu Ala Val Glu Ala Glu Arg Ala Gly Arg
1 5 10 15

Gly Thr Gly His Phe Ile
20

<210> 1241
<211> 15
<212> PRT
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<220>
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<400> 1241

Leu Glu Lys Leu Gly Tyr Ser Gly Gly Asp Leu Leu Gly Ile Leu
1 5 10 15

<210> 1242
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1242

Leu Glu Gln Pro Val Ser Asn Asp Leu Ser
1   5   10

<210> 1243
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1243

Leu Glu Arg Lys Trp Leu Asp Val Val Arg Asn Ile Ile Ala Glu
1   5   10   15

<210> 1244
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1244

Leu Glu Arg Lys Trp Leu Asp Val Val Arg Asn Ile Ile Ala Glu Asp
1   5   10   15

Leu Ser Leu Arg
            20

<210> 1245
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1245

Leu Phe Gly Pro Ser Leu Arg Asp Pro Ile Ser Ala Glu Ile Ser
1   5   10   15

<210> 1246
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1246

Leu Gly Glu Leu Lys Leu Ala Ala Leu Cys His Gly Glu Asp Ser
1 5 10 15

<210> 1247
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1247

Leu Gly Gly Lys Glu Asp Arg Arg Val Lys Gln Ser Arg
1 5 10

<210> 1248
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1248

Leu Gly His Asp Gly His His Gly Gly Thr Leu Arg Val Gly Gln His
1 5 10 15

His Arg Asn Ala Ser Asp Val Leu
20

<210> 1249
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1249

Leu Gly Ser Pro Asn Cys His Gly Pro Asp Trp Ala Ser Pro Val Cys
1   5   10   15

Gln Arg His Ser
            20

<210> 1250
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1250

Leu Gly Ser Pro Asn Cys His Gly Pro Asp Trp Ala Ser Pro Val Cys
1   5   10   15

Gln Arg His Ser Pro Asp Cys Ser Arg Leu Val
            20   25

<210> 1251
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1251

Leu His Asp Pro Asp Thr Glu Ala Pro Thr Glu Ala Cys Val Thr Ser
1   5   10   15

Trp Leu

<210> 1252
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1252

Leu Ile Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Thr Thr
1   5   10   15

<210> 1253
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1253

Leu Ile Gly Leu Leu Ala Ile Ala Gly Ile Arg Leu His Arg Ala Ala
1   5   10   15

Ile Tyr Thr Ala Glu Ile His Lys
            20

<210> 1254
<211> 15
<212> PRT
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<220>
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<400> 1254

Leu Ile Pro Ser Met Asn Gln Leu Ser Cys Asp Leu Ile Gly Gln
1   5   10   15

<210> 1255
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1255

Leu Lys Ile Lys Ile Ala Ser Gly Phe Gly Pro Leu Ile Thr His

1 5 10 15

<210> 1256
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1256

Leu Lys Ile Lys Ile Ala Ser Gly Phe Gly Pro Leu Ile Thr His Gly
1 5 10 15

Ser Gly Met Asp Leu Tyr Lys
20

<210> 1257
<211> 7
<212> PRT
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<220>
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<400> 1257

Leu Lys Leu Tyr Phe Glu Pro
1 5

<210> 1258
<211> 10
<212> PRT
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<220>
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<400> 1258

Leu Leu Ala Val Leu Phe Val Met Phe Leu
1 5 10

<210> 1259
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<212> PRT
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<220>
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<400> 1259

Leu Leu Asp Arg Leu Val Arg Leu Ile Gly Asn Pro Asp Val Ser
1   5   10   15

<210> 1260
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<212> PRT
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<220>
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<400> 1260

Leu Leu Asp Arg Leu Val Arg Leu Ile Gly Asn Pro Asp Val Ser Gly
1   5   10   15

Pro Lys Leu Thr
            20

<210> 1261
<211> 15
<212> PRT
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<220>
<223> Synthetic

<400> 1261

Leu Leu Glu Ser Ser Asp Gln Ile Leu Arg Ser Met Lys Gly Leu
1   5   10   15

<210> 1262
<211> 15
<212> PRT
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<220>
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<400> 1262

Leu Leu Glu Thr Arg Thr Thr Asn Gln Phe Leu Ala Val Ser Lys

1 5 10 15

<210> 1263
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1263

Leu Leu Glu Val Val Gln Ser Asp Gln Ser Gln Ser Gly Leu Thr
1 5 10 15

<210> 1264
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1264

Leu Leu Glu Val Val Gln Ser Asp Gln Ser Gln Ser Gly Leu Thr Phe
1 5 10 15

Ala Ser Arg

<210> 1265
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1265

Leu Leu Glu Val Val Gln Ser Asp Gln Ser Gln Ser Gly Leu Thr Phe
1 5 10 15

Ala Ser Arg Gly
20

<210> 1266
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1266

Leu Leu Gly Ile Leu Glu Ser Arg Gly Ile Lys Ala Arg Ile Thr
1 5 10 15

<210> 1267
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1267

Leu Leu Arg Thr Ala Pro Gly Pro
1 5

<210> 1268
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1268

Leu Leu Arg Tyr Tyr Thr Glu Ile Leu Ser Leu Phe Gly Pro Ser
1 5 10 15

<210> 1269
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1269

Leu Leu Val Pro Trp Val Leu Ile Phe Met Val Cys Arg Arg Ala Cys

1 5 10 15

Arg Arg Arg Gly
20

<210> 1270
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1270

Leu Leu Trp Arg Ser Arg Cys Lys Ile Val
1 5 10

<210> 1271
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1271

Leu Leu Trp Ser Tyr Ala Met Gly Val
1 5

<210> 1272
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1272

Leu Leu Trp Ser Tyr Ala Met Gly Val Gly Val Glu Leu Glu Asn
1 5 10 15

<210> 1273
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1273

Leu Leu Trp Ser Tyr Ala Met Gly Val Gly Val Glu Leu Glu Asn Ser
1   5   10   15

Met Gly Gly Leu
            20

<210> 1274
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1274

Leu Met Ile Asp Arg Pro Tyr Val Leu
1   5

<210> 1275
<211> 15
<212> PRT
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<220>
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<400> 1275

Leu Asn Ala Met Thr Gln Asn Ile Arg Pro Val Gln Ser Val Ala
1   5   10   15

<210> 1276
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<212> PRT
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<220>
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<400> 1276

Leu Asn Thr Pro Pro Pro Tyr Gln Val Ser Cys Gly Gly Glu Ser

1 5 10 15

<210> 1277
<211> 15
<212> PRT
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<220>
<223> Synthetic

<400> 1277

Leu Arg Asp Pro Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser
1 5 10 15

<210> 1278
<211> 16
<212> PRT
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<220>
<223> Synthetic

<400> 1278

Leu Arg Gly Ser Gly Asp Leu Gln Glu Tyr Leu Arg His Val Thr Arg
1 5 10 15

<210> 1279
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<400> 1279

Leu Arg Leu Val Asp Ala Asp Asp
1 5

<210> 1280
<211> 12
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<213> Artificial Sequence

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<400> 1280

Leu Arg Leu Val Asp Ala Asp Asp Pro Leu Leu Arg
1 5 10

<210> 1281
<211> 31
<212> PRT
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<400> 1281

Leu Arg Leu Val Asp Ala Asp Asp Pro Leu Leu Arg Thr Ala Pro Gly
1 5 10 15

Pro Gly Glu Val Trp Val Thr Pro Val Ile Gly Ser Gln Ala Arg
20 25 30

<210> 1282
<211> 28
<212> PRT
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<400> 1282

Leu Arg Arg Leu Leu Tyr Met Ile Tyr Met Ser Gly Leu Ala Val Arg
1 5 10 15

Val His Val Ser Lys Glu Glu Gln Tyr Tyr Asp Tyr
20 25

<210> 1283
<211> 8
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<220>
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<400> 1283

Leu Arg Thr Ala Pro Gly Pro Gly

1 5

<210> 1284
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1284

Leu Arg Val Gly Gln His Tyr Arg Asn Ala Ser Asp Val Leu Pro Gly
1 5 10 15

His Trp Leu Gln
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<210> 1285
<211> 5
<212> PRT
<213> Artificial Sequence

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<400> 1285

Leu Arg Tyr Leu Ala
1 5

<210> 1286
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1286

Leu Ser Cys Lys Pro Trp Gln Glu Ser Arg Lys Asn Lys
1 5 10

<210> 1287
<211> 15
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<400> 1287

Leu Ser Glu Ile Lys Gly Val Ile Val His Arg Leu Glu Gly Val
1   5   10   15

<210> 1288
<211> 15
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<400> 1288

Leu Ser Ile Ala Tyr Pro Thr Leu Ser Glu Ile Lys Gly Val Ile
1   5   10   15

<210> 1289
<211> 15
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<400> 1289

Leu Ser Leu Leu Asp Leu Tyr Leu Gly Arg Gly Tyr Asn Val Ser
1   5   10   15

<210> 1290
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<220>
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<400> 1290

Leu Ser Gln Gly Asn Leu Ile Ala Asn Cys Ala Ser Ile Leu Cys
1   5   10   15

<210> 1291

<211> 15
<212> PRT
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<400> 1291

Leu Ser Ser His Arg Gly Val Ile Ala Asp Asn Gln Ala Lys Trp
1 5 10 15

<210> 1292
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1292

Leu Ser Val Asp Leu Ser Leu Thr Val Glu Leu Lys Ile Lys Ile
1 5 10 15

<210> 1293
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1293

Leu Thr Gly Ile Ser Ile Cys Asn Pro Gly Ser Ser Leu Cys
1 5 10

<210> 1294
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1294

Leu Thr Ile Lys Phe Gly Ile Glu Thr Met Tyr Pro Ala Leu Gly
1 5 10 15

<210> 1295
<211> 20
<212> PRT
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<220>
<223> Synthetic

<400> 1295

Leu Thr Ile Lys Phe Gly Ile Glu Thr Met Tyr Pro Ala Leu Gly Leu
1 5 10 15

His Glu Phe Ala
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<210> 1296
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1296

Leu Thr Leu Gln Thr Pro Thr Gly Gln Ile His Trp Gly Asn Leu
1 5 10 15

<210> 1297
<211> 8
<212> PRT
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<220>
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<400> 1297

Leu Val Asp Ala Asp Asp Pro Leu
1 5

<210> 1298
<211> 10
<212> PRT
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<220>
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<400> 1298

Leu Val Asp Ala Asp Asp Pro Leu Leu Arg
1   5   10

<210> 1299
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1299

Leu Val Glu Lys Pro Asn Leu Ser Ser Lys Arg Ser Glu Leu Ser
1   5   10   15

<210> 1300
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<212> PRT
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<220>
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<400> 1300

Leu Val Gly Ala Thr Pro Glu
1   5

<210> 1301
<211> 8
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<220>
<223> Synthetic

<400> 1301

Leu Val Gly Ala Thr Pro Glu Arg
1   5

<210> 1302
<211> 15

<212> PRT
<213> Artificial Sequence

<220>
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<400> 1302

Leu Val Lys Leu Gly Val Trp Lys Ser Pro Thr Gly Met Gln Ser
1 5 10 15

<210> 1303
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1303

Leu Val Ser Gly Ser Phe Gly Asn Arg Phe Ile Leu Ser Gln Gly Asn
1 5 10 15

Leu Ile

<210> 1304
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1304

Leu Tyr Lys Ser Asn His Asn Asn Val Tyr Trp Leu Thr Ile Pro
1 5 10 15

<210> 1305
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1305

Leu Tyr Pro Met Ser Pro Leu Leu Gln Glu Cys Leu Arg Gly Ser Thr
1   5   10   15

Lys Ser Cys Ala Arg Thr Leu Val Ser
            20   25

<210> 1306
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1306

Met Ala Ser Thr Thr Pro Ile Thr Met Glu Asp Leu Gln Lys Ala Leu
1   5   10   15

Glu Ala

<210> 1307
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1307

Met Ala Ser Thr Thr Pro Ile Thr Met Glu Asp Leu Gln Lys Ala Leu
1   5   10   15

Glu Ala Gln Ser Arg
            20

<210> 1308
<211> 29
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1308

Met Ala Ser Thr Thr Pro Ile Thr Met Glu Asp Leu Gln Lys Ala Leu
1 5 10 15

Glu Ala Gln Ser Arg Ala Leu Arg Ala Glu Leu Ala Ala
20 25

<210> 1309
<211> 29
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1309

Met Ala Ser Thr Thr Pro Ile Thr Met Glu Asp Leu Gln Lys Ala Leu
1 5 10 15

Glu Ala Gln Ser Arg Ala Leu Arg Ala Gly Leu Ala Ala
20 25

<210> 1310
<211> 29
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1310

Met Ala Ser Thr Thr Pro Ile Thr Met Glu Asp Leu Gln Lys Ala Leu
1 5 10 15

Glu Thr Gln Ser Arg Val Leu Arg Ala Gly Leu Thr Ala
20 25

<210> 1311
<211> 15
<212> PRT
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<220>
<223> Synthetic

<400> 1311

Met Ala Thr Leu Leu Arg Ser Leu Ala Leu Phe Lys Arg Asn Lys
1 5 10 15

<210> 1312
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1312

Met Ala Thr Leu Leu Arg Ser Leu Ala Leu Phe Lys Arg Asn Lys Asp
1 5 10 15

Lys Pro Pro Ile
20

<210> 1313
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1313

Met Asp Leu Tyr Lys Ser Asn His Asn Asn Val Tyr Trp Leu Thr
1 5 10 15

<210> 1314
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1314

Met Glu Asp Leu Gln Lys Ala Leu Glu Ala Gln Ser Arg Ala
1 5 10

<210> 1315
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1315

Met Glu Asp Leu Gln Lys Ala Leu Glu Ala Gln Ser Arg Ala Leu Arg
1 5 10 15

Ala Glu Leu Ala Ala
20

<210> 1316
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1316

Met Gly Leu Lys Val Asn Val Ser Ala Ile Phe Met Ala Val Leu
1 5 10 15

<210> 1317
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1317

Met Ile Asp Arg Pro Tyr Val Leu Leu Ala Val Leu Phe Val Met
1 5 10 15

<210> 1318
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1318

Met Ile Leu Ala Val Gln Gly Val Gln Asp Tyr Ile Asn Asn Glu
1 5 10 15

<210> 1319
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1319

Met Leu Asn Ser Gln Ala Ile Asp Asn Leu Arg Ala Ser Leu Glu
1 5 10 15

<210> 1320
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1320

Met Asn Ala Leu Val Asn Ser Thr Leu Leu Glu Thr Arg Thr Thr
1 5 10 15

<210> 1321
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1321

Met Asn Tyr Thr Gly Asn Gln Gln Ser Arg Trp Gly Leu Gly Ser Pro
1 5 10 15

Asn Cys His Gly Pro Asp Trp Ala Ser Pro Val Cys Gln Arg His Ser
20 25 30

<210> 1322
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1322

Met Gln Ser Trp Val Pro Leu Ser Thr Asp Asp Pro Val Ile Asp
1 5 10 15

<210> 1323
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1323

Met Ser Leu Ser Leu Leu Asp Leu Tyr Leu Gly Arg Gly Tyr Asn
1 5 10 15

<210> 1324
<211> 15
<212> PRT
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<220>
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<400> 1324

Met Ser Pro Leu Leu Gln Glu Cys Leu Arg Gly Ser Thr Lys Ser
1 5 10 15

<210> 1325
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1325

Met Ser Pro Gln Arg Asp Arg Ile Asn Ala Phe Tyr Lys Asp Asn

1 5 10 15

<210> 1326
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1326

Met Tyr Arg Val Phe Glu Val Ser Val Ile Arg Asn Pro Gly Leu
1 5 10 15

<210> 1327
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1327

Asn Ala Leu Tyr Pro Met Ser Pro Leu Leu Gln Glu Cys Leu Arg
1 5 10 15

<210> 1328
<211> 26
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1328

Asn Cys His Gly Pro Asp Trp Ala Ser Pro Val Cys Gln Arg His Ser
1 5 10 15

Pro Asp Cys Ser Arg Leu Val Gly Ala Thr
20 25

<210> 1329
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1329

Asn Phe Gly Arg Ser Tyr Phe Asp Pro Ala Tyr Phe Arg Leu Gly
1   5   10   15

<210> 1330
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1330

Asn Phe Gly Arg Ser Tyr Phe Asp Pro Ala Tyr Phe Arg Leu Gly Gln
1   5   10   15

Glu Met Val Arg
            20

<210> 1331
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1331

Asn Gly Thr Gln Arg Ala Cys Thr Phe Trp Ala Val Asn Ala Tyr
1   5   10   15

<210> 1332
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1332

Asn Gly Val Thr Ile Gln Val Gly Ser Arg Arg Tyr Pro Asp Ala

1 5 10 15

<210> 1333
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1333

Asn Ile Ile Ala Glu Asp Leu Ser Leu Arg Arg Phe Met Val Ala
1 5 10 15

<210> 1334
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1334

Asn Ile Ile Ala Glu Asp Leu Ser Leu Arg Arg Phe Met Val Ala Leu
1 5 10 15

Ile Leu Asp Ile
20

<210> 1335
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1335

Asn Ile Thr Leu Leu Asn Asn Cys Thr Arg Val Glu Ile Ala Glu
1 5 10 15

<210> 1336
<211> 15
<212> PRT
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<220>
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<400> 1336

Asn Leu Ala Leu Gly Val Ile Asn Thr Leu Glu Trp Ile Pro Arg
1   5   10   15

<210> 1337
<211> 18
<212> PRT
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<220>
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<400> 1337

Asn Leu Phe Gln Val Val His Trp Ser Tyr Asn Arg Pro Ala Tyr Ser
1   5   10   15

Pro Gly

<210> 1338
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1338

Asn Leu Val Ile Leu Pro Gly Gln Asp Leu Gln Tyr Val Leu Ala
1   5   10   15

<210> 1339
<211> 15
<212> PRT
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<220>
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<400> 1339

Asn Leu Tyr Gln Gln Met Gly Lys Pro Ala Pro Tyr Met Val Asn

1 5 10 15

<210> 1340
<211> 20
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<220>
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<400> 1340

Asn Leu Tyr Gln Gln Met Gly Lys Pro Ala Pro Tyr Met Val Asn Leu
1 5 10 15

Glu Asn Ser Ile
20

<210> 1341
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1341

Asn Asn Cys Thr Arg Val Glu Ile Ala Glu Tyr Arg Arg Leu Leu
1 5 10 15

<210> 1342
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1342

Asn Pro Asp Arg Glu Tyr Asp Phe Arg Asp
1 5 10

<210> 1343
<211> 9
<212> PRT
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<220>
<223> Synthetic

<400> 1343

Asn Pro Asp Val Ser Gly Pro Lys Leu
1   5

<210> 1344
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1344

Asn Pro Asp Val Ser Gly Pro Lys Leu Thr Gly Ala Leu Ile Gly
1   5   10   15

<210> 1345
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1345

Asn Pro Asp Val Ser Gly Pro Lys Leu Thr Gly Ala Leu Ile Gly Ile
1   5   10   15

Leu Ser Leu Phe
            20

<210> 1346
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1346

Asn Pro Pro Glu Arg Ile Lys Leu Asp Tyr Asp Gln Tyr Cys Ala

1 5 10 15

<210> 1347
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1347

Asn Gln Ala Lys Trp Ala Val Pro Thr Thr Arg Thr Asp Asp Lys
1 5 10 15

<210> 1348
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1348

Asn Gln Asp Pro Asp Lys Ile Leu Thr Tyr Ile Ala Ala Asp His
1 5 10 15

<210> 1349
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1349

Asn Gln Leu Ser Cys Asp Leu Ile Gly Gln Lys Leu Gly Leu Lys
1 5 10 15

<210> 1350
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1350

Asn Gln Gln Ser Arg Trp Gly Leu Gly Ser Pro Asn Cys His Gly Pro
1 5 10 15

Asp Trp Ala Ser Pro Val Cys Gln Arg His Ser
20 25

<210> 1351
<211> 12
<212> PRT
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<220>
<223> Synthetic

<400> 1351

Asn Ser Thr Leu Gly Val Lys Ser Ala Arg Glu Phe
1 5 10

<210> 1352
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1352

Asn Thr Pro His Gly Gln Leu Glu Val Gln Val Pro Pro Asp Pro
1 5 10 15

<210> 1353
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1353

Asn Val Ser Ala Ile Phe Met Ala Val Leu Leu Thr Leu Gln Thr
1 5 10 15

<210> 1354

<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1354

Pro Ala Glu Val Asp Gly Asp Val Lys Leu Ser Ser Asn Leu Val
1 5 10 15

<210> 1355
<211> 15
<212> PRT
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<220>
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<400> 1355

Pro Ala Phe Gly His Ser Asp Ala Ala Cys Trp Gly Phe Pro Thr
1 5 10 15

<210> 1356
<211> 15
<212> PRT
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<220>
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<400> 1356

Pro Ala Leu Ile Cys Cys Cys Arg Gly Arg Cys Asn Lys Lys Gly
1 5 10 15

<210> 1357
<211> 13
<212> PRT
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<220>
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<400> 1357

Pro Asp Lys Ile Leu Thr Tyr Ile Ala Ala Asp His Cys
1 5 10

<210> 1358
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1358

Pro Glu Arg Ile Lys Leu Asp Tyr Asp Gln Tyr Cys Ala Asp Val
1 5 10 15

<210> 1359
<211> 8
<212> PRT
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<220>
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<400> 1359

Pro Glu Arg Pro Arg Leu Arg Leu
1 5

<210> 1360
<211> 15
<212> PRT
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<400> 1360

Pro Gly Cys Ala Thr Gln Ala Pro Val Pro Val Arg Leu Ala Gly
1 5 10 15

<210> 1361
<211> 29
<212> PRT
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<220>
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<400> 1361

Pro Gly Cys Ala Thr Gln Ala Pro Val Pro Val Arg Leu Ala Gly Val
1   5   10   15

Arg Phe Glu Ser Lys Ile Val Asp Gly Gly Cys Phe Ala
            20   25

<210> 1362
<211> 8
<212> PRT
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<220>
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<400> 1362

Pro Gly Glu Val Trp Val Thr Pro
1   5

<210> 1363
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1363

Pro Gly Glu Val Trp Val Thr Pro Val Ile Gly Ser Gln Ala Arg
1   5   10   15

<210> 1364
<211> 16
<212> PRT
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<220>
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<400> 1364

Pro Gly Lys Leu Asp Val Asn Lys Ser Lys Thr His Ile Ser Val Asn
1   5   10   15

<210> 1365
<211> 15

<212> PRT
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<220>
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<400> 1365

Pro Gly Leu Gly Ala Pro Val Phe His Met Thr Asn Tyr Leu Glu
1 5 10 15

<210> 1366
<211> 8
<212> PRT
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<220>
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<400> 1366

Pro Gly Pro Gly Glu Val Trp Val
1 5

<210> 1367
<211> 15
<212> PRT
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<220>
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<400> 1367

Pro His Lys Thr Val Arg Val Lys Phe His Thr Glu Thr Arg Thr
1 5 10 15

<210> 1368
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1368

Pro Ile Glu Leu Gln Val Glu Cys Phe Thr Trp Asp Gln Lys Leu
1 5 10 15

<210> 1369
<211> 10
<212> PRT
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<220>
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<400> 1369

Pro Ile Ser Leu Glu Arg Leu Asp Val Gly
1 5 10

<210> 1370
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1370

Pro Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly Asn
1 5 10 15

<210> 1371
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1371

Pro Lys Ala Leu Phe Thr Gln Gln Gly Gly Ala Tyr Gly Arg Cys
1 5 10 15

<210> 1372
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1372

Pro Lys Tyr Val Ala Thr Gln Gly Tyr Leu Ile Ser Asn Phe Asp
1 5 10 15

<210> 1373
<211> 13
<212> PRT
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<220>
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<400> 1373

Pro Leu Asp Ile Asp Thr Ala Ser Glu Ser Ser Gln Asp
1 5 10

<210> 1374
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1374

Pro Leu Gly Leu Lys Phe Lys Thr Val Arg Pro Val Ala Leu Pro
1 5 10 15

<210> 1375
<211> 15
<212> PRT
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<220>
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<400> 1375

Pro Leu Ile Thr His Gly Ser Gly Met Asp Leu Tyr Lys Ser Asn
1 5 10 15

<210> 1376
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1376

Pro Leu Lys Asp Asn Arg Ile Pro Ser Tyr Gly Val Leu Ser Val
1 5 10 15

<210> 1377
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1377

Pro Leu Leu Arg Thr Ala Pro Gly
1 5

<210> 1378
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1378

Pro Leu Leu Ser Cys Lys Pro Trp Gln Glu Ser Arg Lys
1 5 10

<210> 1379
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1379

Pro Pro Ala Thr Val Tyr Arg Tyr Asp Ser Arg Pro Pro Glu
1 5 10

<210> 1380
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1380

Pro Pro Ile Ser Leu Glu Arg Leu Asp Val Gly Thr
1   5   10

<210> 1381
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1381

Pro Pro Pro Pro Glu Glu Arg Gln Glu Thr Arg Ser Gln Thr Pro Ala
1   5   10   15

Pro Lys Pro Ser
            20

<210> 1382
<211> 15
<212> PRT
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<220>
<223> Synthetic

<400> 1382

Pro Gln Glu Gln Ile Thr Gln His Gly Ser Pro Tyr Gly Arg Cys
1   5   10   15

<210> 1383
<211> 18
<212> PRT
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<220>
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<400> 1383

Pro Gln Glu Gln Ile Thr Gln His Gly Ser Pro Tyr Gly Arg Cys Ala

1 5 10 15

Asn Lys

<210> 1384
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1384

Pro Gln Pro Gly Pro Gln Pro Pro Gln Pro Pro Gln Pro Gln Pro Glu
1 5 10 15

Ala Pro Ala Pro Gln Pro Pro Ala Gly
20 25

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Pro Arg Leu Gly Gly Lys Glu Asp Arg Arg Val Lys Gln
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<400> 1386

Pro Arg Leu Arg Leu Val Asp Ala
1 5

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<400> 1387

Pro Arg Asn Val Arg Val Thr Gly Cys Tyr Gln Cys Gly Thr Pro
1 5 10 15

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<400> 1388

Pro Ser Arg Ala Ser Asp Ala Arg Ala Ala His Leu Pro
1 5 10

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<400> 1389

Pro Thr Gly Gln Ile His Trp Gly Asn Leu Ser Lys Ile Gly Val
1 5 10 15

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<400> 1390

Pro Thr Gly Thr Pro Leu Asp Ile Asp Thr Ala Ser Glu

1 5 10

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<400> 1391

Pro Thr Leu Ser Glu Ile Lys Gly Val Ile Val His Arg Leu Glu
1 5 10 15

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Pro Thr Thr Ile Arg Gly Gln Phe Ser Asn Met Ser Leu Ser Leu
1 5 10 15

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Pro Thr Thr Arg Thr Asp Asp Lys Leu Arg
1 5 10

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<400> 1394

Pro Thr Thr Arg Thr Asp Asp Lys Leu Arg Met Glu Thr Cys Phe Gln
1 5 10 15

Gln Ala Cys Lys Gly
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<220>
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<400> 1395

Pro Val Ala Leu Pro Arg Thr Leu Ala Pro Pro Arg Asn Val Arg
1 5 10 15

<210> 1396
<211> 19
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<400> 1396

Pro Val Phe Ala Gly Ala Asn Tyr Ala Ala Trp Ala Val Asn Val Ala
1 5 10 15

Gln Val Ile

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<400> 1397

Pro Val Ile Gly Ser Gln Ala Arg

1 5

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<400> 1398

Pro Val Val Glu Val Asn Gly Val Thr Ile Gln Val Gly Ser Arg
1 5 10 15

<210> 1399
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<400> 1399

Pro Trp Glu Leu Val Val Leu Thr Ala Arg Pro Glu Asp Gly Trp Thr
1 5 10 15

Cys Arg Gly Val
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<210> 1400
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<220>
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<400> 1400

Pro Trp Gln Glu Ser Arg Lys Asn Lys Ala Gln Thr Arg
1 5 10

<210> 1401
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<400> 1401

Pro Tyr Met Val Asn Leu Glu Asn Ser Ile Gln Asn Lys Phe Ser
1   5   10   15

<210> 1402
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<400> 1402

Pro Tyr Met Val Asn Leu Glu Asn Ser Ile Gln Asn Lys Phe Ser Ala
1   5   10   15

Gly Ser Tyr Pro
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<400> 1403

Pro Tyr Gln Gly Ser Gly Lys Gly Val Ser
1   5   10

<210> 1404
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<212> PRT
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<220>
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<400> 1404

Pro Tyr Gln Val Ser Cys Gly Gly Glu Ser Asp Arg Ala Ser Ala

1 5 10 15

<210> 1405
<211> 13
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<400> 1405

Gln Ala Cys Lys Gly Lys Ile Gln Ala Leu Cys Glu Asn
1 5 10

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<400> 1406

Gln Ala Gly Gln Glu Met Ile Leu Ala Val Gln Gly Val Gln Asp
1 5 10 15

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<400> 1407

Gln Ala Leu Cys Glu Asn Pro Glu Cys Val Pro Leu Lys Asp Asn
1 5 10 15

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<400> 1408

Gln Ala Leu Gly Ala Leu Lys
1 5

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<211> 15
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<400> 1409

Gln Ala Pro Val Pro Val Arg Leu Ala Gly Val Arg Phe Glu Ser
1 5 10 15

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<400> 1410

Gln Cys Gly Thr Pro Ala Leu Val Glu Gly Leu Ala Pro Gly Gly
1 5 10 15

<210> 1411
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<400> 1411

Gln Asp Pro Asp Lys Ile Leu Thr Tyr Ile Ala Ala Asp His Cys
1 5 10 15

<210> 1412
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<400> 1412

Gln Glu Cys Leu Arg Gly Ser Thr Lys Ser Cys Ala Arg Thr Leu
1   5   10   15

<210> 1413
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<400> 1413

Gln Glu Gln Ile Thr Gln His Gly Ser Pro Tyr Gly Arg Cys
1   5   10

<210> 1414
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<400> 1414

Gln Glu Ser Arg Lys Asn Lys Ala Gln Thr Arg Thr Pro
1   5   10

<210> 1415
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<220>
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<400> 1415

Gln Gly Asp Gln Ser Glu Asn Glu Leu Pro Arg Leu Gly Gly Lys
1   5   10   15

<210> 1416
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<212> PRT
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<220>
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<400> 1416

Gln Gly Asp Gln Ser Glu Asn Glu Leu Pro Arg Leu Gly Gly Lys Glu
1 5 10 15

Asp Arg Arg Val
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<210> 1417
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<400> 1417

Gln Gly Glu Ser Gly His Asp Ile Lys Ile Thr Ala Glu Asn Thr Pro
1 5 10 15

Leu Pro Ile Ala
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<210> 1418
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<400> 1418

Gln Gly Ser Gly Lys Gly Val Ser Phe Gln Leu Val Lys Leu Gly
1 5 10 15

<210> 1419
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<212> PRT
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<400> 1419

Gln Gly Val Gln Asp Tyr Ile Asn Asn Glu Leu Ile Pro Ser Met
1   5   10   15

<210> 1420
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<400> 1420

Gln Leu Glu Val Gln Val Pro Pro Asp Pro Gly Asp Leu Val Glu
1   5   10   15

<210> 1421
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<400> 1421

Gln Leu Pro Glu Ala Thr Phe Met Val
1   5

<210> 1422
<211> 25
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<400> 1422

Gln Leu Pro Phe Leu Gly His Asp Gly His His Gly Gly Thr Leu Arg
1   5   10   15

Val Gly Gln His Tyr Arg Asn Ala Ser
            20   25

<210> 1423
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<400> 1423

Gln Leu Ser Met Tyr Arg Val Phe Glu Val
1 5 10

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<400> 1424

Gln Leu Ser Asn Ile Thr
1 5

<210> 1425
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<220>
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<400> 1425

Gln Asn Ile Arg Pro Val Gln Ser Val Ala Ser Ser Arg Arg His
1 5 10 15

<210> 1426
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<212> PRT
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<220>
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<400> 1426

Gln Asn Lys Phe Ser Ala Gly Ser Tyr Pro Leu Leu Trp Ser Tyr
1 5 10 15

<210> 1427
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<212> PRT
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<400> 1427

Gln Asn Lys Phe Ser Ala Gly Ser Tyr Pro Leu Leu Trp Ser Tyr Ala
1 5 10 15

Met Gly Val Gly
20

<210> 1428
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<212> PRT
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<220>
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<400> 1428

Gln Asn Lys Phe Ser Ala Gly Ser Tyr Pro Leu Leu Trp Ser Tyr Ala
1 5 10 15

Met Gly Val Gly Val Glu Leu Glu Asn
20 25

<210> 1429
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<212> PRT
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<220>
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<400> 1429

Gln Gln Ala Cys Lys Gly Lys Ile Gln Ala Leu Cys Glu Asn Pro
1 5 10 15

<210> 1430
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<400> 1430

Gln Gln Arg Arg Val Val Gly Glu Phe Arg Leu Glu Arg Lys Trp
1 5 10 15

<210> 1431
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<212> PRT
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<220>
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<400> 1431

Gln Gln Arg Arg Val Val Gly Glu Phe Arg Leu Glu Arg Lys Trp Leu
1 5 10 15

Asp Val Val Arg
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<210> 1432
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<220>
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<400> 1432

Gln Gln Thr Arg Ala Asn Pro Asn Pro Tyr Thr Ser Arg Arg Ser Val
1 5 10 15

Ala Ser

<210> 1433

<211> 15
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<220>
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<400> 1433

Gln Arg His Ser Pro Asp Cys Ser Arg Leu Val Gly Ala Thr Pro
1 5 10 15

<210> 1434
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<220>
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<400> 1434

Gln Ser Gly Leu Thr Phe Ala Ser Arg Gly Thr Asn Met Glu Asp
1 5 10 15

<210> 1435
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<212> PRT
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<220>
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<400> 1435

Gln Ser Gly Leu Thr Phe Ala Ser Arg Gly Thr Asn Met Glu Asp Glu
1 5 10 15

Ala Asp Gln Tyr
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<210> 1436
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<400> 1436

Gln Ser Ile Ala Leu Ser Ser Leu Met Val Ala Gln Ala Ile Pro Leu
1 5 10 15

Val Gly Glu Leu
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<210> 1437
<211> 15
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<220>
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<400> 1437

Gln Ser Arg Phe Gly Trp Phe Glu Asn Lys Glu Ile Ser Asp Ile
1 5 10 15

<210> 1438
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<220>
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<400> 1438

Gln Ser Arg Phe Gly Trp Phe Glu Asn Lys Glu Ile Ser Asp Ile Glu
1 5 10 15

Val Gln Asp Pro
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<220>
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<400> 1439

Gln Ser Arg Gly Glu Ala Arg

1 5

<210> 1440
<211> 18
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<220>
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<400> 1440

Gln Ser Arg Gly Glu Ala Arg Glu Ser Tyr Arg Glu Thr Gly Pro Ser
1 5 10 15

Arg Ala

<210> 1441
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<212> PRT
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<220>
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<400> 1441

Gln Thr Gly Arg Gly Gly Ser Ala Pro Arg Pro Glu Leu Gly Pro Pro
1 5 10 15

Thr Asn

<210> 1442
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1442

Gln Thr Pro Ala Pro Lys Pro Ser Arg Ala Pro Pro Gln Gln Pro Gln
1 5 10 15

Pro Pro Arg Met Gln Thr Gly Arg Gly
            20   25

<210> 1443
<211> 15
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<220>
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<400> 1443

Gln Val Gly Ser Arg Arg Tyr Pro Asp Ala Val Tyr Leu His Arg
1   5   10   15

<210> 1444
<211> 13
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<220>
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<400> 1444

Gln Val Ser Phe Leu Gln Gly Asp Gln Ser Glu Asn Glu
1   5   10

<210> 1445
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<212> PRT
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<220>
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<400> 1445

Gln Tyr His Pro Thr Ala Cys Glu Val Glu Pro Ala Phe Gly His
1   5   10   15

<210> 1446
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<212> PRT
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<220>
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<400> 1446

Gln Tyr Val Leu Ala Thr Tyr Asp Thr Ser Arg Val Glu His Ala
1 5 10 15

<210> 1447
<211> 13
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<220>
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<400> 1447

Arg Ala Asn Pro Asn Pro Tyr Thr Ser Arg Arg Ser Val
1 5 10

<210> 1448
<211> 13
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<220>
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<400> 1448

Arg Ala Ser Asp Ala Arg Ala Ala His Leu Pro Thr Gly
1 5 10

<210> 1449
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1449

Arg Ala Ser Leu Glu Thr Thr Asn Gln Ala Ile Glu Ala Ile Arg
1 5 10 15

<210> 1450
<211> 20
<212> PRT
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<400> 1450

Arg Cys Gly Arg Leu Ile Cys Gly Leu Ser Thr Thr Ala Gln Tyr Pro
1   5   10   15

Pro Thr Arg Phe
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<210> 1451
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<220>
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<400> 1451

Arg Asp Gly Gln Ser Val Ile Gly Ala Cys Ala Ser Pro Tyr Glu Gly
1   5   10   15

Arg Tyr Arg

<210> 1452
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<220>
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<400> 1452

Arg Glu Ser Tyr Arg Glu Thr Gly Pro Ser Arg Ala Ser
1   5   10

<210> 1453
<211> 13
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<220>
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<400> 1453

Arg Glu Thr Gly Pro Ser Arg Ala Ser Asp Ala Arg Ala
1 5 10

<210> 1454
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<400> 1454

Arg Phe Ala Lys Tyr Gln Gln Gln Gly Arg Leu Glu Ala Arg
1 5 10

<210> 1455
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<220>
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<400> 1455

Arg Phe Gly Ala Pro Gln Ala Phe Leu Ala Gly Leu Leu Leu Ala Thr
1 5 10 15

Val Ala Val Gly Thr Ala Arg Ala
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<210> 1456
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<220>
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<400> 1456

Arg Phe Met Val Ala Leu Ile Leu Asp Ile Lys Arg Thr Pro Gly
1 5 10 15

<210> 1457
<211> 20
<212> PRT
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<220>
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<400> 1457

Arg Phe Met Val Ala Leu Ile Leu Asp Ile Lys Arg Thr Pro Gly Asn
1 5 10 15

Lys Pro Arg Ile
20

<210> 1458
<211> 13
<212> PRT
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<220>
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<400> 1458

Arg Gly Glu Ala Arg Glu Ser Tyr Arg Glu Thr Gly Pro
1 5 10

<210> 1459
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<220>
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<400> 1459

Arg Gly Thr Thr Pro Pro Ala Tyr Gly
1 5

<210> 1460
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<220>
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<400> 1460

Arg Ile Glu Thr Arg Ser Ala Arg His
1 5

<210> 1461
<211> 11
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<220>
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<400> 1461

Arg Ile Leu Ala Gly Ala Leu Ala Thr Tyr Gln
1 5 10

<210> 1462
<211> 11
<212> PRT
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<220>
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<400> 1462

Arg Ile Pro Pro Glu Asn Ile Arg Arg Val Thr
1 5 10

<210> 1463
<211> 7
<212> PRT
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<220>
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<400> 1463

Arg Ile Ser Asn Leu Asn Asp
1 5

<210> 1464
<211> 7
<212> PRT
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<220>
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<400> 1464

Arg Leu Ala Asn Leu Asn Gly
1   5

<210> 1465
<211> 15
<212> PRT
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<220>
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<400> 1465

Arg Leu Asp Val Gly Thr Asn Leu Gly Asn Ala Ile Ala Lys Leu
1   5   10   15

<210> 1466
<211> 9
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<220>
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<400> 1466

Arg Leu Glu Arg Lys Trp Leu Asp Val
1   5

<210> 1467
<211> 15
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<220>
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<400> 1467

Arg Leu Gly Gly Lys Glu Asp Arg Arg Val Lys Gln Ser Arg Gly
1   5   10   15

<210> 1468

<211> 20
<212> PRT
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<220>
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<400> 1468

Arg Leu Gly Gly Lys Glu Asp Arg Arg Val Lys Gln Ser Arg Gly Glu
1 5 10 15

Ala Arg Glu Ser
20

<210> 1469
<211> 9
<212> PRT
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<220>
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<400> 1469

Arg Leu Leu Asp Arg Leu Val Arg Leu
1 5

<210> 1470
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<220>
<223> Synthetic

<400> 1470

Arg Leu Arg Leu Val Asp Ala Asp
1 5

<210> 1471
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1471

Arg Leu Arg Leu Val Asp Ala Asp Asp Pro Leu Leu Arg
1 5 10

<210> 1472
<211> 31
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1472

Arg Leu Arg Leu Val Asp Ala Asp Asp Pro Leu Leu Arg Thr Ala Pro
1 5 10 15

Gly Pro Gly Glu Val Trp Val Thr Pro Val Ile Gly Ser Gln Ala
20 25 30

<210> 1473
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1473

Arg Leu Arg Leu Val Gln Asp Ala Asp Asp Pro Leu Leu Arg Ile Ala
1 5 10 15

Pro Gly Pro Gly Glu Val Trp Val Thr Pro Val Ile Gly Ser Gln Ala
20 25 30

<210> 1474
<211> 10
<212> PRT
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<220>
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<400> 1474

Arg Leu Ser Asp Asn Gly Tyr Tyr Thr Val

1 5 10

<210> 1475
<211> 8
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<220>
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<400> 1475

Arg Leu Val Asp Ala Asp Asp Pro
1 5

<210> 1476
<211> 15
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<220>
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<400> 1476

Arg Leu Val Asp Ala Asp Asp Pro Leu Leu Arg Thr Ala Pro Gly
1 5 10 15

<210> 1477
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<220>
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<400> 1477

Arg Leu Val Gly Ala Thr Pro Glu
1 5

<210> 1478
<211> 27
<212> PRT
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<220>
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<400> 1478

Arg Met Gln Thr Gly Arg Gly Gly Ser Ala Pro Arg Pro Glu Leu Gly
1 5 10 15

Pro Pro Thr Asn Pro Phe Gln Ala Ala Val Ala
20 25

<210> 1479
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<400> 1479

Arg Met Ser Lys Gly Val Phe Lys Val
1 5

<210> 1480
<211> 15
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<220>
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<400> 1480

Arg Asn Pro Gly Leu Gly Ala Pro Val Phe His Met Thr Asn Tyr
1 5 10 15

<210> 1481
<211> 8
<212> PRT
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<220>
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<400> 1481

Arg Pro Arg Leu Arg Leu Val Asp
1 5

<210> 1482

<211> 19
<212> PRT
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<220>
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<400> 1482

Arg Gln Ala Glu Ser Ser Glu Ala Met Ala Ala Trp Ser Glu Arg Ala
1 5 10 15

Gly Glu Ala

<210> 1483
<211> 15
<212> PRT
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<220>
<223> Synthetic

<400> 1483

Arg Gln Thr Trp Ala Glu Trp Ala Ala Ala His Trp Trp Gln Leu
1 5 10 15

<210> 1484
<211> 13
<212> PRT
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<220>
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<400> 1484

Arg Arg Val Lys Gln Ser Arg Gly Glu Ala Arg Glu Ser
1 5 10

<210> 1485
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<220>
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<400> 1485

Arg Arg Tyr Pro Asp Ala Val Tyr Leu
1 5

<210> 1486
<211> 15
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<220>
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<400> 1486

Arg Arg Tyr Pro Asp Ala Val Tyr Leu His Arg Ile Asp Leu Gly
1 5 10 15

<210> 1487
<211> 15
<212> PRT
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<220>
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<400> 1487

Arg Ser Ala Gly Lys Val Ser Ser Thr Leu Ala Ser Glu Leu Gly
1 5 10 15

<210> 1488
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1488

Arg Ser Ala Gly Lys Val Ser Ser Thr Leu Ala Ser Glu Leu Gly Ile
1 5 10 15

Thr Ala Glu Asp
20

<210> 1489

<211> 8
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<400> 1489

Arg Ser Glu Leu Ser Gln Leu Ser
1 5

<210> 1490
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<220>
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<400> 1490

Arg Ser Glu Leu Ser Gln Leu Ser Met Tyr Arg Val Phe Glu Val
1 5 10 15

<210> 1491
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<220>
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<400> 1491

Arg Ser Gln Thr Pro Ala Pro Lys Pro Ser Arg Ala Pro Pro Gln Gln
1 5 10 15

Pro Gln Pro Pro Arg Met Gln Thr
20

<210> 1492
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<220>
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<400> 1492

Arg Thr Ala Pro Gly Pro Gly Glu
1 5

<210> 1493
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<400> 1493

Arg Thr Ala Pro Gly Pro Gly Glu Val Trp Val Thr Pro Val Ile
1 5 10 15

<210> 1494
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<400> 1494

Arg Thr Asp Asp Lys Leu Arg Met Glu Thr Cys Phe Gln Gln Ala
1 5 10 15

<210> 1495
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<400> 1495

Arg Thr Leu Ala Pro Pro Arg Asn Val Arg Val Thr Gly Cys Tyr
1 5 10 15

<210> 1496
<211> 15
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<400> 1496

Arg Thr Val Leu Glu Pro Ile Arg Asp Ala Leu Asn Ala Met Thr
1   5   10   15

<210> 1497
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<400> 1497

Arg Val Glu His Ala Val Val Tyr Tyr Val Tyr Ser Pro Ser Arg
1   5   10   15

<210> 1498
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<400> 1498

Arg Val Phe Glu Val Gly Val Ile Arg Asn Pro Gly Leu Gly Ala
1   5   10   15

<210> 1499
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<400> 1499

Arg Val His Val Ser Lys Glu Glu Gln Tyr Tyr Asp Tyr Glu Asp Ala
1   5   10   15

Thr Phe Glu

<210> 1500
<211> 8
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<400> 1500

Arg Val Ile Asp Pro Ala Ala Gln
1 5

<210> 1501
<211> 15
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<400> 1501

Arg Val Lys Phe His Thr Glu Thr Arg Thr Val Trp Gln Leu Ser
1 5 10 15

<210> 1502
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<400> 1502

Arg Val Tyr His Asn Gly Ile Thr Gly Glu Thr
1 5 10

<210> 1503
<211> 11
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<213> Artificial Sequence

<220>
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<400> 1503

Arg Tyr Asp Ser Arg Pro Pro Glu Asp Val Phe
1 5 10

<210> 1504
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<400> 1504

Arg Tyr Pro Asp Ala Val Tyr Leu His Arg Ile Asp Leu Gly Pro
1 5 10 15

<210> 1505
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<400> 1505

Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
1 5 10 15

<210> 1506
<211> 15
<212> PRT
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<400> 1506

Ser Ala Glu Pro Leu Leu Ser Cys Lys Pro Trp Gln Glu Ser Arg
1 5 10 15

<210> 1507
<211> 20
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<220>

<223> Synthetic

<400> 1507

Ser Ala Glu Pro Leu Leu Ser Cys Lys Pro Trp Gln Glu Ser Arg Lys
1   5   10   15

Asn Lys Ala Gln
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<210> 1508
<211> 14
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<220>
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<400> 1508

Ser Ala Gly Lys Val Ser Ser Thr Leu Ala Ser Glu Leu Gly
1   5   10

<210> 1509
<211> 24
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<220>
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<400> 1509

Ser Ala Gly Lys Val Ser Ser Thr Leu Ala Ser Glu Leu Gly Ile Thr
1   5   10   15

Ala Glu Asp Ala Arg Leu Val Ser
            20

<210> 1510
<211> 10
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<220>
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<400> 1510

Ser Cys Thr Val Thr Arg Glu Asp Gly Thr
1 5 10

<210> 1511
<211> 15
<212> PRT
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<220>
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<400> 1511

Ser Asp Ala Ala Cys Trp Gly Phe Pro Thr Asp Thr Val Met Ser
1 5 10 15

<210> 1512
<211> 13
<212> PRT
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<220>
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<400> 1512

Ser Asp Ala Arg Ala Ala His Leu Pro Thr Gly Thr Pro
1 5 10

<210> 1513
<211> 23
<212> PRT
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<220>
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<400> 1513

Ser Asp Trp His Gln Gly Thr His Val Cys His Thr Lys His Met Asp
1 5 10 15

Phe Trp Cys Val Glu His Asp
20

<210> 1514
<211> 15

<212> PRT
<213> Artificial Sequence

<220>
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<400> 1514

Ser Glu Leu Arg Arg Trp Ile Lys Tyr Thr Gln Gln Arg Arg Val
1 5 10 15

<210> 1515
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1515

Ser Glu Leu Arg Arg Trp Ile Lys Tyr Thr Gln Gln Arg Arg Val Val
1 5 10 15

Gly Glu Phe Arg
20

<210> 1516
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<400> 1516

Ser Glu Leu Ser Gln Leu
1 5

<210> 1517
<211> 7
<212> PRT
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<220>
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<400> 1517

Ser Glu Leu Ser Gln Leu Ser
1   5

<210> 1518
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1518

Ser Glu Tyr Leu Ala His Arg Arg Ile Pro Pro Glu Asn Ile Arg Arg
1   5   10   15

Val Thr Arg Val
            20

<210> 1519
<211> 13
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<400> 1519

Ser Phe Leu Gln Gly Asp Gln Ser Glu Asn Glu Leu Pro
1   5   10

<210> 1520
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1520

Ser Gly Lys Gly Val Ser Phe Gln Leu Val Lys Leu Gly Val Trp
1   5   10   15

<210> 1521
<211> 15

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1521

Ser His Arg Gly Val Ile Ala Asp Asn Gln Ala Lys Trp Ala Val
1 5 10 15

<210> 1522
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1522

Ser Ile Glu His Gln Val Lys Asp Val Leu Thr Pro Leu Phe Lys
1 5 10 15

<210> 1523
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1523

Ser Lys Ile Gly Val Val Gly Ile Gly Ser Ala Ser Tyr Lys Val
1 5 10 15

<210> 1524
<211> 15
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<213> Artificial Sequence

<220>
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<400> 1524

Ser Lys Arg Ser Glu Leu Ser Gln Leu Ser Met Tyr Arg Val Phe
1 5 10 15

<210> 1525
<211> 21
<212> PRT
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<220>
<223> Synthetic

<400> 1525

Ser Leu Phe Val Glu Ser Pro Gly Gln Leu Ile Gln Arg Ile Thr Asp
1   5   10   15

Asp Pro Asp Val Ser
            20

<210> 1526
<211> 15
<212> PRT
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<220>
<223> Synthetic

<400> 1526

Ser Leu Ser Thr Asn Leu Asp Val Thr Asn Ser Ile Glu His Gln
1   5   10   15

<210> 1527
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1527

Ser Leu Ser Thr Asn Leu Asp Val Thr Asn Ser Ile Glu His Gln Val
1   5   10   15

Lys Asp Val Leu Thr Pro Leu Phe Lys
            20   25

<210> 1528
<211> 10

<212> PRT
<213> Artificial Sequence

<220>
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<400> 1528

Ser Leu Trp Gly Ser Gly Leu Leu Met Leu
1 5 10

<210> 1529
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1529

Ser Met Lys Gly Leu Ser Ser Thr Ser Ile Val Tyr Ile Leu Ile
1 5 10 15

<210> 1530
<211> 10
<212> PRT
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<220>
<223> Synthetic

<400> 1530

Ser Met Tyr Arg Val Phe Glu Val Gly Val
1 5 10

<210> 1531
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1531

Ser Asn Asp Leu Ser Asn Cys Met Val Ala Leu Gly Glu Leu Lys
1 5 10 15

<210> 1532
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1532

Ser Pro Gly Gln Leu Ile Gln Arg
1   5

<210> 1533
<211> 13
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<220>
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<400> 1533

Ser Gln Asp Pro Gln Asp Ser Arg Arg Ser Ala Glu Pro
1   5   10

<210> 1534
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1534

Ser Arg Ile Val Ile Asn Arg Glu His Leu Met Ile Asp Arg Pro
1   5   10   15

<210> 1535
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1535

Ser Arg Lys Asn Lys Ala Gln Thr Arg Thr Pro Leu Gln
1   5   10

<210> 1536
<211> 8
<212> PRT
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<220>
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<400> 1536

Ser Arg Leu Val Gly Ala Thr Pro
1   5

<210> 1537
<211> 24
<212> PRT
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<220>
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<400> 1537

Ser Arg Leu Val Gly Ala Thr Pro Glu Arg Pro Arg Leu Arg Leu Val
1   5   10   15

Asp Ala Asp Asp Pro Leu Leu Arg
            20

<210> 1538
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1538

Ser Arg Pro Gly Leu Lys Pro Asp Leu Thr Gly Thr Ser Lys Ser
1   5   10   15

<210> 1539
<211> 15
<212> PRT

<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1539

Ser Arg Arg Ser Val Ala Ser Ile Val Gly Thr Leu Val Arg Met
1 5 10 15

<210> 1540
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1540

Ser Arg Trp Gly Leu Gly Ser Pro Asn Cys His Gly Pro Asp Trp
1 5 10 15

<210> 1541
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1541

Ser Ser Ala Thr Lys
1 5

<210> 1542
<211> 15
<212> PRT
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<220>
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<400> 1542

Ser Ser Gly Gly Tyr Ala Gln Leu Ala Ser Tyr Phe Asn Pro Gly
1 5 10 15

<210> 1543
<211> 7
<212> PRT
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<220>
<223> Synthetic

<400> 1543

Ser Ser Leu Gly Asn Gly Val
1   5

<210> 1544
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1544

Ser Ser Asn Leu Val Ile Leu Pro Gly Gln Asp Leu Gln Tyr Val
1   5   10   15

<210> 1545
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1545

Ser Ser Gln Asp Pro Gln Asp Ser Arg Arg Ser Ala Glu Pro Leu
1   5   10   15

<210> 1546
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1546

Ser Ser Gln Asp Pro Gln Asp Ser Arg Arg Ser Ala Glu Pro Leu Leu

1 5 10 15

Ser Cys Lys Pro
20

<210> 1547
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1547

Ser Ser Arg Arg His Lys Arg Phe Ala Gly Val Val Leu Ala Gly
1 5 10 15

<210> 1548
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1548

Ser Ser Thr Ser Ile Val Tyr Ile Leu Ile Ala Val Cys Leu Gly
1 5 10 15

<210> 1549
<211> 7
<212> PRT
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<220>
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<400> 1549

Ser Thr Pro Gly Ile Val Ile
1 5

<210> 1550
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1550

Ser Thr Pro Gly Ile Val Ile Pro Pro Gln Glu Gln Ile Thr Gln His
1   5   10   15

Gly Ser Pro Tyr Gly Arg Cys
            20

<210> 1551
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1551

Ser Thr Ser Ser Ser Arg Arg Tyr Thr Glu Val Tyr
1   5   10

<210> 1552
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1552

Ser Tyr Phe Ile Val Leu Ser Ile Ala Tyr Pro Thr Leu Ser Glu
1   5   10   15

<210> 1553
<211> 13
<212> PRT
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<220>
<223> Synthetic

<400> 1553

Ser Tyr Arg Glu Thr Gly Pro Ser Arg Ala Ser Asp Ala

1 5 10

<210> 1554
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<220>
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<400> 1554

Ser Tyr Val Lys
1

<210> 1555
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1555

Ser Tyr Val Gln His Pro His Lys Thr Val Arg Val Lys Phe His
1 5 10 15

<210> 1556
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1556

Thr Ala Pro Gly Pro Gly Glu Val
1 5

<210> 1557
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1557

Thr Ala Thr Arg Leu Leu Ser Ser Thr Asn Ser Arg Leu Cys
1 5 10

<210> 1558
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1558

Thr Asp Asp Pro Val Ile Asp Arg Leu Tyr Leu Ser Ser His Arg
1 5 10 15

<210> 1559
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1559

Thr Glu Ile Leu Ser Leu Phe Gly Pro Ser Leu Arg Asp Pro Ile
1 5 10 15

<210> 1560
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1560

Thr Glu Thr Arg Thr Val Trp Gln Leu Ser Val Ala Gly Val Ser
1 5 10 15

<210> 1561
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1561

Thr Glu Val Tyr Leu Glu His Arg Met Gln Glu Ala Val Glu
1   5   10

<210> 1562
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1562

Thr Phe Met Pro Glu Gly Thr Val Cys Ser Gln Asn Ala Leu Tyr
1   5   10   15

<210> 1563
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1563

Thr Gly Ala Cys Ile Cys Glu Ile Pro Thr Asp Val Ser Cys Glu
1   5   10   15

<210> 1564
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1564

Thr Gly Asp Leu Arg Ala Tyr
1   5

<210> 1565
<211> 15

<212> PRT
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<220>
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<400> 1565

Thr Gly Met Gln Ser Trp Val Pro Leu Ser Thr Asp Asp Pro Val
1 5 10 15

<210> 1566
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1566

Thr Gly Asn Gln Gln Ser Arg Trp Gly Leu Gly Ser Pro Asn Cys
1 5 10 15

<210> 1567
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1567

Thr Gly Pro Ser Arg Ala Ser Asp Ala Arg Ala Ala His
1 5 10

<210> 1568
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1568

Thr Gly Thr Ile Ile Asn Gln Asp Pro Asp Lys Ile Leu Thr Tyr
1 5 10 15

<210> 1569
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1569

Thr Gly Val Val Tyr Gly Thr His Thr Thr Ala Val Ser Glu Thr
1 5 10 15

<210> 1570
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1570

Thr Ile Arg Gly Gln Phe Ser Asn Met Ser Leu Ser Leu Leu Asp
1 5 10 15

<210> 1571
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1571

Thr Leu Gly Ala Thr Cys Ala Leu Pro Leu Ala Gly Leu Leu Ala
1 5 10 15

<210> 1572
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1572

Thr Leu Leu Asn Asn Cys Thr Arg Val
1   5

<210> 1573
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1573

Thr Leu Asn Val Pro Pro Pro Pro Asp Pro Gly Arg
1   5   10

<210> 1574
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1574

Thr Leu Asn Val Pro Pro Pro Pro Asp Pro Gly Arg Ala Ser Thr Ser
1   5   10   15

Gly Thr Pro Ile Lys Lys
            20

<210> 1575
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1575

Thr Met Thr Ser Gln Gly Met Tyr Gly Gly Thr Tyr Pro Val Glu
1   5   10   15

<210> 1576
<211> 15
<212> PRT

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<220>
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<400> 1576

Thr Asn Leu Gly Asn Ala Ile Ala Lys Leu Glu Asp Ala Lys Glu
1 5 10 15

<210> 1577
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1577

Thr Asn Met Glu Asp Glu Ala Asp Gln Tyr Phe Ser His Asp Asp
1 5 10 15

<210> 1578
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1578

Thr Asn Met Glu Asp Glu Ala Asp Gln Tyr Phe Ser His Asp Asp Pro
1 5 10 15

Ile Ser Ser Asp
20

<210> 1579
<211> 15
<212> PRT
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<220>
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<400> 1579

Thr Asn Pro Phe Gln Ala Ala Val Ala Arg Gly Leu Arg Pro Pro
1   5   10   15

<210> 1580
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<212> PRT
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<220>
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<400> 1580

Thr Asn Ser Ile Glu His Gln Val Lys Asp Val Leu Thr Pro Leu
1   5   10   15

<210> 1581
<211> 15
<212> PRT
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<220>
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<400> 1581

Thr Asn Tyr Leu Glu Gln Pro Val Ser Asn Asp Leu Ser Asn Cys
1   5   10   15

<210> 1582
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1582

Thr Asn Tyr Leu Glu Gln Pro Val Ser Asn Asp Leu Ser Asn Cys Met
1   5   10   15

Val Ala Leu Gly Glu Leu Lys Leu Ala Ala Leu
            20   25

<210> 1583
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<212> PRT

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<220>
<223> Synthetic

<400> 1583

Thr Pro Glu Arg Pro Arg Leu Arg
1 5

<210> 1584
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1584

Thr Pro Glu Arg Pro Arg Leu Arg Leu Val Asp Ala Asp Asp Pro Leu
1 5 10 15

Leu Arg Thr Ala
20

<210> 1585
<211> 9
<212> PRT
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<220>
<223> Synthetic

<400> 1585

Thr Pro Gly Asn Lys Pro Arg Ile Ala
1 5

<210> 1586
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1586

Thr Pro Leu Asp Ile Asp Thr Ala Ser Glu Ser Ser Gln Asp Pro
1 5 10 15

<210> 1587
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1587

Thr Pro Leu Asp Ile Asp Thr Ala Ser Glu Ser Ser Gln Asp Pro Gln
1 5 10 15

Asp Ser Arg Arg
20

<210> 1588
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1588

Thr Pro Leu Phe Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Thr
1 5 10 15

<210> 1589
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1589

Thr Pro Leu Gln Cys Thr Met
1 5

<210> 1590
<211> 8
<212> PRT

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<220>
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<400> 1590

Thr Pro Val Ile Gly Ser Gln Ala
1 5

<210> 1591
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1591

Thr Pro Val Ile Gly Ser Gln Ala Arg Lys
1 5 10

<210> 1592
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 1592

Thr Gln Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Thr
1 5 10 15

<210> 1593
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1593

Thr Arg Ala Asn Pro Asn Pro Tyr Thr Ser Arg Arg Ser Val Ala Ser
1 5 10 15

Ile Val Gly Thr Leu Val Arg Met
            20

<210> 1594
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1594

Thr Arg Phe Gly Cys Ala Met Arg Trp Gly Leu Pro Pro
1   5   10

<210> 1595
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1595

Thr Arg Asn Thr Gly Gln Pro Ala Thr Asp His Tyr Tyr Ser Asn Val
1   5   10   15

<210> 1596
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1596

Thr Arg Thr Pro Leu Gln Cys Thr Met Thr Glu Ile Phe
1   5   10

<210> 1597
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1597

Thr Arg Trp His Arg Leu Leu Arg Met Pro Val Arg
1 5 10

<210> 1598
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1598

Thr Ser Gly Ser Gly Gly Ala Ile Arg Gly Ile Lys His Ile Ile
1 5 10 15

<210> 1599
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1599

Thr Ser Gly Ser Gly Gly Ala Ile Arg Gly Ile Lys His Ile Ile Ile
1 5 10 15

Val Pro Ile Pro
20

<210> 1600
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1600

Thr Ser Gln Gly Met Tyr Gly Gly Thr Tyr Leu Val Glu Lys Pro
1 5 10 15

<210> 1601
<211> 15
<212> PRT
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<220>
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<400> 1601

Thr Ser Arg Val Glu His Ala Val Val Tyr Tyr Val Tyr Ser Pro
1 5 10 15

<210> 1602
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1602

Thr Ser Ser Ser Arg Arg Tyr Thr Glu Val Tyr Leu
1 5 10

<210> 1603
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<400> 1603

Thr Ser Tyr Val Gly
1 5

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<400> 1604

Thr Thr Glu Asp Lys Ile Ser Arg Ala Val Gly Pro Arg Gln Ala

1 5 10 15

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<400> 1605

Thr Thr Glu Asp Lys Ile Ser Arg Ala Val Gly Pro Arg Gln Ala Gln
1 5 10 15

Val Ser Phe Leu
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<400> 1606

Thr Thr Glu Arg Ile Glu Thr Arg Ser Ala Arg His Pro
1 5 10

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<400> 1607

Thr Thr Asn Gln Ala Ile Glu Ala Ile Arg Gln Ala Gly Gln Glu
1 5 10 15

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<400> 1608

Thr Thr Ser Asp Pro Trp His Pro Pro Gly Pro Leu Gly Leu Lys
1   5   10   15

<210> 1609
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<400> 1609

Thr Val Cys Ser Gln Asn Ala Leu Tyr Pro Met Ser Pro Leu Leu
1   5   10   15

<210> 1610
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<400> 1610

Thr Val Asn Gly Glu Asp Val Gly Ala Val Pro Pro Gly Lys Phe
1   5   10   15

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Thr Tyr Pro Val Glu Lys Pro Asn Leu Ser Ser Lys Arg Ser Glu
1   5   10   15

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<400> 1612

Val Ala Gly Val Ser Cys Asn Val Thr Thr Glu His Pro Phe Cys
1   5   10   15

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<400> 1613

Val Ala Pro Gly Ile Val Ile Pro Pro Lys Ala Leu Phe Thr Gln Gln
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Gly Gly Ala Tyr Gly Arg Cys
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<400> 1614

Val Cys His Thr Lys His Met Asp Phe Trp Cys Val Glu His Asp Arg
1   5   10   15

Pro Pro Pro Ala Thr Pro Thr Pro Leu
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<400> 1615

Val Cys Gln Arg His Ser Pro Asp Cys Ser Arg Leu Val Gly Ala Thr
1   5   10   15

Pro Glu Arg

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<400> 1616

Val Asp Ala Asp Asp Pro Leu Leu
1   5

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<400> 1617

Val Asp Ala Asp Asp Pro Leu Leu Arg Thr Ala Pro Gly Pro Gly Glu
1   5   10   15

Val Trp Val Thr
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<400> 1618

Val Asp Ile Gly Phe Ala Ala Tyr Asn Phe Val Glu Ser Ile Ile Asn
1 5 10 15

Leu Phe Gln Val
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<400> 1619

Val Glu Ile Ala Glu Tyr Arg Arg Leu Leu Arg Thr Val Leu Glu
1 5 10 15

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<400> 1620

Val Glu Leu Glu Asn Ser Met Gly Gly Leu Asn Phe Gly Arg Ser
1 5 10 15

<210> 1621
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<400> 1621

Val Glu Leu Glu Asn Ser Met Gly Gly Leu Asn Phe Gly Arg Ser Tyr
1 5 10 15

Phe Asp Pro Ala
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<400> 1622

Val Glu Leu Lys Ile Lys Ile Ala Ser Gly Phe Gly Pro Leu Ile
1   5   10   15

<210> 1623
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Val Glu Met Asp Glu Trp Ile His Ala His Thr Thr Ser Asp
1   5   10

<210> 1624
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<400> 1624

Val Glu Met Pro Glu Trp Ile His Ala His Thr Thr Ser Asp Pro
1   5   10   15

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<400> 1625

Val Glu Arg Arg Leu Val Lys Val Leu
1 5

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<400> 1626

Val Glu Ser Pro Gly Gln Leu Ile
1 5

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<400> 1627

Val Glu Ser Pro Gly Gln Leu Ile Gln Arg Ile Thr Asp Asp Pro
1 5 10 15

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Val Glu Ser Pro Gly Gln Leu Ile Gln Arg Ile Thr Asp Asp Pro Asp
1 5 10 15

Val Ser Ile Arg
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<400> 1629

Val Phe Ala Leu Ala Ser Tyr Val Gln His Pro His Lys Thr Val
1 5 10 15

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<400> 1630

Val Gly Ala Thr Pro Glu Arg Pro
1 5

<210> 1631
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<400> 1631

Val Gly Ala Thr Pro Glu Arg Pro Arg Leu
1 5 10

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<400> 1632

Val Gly Ala Thr Pro Glu Arg Pro Arg Leu Arg Leu Val Asp Ala

1 5 10 15

<210> 1633
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<400> 1633

Val Gly Ile Gly Ser Ala Ser Tyr Lys Val Met Thr Arg Ser Ser
1 5 10 15

<210> 1634
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<400> 1634

Val Gly Leu Arg Thr Pro Gln Arg Phe Thr Asp Leu Val Lys Phe
1 5 10 15

<210> 1635
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<400> 1635

Val His His Asn Thr Glu Glu Ile Val Ala Gln Ser Ile Ala Leu Ser
1 5 10 15

Ser Leu Met Val
20

<210> 1636
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<400> 1636

Val His Arg Leu Glu Gly Val Ser Tyr Asn Ile Gly Ser Gln Glu
1   5   10   15

<210> 1637
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<400> 1637

Val Ile Gly Ser Gln Ala Arg Lys
1   5

<210> 1638
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<400> 1638

Val Ile Thr Gly Ser Ile
1   5

<210> 1639
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<400> 1639

Val Ile Thr Gly Thr Ile
1   5

<210> 1640

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<400> 1640

Val Lys Gln Ser Arg Gly Glu Ala
1 5

<210> 1641
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<400> 1641

Val Leu Phe Val Met Phe Leu Ser Leu Ile
1 5 10

<210> 1642
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<400> 1642

Val Leu Phe Val Met Phe Leu Ser Leu Ile Gly Leu Leu Ala Ile
1 5 10 15

<210> 1643
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<400> 1643

Val Leu Thr Pro Leu Phe Lys Ile Ile Gly Asp Glu Val Gly Leu
1 5 10 15

<210> 1644
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<400> 1644

Val Met Thr Arg Ser Ser His Gln Ser Leu Val Ile Lys Leu Met
1 5 10 15

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<400> 1645

Val Pro Ala Ala Pro Cys Ala Arg Ile Trp Asn Gly Thr Gln Arg
1 5 10 15

<210> 1646
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<400> 1646

Val Pro Pro Asp Pro Gly Asp Leu Val Glu Tyr Ile Met Asn Tyr
1 5 10 15

<210> 1647
<211> 15
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<400> 1647

Val Gln Ser Val Ala Ser Ser Arg Arg His Lys Arg Phe Ala Gly
1 5 10 15

<210> 1648
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<400> 1648

Val Gln Thr Gly Gly Thr Ser Arg Thr Val Thr Met Arg Tyr Leu Ala
1 5 10 15

Ser

<210> 1649
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<220>
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<400> 1649

Val Gln Val Arg Ile
1 5

<210> 1650
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<400> 1650

Val Arg Ala Tyr Asn Gln Pro Ala Gly Asp Val
1 5 10

<210> 1651
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<212> PRT
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<400> 1651

Val Arg Phe Glu Ser Lys Ile Val Asp Gly Gly Cys Phe Ala Pro
1 5 10 15

<210> 1652
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<212> PRT
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<220>
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<400> 1652

Val Arg Leu Ala Gly Val Arg Phe Glu Ser Lys Ile Val Asp Gly
1 5 10 15

<210> 1653
<211> 15
<212> PRT
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<400> 1653

Val Ser Gly Ser Phe Gly Asn Arg Phe Ile Leu Ser Gln Gly Asn
1 5 10 15

<210> 1654
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<212> PRT
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<400> 1654

Val Ser Lys Glu Glu Gln Tyr Tyr Asp Tyr Glu Asp Ala Thr
1 5 10

<210> 1655
<211> 15
<212> PRT
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<400> 1655

Val Ser Lys Gly Asn Cys Ser Gly Pro Thr Thr Ile Arg Gly Gln
1 5 10 15

<210> 1656
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<212> PRT
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<400> 1656

Val Thr Ala Ala Leu Leu Asn Thr Pro Pro Pro Tyr Gln Val Ser
1 5 10 15

<210> 1657
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<220>
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<400> 1657

Val Thr Gly Cys Tyr Gln Cys Gly Thr Pro Ala Leu Val Glu Gly
1 5 10 15

<210> 1658
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<400> 1658

Val Thr Pro Val Ile Gly Ser Gln
1   5

<210> 1659
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<400> 1659

Val Thr Thr Glu His Pro Phe Cys Asn Thr Pro His Gly Gln Leu Glu
1   5   10   15

Val Gln Val Pro Pro Asp
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<210> 1660
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<400> 1660

Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala Ala Gln
1   5   10   15

<210> 1661
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<220>
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<400> 1661

Val Trp Gln Leu Ser Val Ala Gly Val Ser Cys Asn Val Thr Thr
1   5   10   15

<210> 1662
<211> 8
<212> PRT

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<220>
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<400> 1662

Val Trp Val Thr Pro Val Ile Gly
1 5

<210> 1663
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<400> 1663

Val Trp Val Thr Pro Val Ile Gly Ser Gln Ala Arg
1 5 10

<210> 1664
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<212> PRT
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<220>
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<400> 1664

Val Tyr Ile Leu Ile Ala Val Cys Leu Gly Gly Leu Ile Gly Ile
1 5 10 15

<210> 1665
<211> 15
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<220>
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<400> 1665

Val Tyr Leu His Arg Ile Asp Leu Gly Pro Pro Ile Ser Leu Glu
1 5 10 15

<210> 1666
<211> 8
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<400> 1666

Val Tyr Arg Tyr Asp Ser Arg Pro
1 5

<210> 1667
<211> 12
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<400> 1667

Val Tyr Arg Tyr Asp Ser Arg Pro Pro Glu Asp Val
1 5 10

<210> 1668
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<400> 1668

Val Tyr Trp Leu Thr Ile Pro Pro Met Lys Asn Leu Ala Leu Gly
1 5 10 15

<210> 1669
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<400> 1669

Trp Asp Leu Glu Ala Thr Gly Ala Cys Ile Cys Glu Ile Pro Thr

1 5 10 15

<210> 1670
<211> 15
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<220>
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<400> 1670

Trp Asp Gln Lys Leu Trp Cys Arg His Phe Cys Val Leu Ala Asp
1 5 10 15

<210> 1671
<211> 15
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<220>
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<400> 1671

Trp Gly Phe Pro Thr Asp Thr Val Met Ser Val Phe Ala Leu Ala
1 5 10 15

<210> 1672
<211> 15
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<220>
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<400> 1672

Trp His Pro Pro Gly Pro Leu Gly Leu Lys Phe Lys Thr Val Arg
1 5 10 15

<210> 1673
<211> 15
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<220>
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<400> 1673

Trp Ile His Ala His Thr Thr Ser Asp Pro Trp His Pro Pro Gly
1 5 10 15

<210> 1674
<211> 15
<212> PRT
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<220>
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<400> 1674

Trp Leu Thr Ile Pro Pro Met Lys Asn Leu Ala Leu Gly Val Ile
1 5 10 15

<210> 1675
<211> 20
<212> PRT
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<220>
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<400> 1675

Trp Gln Glu Ser Arg Lys Asn Lys Ala Gln Thr Arg Thr Pro Leu Gln
1 5 10 15

Cys Thr Met Thr
20

<210> 1676
<211> 13
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<220>
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<400> 1676

Trp Val Cys Ile Phe Met Val Cys Arg Arg Ala Cys Arg
1 5 10

<210> 1677

<211> 8
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<400> 1677

Trp Val Thr Pro Val Ile Gly Ser
1 5

<210> 1678
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<400> 1678

Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala Thr Gln Gly Tyr Leu
1 5 10 15

<210> 1679
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<220>
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<400> 1679

Tyr Ala Leu Gly Gly Asp Ile Asn Lys Val Leu Glu Lys Leu Gly
1 5 10 15

<210> 1680
<211> 10
<212> PRT
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<400> 1680

Tyr Ala Met Gly Val Gly Val Glu Leu Glu
1 5 10

<210> 1681
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<220>
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<400> 1681

Tyr Ala Met Gly Val Gly Val Glu Leu Glu Asn
1 5 10

<210> 1682
<211> 15
<212> PRT
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<220>
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<400> 1682

Tyr Cys Ala Asp Val Ala Ala Glu Glu Leu Met Asn Ala Leu Val
1 5 10 15

<210> 1683
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<212> PRT
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<400> 1683

Tyr Asp Phe Arg Asp Leu Thr Trp Cys Ile Asn Pro Pro Glu Arg
1 5 10 15

<210> 1684
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<220>
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<400> 1684

Tyr Phe Glu Pro Gly Pro Thr
1   5

<210> 1685
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<400> 1685

Tyr Phe Asn Pro Gly Gly Ser Tyr Tyr Lys Gln Tyr His Pro Thr
1   5   10   15

<210> 1686
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<220>
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<400> 1686

Tyr Phe Arg Leu Gly Gln Glu Met Val Arg Arg Ser Ala Gly Lys
1   5   10   15

<210> 1687
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<400> 1687

Tyr Phe Arg Leu Gly Gln Glu Met Val Arg Arg Ser Ala Gly Lys Val
1   5   10   15

Ser Ser Thr Leu
            20

<210> 1688
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<212> PRT
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<400> 1688

Tyr Phe Tyr Pro Phe Arg Leu Pro Ile Lys Gly Val Pro Ile Glu
1 5 10 15

<210> 1689
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<220>
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<400> 1689

Tyr Gly Asp Asn Ala Gly Arg Ile Leu Ala Gly Ala Leu Ala Thr
1 5 10 15

<210> 1690
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<212> PRT
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<220>
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<400> 1690

Tyr Gly His Ala Thr Val Glu Met Pro Glu Trp Ile His Ala His
1 5 10 15

<210> 1691
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<212> PRT
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<220>
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<400> 1691

Tyr Ile Met Asn Tyr Thr Gly Asn Gln Gln Ser Arg Trp Gly Leu
1 5 10 15

<210> 1692
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<212> PRT
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<220>
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<400> 1692

Tyr Ile Asn Asn Glu Leu Ile Pro Ser Met Asn Gln Leu Ser Cys
1   5   10   15

<210> 1693
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<220>
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<400> 1693

Tyr Leu Cys Thr Ala Pro Gly Cys Ala Thr Gln Ala Pro Val Pro
1   5   10   15

<210> 1694
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<212> PRT
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<220>
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<400> 1694

Tyr Leu Phe Thr Val Pro Ile Lys Glu Ala Gly Glu Asp Cys His
1   5   10   15

<210> 1695
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<220>
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<400> 1695

Tyr Leu His Asp Pro Glu Phe Asn Leu
1   5

<210> 1696
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<400> 1696

Tyr Leu Asn Met Ser Arg Leu Phe Val
1   5

<210> 1697
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<220>
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<400> 1697

Tyr Pro Ala Leu Gly Leu His Glu Phe
1   5

<210> 1698
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<220>
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<400> 1698

Tyr Pro Ala Leu Gly Leu His Glu Phe Ala
1   5   10

<210> 1699
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<220>
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<400> 1699

Tyr Pro Ala Leu Gly Leu His Glu Phe Ala Gly Glu Leu Ser Thr
1 5 10 15

<210> 1700
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<220>
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<400> 1700

Tyr Pro Ala Leu Gly Leu His Glu Phe Ala Gly Glu Leu Ser Thr Leu
1 5 10 15

Glu Ser Leu Met
20

<210> 1701
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<400> 1701

Tyr Pro Phe Arg Leu Pro Ile Lys Gly Val Pro Ile Glu Leu Gln
1 5 10 15

<210> 1702
<211> 9
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<400> 1702

Tyr Pro Leu Leu Trp Ser Tyr Ala Met
1 5

<210> 1703
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<400> 1703

Tyr Gln Gln Gln Gly Arg Leu
1 5

<210> 1704
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<400> 1704

Tyr Gln Ser Glu Tyr Leu Ala His Arg Arg
1 5 10

<210> 1705
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<400> 1705

Tyr Arg Glu Thr Gly Pro Ser Arg Ala Ser Asp Ala Arg Ala Ala
1 5 10 15

<210> 1706
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<212> PRT
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<220>
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<400> 1706

Tyr Arg Glu Thr Gly Pro Ser Arg Ala Ser Asp Ala Arg Ala Ala His

1 5 10 15

Leu Pro Thr Gly
20

<210> 1707
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<220>
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<400> 1707

Tyr Arg Asn Ala Ser Asp Val Leu Pro Gly His Trp Leu Gln Gly Gly
1 5 10 15

Trp Gly Cys Tyr Asn Leu Ser Asp Trp
20 25

<210> 1708
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<400> 1708

Tyr Arg Arg Leu Leu Arg Thr Val Leu Glu Pro Ile Arg Asp Ala
1 5 10 15

<210> 1709
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<400> 1709

Tyr Arg Tyr Asp Ser Arg Pro Pro
1 5

<210> 1710
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<400> 1710

Tyr Ser Gly Gly Asp Leu Leu Gly Ile Leu Glu Ser Arg Gly Ile
1 5 10 15

<210> 1711
<211> 25
<212> PRT
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<400> 1711

Tyr Ser Lys Val Thr Ala Thr Asx Leu Leu Ala Ser Thr Asn Ser Arg
1 5 10 15

Leu Cys Ala Val Phe Val Arg Asp Gly
20 25

<210> 1712
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<212> PRT
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<220>
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<400> 1712

Tyr Ser Pro Ser Arg Ser Phe Ser Tyr Phe Tyr Pro Phe Arg Leu
1 5 10 15

<210> 1713
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<220>
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<400> 1713

Tyr Thr Gly Asn Gln Gln Ser Arg Trp Gly Leu Gly Ser Pro Asn Cys
1 5 10 15

His Gly Pro Asp Trp Ala Ser Pro Val
20 25

<210> 1714
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1714

Tyr Val Leu Leu Ala Val Leu Phe Val
1 5

<210> 1715
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1715

Tyr Val Tyr Ser Pro Gly Arg Ser Phe Ser Tyr Phe Tyr Pro Phe
1 5 10 15

<210> 1716
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1716

Tyr Tyr Asp Tyr Glu Asp Ala Thr Phe Gln Thr Tyr Ala Leu Thr Gly
1 5 10 15

Ile Ser Leu Cys Asn Pro Ala Ala Ser Ile Cys
            20   25

<210> 1717
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1717

Gly Asp Leu Leu Gly Ile Leu Glu Ser Arg Gly Ile Lys Ala Arg
1   5   10   15

<210> 1718
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1718

Thr Val Pro Lys Tyr Val Ala Thr Gln Gly Tyr Leu Ile Ser Asn
1   5   10   15

<210> 1719
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1719

Lys Pro Trp Asp Ser Pro Gln Glu Ile
1   5

<210> 1720
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1720

Lys Pro Trp Glu Ser Pro Gln Glu Ile
1 5

<210> 1721
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1721

Ala Thr Tyr Gln Ser Glu Tyr Leu Ala His Arg Arg Ile Pro Pro
1 5 10 15

<210> 1722
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1722

Cys Met Ala Arg Gln Ala Glu Ser Ser Glu Ala Met Ala Ala Trp Ser
1 5 10 15

Glu Arg Ala Gly Glu Ala Met Val Leu Val Tyr Tyr Glu Ser Ile Ala
20 25 30

Tyr Ser Phe
35

<210> 1723
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1723

Cys Gln Val Gly Ser Ser Asn Ser Ala Phe Val Ser Thr Ser Ser Ser
1   5   10   15

Arg Arg Tyr Thr Glu Val Tyr Leu
            20

<210> 1724
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1724

Asp Asp Pro Pro Ala Thr Val Tyr Arg Tyr Asp Ser Arg Pro Pro
1   5   10   15

<210> 1725
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1725

Gly Ala Leu Ala Thr Tyr Gln Ser Glu Tyr Leu Ala His Arg Arg Ile
1   5   10   15

Pro Pro

<210> 1726
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1726

Met Ala Ala Trp Ser Glu Arg Ala Gly Glu Ala Met Val Leu Val Tyr
1   5   10   15

Tyr Glu Ser Ile Ala Tyr Ser Phe
            20

<210> 1727
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1727

Met Val Leu Val Tyr Tyr Glu Ser Ile Ala Tyr Ser Phe
1   5   10

<210> 1728
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1728

Pro Ala Thr Val Tyr Arg Tyr Asp Ser Arg Pro Pro Glu Asp Val
1   5   10   15

<210> 1729
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1729

Tyr Asp Ser Arg Pro Pro Glu Asp Val
1   5

<210> 1730
<211> 10
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 1730

Glu Pro Gly Ile Thr Thr Asn Tyr Asp Thr
1   5   10

<210> 1731
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1731

Gly Asp Leu Arg Ala Tyr Lys Met Val Tyr Ala Thr Asn Pro Gln Thr
1   5   10   15

Gln Leu Ser Asn
            20

<210> 1732
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1732

Lys Asn Gly Asp Val Glu Ala Ser Ala Ile Thr Thr Tyr Val Gly Phe
1   5   10   15

Ser Val Val Tyr Pro
            20

<210> 1733
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1733

Lys Val Thr Asn Gly Ser Lys Ser Tyr Thr Leu Arg Tyr Leu Ala Ser
1   5   10   15

Tyr Val Lys

<210> 1734
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1734

Gln Ala Leu Gly Ala Leu Lys Leu Tyr Phe Glu Pro Gly Ile Thr Thr
1   5   10   15

Asn Tyr Asp Thr Gly Asp Leu Ile Ala Tyr Lys Gln Thr Tyr Asn Ala
            20   25   30

Ser Gly Asn
        35

<210> 1735
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1735

Tyr Ala Thr Asn Pro Gln Thr Gln Leu Ser
1   5   10

<210> 1736
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1736

Asp Asn Glu Asn Pro Leu Ser Gly Lys Ala Gly Gly Val Val Lys Val
1 5 10 15

Thr Tyr Pro Gly Leu Thr Lys Val
20

<210> 1737
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1737

Glu Asn Phe Ser Ser Tyr His Gly Thr Lys Pro Gly Tyr Val Asp Ser
1 5 10 15

Ile

<210> 1738
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1738

Lys Val Asp Asn Ala Glu Thr Ile Lys Lys Glu Leu Gly Leu Ser Leu
1 5 10 15

Thr Glu Pro

<210> 1739
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1739

Met Glu Asp Leu Gln Lys Ala Leu Glu Ala Gln Ser Arg Ala Leu Arg
1   5   10   15

Ala Gly Leu Ala Ala
            20

<210> 1740
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1740

Gln Lys Gly Ile Gln Lys Pro Lys Ser Gly Thr Gln Gly Asn Tyr Asp
1   5   10   15

Asp Asp Trp Lys Gly Phe Tyr
            20

<210> 1741
<211> 34
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1741

Arg Thr Gly Ala Trp Gln Arg Lys Asp Trp Ser Arg Ala Pro Pro Pro
1   5   10   15

Pro Glu Glu Arg Gln Glu Ser Arg Ser Gln Thr Pro Ala Pro Lys Pro
            20   25   30

Ser Arg

<210> 1742
<211> 29

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1742

Ala Ala Gly Ala Ser Gln Ser Arg Arg Pro Arg Pro Pro Arg His Ala
1   5   10   15

Arg Ala Gln His Leu Pro Glu Met Thr Pro Ala Val Thr
            20   25

<210> 1743
<211> 28
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1743

Cys Val Thr Ser Trp Leu Trp Ser Glu Gly Glu Gly Ala Val Phe Tyr
1   5   10   15

Arg Val Asp Leu His Phe Ile Asn Leu Gly Thr Pro
            20   25

<210> 1744
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1744

Phe Arg Val Gly Gly Thr Arg Trp His Arg Leu Leu Arg Met Pro Val
1   5   10   15

Arg Gly Leu Asp Gly Asp Thr Ala Pro Leu Pro
            20   25

<210> 1745

<211> 28
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1745

Gly Arg Lys Ile Arg Met Arg Cys Arg Ala Ile Asp Gly Asp Val Thr
1 5 10 15

Phe Cys Arg Pro Lys Ser Pro Val Tyr Val Gly Asn
20 25

<210> 1746
<211> 28
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1746

Gly Thr Pro Pro Leu Asp Glu Asp Gly Arg Trp Asp Pro Ala Leu Met
1 5 10 15

Tyr Asn Pro Cys Gly Pro Glu Pro Pro Ala His Val
20 25

<210> 1747
<211> 54
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1747

Gly Val His Ala Asn Leu His Val Ala Phe His Arg Ser Ser Ser Glu
1 5 10 15

Lys Ile His Ser Asn Glu Ile Ser Ser Asp Ser Ile Gly Val Leu Gly
20 25 30

Tyr Gln Lys Thr Val Asp His Thr Lys Val Asn Ser Lys Leu Ser Leu
        35   40   45

Phe Phe Glu Ile Lys Ser
    50

<210> 1748
<211> 30
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1748

Met Ala Ser Thr Thr Pro Ile Thr Met Glu Asp Leu Gln Lys Ala Leu
1   5   10   15

Glu Ala Gln Ser Arg Ala Leu Arg Ala Gly Leu Ala Ala Gly
            20   25   30

<210> 1749
<211> 34
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1749

Pro Glu Leu Gly Pro Pro Thr Asn Pro Phe Gln Ala Ala Val Ala Arg
1   5   10   15

Gly Leu Arg Pro Pro Leu His Asp Pro Asp Thr Glu Ala Pro Thr Glu
            20   25   30

Ala Cys

<210> 1750
<211> 26
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1750

Pro Leu Pro Pro His Thr Thr Glu Arg Ile Glu Thr Arg Ser Ala Arg
1   5   10   15

His Pro Trp Arg Ile Arg Phe Gly Ala Pro
            20   25

<210> 1751
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1751

Ser Arg Ala Pro Pro Pro Pro Glu Glu Arg Gln Glu Ser Arg Ser Gln
1   5   10   15

Thr Pro Ala Pro Lys Pro Ser Arg Ala Pro Pro
            20   25

<210> 1752
<211> 28
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1752

Ser Arg Ala Pro Pro Gln Gln Pro Gln Pro Pro Arg Met Gln Thr Gly
1   5   10   15

Arg Gly Gly Ser Ala Pro Arg Pro Glu Leu Gly Pro
            20   25

<210> 1753
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1753

Thr Pro Ala Val Thr Pro Glu Gly Pro Ala Pro Pro Arg Thr Gly Ala
1   5   10   15

Trp Gln Arg Lys Asp Trp Ser Arg Ala Pro Pro
            20   25

<210> 1754
<211> 29
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1754

Val Arg Ala Tyr Asn Gln Pro Ala Gly Asp Val Arg Gly Val Trp Gly
1   5   10   15

Lys Gly Glu Arg Thr Tyr Ala Glu Gln Asp Phe Arg Val
            20   25

<210> 1755
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1755

Ala Phe Gly His Ser Asp Ala Ala Cys Trp Gly Phe Pro Thr Asp Thr
1   5   10   15

Val Met Ser Val
            20

<210> 1756
<211> 21
<212> PRT

<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1756

Cys Ala Arg Ile Trp Asn Gly Thr Gln Arg Ala Cys Thr Phe Trp Ala
1 5 10 15

Val Asn Ala Tyr Ser
20

<210> 1757
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1757

Glu Glu Ala Phe Thr Tyr Leu Cys Thr Ala Pro Gly Cys Ala Thr Gln
1 5 10 15

Thr Pro Val Pro Val Arg
20

<210> 1758
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1758

Phe Ala Pro Trp Asp Leu Glu Ala Thr Gly Ala Cys Ile Cys Glu Ile
1 5 10 15

Pro Thr Asp Val
20

<210> 1759
<211> 17

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1759

Gly Glu Asp Val Gly Ala Phe Pro Pro Gly Lys Phe Val Thr Ala Ala
1   5   10   15

Leu

<210> 1760
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1760

Gly Glu Val Trp Val Thr Pro Val Ile Gly Ser Gln Ala Arg Lys Cys
1   5   10   15

Gly Leu His Ile
            20

<210> 1761
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1761

Gly Gln Leu Glu Val Gln Val Pro Pro Asp Pro Gly Asp Leu Val Glu
1   5   10   15

Tyr Ile Met Asn
            20

<210> 1762

<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1762

Gly Ser Tyr Tyr Lys Gln Tyr His Pro Thr Ala Cys Glu Val Glu Pro
1 5 10 15

Ala Phe Gly His
20

<210> 1763
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1763

Ile His Ala His Thr Thr Ser Asp Pro Trp His Pro Pro Gly Pro Leu
1 5 10 15

Gly Leu Lys Phe
20

<210> 1764
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1764

Ile Met Asn Tyr Thr Gly Asn Gln Gln Ser Arg Trp Gly Leu Gly Ser
1 5 10 15

Pro Asn Cys His
20

<210> 1765
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1765

Leu His Ile Arg Ala Gly Pro Tyr Gly His Ala Thr Val Glu Met Pro
1 5 10 15

Glu Trp Ile His
20

<210> 1766
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1766

Leu Lys Phe Lys Thr Val Arg Pro Val Ala Leu Pro Arg Ala Leu Ala
1 5 10 15

Pro Pro Arg Asn
20

<210> 1767
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1767

Leu Asn Thr Pro Pro Pro Tyr Gln Val Ser Cys Gly Gly Glu Ser Asp
1 5 10 15

Arg Ala Ser Ala Gly His
20

<210> 1768
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1768

Asn Cys His Gly Pro Asp Trp Ala Ser Pro Val Cys Gln Arg His Ser
1   5   10   15

Pro Asp Cys Ser
            20

<210> 1769
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1769

Pro Asp Cys Ser Arg Leu Val Gly Ala Thr Pro Glu Arg Pro Arg Leu
1   5   10   15

Arg Leu Val Asp
            20

<210> 1770
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1770

Pro Arg Asn Val Arg Val Thr Gly Cys Tyr Gln Cys Gly Thr Pro Ala
1   5   10   15

Leu Val Glu Gly
            20

<210> 1771
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1771

Pro Thr Asp Val Ser Cys Glu Gly Leu Gly Ala Trp Val Pro Thr Ala
1 5 10 15

Pro Cys Ala Arg Ile
20

<210> 1772
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1772

Arg Leu Val Asp Ala Asp Asp Pro Leu Leu Arg Thr Ala Pro Gly Pro
1 5 10 15

Gly Glu Val Trp
20

<210> 1773
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1773

Ser Val Phe Ala Leu Ala Ser Tyr Val Gln His Pro His Lys Thr Val
1 5 10 15

Arg Val Lys Phe

20

<210> 1774
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1774

Val Glu Gly Leu Ala Pro Gly Gly Gly Asn Cys His Leu Thr Val Asn
1 5 10 15

Gly Glu Asp Val
20

<210> 1775
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1775

Val Lys Phe His Thr Glu Thr Arg Thr Val Trp Gln Leu Ser Val Ala
1 5 10 15

Gly Val Ser Cys
20

<210> 1776
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1776

Val Pro Val Arg Leu Ala Gly Val Gly Phe Glu Ser Lys Ile Val Asp
1 5 10 15

Gly Gly Cys Phe
            20

<210> 1777
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1777

Val Ser Cys Asn Val Thr Thr Glu His Pro Phe Cys Asn Thr Pro His
1   5   10   15

Gly Gln Leu Glu
            20

<210> 1778
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1778

Ala Ala Ala Ser Ser Pro Asp Ala His Val Pro Phe
1   5   10

<210> 1779
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1779

Ala Ala Ser Ser Pro Asp Ala
1   5

<210> 1780
<211> 12
<212> PRT

<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1780

Ala Lys Leu Gly Ala Ala Ala Ser Ser Pro Asp Ala
1 5 10

<210> 1781
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1781

Ala Met Lys Pro Tyr Glu Val Thr Pro Thr Arg Met
1 5 10

<210> 1782
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1782

Ala Met Thr His Leu Ser Pro Ala Leu Ala Asp Val Pro Tyr Val Leu
1 5 10 15

Val Lys Thr Asn Met Val Val Thr Ser
20 25

<210> 1783
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1783

Ala Ser Ser Pro Asp Ala His Val Pro Phe Cys Phe
1   5   10

<210> 1784
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1784

Ala Ser Ser Pro Asp Ala His Val Pro Phe Cys Phe Gly Lys Asp Leu
1   5   10   15

Lys Arg Pro Gly Ser Ser Pro Met Glu
            20   25

<210> 1785
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1785

Cys Phe Gly Lys Asp Leu Lys Arg Pro Gly Ser Ser
1   5   10

<210> 1786
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1786

Cys Phe Gly Lys Asp Leu Lys Arg Pro Gly Ser Ser Pro Met Glu Val
1   5   10   15

Met Leu Arg Ala Val Phe Met Gln Gln
            20   25

<210> 1787
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1787

Cys Gly Ile Ala Ala Lys Leu Gly Ala Ala Ala Ser
1   5   10

<210> 1788
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1788

Cys Gly Ile Ala Ala Lys Leu Gly Ala Ala Ala Ser Ser Pro Asp Ala
1   5   10   15

His Val Pro Phe Cys Phe Gly Lys Asp
            20   25

<210> 1789
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1789

Asp Ala His Val Pro Phe Cys Phe Gly Lys Asp Leu
1   5   10

<210> 1790
<211> 12
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 1790

Asp Leu Lys Arg Pro Gly Ser Ser Pro Met Glu Val
1   5   10

<210> 1791
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1791

Asp Val Pro Tyr Val Leu Val Lys Thr Asn Met Val
1   5   10

<210> 1792
<211> 26
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1792

Asp Val Pro Tyr Val Leu Val Lys Thr Asn Met Val Val Thr Ser Val
1   5   10   15

Ala Met Lys Pro Tyr Glu Val Thr Pro Thr
            20   25

<210> 1793
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1793

Glu Val Met Leu Arg Ala Val Phe Met Gln Gln Arg
1   5   10

<210> 1794
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1794

Phe Glu Gly Lys Pro Ala Leu Glu Leu Ile Arg Met
1   5   10

<210> 1795
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1795

Phe Leu Gly Pro Lys Gln Leu Thr Phe Glu Gly Lys
1   5   10

<210> 1796
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1796

Phe Leu Gly Pro Lys Gln Leu Thr Phe Glu Gly Lys Pro Ala Leu Glu
1   5   10   15

Leu Ile Arg Met Val Glu Cys Ser Gly
            20   25

<210> 1797
<211> 17
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 1797

Phe Met Gln Gln Arg Pro Leu Arg Met Phe Leu Gly Pro Lys Gln Leu
1 5 10 15

Thr

<210> 1798
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1798

Gly Lys Asp Leu Lys Arg Pro Gly Ser Ser Pro Met
1 5 10

<210> 1799
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1799

Gly Lys Asp Leu Lys Arg Pro Gly Ser Ser Pro Met Glu
1 5 10

<210> 1800
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1800

Gly Lys Pro Ala Leu Glu Leu Ile Arg Met Val Glu
1 5 10

<210> 1801
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1801

Gly Pro Lys Gln Leu Thr Phe Glu Gly Lys Pro Ala
1 5 10

<210> 1802
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1802

His Val Pro Phe Cys Phe Gly Lys Asp Leu Lys Arg
1 5 10

<210> 1803
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1803

Ile Ala Ala Lys Leu Gly Ala Ala Ala Ser Ser Pro
1 5 10

<210> 1804
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1804

Lys Pro Tyr Glu Val Thr Pro Thr Arg Met Leu Val
1   5   10

<210> 1805
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1805

Lys Gln Leu Thr Phe Glu Gly Lys Pro Ala Leu Glu
1   5   10

<210> 1806
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1806

Lys Arg Pro Gly Ser Ser Pro Met Glu Val Met Leu
1   5   10

<210> 1807
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1807

Leu Glu Leu Ile Arg Met Val Glu Cys Ser Gly Lys
1   5   10

<210> 1808
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1808

Leu Gly Ala Ala Ala Ser Ser Pro Asp Ala His Val
1 5 10

<210> 1809
<211> 12
<212> PRT
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<220>
<223> Synthetic

<400> 1809

Leu Ile Arg Met Val Glu Cys Ser Gly Lys Gln Asp
1 5 10

<210> 1810
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1810

Leu Val Cys Gly Ile Ala Ala Lys Leu Gly Ala Ala
1 5 10

<210> 1811
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1811

Met Lys Pro Tyr Glu Val Thr Pro Thr Arg Met
1 5 10

<210> 1812
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1812

Met Leu Arg Ala Val Phe Met Gln Gln Arg Pro Leu
1   5   10

<210> 1813
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1813

Met Gln Gln Arg Pro Leu Arg Met
1   5

<210> 1814
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1814

Met Gln Gln Arg Pro Leu Arg Met Phe Leu Gly Pro
1   5   10

<210> 1815
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1815

Met Val Val Thr Ser Val Ala Met Lys Pro Tyr Glu
1   5   10

<210> 1816

<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1816

Met Val Val Thr Ser Val Ala Met Lys Pro Tyr Glu Val Thr Pro Thr
1 5 10 15

Arg Met Leu Val Cys Gly Ile Ala Ala
20 25

<210> 1817
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1817

Pro Ala Leu Glu Leu Ile Arg Met Val Glu Cys Ser
1 5 10

<210> 1818
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1818

Pro Ala Leu Glu Leu Ile Arg Met Val Glu Cys Ser Gly Lys
1 5 10

<210> 1819
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1819

Pro Phe Cys Phe Gly Lys Asp Leu Lys Arg Pro Gly
1 5 10

<210> 1820
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1820

Pro Gly Ser Ser Pro Met Glu Val Met Leu Arg Ala
1 5 10

<210> 1821
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1821

Pro Gly Ser Ser Pro Met Glu Val Met Leu Arg Ala Val Phe
1 5 10

<210> 1822
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1822

Pro Lys Gln Leu Thr Phe Glu Gly Lys
1 5

<210> 1823
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1823

Pro Leu Arg Met Phe Leu Gly Pro Lys Gln Leu Thr
1   5   10

<210> 1824
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1824

Pro Thr Arg Met Leu Val Cys Gly Ile Ala Ala Lys
1   5   10

<210> 1825
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1825

Pro Tyr Val Leu Val Lys Thr Asn Met Val Val Thr
1   5   10

<210> 1826
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1826

Gln Leu Thr Phe Glu Gly Lys Pro Ala Leu Glu Leu Ile Arg Met Val
1   5   10   15

Glu Cys Ser Gly Lys Gln Asp Cys Pro
            20   25

<210> 1827
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1827

Gln Arg Pro Leu Arg Met Phe Leu Gly Pro Lys Gln
1 5 10

<210> 1828
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1828

Arg Ala Val Phe Met Gln Gln Arg Pro Leu Arg Met
1 5 10

<210> 1829
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1829

Arg Met Phe Leu Gly Pro Lys Gln Leu Thr Phe Glu
1 5 10

<210> 1830
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1830

Arg Met Leu Val Cys Gly Ile Ala Ala Lys Leu Gly
1   5   10

<210> 1831
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1831

Arg Met Val Glu Cys Ser Gly Lys Gln Asp Cys Pro
1   5   10

<210> 1832
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1832

Ser Pro Asp Ala His Val Pro Phe Cys Phe Gly Lys
1   5   10

<210> 1833
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1833

Ser Ser Pro Met Glu Val Met Leu Arg Ala Val Phe
1   5   10

<210> 1834
<211> 25
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 1834

Ser Ser Pro Met Glu Val Met Leu Arg Ala Val Phe Met Gln Gln Arg
1   5   10   15

Pro Leu Arg Met Phe Leu Gly Pro Lys
            20   25

<210> 1835
<211> 12
<212> PRT
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<220>
<223> Synthetic

<400> 1835

Ser Val Ala Met Lys Pro Tyr Glu Val Thr Pro Thr
1   5   10

<210> 1836
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1836

Val Glu Cys Ser Gly Lys Gln Asp Cys Pro
1   5   10

<210> 1837
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1837

Val Phe Met Gln Gln Arg Pro Leu Arg Met Phe Leu
1   5   10

<210> 1838
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1838

Val Phe Met Gln Gln Arg Pro Leu Arg Met Phe Leu Gly Pro Lys Gln
1 5 10 15

Leu Thr Phe Glu Gly Lys Pro Ala Leu
20 25

<210> 1839
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1839

Val Lys Thr Asn Met Val Val Thr Ser Val Ala Met
1 5 10

<210> 1840
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1840

Val Leu Val Lys Thr Asn Met Val Val Thr Ser Val
1 5 10

<210> 1841
<211> 12
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 1841

Val Thr Pro Thr Arg Met Leu Val Cys Gly Ile Ala
1   5   10

<210> 1842
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1842

Val Thr Ser Val Ala Met Lys Pro Tyr Glu Val Thr
1   5   10

<210> 1843
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1843

Tyr Glu Val Thr Pro Thr Arg Met Leu Val Cys Gly
1   5   10

<210> 1844
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1844

Tyr Glu Val Thr Pro Thr Arg Met Leu Val Cys Gly Ile Ala Ala Lys
1   5   10   15

Leu Gly Ala Ala Ala Ser Ser Pro Asp
            20   25

<210> 1845
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1845

Cys Ala Ser Pro Tyr Glu Gly Arg Tyr Arg Asp Met Tyr Asp Ala Leu
1 5 10 15

Arg

<210> 1846
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1846

Cys Ala Val Phe Val Arg Asp Gly Gln Ser Val
1 5 10

<210> 1847
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1847

Cys Ile Thr Thr Ile Tyr Lys Thr Gly
1 5

<210> 1848
<211> 10
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 1848

Cys Pro Asn Gly Thr Arg Ala Leu Thr Val
1   5   10

<210> 1849
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1849

Asp Ala Leu Arg Arg Leu Leu Tyr Met Ile Tyr Met Ser Gly
1   5   10

<210> 1850
<211> 26
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1850

Gly Asn Arg Gly Arg Gly Gln Arg Arg Asp Trp Ser Arg Ala Pro Pro
1   5   10   15

Pro Pro Glu Glu Arg Gln Glu Thr Arg Ser
            20   25

<210> 1851
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1851

Gly Gln Pro Ala Ala Asp His Tyr Tyr Ser Lys Val Thr
1   5   10

<210> 1852
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1852

Gly Ser Pro Asn Cys His Gly Pro Asp Trp Ala Ser Pro Val Cys Gln
1   5   10   15

Arg His Ser

<210> 1853
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1853

His Lys Ser Leu Ser Thr Asn Leu Asp Val Thr Asn Ser Ile Glu His
1   5   10   15

Gln

<210> 1854
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1854

Leu Phe Thr Gln Gln Gly Gly Ala Tyr Gly Arg Cys
1   5   10

<210> 1855
<211> 22

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1855

Leu Ile Gly Leu Leu Ala Ile Ala Gly Ile Arg Leu His Arg Ala Ala
1   5   10   15

Ile Tyr Thr Ala Glu Ile
            20

<210> 1856
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1856

Pro Asp Thr Ala Ala Asp Ser Glu Leu Arg Arg Trp Ile Lys Tyr
1   5   10   15

<210> 1857
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1857

Pro Asn Cys His Gly Pro Asp Trp Ala Ser Pro Val Cys Gln Arg His
1   5   10   15

Ser

<210> 1858
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1858

Gln Thr Pro Ala Pro Lys Pro Ser Arg Ala Pro Pro Gln Gln Pro Gln
1   5   10   15

Pro Pro Arg Met Gln Thr Gly Arg
            20

<210> 1859
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1859

Arg Ala Gly Leu Thr Ala Gly Ala Ser Gln Ser Arg Arg Pro Arg Pro
1   5   10   15

Pro Arg

<210> 1860
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1860

Arg Phe Gly Ala Pro Gln Ala Phe Leu Ala Gly Leu Leu Leu Ala Ala
1   5   10   15

Val Ala Val Gly Thr Ala Arg Ala
            20

<210> 1861
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1861

Arg Gly Asn Ala Glu Leu Gln Thr Tyr Leu Arg Gln Ile Thr Pro Gly
1   5   10   15

<210> 1862
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1862

Arg Val His Val Ser Lys Glu Glu Gln Tyr Tyr Asp Tyr Glu Asp
1   5   10   15

<210> 1863
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1863

Ser Ile Tyr Gly Leu Tyr Asp Gly Thr Tyr Leu
1   5   10

<210> 1864
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1864

Ser Lys Val Thr Ala Thr Arg Leu Leu Ala Ser Thr Asn Ser
1   5   10

<210> 1865

<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1865

Thr Gln Gln Gly Gly Ala Tyr Gly Arg Cys Pro Asn Gly Thr Arg Ala
1 5 10 15

<210> 1866
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1866

Val Ala Pro Gly Ile Val Ile Pro Pro Lys Ala Leu
1 5 10

<210> 1867
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1867

Asp Ser Arg Pro Pro Glu Asp Val Phe Gln Asn Gly Phe Thr Ala Trp
1 5 10 15

Gly

<210> 1868
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1868

Glu His Arg Met Gln Glu Ala Val Glu Ala Glu Arg Ala Gly Arg
1 5 10 15

<210> 1869
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1869

Glu Thr Cys Phe Gln Gln Ala Cys Lys Gly Lys Ile Gln Ala Leu Cys
1 5 10 15

Glu Asn Pro Glu Trp Ala
20

<210> 1870
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1870

Glu Tyr Val Asp Thr Tyr Gly Asp Asn Ala Gly Arg Ile Leu Ala Gly
1 5 10 15

Ala Leu Ala Thr Tyr Gln
20

<210> 1871
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1871

His Arg Arg Ile Pro Pro Glu Asn Ile Arg Arg Val Thr Arg

1 5 10

<210> 1872
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1872

Met Ala Arg Gln Ala Glu Ser Ser Glu
1 5

<210> 1873
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1873

Met Gln Glu Ala Val Glu Ala Glu Arg Ala Gly Arg
1 5 10

<210> 1874
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1874

Ser Gln Gln Thr Arg Ala Asn Pro Asn Pro Tyr Thr Ser Arg Arg
1 5 10 15

<210> 1875
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1875

Thr Arg Ala Asn Pro Asn Pro Tyr Thr Ser Arg Arg Ser Val Ala Ser
1 5 10 15

Ile Val Gly Thr Leu Val His Gly
20

<210> 1876
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1876

Thr Val Tyr Arg Tyr Asp Ser Arg Pro Pro Glu Asp
1 5 10

<210> 1877
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1877

Asn Asp Arg Asn Leu Leu Asp
1 5

<210> 1878
<211> 29
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1878

Asn Met Glu Asp Glu Ala Asp Gln Tyr Phe Ser His Asp Asp Pro Ile
1 5 10 15

Ser Ser Asp Gln Ser Arg Phe Gly Trp Phe Glu Asn Lys

20 25

<210> 1879
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1879

Ser Arg Ala Ser Asp Ala Arg Ala Ala His Leu Pro Thr Gly Thr Pro
1 5 10 15

Leu Asp Ile Asp
20

<210> 1880
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1880

Glu Asp Val Phe Gln Asn Gly Phe Thr Ala Trp
1 5 10

<210> 1881
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1881

Ala Glu Gly Ser Ser Ser Val Glu Tyr Ile Asn Asn Trp Glu Gln Ala
1 5 10 15

Lys

<210> 1882
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1882

Gly Pro Ile Lys Asn Lys Met Ser Glu Ser Pro Asn Lys Thr
1 5 10

<210> 1883
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1883

Gly Pro Lys Leu Thr Gly Ala Leu Ile Gly Ile Leu Ser Leu Phe Val
1 5 10 15

Glu Ser Pro Gly Gln Leu Ile Gln Arg Ile Thr Asp Asp Pro Asp Val
20 25 30

<210> 1884
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1884

Gly Tyr Gln Lys Thr Val Asp His Thr Lys Val Asn Ser Lys
1 5 10

<210> 1885
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1885

Lys Thr Val Asp His
1 5

<210> 1886
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1886

Ser Glu Ser Pro Asn Lys
1 5

<210> 1887
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1887

Ala Glu Gly Ser Ser Ser Val Glu Tyr Ile Asn Asn Trp Glu Gln Ala
1 5 10 15

Lys Ala Leu Ser
20

<210> 1888
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1888

Ala Gln Ala Ile Pro Leu Val Gly Glu Leu Val Asp Ile Gly Phe Ala
1 5 10 15

Ala Tyr Asn Phe
            20

<210> 1889
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1889

Ala Ser Arg Val Val Leu Ser Leu Pro Phe Ala Glu Gly Ser Ser Ser
1   5   10   15

Val Glu Tyr Ile
            20

<210> 1890
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1890

Cys Ile Asn Leu Asp Trp Asp Val Ile Arg Asp Lys Thr Lys Thr Lys
1   5   10   15

Ile Glu Ser Leu
            20

<210> 1891
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1891

Cys Arg Ala Ile Asp Gly Asp Val Thr Phe Cys Arg Pro Lys Ser Pro
1   5   10   15

Val Tyr Val Gly
            20

<210> 1892
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1892

Cys Arg Pro Lys Ser Pro Val Tyr Val Gly Asn Gly Val His Ala Asn
1   5   10   15

Leu His Val Ala
            20

<210> 1893
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1893

Asp Ala Ala Gly Tyr Ser Val Asp Asn Glu Asn Pro Leu Ser Gly Lys
1   5   10   15

Ala Gly Gly Val
            20

<210> 1894
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1894

Asp Lys Thr Lys Thr Lys Ile Glu Ser Leu Lys Glu His Gly Pro Ile
1   5   10   15

Lys Asn Lys Met
            20

<210> 1895
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1895

Glu Glu Phe Ile Lys Arg Phe Gly Asp Gly Ala Ser Arg Val Val Leu
1   5   10   15

Ser Leu Pro Phe
            20

<210> 1896
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1896

Glu Lys Ala Lys Gln Tyr Leu Glu Glu Phe His Gln Thr Ala Leu Glu
1   5   10   15

His Pro Glu Leu
            20

<210> 1897
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1897

Phe His Arg Ser Ser Ser Glu Lys Ile His Ser Asn Glu Ile Ser Ser

1 5 10 15

Asp Ser Ile Gly
20

<210> 1898
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1898

Gly Ala Asp Asp Val Val Asp Ser Ser Lys Ser Phe Val Met Glu Asn
1 5 10 15

Phe Ser Ser Tyr
20

<210> 1899
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1899

Gly Lys Arg Gly Gln Asp Ala Met Tyr Glu Tyr Met Ala Gln Ala Cys
1 5 10 15

Ala Gly Asn Arg
20

<210> 1900
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1900

Gly Ser Val Met Gly Ile Ala Asp Gly Ala Val His His Asn Thr Glu
1   5   10   15

Glu Ile Val Ala
            20

<210> 1901
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1901

Gly Thr Gln Gly Asn Tyr Asp Asp Asp Trp Lys Gly Phe Tyr Ser Thr
1   5   10   15

Asp Asn Lys Tyr
            20

<210> 1902
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1902

His Asp Gly Tyr Ala Val Ser Trp Asn Thr Val Glu Asp Ser Ile Ile
1   5   10   15

Arg Thr Gly Phe
            20

<210> 1903
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1903

His Gly Thr Lys Pro Gly Tyr Val Asp Ser Ile Gln Lys Gly Ile Gln
1   5   10   15

Lys Pro Lys Ser
            20

<210> 1904
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1904

His Gln Thr Ala Leu Glu His Pro Glu Leu Ser Glu Leu Lys Thr Val
1   5   10   15

Thr Gly Thr Asn
            20

<210> 1905
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1905

Ile Gln Lys Gly Ile Gln Lys Pro Lys Ser Gly Thr Gln Gly Asn Tyr
1   5   10   15

Asp Asp Asp Trp
            20

<210> 1906
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1906

Lys Glu His Gly Pro Ile Lys Asn Lys Met Ser Glu Ser Pro Asn Lys
1 5 10 15

Thr Val Ser Glu
20

<210> 1907
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1907

Lys Gly Phe Tyr Ser Thr Asp Asn Lys Tyr Asp Ala Ala Gly Tyr Ser
1 5 10 15

Val Asp Asn Glu
20

<210> 1908
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1908

Leu Asp Val Asn Lys Ser Lys Thr His Ile Ser Val Asn Gly Arg Lys
1 5 10 15

Ile Arg Met Arg
20

<210> 1909
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1909

Met Ala Ser Thr Ile Pro Ile Thr Met Glu Asp Leu Gln Lys Ala Leu
1   5   10   15

Glu Ala

<210> 1910
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1910

Asn Gly Val His Ala Asn Leu His Val Ala Phe His Arg Ser Ser Ser
1   5   10   15

Glu Lys Ile His
            20

<210> 1911
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1911

Asn Asn Trp Glu Gln Ala Lys Ala Leu Ser Val Glu Leu Glu Ile Asn
1   5   10   15

Phe Glu Thr Arg
            20

<210> 1912
<211> 20
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 1912

Asn Pro Leu Ser Gly Lys Ala Gly Gly Val Val Lys Val Thr Tyr Pro
1   5   10   15

Gly Leu Thr Lys
            20

<210> 1913
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1913

Pro Val Phe Ala Gly Ala Asn Tyr Ala Ala Trp Ala Val Asn Val Ala
1   5   10   15

Gln Val Ile Asp
            20

<210> 1914
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1914

Ser Glu Leu Lys Thr Val Thr Gly Thr Asn Pro Val Phe Ala Gly Ala
1   5   10   15

Asn Tyr Ala Ala
            20

<210> 1915
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1915

Ser Glu Ser Pro Asn Lys Thr Val Ser Glu Glu Lys Ala Lys Gln Tyr
1   5   10   15

Leu Glu Glu Phe
            20

<210> 1916
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1916

Ser Glu Thr Ala Asp Asn Leu Glu Lys Thr Thr Ala Ala Leu Ser Ile
1   5   10   15

Leu Pro Gly Ile
            20

<210> 1917
<211> 20
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<220>
<223> Synthetic

<400> 1917

Ser Phe Val Met Glu Asn Phe Ser Ser Tyr His Gly Thr Lys Pro Gly
1   5   10   15

Tyr Val Asp Ser
            20

<210> 1918
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1918

Ser Asn Glu Ile Ser Ser Asp Ser Ile Gly Val Leu Gly Tyr Gln Lys
1   5   10   15

Thr Val Asp His
            20

<210> 1919
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1919

Ser Pro Gly His Lys Thr Gln Pro Phe Leu His Asp Gly Tyr Ala Val
1   5   10   15

Ser Trp Asn Thr
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<210> 1920
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1920

Ser Val Asn Gly Arg Lys Ile Arg Met Arg Cys Arg Ala Ile Asp Gly
1   5   10   15

Asp Val Thr Phe
            20

<210> 1921
<211> 20
<212> PRT

<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1921

Thr Ala Ala Leu Ser Ile Leu Pro Gly Ile Gly Ser Val Met Gly Ile
1 5 10 15

Ala Asp Gly Ala
20

<210> 1922
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1922

Thr Ala Glu Asn Thr Pro Leu Pro Ile Ala Gly Val Leu Leu Pro Thr
1 5 10 15

Ile Pro Gly Lys
20

<210> 1923
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1923

Thr Glu Pro Leu Met Glu Gln Val Gly Thr Glu Glu Phe Ile Lys Arg
1 5 10 15

Phe Gly Asp Gly
20

<210> 1924
<211> 20

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1924

Thr Ile Lys Lys Glu Leu Gly Leu Ser Leu Thr Glu Pro Leu Met Glu
1   5   10   15

Gln Val Gly Thr
            20

<210> 1925
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1925

Thr Lys Val Asn Ser Lys Leu Ser Leu Phe Phe Glu Ile Lys Ser
1   5   10   15

<210> 1926
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1926

Val Glu Asp Ser Ile Ile Arg Thr Gly Phe Gln Gly Glu Ser Gly His
1   5   10   15

Asp Ile Lys Ile
            20

<210> 1927
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1927

Val Glu Leu Glu Ile Asn Phe Glu Thr Arg Gly Lys Arg Gly Gln Asp
1   5   10   15

Ala Met Tyr Glu
            20

<210> 1928
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1928

Val Glu Ser Ile Ile Asn Leu Phe Gln Val Val His Asn Ser Tyr Asn
1   5   10   15

Arg Pro Ala Tyr
            20

<210> 1929
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1929

Val His Asn Ser Tyr Asn Arg Pro Ala Tyr Ser Pro Gly His Lys Thr
1   5   10   15

Gln Pro Phe Leu
            20

<210> 1930
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1930

Val Lys Val Thr Tyr Pro Gly Leu Thr Lys Val Leu Ala Leu Lys Val
1   5   10   15

Asp Asn Ala Glu
            20

<210> 1931
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1931

Val Leu Ala Leu Lys Val Asp Asn Ala Glu Thr Ile Lys Lys Glu Leu
1   5   10   15

Gly Leu Ser Leu
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<210> 1932
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1932

Val Leu Gly Tyr Gln Lys Thr Val Asp His Thr Lys Val Asn Ser Lys
1   5   10   15

Leu Ser Leu Phe
            20

<210> 1933
<211> 20
<212> PRT

<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1933

Val Arg Arg Ser Val Gly Ser Ser Leu Ser Cys Ile Asn Leu Asp Trp
1 5 10 15

Asp Val Ile Arg
20

<210> 1934
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1934

Trp Ala Val Asn Val Ala Gln Val Ile Asp Ser Glu Thr Ala Asp Asn
1 5 10 15

Leu Glu Lys Thr
20

<210> 1935
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1935

Tyr Met Ala Gln Ala Cys Ala Gly Asn Arg Val Arg Arg Ser Val Gly
1 5 10 15

Ser Ser Leu Ser
20

<210> 1936
<211> 15

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1936

Ala Lys Ala Pro Pro Ala Pro Lys Pro Ala Pro Gln Pro Gly Pro
1 5 10 15

<210> 1937
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1937

Ala Pro Lys Pro Ala Pro Gln Pro Gly Pro
1 5 10

<210> 1938
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1938

Ala Pro Lys Pro Ala Pro Gln Pro Gly Pro Gln Pro Pro Gln Pro
1 5 10 15

<210> 1939
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1939

Ala Gln Thr Arg Thr Pro Leu Gln Cys Thr Met Thr Glu Ile Phe
1 5 10 15

<210> 1940
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1940

Ala Ser Arg Gly Thr Asn Met Glu Asp Glu Ala Asp Gln Tyr Phe Ser
1   5   10   15

His Asp Asp

<210> 1941
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1941

Ala Thr Ile Arg Arg
1   5

<210> 1942
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1942

Asp Asn Arg Ala Gly
1   5

<210> 1943
<211> 15
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 1943

Glu Ala Pro Ala Pro Gln Pro Pro Ala Gly Arg Glu Leu Ser Ala
1   5   10   15

<210> 1944
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1944

Glu Met Val Arg Arg Ser Ala Gly Lys Val Ser Ser Thr Leu Ala Ser
1   5   10   15

Glu Leu Gly Ile
            20

<210> 1945
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1945

Gly Ala Ser Glu Leu
1   5

<210> 1946
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1946

Gly Asp Ala Leu Ala Gly Gly Ala Val Pro
1   5   10

<210> 1947
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1947

Gly Asp Ala Pro Ala Gly Gly Ala Val Pro
1   5   10

<210> 1948
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1948

Gly Asp Thr Trp Asp Asp Asp
1   5

<210> 1949
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1949

Gly Glu Arg Gln His
1   5

<210> 1950
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1950

Gly Gly Ala Val Pro
1   5

<210> 1951
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1951

Gly Gly Phe Gly Pro
1   5

<210> 1952
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1952

Gly Gly Phe Gly Pro Gly Gly Phe Gly Pro
1   5   10

<210> 1953
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1953

Gly Gly Phe Gly Pro Val Leu Asp Gly Trp
1   5   10

<210> 1954
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1954

Gly Gly Lys Glu Asp Arg Arg Val Lys Gln Ser Arg Gly Glu Ala Arg
1   5   10   15

Glu Ser Tyr Arg
            20

<210> 1955
<211> 6
<212> PRT
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<220>
<223> Synthetic

<400> 1955

Gly Ile Leu Leu Glu Asn
1   5

<210> 1956
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1956

Gly Ile Arg Arg Phe Leu
1   5

<210> 1957
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1957

His Asp Asp Pro Ile Ser Ser Asp Gln Ser Arg Phe Gly Trp Phe Glu
1   5   10   15

Asn Lys Glu Ile
            20

<210> 1958
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1958

His Glu Phe Ala Gly Glu Leu Ser Thr Leu Glu Ser Leu Met Asn Leu
1   5   10   15

Tyr

<210> 1959
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1959

His Leu Gly Gly Leu Ala Gly Tyr
1   5

<210> 1960
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1960

His Thr Thr Glu Asp Lys Ile Ser Arg Ala Val Gly Pro Arg Gln Ala
1   5   10   15

Gln Val Ser Phe Leu
            20

<210> 1961
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1961

Ile Cys Asp Ile Asp Thr Tyr Ile Val Glu Ala Gly Leu Ala Ser Phe
1   5   10   15

Ile Leu Thr Ile
            20

<210> 1962
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1962

Ile Ile Ile Val Pro Ile Pro Gly Asp Ser Ser Ile Thr Thr Arg Ser
1   5   10   15

Arg Leu Leu Asp
            20

<210> 1963
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1963

Ile Leu Asp Ile Lys Arg Thr Pro Gly Asn Lys Pro Arg Ile Ala Glu
1   5   10   15

Met Ile Cys Asp
            20

<210> 1964
<211> 6
<212> PRT
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<220>
<223> Synthetic

<400> 1964

Lys Ala Leu Leu Tyr Arg
1   5

<210> 1965
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1965

Lys Pro Pro Ile Thr Ser Gly Ser Gly Gly Ala Ile Arg Gly Ile Lys
1   5   10   15

His Ile Ile Ile
            20

<210> 1966
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1966

Leu Ala Gly Ser Gly Leu
1   5

<210> 1967
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1967

Leu Gly Ile Thr Ala Glu Asp Ala Arg Leu Val Ser Glu Ile Ala Met
1   5   10   15

His Thr Thr Glu
            20

<210> 1968
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1968

Leu Gly Thr Ile Leu Ala Gln Ile Trp Val Leu Leu Ala Lys Ala Val
1   5   10   15

Thr Ala

<210> 1969
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1969

Leu Pro Thr Gly Thr Pro Leu Asp Ile Asp Thr Ala Ser Glu Ser Ser
1   5   10   15

Gln Asp

<210> 1970
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1970

Met Ala Thr Leu Leu Arg Ser Leu Ala Leu Phe Lys Arg Asn Lys Asp
1   5   10   15

Lys

<210> 1971
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1971

Pro Ala Pro Gln Pro Pro
1   5

<210> 1972
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1972

Pro Asp Thr Ala Ala Asp Ser Glu Leu Arg Arg Trp Ile Lys Tyr Thr
1   5   10   15

Gln Gln Arg Arg
            20

<210> 1973
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1973

Pro Lys Leu Thr Gly Ala Leu Ile Gly Ile Leu Ser Leu Phe Val Glu
1 5 10 15

Ser Pro Gly Gln
20

<210> 1974
<211> 3
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<220>
<223> Synthetic

<400> 1974

Pro Gln Pro
1

<210> 1975
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1975

Pro Gln Pro Gly Pro
1 5

<210> 1976
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1976

Pro Gln Pro Gly Pro Gln Pro Pro Gln Pro Pro Gln Pro Gln Pro
1 5 10 15

<210> 1977
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1977

Gln Asp Pro Gln Asp Ser Arg Arg Ser Ala Glu Pro Leu Leu Ser Cys
1 5 10 15

Lys Pro Trp Gln
20

<210> 1978
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1978

Gln Arg Arg Val Val Gly Glu Phe Arg Leu Glu Arg Lys Trp Leu Asp
1 5 10 15

Val Val Arg

<210> 1979
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1979

Arg Glu Leu Ser Ala
1 5

<210> 1980
<211> 5
<212> PRT

<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1980

Arg Phe Ala Pro Gln
1 5

<210> 1981
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1981

Ser Ile Gln Asn Lys Phe Ser Ala Gly Ser Tyr Pro Leu Leu Trp Ser
1 5 10 15

Tyr Ala Met Gly
20

<210> 1982
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1982

Ser Ile Thr Leu Gln Ala Gly Ala His
1 5

<210> 1983
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1983

Ser Leu Gln Pro Glu Asp
1   5

<210> 1984
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1984

Ser Asn Ala Leu Ser Lys Arg Leu
1   5

<210> 1985
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1985

Ser Pro Gly Gln Leu Ile Gln Arg Ile Thr Asp Asp Pro Asp Val Ser
1   5   10   15

Ile Arg Leu Leu
            20

<210> 1986
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1986

Thr Glu Leu Pro Ser Ile Pro Gly
1   5

<210> 1987
<211> 7
<212> PRT

<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1987

Thr Phe Thr Leu Ala Asn Lys
1 5

<210> 1988
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1988

Thr Trp Asp Asp Asp
1 5

<210> 1989
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1989

Val Ser Phe Leu Gln Gly Asp Gln Ser Glu Asn Glu Leu Pro Arg Leu
1 5 10 15

Gly Gly Lys Glu
20

<210> 1990
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1990

Trp Gln Glu Ser Arg Lys Asn Lys Ala Gln Thr Arg Thr Pro Leu Gln
1   5   10   15

Cys

<210> 1991
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1991

Tyr Ala Met Gly Val Gly Val Glu Leu Glu Asn Ser Met Gly Gly Leu
1   5   10   15

Asn Phe Gly Arg
            20

<210> 1992
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1992

Tyr Gln Gln Met Gly Lys Pro Ala Pro Tyr Met Val Asn Leu Glu Asn
1   5   10   15

Ser Ile

<210> 1993
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1993

Met Thr Arg Ser Ser His Gln Ser Leu Val Ile Lys Leu Met Pro
1 5 10 15

<210> 1994
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1994

Pro Ile Arg Asp Ala Leu Asn Ala Met Thr Gln Asn Ile Arg Pro
1 5 10 15

<210> 1995
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1995

Ala Leu Leu Asn Thr Pro Pro Pro Tyr Gln Val Ser Cys Gly Gly Glu
1 5 10 15

Ser Asp Arg Ala Ser Ala Gly His
20

<210> 1996
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1996

Gly Leu Gly Ser Pro Asn Cys His Gly Pro Asp Trp Ala Ser Pro Val
1 5 10 15

Cys Gln Arg His Ser
20

<210> 1997
<211> 28
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1997

Gly Leu Gly Ser Pro Asn Cys His Gly Pro Asp Trp Ala Ser Pro Val
1 5 10 15

Cys Gln Arg His Ser Pro Asp Cys Ser Arg Leu Val
20 25

<210> 1998
<211> 26
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1998

Asn Tyr Thr Gly Asn Gln Gln Ser Arg Trp Gly Leu Gly Ser Pro Asn
1 5 10 15

Cys His Gly Pro Asp Trp Ala Ser Pro Val
20 25

<210> 1999
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 1999

Thr Leu Pro Gln Pro Pro Cys Ala His Gly Gln His Tyr Gly His His
1 5 10 15

His His Gln Leu

20

<210> 2000
<211> 26
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2000

Thr Val Arg Val Lys Phe His Thr Glu Thr Arg Thr Val Trp Gln Leu
1 5 10 15

Ser Val Ala Gly Val Ser Cys Asn Val Thr
20 25

<210> 2001
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2001

Ala Ser Tyr Phe Asn Pro Gly Gly Ser Tyr Tyr Lys Gln Tyr His
1 5 10 15

<210> 2002
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2002

Phe Ala Leu Ala Ser Tyr Val Gln His Pro His Lys Thr Val Arg
1 5 10 15

<210> 2003
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2003

Gly Gly Glu Ser Asp Arg Ala Ser Ala Arg Val Ile Asp Pro Ala Ala
1   5   10   15

Gln Ser Phe Thr Gly
            20

<210> 2004
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2004

Gly Pro Gly Glu Val Trp Val Thr Pro Val Ile Gly Ser Gln Ala Arg
1   5   10   15

Lys Cys

<210> 2005
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2005

Gly Ser Gln Ala Arg Lys Cys Gly Leu His Ile Arg Ala Gly
1   5   10

<210> 2006
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2006

Leu Val Gly Ala Thr Pro Glu Arg Pro Arg Leu Arg Leu Val Asp Ala
1 5 10 15

Asp Asp Pro Leu Leu Arg Thr Ala Pro
20 25

<210> 2007
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2007

Thr Ala Pro Gly Pro Gly Glu Val Trp Val Thr Pro Val Ile
1 5 10

<210> 2008
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2008

Phe Ile Val Leu Ser Ile Ala Tyr Pro Thr Leu Ser Glu Ile Lys
1 5 10 15

<210> 2009
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2009

Glu Thr Cys Phe Gln Gln Ala Cys Lys Gly Lys Ile Gln Ala Leu Cys
1 5 10 15

Glu Asn Pro Glu Trp Ala Pro Leu Lys Asp Asn Arg Ile Pro Ser Tyr
            20   25   30

<210> 2010
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2010

Leu Pro Arg Leu Gly Gly Lys Glu Asp Arg
1   5   10

<210> 2011
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2011

Met Ser Lys Thr Glu Trp Asn Ala Ser Gln
1   5   10

<210> 2012
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2012

Ser Arg Phe Gly Trp Phe Glu Asn Lys Glu
1   5   10

<210> 2013
<211> 29
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2013

Glu Ala Cys Val Thr Ser Trp Leu Trp Ser Glu Gly Glu Gly Ala Val
1   5   10   15

Phe Tyr Arg Val Asp Leu His Phe Ile Asn Leu Gly Thr
            20   25

<210> 2014
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2014

Met Asp Phe Trp Cys Val Glu His Asp Arg Pro Pro Pro Ala Thr Pro
1   5   10   15

Thr Ser Leu Thr Thr
            20

<210> 2015
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2015

Pro Phe Leu Gly His Asp Gly His His Gly Gly Thr Leu Arg Val Gly
1   5   10   15

Gln His His Arg Asn Ala Ser Asp Val
            20   25

<210> 2016
<211> 21
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 2016

Arg Val Lys Phe His Thr Glu Thr Arg Thr Val Trp Gln Leu Ser Val
1 5 10 15

Ala Gly Val Ser Cys
20

<210> 2017
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2017

Ala Glu Glu Gln Ala Arg His Val Lys Asn Gly Leu Glu
1 5 10

<210> 2018
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2018

Glu Ser Pro Gln Glu Ile Ser Lys His Gln Ala Leu Gly
1 5 10

<210> 2019
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2019

Gly Val Gly Val Glu Leu Glu Asn Ser Met Gly Gly Leu Asn Phe
1 5 10 15

<210> 2020
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2020

Ile Lys Gly Ala Asn Asp Leu Ala Lys Phe His Gln Met Leu Met Lys
1   5   10   15

Ile Ile Met Lys
            20

<210> 2021
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2021

Met Ser Lys Thr Leu His Ala Gln Leu Gly Phe Lys Lys Thr
1   5   10

<210> 2022
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
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<400> 2022

Asn Ala Ser Gly Leu Ser Arg Pro Ser Pro Ser Ala His
1   5   10

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<400> 2023

Val Arg Val Ile Asp Pro Ser Leu Gly Asp Arg Lys Asp Glu
1   5   10

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<400> 2024

Asp Leu Ser Asp Gly Asp Leu Leu Val
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<400> 2025

Glu Ala Glu Arg Ala Gly Arg Gly Thr Gly
1   5   10

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<400> 2026

Tyr Arg Tyr Asp Ser Arg Pro Pro Glu Asp Val
1   5   10

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<400> 2027

Tyr Val Asp Thr Tyr Gly Asp Asn Ala Gly
1 5 10

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<400> 2028

Ser Phe Ser Tyr Phe Tyr Pro Phe Arg
1 5

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<400> 2029

Asp Ile Phe Ile Val Ser Pro Arg
1 5

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<400> 2030

Gln Asp Ser Arg Arg Ser Ala Asp Ala Leu Leu Arg Leu Gln Ala Met
1 5 10 15

Ala Gly Ile Ser Glu Glu Gln Gly Ser Asp Thr Asp Thr Pro Ile Val
            20   25   30

Tyr Asn Asp Arg Asn
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Ser Ala Glu Ala Leu Leu Arg Leu Gln Ala
1   5   10

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<400> 2032

Arg Ile Val Ile Asn Arg Glu His Leu
1   5

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<400> 2033

Ile Pro Arg Phe Lys
1   5

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<400> 2034

Ala Ala Ala Leu Ser Pro Met Glu Ile
1 5

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<400> 2035

Ala Ala Ala Ser Val Val Gly Ala Pro Val
1 5 10

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<400> 2036

Ala Ala Leu Gly Arg Gln Asp Ser Ile
1 5

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Ala Ala Gln Arg Leu Val His Ala Ile Ala
1 5 10

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<400> 2038

Ala Ala Val Glu Ala Ala Glu Leu
1   5

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<400> 2039

Ala Gly Ala Asn Val Leu Asn Gly Leu
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<400> 2040

Ala Gly Tyr Ala Asn Ala Ala Asp
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<400> 2041

Ala Gly Tyr Glu Gln Phe Glu Phe Arg Val

1 5 10

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<400> 2042

Ala Ile Thr Gly Asn Ala Asp Asn Leu
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<400> 2043

Ala Lys Glu Lys Asn Ala Thr Leu Met
1 5

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<400> 2044

Ala Lys Gly Val Phe Leu Ser Leu
1 5

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<400> 2045

Ala Pro His Glu Tyr Gly Phe Gly Ile
1 5

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Ala Arg Gln Gly Asn Asp Leu Glu Ile
1 5

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Ala Ser Val Val Gly Ala Pro Val
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<400> 2048

Ala Thr Leu Met Phe Arg Leu Val
1 5

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<400> 2049

Ala Val Ala Ala Ala Gln Arg Leu
1   5

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<400> 2050

Asp Ala Gly Ala Asn Val Leu Asn Gly Leu
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<400> 2051

Asp Ala Leu Leu Ala Gln Leu Tyr Arg
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<400> 2052

Asp Ala Asn Gly Val Leu Lys His Ser Ile
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<400> 2053

Asp Gly Asp Met Asn Ile Gly Val Ile
1   5

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<400> 2054

Asp His Val Lys Asn Ile Glu Asn Leu
1   5

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<400> 2055

Asp Ile Asp Met Phe Ala Ile Met
1   5

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<400> 2056

Asp Met Phe Ala Ile Met Pro His Leu
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<400> 2057

Asp Asn Val Arg Asn Val Glu Asn Val
1   5

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<400> 2058

Asp Asn Val Arg Asn Val Glu Asn Val Ile
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Asp Thr Val Asp Tyr Ser Ala Met
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Asp Thr Val Asp Tyr Ser Ala Met Ile
1   5

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<400> 2061

Asp Tyr Leu Arg Gln Ala Gly Leu
1   5

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<400> 2062

Asp Tyr Tyr Asp Asn Val Arg Asn Val
1   5

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<400> 2063

Glu Phe Thr Thr Phe Val Glu Ile
1   5

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Glu Phe Thr Thr Phe Val Glu Ile Val
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<400> 2065

Glu Gly Tyr Val Phe Tyr Glu Asn
1 5

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<400> 2066

Glu Asn Val Gln Tyr Arg His Val
1 5

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<400> 2067

Glu Gln Leu Ala Asn Ser Asp Gly Leu
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<400> 2068

Phe Gly Val Gly Tyr Gly His Asp Thr Ile
1   5   10

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<400> 2069

Phe Ser Pro Asp Val Leu Glu Thr Val Pro
1   5   10

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<400> 2070

Phe Ser Val Asp His Val Lys Asn Ile
1   5

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<400> 2071

Gly Asp Asp Thr Tyr Leu Phe Gly Val
1   5

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<400> 2072

Gly Asp Asp Val Phe Leu Gln Asp Leu
1 5

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<400> 2073

Gly Glu Asp Gly Asn Asp Ile Phe Leu
1 5

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Gly Glu Arg Phe Asn Val Arg Lys Gln Leu
1 5 10

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<400> 2075

Gly Gly Ala Gly Asn Asp Thr Leu Val
1 5

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Gly Gly Asp Asp Phe Glu Ala Val
1 5

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Gly Lys Ser Glu Phe Thr Thr Phe Val
1 5

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Gly Lys Ser Leu Phe Asp Asp Gly Leu
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Gly Asn Ala Asp Asn Leu Lys Ser Val
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Gly Gln Leu Val Glu Val Asp Thr Leu
1   5

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Gly Arg Ser Lys Phe Ser Pro Asp Val
1   5

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Gly Ser Ser Ala Tyr Asp Thr Val
1   5

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Gly Thr Val Glu Lys Trp Pro Ala Leu
1   5

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Gly Val Asp Tyr Tyr Asp Asn Val
1   5

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Gly Tyr Glu Gln Phe Glu Phe Arg Val
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His Ala Val Gly Ala Gln Asp Val Val
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Ile Ala Ala Gly Arg Ile Gly Leu Gly Ile
1 5 10

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Ile Gly Asp Ala Gln Ala Asn Thr Leu
1 5

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Ile Gly Leu Gly Ile Leu Ala Asp Leu
1 5

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<400> 2090

Ile Gly Asn Ala Ala Gly Ile Pro Leu
1 5

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Ile Gly Thr Ser Met Lys Asp Val Leu
1   5

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Ile Gly Val Ile Thr Asp Phe Glu Leu
1   5

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<400> 2093

Ile Pro Leu Thr Ala Asp Ile Asp Met
1   5

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<400> 2094

Ile Ser Lys Ser Ala Leu Glu Leu

1 5

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<400> 2095

Ile Thr Gly Asn Ala Asp Asn Leu
1 5

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Lys Ile Phe Val Val Ser Ala Thr
1 5

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<400> 2097

Lys Gln Leu Asn Asn Ala Asn Val Tyr Arg
1 5 10

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<400> 2098

Lys Val Ile Gly Asn Ala Ala Gly Ile
1 5

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<400> 2099

Leu Ala Lys Val Val Ser Gln Leu
1 5

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<400> 2100

Leu Ala Asn Asp Tyr Ala Arg Lys Ile
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Leu Asp Tyr Leu Arg Gln Ala Gly Leu
1 5

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<400> 2102

Leu Gly Lys Gly Phe Ala Ser Leu
1   5

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<400> 2103

Leu Gly Lys Gly Phe Ala Ser Leu Met
1   5

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<400> 2104

Leu Gly Val Asp Tyr Tyr Asp Asn
1   5

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<400> 2105

Leu Gly Val Asp Tyr Tyr Asp Asn Val
1   5

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Leu Lys His Ser Ile Lys Leu Asp Val Ile
1   5   10

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<400> 2107

Leu Gln Ala Gly Tyr Ile Pro Val
1   5

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<400> 2108

Leu Gln Leu Thr Gly Gly Thr Val Glu
1   5

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<400> 2109

Leu Ser Ala Ala Val Phe Gly Leu
1   5

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Leu Ser Leu Gly Lys Gly Phe Ala Ser Leu
1   5   10

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<400> 2111

Leu Ser Pro Met Glu Ile Tyr Gly Leu
1   5

<210> 2112
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<400> 2112

Asn Ala His Asp Asn Phe Leu Ala Gly Gly
1   5   10

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Asn Ala Asn Val Tyr Arg Glu Gly Val
1   5

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<400> 2114

Asn Asp Thr Leu Tyr Gly Gly Leu
1   5

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Asn Gly Leu Ala Gly Asn Asp Val Leu
1   5

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Asn Asn Ala Asn Val Tyr Arg Glu Gly Val
1   5   10

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<400> 2117

Asn Thr Val Ser Tyr Ala Ala Leu
1 5

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Asn Val Leu Arg Asn Ile Glu Asn Ala Val
1 5 10

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Pro Ala Leu Thr Phe Ile Thr Pro Leu
1 5

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<400> 2120

Pro Glu Thr Ser Asn Val Leu Arg Asn Ile
1 5 10

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<400> 2121

Pro Met Glu Ile Tyr Gly Leu Val
1   5

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<400> 2122

Pro Gln Ala Tyr Phe Glu Lys Asn Leu
1   5

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Pro Val Asn Pro Asn Leu Ser Lys Leu
1   5

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<400> 2124

Gln Ala Gly Trp Asn Ala Ser Ser Val
1   5

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<400> 2125

Gln Ala Gly Trp Asn Ala Ser Ser Val Ile
1   5   10

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<400> 2126

Gln Asp Ala Ala Asn Ala Gly Asn Leu
1   5

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<400> 2127

Gln Asp Ala Ala Asn Ala Gly Asn Leu Leu
1   5   10

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<400> 2128

Gln Asp Ser Gly Tyr Asp Ser Leu
1   5

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Gln Gln Ser His Tyr Ala Asp Gln Leu
1   5

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<400> 2130

Arg Ala Leu Gln Gly Ala Gln Ala Val
1   5

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<400> 2131

Arg Gly Gly Leu Gly Leu Asp Thr Leu
1   5

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<400> 2132

Arg Lys Gln Leu Asn Asn Ala Asn Val
1   5

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<400> 2133

Arg Gln Asp Ser Gly Tyr Asp Ser Leu
1   5

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<400> 2134

Arg Gln Phe Arg Tyr Asp Gly Asp Met
1   5

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<400> 2135

Arg Ser Lys Phe Ser Pro Asp Val Leu
1   5

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<400> 2136

Ser Ala Gly Ala Ala Ala Gly Ala Leu
1   5

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<400> 2137

Ser Ala His Trp Gly Gln Arg Ala Leu
1   5

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<400> 2138

Ser Ala Met Ile His Pro Gly Arg Ile
1   5

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<400> 2139

Ser Ala Met Ile His Pro Gly Arg Ile Val
1   5   10

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<400> 2140

Ser Ala Tyr Asp Thr Val Ser Gly Ile
1 5

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<400> 2141

Ser Ala Tyr Gly Tyr Glu Gly Asp
1 5

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<400> 2142

Ser Gly Gly Ala Gly Asp Asp Val Leu
1 5

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<400> 2143

Ser Gly Leu Gln Val Ala Gly Ala
1 5

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<400> 2144

Ser Gly Tyr Asp Ser Leu Asp Gly Val
1   5

<210> 2145
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<400> 2145

Ser Leu Leu Thr Gly Ala Leu Asn Gly Ile
1   5   10

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Ser Pro Met Glu Ile Tyr Gly Leu
1   5

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<400> 2147

Ser Gln Met Leu Thr Arg Gly Gln Leu

1 5

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<400> 2148

Ser Ser Ala Tyr Asp Thr Val Ser Gly Ile
1 5 10

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Ser Ser Leu Ala His Gly His Thr Ala
1 5

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Ser Ser Val Thr Ser Gly Asp Ser Val
1 5

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Ser Val Ile Gly Val Gln Thr Thr Glu Ile
1 5 10

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<400> 2152

Thr Asn Thr Val Ser Tyr Ala Ala Leu
1 5

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<400> 2153

Thr Ser Leu Ile Ala Glu Gly Val
1 5

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Thr Ser Leu Leu Thr Gly Ala Leu
1 5

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Thr Val Pro Ala Ser Pro Gly Leu
1   5

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<400> 2156

Val Ala Lys Glu Lys Asn Ala Thr Leu
1   5

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Val Ala Pro His Glu Tyr Gly Phe Gly Ile
1   5   10

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<400> 2158

Val Ala Val Val Thr Ser Leu Leu
1   5

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<400> 2159

Val Phe Tyr Glu Asn Arg Ala Tyr Gly
1   5

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Val Phe Tyr Glu Asn Arg Ala Tyr Gly Val
1   5   10

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Val Ile Thr Asp Phe Glu Leu Glu Val
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<400> 2162

Val Asn Pro His Ser Thr Ser Leu
1   5

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<400> 2163

Val Asn Pro His Ser Thr Ser Leu Ile
1   5

<210> 2164
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<400> 2164

Val Asn Pro Asn Leu Ser Lys Leu
1   5

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<400> 2165

Val Asn Pro Asn Leu Ser Lys Leu Phe
1   5

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<400> 2166

Val Gln Gln Pro Ile Ile Glu Lys Leu
1   5

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<400> 2167

Val Gln Tyr Arg His Val Glu Leu
1   5

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<400> 2168

Val Ser Ile Ala Ala Ala Ala Ser Val
1   5

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<400> 2169

Val Ser Ile Ala Ala Ala Ala Ser Val Val
1   5   10

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<400> 2170

Val Thr Ser Leu Leu Thr Gly Ala Leu
1 5

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<400> 2171

Val Val Leu Ala Asn Ala Ser Arg Ile
1 5

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<400> 2172

Trp Pro Ala Leu Asn Leu Phe Ser Val
1 5

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<400> 2173

Trp Val Arg Lys Ala Ser Ala Leu
1 5

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<400> 2174

Tyr Ala Val Gln Tyr Arg Arg Lys Gly Gly
1   5   10

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<220>
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<400> 2175

Tyr Gly Gly Leu Gly Asp Asp Thr Leu
1   5

<210> 2176
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<400> 2176

Tyr Gly Leu Val Gln Gln Ser His Tyr Ala
1   5   10

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<220>
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<400> 2177

Tyr Gly Tyr Glu Gly Asp Ala Leu Leu
1   5

<210> 2178

<211> 8
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<220>
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<400> 2178

Tyr Ile Pro Val Asn Pro Asn Leu
1 5

<210> 2179
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<220>
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<400> 2179

Tyr Ser Ala Met Ile His Pro Gly Arg Ile
1 5 10

<210> 2180
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<212> PRT
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<220>
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<400> 2180

Tyr Ser Gln Thr Gly Ala His Ala Gly Ile
1 5 10

<210> 2181
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<213> Artificial Sequence

<220>
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<400> 2181

Ala Tyr Asn Phe Val Glu Ser Ile Ile Asn Leu Phe Gln Val Val His
1 5 10 15

Asn Ser Tyr Asn
            20

<210> 2182
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<220>
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<400> 2182

Ser Gly Thr Thr Ile Lys
1   5

<210> 2183
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<220>
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<400> 2183

Arg Gly His Thr Leu Glu Ser Ala Glu Gly Arg Lys Ile Phe Gly
1   5   10   15

<210> 2184
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<400> 2184

Ala Gly Ala Met Thr Val Arg Asp Val Ala Ala Ala Ala Asp Leu Ala
1   5   10   15

Leu Gln Ala Gly Asp Ala
            20

<210> 2185

<211> 23
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<220>
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<400> 2185

Ala Gly Ala Met Thr Val Arg Asp Val Ala Ala Ala Ala Asp Leu Ala
1 5 10 15

Leu Gln Ala Gly Asp Ala Leu
20

<210> 2186
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<220>
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<400> 2186

Ala Leu Ala Ala Val Leu Val Asn Pro His Ile Phe Thr Arg Ile Gly
1 5 10 15

Ala Ala Gln Thr Ser Leu Ala Asp Gly Ala Ala Gly Pro Ala
20 25 30

<210> 2187
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<220>
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<400> 2187

Ala Leu Ser Ile Asp Ser Met Thr Ala Leu Gly Ala
1 5 10

<210> 2188
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<212> PRT
<213> Artificial Sequence

<220>
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<400> 2188

Asp Leu Ser Ala Ala Arg Gly Ala Asp Ile Ser Gly Glu Gly Arg
1   5   10   15

<210> 2189
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<212> PRT
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<400> 2189

Asp Gln Asn Arg Tyr Glu Tyr Ile Trp Gly Leu Tyr
1   5   10

<210> 2190
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<212> PRT
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<220>
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<400> 2190

Asp Tyr Thr Val Ser Ala Asp Ala Ile Ala Leu Ala
1   5   10

<210> 2191
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<400> 2191

Gly Pro Ile Val Val Glu Ala Gly Glu Leu Val Ser His Ala Gly Gly
1   5   10   15

<210> 2192

<211> 23
<212> PRT
<213> Artificial Sequence

<220>
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<400> 2192

Gly Arg Pro Glu Gly Leu Lys Ile Gly Ala His Ser Ala Thr Ser Val
1 5 10 15

Ser Gly Ser Phe Asp Ala Leu
20

<210> 2193
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<212> PRT
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<400> 2193

Ile Thr Val Thr Ser Arg Gly Gly Phe Asp Asn Glu Gly Lys Met Glu
1 5 10 15

Ser Asn Lys

<210> 2194
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 2194

Leu Asp Gln Asn Arg Tyr Glu Tyr Ile Trp Gly Leu Tyr Pro
1 5 10

<210> 2195
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<212> PRT
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<400> 2195

Leu Ser Ala Ala Arg Gly Ala Asp Ile Ser Gly
1   5   10

<210> 2196
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<212> PRT
<213> Artificial Sequence

<220>
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<400> 2196

Asn Lys Ile Arg Leu Met Gly Pro Leu Gln
1   5   10

<210> 2197
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<220>
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<400> 2197

Asn Lys Leu Gly Arg Ile Arg Ala Gly Glu Asp Met
1   5   10

<210> 2198
<211> 20
<212> PRT
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<220>
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<400> 2198

Asn Lys Leu Gly Arg Ile Arg Ala Gly Glu Asp Met His Leu Asp Ala
1   5   10   15

Pro Arg Ile Glu

20

<210> 2199
<211> 12
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<220>
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<400> 2199

Pro His Leu Arg Asn Thr Gly Gln Val Val Ala Gly
1 5 10

<210> 2200
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<212> PRT
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<220>
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<400> 2200

Gln Val Asp Leu His Asp Leu Ser Ala Ala Arg Gly Ala Asp Ile Ser
1 5 10 15

Gly

<210> 2201
<211> 12
<212> PRT
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<220>
<223> Synthetic

<400> 2201

Arg Asp Val Ala Ala Ala Ala Asp Leu Ala Leu Gln
1 5 10

<210> 2202
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<212> PRT
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<220>
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<400> 2202

Ser Ala Ala Arg Gly Ala Asp Ile Ser Gly Glu Gly
1   5   10

<210> 2203
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<212> PRT
<213> Artificial Sequence

<220>
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<400> 2203

Thr Lys Gly Glu Met Gln Ile Ala Gly Lys Gly Gly Gly Ser Pro
1   5   10   15

<210> 2204
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<212> PRT
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<220>
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<400> 2204

Thr Val Ser Ala Asp Ala Ile Ala Leu Ala Ala Gln
1   5   10

<210> 2205
<211> 9
<212> PRT
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<220>
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<400> 2205

Val Val Ala Gly His Asp Ile His Ile
1   5

<210> 2206

<211> 24
<212> PRT
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<220>
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<400> 2206

Pro Ser Gly Pro Asn His Thr Lys Val Val Gln Leu Pro Lys Ile Ser
1   5   10   15

Lys Asn Ala Leu Lys Ala Asn Gly
            20

<210> 2207
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<220>
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<400> 2207

Leu Val Gly Ala Thr Pro Glu Arg Pro Arg Leu Arg Leu Val Asp Ala
1   5   10   15

Asp Asp Pro Leu Leu Arg Thr Ala Pro Gly Pro Gly Glu Val Trp Val
            20   25   30

Thr Pro Val Ile Gly Ser Gln Ala Arg
        35   40

<210> 2208
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<212> PRT
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<220>
<223> Synthetic

<400> 2208

Gln Gln Ser Arg Trp Gly Leu Gly Ser Pro Asn Cys His Gly Pro Asp
1   5   10   15

Trp Ala Ser Pro Val Cys Gln Arg His Ser Pro
20 25

<210> 2209
<211> 17
<212> PRT
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<220>
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<400> 2209

Ala Gly Glu Ala Met Val Leu Val Tyr Tyr Glu Ser Ile Ala Tyr Ser
1 5 10 15

Phe

<210> 2210
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<212> PRT
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<220>
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<400> 2210

Gly Gly Val Gly Leu Ala Ser Thr Leu Trp Tyr Ala Glu Ser Asn Ala
1 5 10 15

Leu Ser Lys Arg Leu Gly Glu Leu
20

<210> 2211
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<220>
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<400> 2211

Gly Thr Leu Val Arg Ile Ala Pro Val Ile Gly Ala Cys Met Ala Arg
1 5 10 15

Gln Ala

<210> 2212
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<220>
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<400> 2212

Ile Arg Arg Val Thr Arg Val Tyr His Asn Gly Ile Thr Gly Glu Thr
1   5   10   15

Thr Thr

<210> 2213
<211> 18
<212> PRT
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<220>
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<400> 2213

Ile Val Lys Thr Gly Glu Arg Gln His Gly Ile His Ile Gln Gly Ser
1   5   10   15

Asp Pro

<210> 2214
<211> 24
<212> PRT
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<220>
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<400> 2214

Ile Val Lys Thr Gly Glu Arg Gln His Gly Ile His Ile Gln Gly Ser
1   5   10   15

Asp Pro Gly Gly Val Arg Thr Ala
            20

<210> 2215
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<220>
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<400> 2215

Leu Arg Asp Thr Asn Val Thr Ala Val Pro Ala Ser Gly Ala Pro Ala
1   5   10   15

Ala Val Ser Val Leu Gly Ala Ser
            20

<210> 2216
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<220>
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<400> 2216

Pro Glu Ala Pro Ala Pro Gln Pro Pro Ala Gly Arg Glu Leu Ser Ala
1   5   10   15

Ala Ala Asn Ala Ala Val Asn Thr
            20

<210> 2217
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<400> 2217

Ala Ala Ala Asp Phe Ala His Ala Glu

1 5

<210> 2218
<211> 9
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<220>
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<400> 2218

Ala Ala Ala Glu Val Ala Gly Ala Leu
1 5

<210> 2219
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<220>
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<400> 2219

Ala Ala Glu Ser Thr Phe Glu Ser Tyr
1 5

<210> 2220
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<220>
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<400> 2220

Ala Ala Gly Phe Asp Pro Glu Val Gln
1 5

<210> 2221
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<220>
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<400> 2221

Ala Ala Leu Gly Arg Gly His Ser Leu
1 5

<210> 2222
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<220>
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<400> 2222

Ala Ala Met Gln Gly Ala Val Val His
1 5

<210> 2223
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<220>
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<400> 2223

Ala Ala Pro Ala Ala His Ala Asp Trp
1 5

<210> 2224
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<400> 2224

Ala Ala Gln Ala Thr Val Val Gln Arg
1 5

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<220>
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<400> 2225

Ala Ala Arg Val Ala Gly Asp Asn Tyr
1   5

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<220>
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<400> 2226

Ala Ala Val Ala Leu Leu Asn Lys Leu
1   5

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<400> 2227

Ala Asp Asp Pro Pro Ala Thr Val Tyr
1   5

<210> 2228
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<400> 2228

Ala Glu Ala Gly Arg Phe Lys Val Leu
1   5

<210> 2229
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<220>
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<400> 2229

Ala Glu Ala Thr Gln Leu Val Thr Ala
1   5

<210> 2230
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<220>
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<400> 2230

Ala Glu Gly Gly Ala Thr Leu Gly Ala
1   5

<210> 2231
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<220>
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<400> 2231

Ala Glu His Gly Glu Val Ser Ile Gln
1   5

<210> 2232
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<400> 2232

Ala Glu Ile Ala Phe Tyr Pro Lys Glu
1   5

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<220>
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<400> 2233

Ala Glu Lys Val Thr Thr Pro Ala Val
1   5

<210> 2234
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<400> 2234

Ala Glu Leu Gln Thr Tyr Leu Arg Gln
1   5

<210> 2235
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<220>
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<400> 2235

Ala Glu Gln Ser Leu Ile Glu Val Gly
1   5

<210> 2236
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<220>
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<400> 2236

Ala Glu Ser Asn Ala Leu Ser Lys Arg
1   5

<210> 2237
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<220>
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<400> 2237

Ala Glu Ser Ser Glu Ala Met Ala Ala
1   5

<210> 2238
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<400> 2238

Ala Glu Val Lys Val Gly Tyr Arg Ala
1   5

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<400> 2239

Ala Glu Val Thr Asp Thr Ser Pro Ser
1   5

<210> 2240
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<400> 2240

Ala Gly Lys Ser Leu Lys Lys Lys Asn
1 5

<210> 2241
<211> 9
<212> PRT
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<220>
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<400> 2241

Ala Gly Leu Ala Gly Pro Ser Ala Val
1 5

<210> 2242
<211> 9
<212> PRT
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<220>
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<400> 2242

Ala Ile Arg Val Gly Arg Gly Ala Arg
1 5

<210> 2243
<211> 9
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<220>
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<400> 2243

Ala Leu Ala Ala Ile Ala Ser Ala Ala
1 5

<210> 2244
<211> 9
<212> PRT
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<220>
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<400> 2244

Ala Leu Ala Asp Val Pro Tyr Val Leu
1   5

<210> 2245
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<220>
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<400> 2245

Ala Leu Ala Asn Asp Gly Thr Ile Val
1   5

<210> 2246
<211> 9
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<220>
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<400> 2246

Ala Leu Gly Arg Gly His Ser Leu Tyr
1   5

<210> 2247
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<220>
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<400> 2247

Ala Leu Ile Leu Ala Ala Ser Pro Val
1   5

<210> 2248

<211> 9
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<220>
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<400> 2248

Ala Leu Met Leu Ala Cys Thr Gly Leu
1 5

<210> 2249
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<400> 2249

Ala Met Gln Gly Ala Val Val His Leu
1 5

<210> 2250
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<400> 2250

Ala Met Thr His Leu Ser Pro Ala Leu
1 5

<210> 2251
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<220>
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<400> 2251

Ala Met Tyr Gly Lys His Ile Thr Leu
1 5

<210> 2252
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<220>
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<400> 2252

Ala Asn Glu Ala Asn Ala Leu Leu Trp
1   5

<210> 2253
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<220>
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<400> 2253

Ala Pro Leu Ser Ile Thr Leu Gln Ala
1   5

<210> 2254
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<212> PRT
<213> Artificial Sequence

<220>
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<400> 2254

Ala Pro Asn Ala Leu Ala Trp Ala Leu
1   5

<210> 2255
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<400> 2255

Ala Pro Pro Ala Pro Lys Pro Ala Pro
1 5

<210> 2256
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<220>
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<400> 2256

Ala Pro Pro Gly Ala Gly Phe Ile Tyr
1 5

<210> 2257
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<220>
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<400> 2257

Ala Pro Gln Ala Ala Pro Leu Ser Ile
1 5

<210> 2258
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<212> PRT
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<220>
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<400> 2258

Ala Pro Arg Ile Glu Asn Thr Ala Lys
1 5

<210> 2259
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<220>

<223> Synthetic

<400> 2259

Ala Gln Gly Lys Ala Leu Leu Tyr Arg
1   5

<210> 2260
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<212> PRT
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<220>
<223> Synthetic

<400> 2260

Ala Gln Ile Thr Ser Tyr Val Gly Phe
1   5

<210> 2261
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<400> 2261

Ala Gln Leu Glu Val Arg Gly Gln Arg
1   5

<210> 2262
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 2262

Ala Gln Gln Leu Lys Gln Ala Asp Arg
1   5

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Ala Gln Val Thr Val Ala Gly Arg Tyr
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Ala Arg Arg Ser Arg Val Arg Ala Leu
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Ala Ser Pro Arg Arg Ala Arg Arg Ala
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Ala Ser Ser Pro Asp Ala His Val Pro
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Ala Ser Val Ser Asn Pro Gly Thr Phe
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Ala Thr Tyr Ile Ala Asp Ser Gly Phe
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Ala Val Ala Ala Pro Ala Val Gly Ala

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Ala Val Phe Met Gln Gln Arg Pro Leu
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Ala Val Leu Val Asn Pro His Ile Phe
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Cys Phe Gly Lys Asp Leu Lys Arg Pro
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Cys Pro Ser Ser Leu Gly Asn Gly Val
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Asp Ala Gly His Glu His Asp Thr Trp
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Asp Ala Lys His Asp Leu Thr Val Thr
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Asp Ala Ser Gly Gln His Arg Leu Trp
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Asp Ala Thr Phe Glu Thr Tyr Ala Leu
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Asp Ala Thr Phe Gln Thr Tyr Ala Leu
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Glu Lys Arg Leu Asp Ile Asp Asp Ala
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Glu Pro Ala Ser Ala Asn Thr Leu Leu
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Glu Pro Val Lys Leu Thr Leu Thr Gly
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Glu Ser Ala Glu Gly Arg Lys Ile Phe
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Glu Ser Tyr Ser Glu Ser His Asn Phe
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Glu Val Ala Lys Val Glu Val Val Pro
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Glu Val Asp Gly Ile Ile Gln Glu Phe
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Glu Val Arg Ala Asp Asn Asn Phe Tyr
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Phe Ala Ile Leu Ser Ser Thr Thr Glu
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Phe Glu Pro Gly Ile Thr Thr Asn Tyr
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Phe Ile Tyr Arg Glu Thr Phe Cys Ile
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Phe Pro Thr Arg Thr Thr Ala Pro Gly
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Phe Gln Thr Tyr Ala Leu Thr Gly Ile
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Phe Thr His Ala Asp Gly Trp Phe Leu
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Phe Val Arg Asp Gly Gln Ser Val Ile
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Phe Val Arg Ser Gly Gln Pro Val Ile
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Phe Val Trp Tyr Val Asp Thr Val Ile
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Gly Ala Ala Ser Ser Arg Gln Ala Leu
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Gly Ala Ala Ser Ser Tyr Phe Glu Tyr
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Gly Ala Thr Arg Ala Val Asp Ser Leu

1 5

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Gly Glu Ile Ala Leu Gly Asp Ala Thr
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Gly Glu Leu Met Ala Ala Gln Val Ala
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Gly His Glu His Asp Thr Trp Phe Asp
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Gly Ile Gly Ala Leu Lys Ala Gly Ala
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Gly Lys Asp Leu Lys Arg Pro Gly Ser
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Gly Lys Leu Pro Lys Pro Val Thr Val
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Gly Lys Ser Leu Lys Lys Lys Asn Gln
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Gly Leu Thr Asp Gly Val Ser Arg Ile
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Gly Pro Pro Ser Arg Pro Thr Thr Pro
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Gly Pro Ser Ala Val Ala Ala Pro Ala
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Gly Val Ala Pro Thr Ala Gln Gln Leu
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Gly Tyr Glu Ala Gly Phe Ser Leu Gly
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His Ala Glu His Glu Lys Asp Val Arg
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His Ala Asn His Tyr Gly Thr Arg Ile
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His Ala Gln Gly Lys Ala Leu Leu Tyr
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His Phe Ile Gly Tyr Ile Tyr Glu Val
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His Leu Ser Pro Ala Leu Ala Asp Val
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His Ser Leu Tyr Ala Ser Tyr Glu Tyr
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His Val Arg Gly Met Leu Val Pro Val
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His Val Ser Lys Glu Glu Gln Tyr Tyr
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His Val Thr Arg Gly Trp Ser Ile Phe
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Ile Ala Asp Ser Gly Phe Tyr Leu Asp
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Ile Ala His Arg Thr Glu Leu Arg Gly
1 5

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Ile Glu Asn Thr Ala Lys Leu Ser Gly
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1   5

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Ile Ile Lys Asp Ala Pro Pro Gly Ala
1   5

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Ile Ile Gln Glu Phe Ala Ala Asp Leu
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Ile Leu Ala Gly Ala Leu Ala Thr Tyr
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Ile Leu Leu Glu Asn Pro Ala Ala Glu
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Ile Pro Phe Gln Arg Ala Leu Arg Leu
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Ile Ser Val Arg Val His Val Ser Lys
1   5

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Ile Thr Asn Glu Thr Gly Lys Thr Tyr
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Ile Thr Asn Lys Arg Ala Ala Leu Ile
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Ile Thr Ser Tyr Val Gly Phe Ser Val
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<400> 2370

Ile Thr Val Thr Ser Arg Gly Gly Phe
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Ile Val Ile Pro Pro Lys Ala Leu Phe
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Ile Val Val Glu Ala Gly Glu Leu Val
1 5

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Lys Ala Ala Lys Ser Val Asn Leu Met
1   5

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Lys Ala Ala Pro Leu Arg Arg Thr Thr
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Lys Ala Gly Lys Leu Ser Ala Thr Gly
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<400> 2376

Lys Ala Gly Thr Ile Ala Ala Pro Trp

1 5

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Lys Ala Lys Ser Leu Thr Thr Glu Ile
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Lys Ala Thr Val Thr Thr Val Gln Val
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Lys Asp Tyr Arg Asp Lys Asp Gly Gly
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Lys Glu Ala Ala Thr Ile Val Ala Ala
1 5

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Lys Glu Asp Val Asp Ala Ala Gln Ile
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Lys Glu Val Asp Gly Ile Ile Gln Glu
1 5

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<400> 2383

Lys Gly Pro Lys Leu Ala Met Pro Trp
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<400> 2384

Lys Leu Ala Ser Gly Gly Gly Ala Val
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Lys Leu Lys Gly Lys Asn Gln Glu Phe
1   5

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<400> 2386

Lys Leu Leu His His Ile Leu Pro Ile
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Lys Pro Ala Pro Gln Pro Gly Pro Gln
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<400> 2388

Lys Pro Ala Pro Thr Ala Pro Pro Met
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<210> 2389
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Lys Pro Ala Val Ser Val Lys Val Ala
1 5

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Lys Pro Asp Arg Ala Ala Arg Val Ala
1 5

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Lys Pro Leu Ala Asp Ile Ala Val Ile
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Lys Pro Leu Ala Asp Ile Ala Val Val
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Lys Pro Leu Pro Lys Pro Leu Pro Val
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Lys Gln Ala Asp Arg Asp Phe Val Trp
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Lys Ser Leu Pro Gly Gly Lys Leu Pro
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Lys Ser Tyr Thr Leu Arg Tyr Leu Ala
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Lys Thr Asn Met Val Val Thr Ser Val
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Lys Val Leu Ser Thr Lys Thr Thr Leu
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Leu Ala Ala Gly Ala Gly Leu Thr Leu
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Leu Ala Ala Ile Ala Ser Ala Ala His
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Leu Ala Ala Asn Gly Asn Gly Gln Trp
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Leu Ala Ala Gln Val Thr Gln Arg Gly
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Leu Ala Ala Arg Gly Asp Gly Ala Leu
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Leu Ala Ala Val Leu Val Asn Pro His
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Leu Ala Gly Ser Gly Leu Phe Arg Met
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Leu Ala Lys Ala Leu Ser Ala Ala Leu
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Leu Ala Leu Gln Ala Gly Asp Ala Leu
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Leu Ala Met Pro Trp Thr Phe His Ala
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Leu Ala Asn Asp Gly Thr Ile Val Ile
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Leu Ala Pro Thr Val Gly Val Ala Phe
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Leu Ala Ser Asp Gly Ser Val Asp Phe
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Leu Glu Ala Gly Arg Arg Phe Thr His
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Leu Lys Arg Pro Gly Ser Ser Pro Met
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Leu Leu Gly Ser His Val Ala Arg Ala
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Leu Asn Asp Ser Lys Ile Thr Met Gly
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Leu Pro Lys Ile Ser Lys Asn Ala Leu
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Leu Pro Lys Pro Val Thr Val Lys Leu
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Leu Pro Leu Lys Ala Asn Pro Met His
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Leu Pro Pro Arg Pro Val Val Ala Glu
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Leu Pro Ser Ile Pro Gly Thr Ser Ile

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Leu Pro Thr His Leu Tyr Lys Asn Phe
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Leu Pro Val Arg Gly Val Ala Leu Val
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Leu Pro Val Ser Leu Thr Ala Leu Asp
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Leu Gln Gly Gly Asn Lys Val Pro Val
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Leu Ser Ala Ala Leu Gly Ala Asp Trp
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Leu Ser Asp Ala Gly His Glu His Asp
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Leu Ser Gly Glu Val Gln Arg Lys Gly
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Leu Ser Ser Pro Ser Ala Ile Thr Val
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Leu Thr Trp Leu Ala Ile Leu Ala Val
1   5

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Leu Val Phe Ser His Val Arg Gly Met
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Leu Val Ser Asp Ala Gly Ala Asp Leu
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Leu Val Tyr Tyr Glu Ser Ile Ala Tyr
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Met Ala Ala Glu Ser Thr Phe Glu Ser
1   5

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Met Ala Ala Gly His Asp Ala Thr Leu
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Met Ala Ala Trp Ser Glu Arg Ala Gly
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Met Ala Leu Gly Ala Leu Gly Ala Ala
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Met Ala Pro Val Met Gly Ala Cys Met
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Met Ala Thr Lys Gly Glu Met Gln Ile
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Met Asp Ala Lys Gly Gly Thr Leu Leu
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Met Glu Ser Asn Lys Asp Ile Val Ile
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Met Glu Val Met Leu Arg Ala Val Phe
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Met Glu Tyr Phe Lys Thr Pro Leu Pro
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Met His Thr Ile Ala Ser Ile Leu Leu
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Met Ile Tyr Met Ser Gly Leu Ala Val
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Met Leu Ala Cys Thr Gly Leu Pro Leu
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Met Pro Ile Asp Arg Lys Thr Leu Cys
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Met Pro Lys Ala Pro Glu Leu Asp Leu
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Met Gln Arg Gln Ala Gly Leu Pro Leu
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Asn Ala Leu Ala Trp Ala Leu Met Leu
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Asn Ile Thr Asn Lys Arg Ala Ala Leu
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Asn Leu Met Ala Ala Glu Ser Thr Phe
1 5

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Asn Asn Glu Thr Met Ser Gly Arg Gln
1 5

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Asn Pro Gly Ser Leu Ile Ala Glu Val
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Asn Pro Met His Thr Ile Ala Ser Ile
1 5

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Asn Pro Gln Thr Gln Leu Ser Asn Ile
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Asn Pro Tyr Thr Ser Arg Arg Ser Val
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Pro Ala Pro Thr Ala Pro Pro Met Pro
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Pro Ala Ser Ala Asn Thr Leu Leu Leu
1 5

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Pro Ala Val Ala Leu Pro Arg Pro Leu
1 5

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Pro Asp Ala His Val Pro Phe Cys Phe
1 5

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Pro Glu Leu Gly Ala Ala Ile Arg Val
1 5

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Pro Phe Ile Ile Lys Leu Lys Asp Cys
1   5

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Pro Gly Pro Gln Pro Pro Gln Pro Pro
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Pro Gly Pro Gln Pro Pro Gln Pro Gln
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Pro Gly Pro Thr Thr Asp Tyr Ser Thr
1   5

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Pro Gly Thr Phe Thr Ala Gly Lys Asp
1 5

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Pro Gly Thr Pro Gly Asp Leu Leu Glu
1 5

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Pro Lys Pro Lys Pro Lys Ala Glu Arg
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Pro Lys Pro Lys Pro Lys Pro Lys Ala
1 5

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Pro Lys Pro Lys Pro Lys Pro Lys Pro
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Pro Leu Pro Pro Arg Pro Val Val Ala
1   5

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Pro Pro Ala Pro Lys Pro Ala Pro Gln
1   5

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Pro Pro Lys Pro Ala Pro Val Ala Lys

1 5

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Pro Pro Arg Pro Val Ala Ala Gln Val
1 5

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Pro Pro Arg Pro Val Val Ala Glu Lys
1 5

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Pro Pro Ser Arg Pro Thr Thr Pro Pro
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Pro Arg Arg Ala Arg Arg Ala Leu Arg
1 5

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Gln Ala Ala Pro Leu Ser Ile Thr Leu
1 5

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Gln Ala Asp Arg Asp Phe Val Trp Tyr
1 5

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Gln Ala Ile Val Val Gly Lys Asp Leu
1 5

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Gln Ala Leu Gly Ala Leu Lys Leu Tyr
1   5

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Gln Glu Leu Ala Leu Lys Leu Lys Gly
1   5

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<400> 2492

Gln Ile Thr Gln His Gly Gly Pro Tyr
1   5

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Gln Ile Thr Gln His Gly Ser Pro Tyr
1   5

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Gln Pro Leu Pro Pro Arg Pro Val Ala
1   5

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Gln Pro Pro Ala Gly Arg Glu Leu Ser
1   5

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Gln Gln Leu Lys Gln Ala Asp Arg Asp
1   5

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Gln Gln Val Gln Val Leu Gln Arg Gln
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Gln Ser Ile Val Glu Ala Pro Glu Leu
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Gln Val Gly Ser Ser Asn Ser Ala Phe
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Arg Ala Gly Leu Ser Pro Ala Thr Trp
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<400> 2502

Arg Ala Ser Ala Ser Arg Ala Arg Ile
1   5

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Arg Glu Leu Ser Ala Ala Ala Asn Ala
1   5

<210> 2504
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Arg Glu Thr Phe Cys Ile Thr Thr Ile
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Arg Gly Phe Ala Gln Arg Gln Gln Leu
1 5

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<400> 2506

Arg Gly Ser Ala Ala Thr Phe Thr Leu
1 5

<210> 2507
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<400> 2507

Arg Gly Trp Ser Ile Phe Ala Leu Tyr
1 5

<210> 2508
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<400> 2508

Arg Lys Met Leu Tyr Leu Ile Tyr Val
1 5

<210> 2509
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<400> 2509

Arg Leu Arg Lys Met Leu Tyr Leu Ile
1   5

<210> 2510
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<400> 2510

Arg Pro Gln Ile Thr Asp Ala Val Thr
1   5

<210> 2511
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<400> 2511

Arg Pro Ser Val Asn Gly Gly Arg Ile
1   5

<210> 2512
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Arg Arg Phe Thr His Ala Asp Gly Trp
1   5

<210> 2513

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Arg Ser Gly Ala Arg Ala Thr Ser Leu
1 5

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Arg Ser Arg Val Arg Ala Leu Ala Trp
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Arg Ser Arg Val Arg Ala Leu Ser Trp
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Arg Thr His Gly Val Gly Ala Ser Leu
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Arg Thr Arg Gly Gln Ala Arg Ser Gly
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Arg Val Ala Pro Pro Ala Val Ala Leu
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Arg Val Leu Pro Glu Pro Val Lys Leu
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Arg Val Arg Ala Leu Ala Trp Leu Leu
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Arg Val Arg Ala Leu Ser Trp Leu Leu
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Arg Val Thr Val Ser Gly Gly Ser Leu
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Ser Glu Ala Met Ala Ala Trp Ser Glu
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Ser Glu Ser His Asn Phe His Ala Ser
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Ser Gly Leu Ala Val Arg Val His Val
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Ser Leu Ala Asp Ile Ser Leu Gly Ala
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Ser Leu Phe Ala Ile Leu Ser Ser Thr
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Ser Leu Ser Ile Asp Asn Ala Thr Trp
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Ser Pro Met Glu Val Met Leu Arg Ala
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Ser Pro Gln Pro Ile Arg Ala Thr Val
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Ser Pro Arg Arg Ala Arg Arg Ala Leu
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Ser Pro Ser Arg Leu Ala Gly Thr Leu
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Ser Ser Thr Pro Leu Gly Ser Leu Phe

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Ser Thr Tyr Glu Leu Leu Asp Tyr Leu
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Ser Val Ala Met Lys Pro Tyr Glu Val
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Ser Val Ala Pro Asn Ala Leu Ala Trp
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Ser Val Lys Val Ala Lys Lys Leu Phe
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Thr Ala Phe Met Ser Gly Arg Ser Leu
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Thr Ala Gly Ala Thr Pro Phe Asp Ile
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Thr Gly Asp Gly Gly Gly His Thr Asp
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Thr Leu Ala Lys Ala Leu Ser Ala Ala
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Thr Arg Gln Gly Ile Met Asp Gln Tyr
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Thr Ser Lys Gln Asp Glu Arg Asn Tyr
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Thr Ser Pro Tyr Asp Gly Lys Tyr Trp
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Thr Ser Arg Arg Ser Val Ala Ser Ile
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Thr Ser Arg Thr Val Thr Met Arg Tyr
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Thr Thr Glu Tyr Pro Asn Ala Arg Tyr
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Thr Thr Glu Tyr Ser Asn Ala Arg Tyr
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Thr Thr Leu Gly Leu Glu Gln Thr Phe
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Thr Val Leu Ala Ala Gly Ala Gly Leu
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Thr Val Gln Glu Leu Ala Leu Lys Leu
1 5

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1 5

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Val Ala Met Lys Pro Tyr Glu Val Thr
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Val Ala Val Ala Gly Gly Arg Trp His
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Val Glu Ala Ser Ala Ile Thr Thr Tyr
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Val Glu Asp Ile Gly Gly Lys Asn Tyr
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Val Gly Ala Gly Gly Tyr Glu Ala Gly
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Val Gly Gly Gly Glu His Gly Arg Trp
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Val His Val Ser Lys Glu Glu Gln Tyr
1   5

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Val Ile Asp Gly Gln Lys Val Leu Ala
1 5

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Val Ile Gly Ala Cys Thr Ser Pro Tyr
1 5

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<400> 2583

Val Lys Leu Gly Gly Val Tyr Glu Ala
1 5

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<400> 2584

Val Leu Ala Pro Arg Leu Tyr Leu Thr
1 5

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Val Leu Val Lys Thr Asn Met Val Val
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Val Pro Ala Ser Gly Ala Pro Ala Ala
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Val Pro Phe Cys Phe Gly Lys Asp Leu
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Val Pro Val Ser Glu His Cys Thr Val

1 5

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Val Pro Val Thr Pro Pro Lys Val Glu
1 5

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Val Arg Thr Val Ser Ala Met Glu Tyr
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Val Ser Gly Gly Ser Leu Ser Ala Pro
1 5

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Val Ser Ser Ala Thr Lys Ala Lys Gly
1 5

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Val Ser Ser Pro Pro Pro Val Ser Val
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<210> 2594
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Val Ser Val Lys Val Ala Lys Lys Leu
1 5

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Val Thr Met Arg Tyr Leu Ala Ser Tyr
1 5

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Val Thr Ser Val Ala Met Lys Pro Tyr
1   5

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Val Val Ala Glu Lys Val Thr Thr Pro
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Val Val Asp Gly Pro Pro Ser Arg Pro
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<210> 2599
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Val Val Glu Thr Ala Gln Pro Leu Pro
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<400> 2601

Trp Thr Phe His Ala Gly Tyr Arg Tyr
1 5

<210> 2602
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Trp Val Met Thr Asp Asn Ser Asn Val
1 5

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<400> 2603

Tyr Ala Glu His Gly Glu Val Ser Ile
1 5

<210> 2604
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<400> 2604

Tyr Ala Ile Asp Gly Thr Ala Ala Gly
1   5

<210> 2605
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<400> 2605

Tyr Ala Leu Lys Ser Arg Ile Ala Leu
1   5

<210> 2606
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<400> 2606

Tyr Ala Thr Asn Pro Gln Thr Gln Leu
1   5

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<400> 2607

Tyr Asp Thr Gly Asp Leu Ile Ala Tyr
1   5

<210> 2608
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<400> 2608

Tyr Glu Ala Gly Phe Ser Leu Gly Ser
1   5

<210> 2609
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<400> 2609

Tyr Glu Asp Ala Thr Phe Glu Thr Tyr
1   5

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Tyr Glu Asn Lys Ser Ser Thr Pro Leu
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<400> 2611

Tyr Glu Val Thr Pro Thr Arg Met Leu
1 5

<210> 2612
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<400> 2612

Tyr Glu Tyr Ile Trp Gly Leu Tyr Pro
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Tyr Glu Tyr Ile Trp Gly Leu Tyr Gln
1 5

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<400> 2614

Tyr Glu Tyr Ser Lys Gly Pro Lys Leu
1 5

<210> 2615
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<400> 2615

Tyr Phe Glu Pro Gly Pro Thr Thr Asp
1   5

<210> 2616
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Tyr Ile Trp Gly Leu Tyr Pro Thr Tyr
1   5

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<400> 2617

Tyr Ile Trp Gly Leu Tyr Gln Thr Tyr
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<210> 2618
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Tyr Leu Arg Gln Ile Thr Pro Gly Trp
1   5

<210> 2619

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<400> 2619

Tyr Met Ile Tyr Met Ser Gly Leu Ala
1 5

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<400> 2620

Tyr Pro Ala Leu Arg Ala Ala Leu Ile
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<400> 2621

Tyr Pro Gly Thr Pro Gly Asp Leu Leu
1 5

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<400> 2622

Tyr Pro Thr Tyr Thr Glu Trp Ser Val
1 5

<210> 2623
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<400> 2623

Tyr Gln Thr Tyr Thr Glu Trp Ser Val
1 5

<210> 2624
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<400> 2624

Tyr Ser Thr Gly Asp Leu Arg Ala Tyr
1 5

<210> 2625
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<400> 2625

Tyr Thr Leu Arg Tyr Leu Ala Ser Tyr
1 5

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Tyr Val Leu Val Lys Thr Asn Met Val
1   5

<210> 2627
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<400> 2627

Tyr Tyr Asp Tyr Glu Asp Ala Thr Phe
1   5

<210> 2628
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<400> 2628

Ala Ala Phe Ile Ala Leu Tyr Pro Asn Ser Gln Leu Ala Pro Thr
1   5   10   15

<210> 2629
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<400> 2629

Gly Gly Ala Glu Tyr Asn Leu Ala Leu Gly Gln Arg Arg Ala
1   5   10

<210> 2630
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<400> 2630

Gly Gly Ala Glu Tyr Asn Leu Ala Leu Gly Gln Arg Arg Ala Asp Ala
1   5   10   15

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<400> 2631

Ile Ala Leu Tyr Pro Asn Ser Gln Leu Ala Pro Thr
1   5   10

<210> 2632
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<400> 2632

Lys Pro Asp Gln Gly Glu Val Val Ala Val Gly Pro Gly Lys Lys Thr
1   5   10   15

Glu Asp

<210> 2633
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<213> Artificial Sequence

<220>
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<400> 2633

Lys Pro Asp Gln Gly Glu Val Val Ala Val Gly Pro Gly Lys Lys Thr
1   5   10   15

Glu Asp Gly

<210> 2634
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<400> 2634

Leu Ala Glu Val Leu Asp Tyr His Asn Phe Val Leu Thr Gln
1   5   10

<210> 2635
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<400> 2635

Gln Ser Ile Ala Leu Ser Ser Leu Met Val Ala Gln Ala Ile Pro
1   5   10   15

<210> 2636
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<400> 2636

Ser Ile Gly Val Leu Gly Tyr Gln Lys Thr Val Asp His Thr Lys Val
1   5   10   15

Asn Ser Lys Leu Ser Leu Phe
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<210> 2637
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<400> 2637

Ala Ala His Ala Asp Trp Asn Asn Gln Ser Ile Val Lys Thr
1 5 10

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<400> 2638

Ala Ala Leu Gly Arg Gly
1 5

<210> 2639
<211> 14
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<400> 2639

Ala Ala Leu Gly Arg Gly His Ser Leu Tyr Ala Ser Tyr Glu
1 5 10

<210> 2640
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<400> 2640

Ala Ala Pro Leu Arg Arg Thr Thr Leu Ala Met Ala Leu Gly
1 5 10

<210> 2641
<211> 14
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<220>
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<400> 2641

Ala Ala Pro Leu Ser Ile Thr Leu Gln Ala Gly Ala His Ala
1   5   10

<210> 2642
<211> 14
<212> PRT
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<400> 2642

Ala Asp Ala Gln Gly Asp Ile Val Ala Thr Glu Leu Pro Ser
1   5   10

<210> 2643
<211> 14
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<220>
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<400> 2643

Ala Asp Ser Gly Phe Tyr Leu Asp Ala Thr Leu Arg Ala Ser
1   5   10

<210> 2644
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<400> 2644

Ala Glu Leu Ala
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<210> 2645
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<220>
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<400> 2645

Ala Glu Leu Ala Val Phe Arg Ala Gly Gly Gly Ala Tyr Arg
1   5   10

<210> 2646
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<400> 2646

Ala Glu Leu Gln Phe Arg Asn Gly Ser Val Thr Ser Ser Gly
1   5   10

<210> 2647
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<400> 2647

Ala Gly Gly Arg Trp His Leu Gly Gly Leu Ala Gly Tyr Thr
1   5   10

<210> 2648
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<400> 2648

Ala Gly Val Ala Ala Met Gln Gly Ala Val Val His Leu Gln
1 5 10

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<400> 2649

Ala Gly Tyr Thr Arg Gly Asp Arg Gly Phe Thr Gly Asp Gly
1 5 10

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<400> 2650

Ala Leu Ala Ser Gln Ala Arg Trp Thr Gly Ala Thr Arg Ala
1 5 10

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<400> 2651

Ala Met Pro Trp Thr Phe His Ala Gly Tyr Arg Tyr Ser Trp
1 5 10

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<400> 2652

Ala Met Gln Gly Ala Val Val His Leu Gln Arg Ala Thr Ile Arg Arg
1   5   10   15

Gly Asp Ala Pro
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<400> 2653

Ala Asn Gly Leu Arg Val Arg Asp Glu
1   5

<210> 2654
<211> 14
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<400> 2654

Ala Asn Gly Leu Arg Val Arg Asp Glu Gly Gly Ser Ser Val
1   5   10

<210> 2655
<211> 14
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<400> 2655

Ala Asn Lys Asp Gly Lys Val Asp Ile Gly Thr Tyr Arg Tyr

1 5 10

<210> 2656
<211> 14
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<400> 2656

Ala Pro Ala Ala Val Ser Val Leu Gly Ala Ser Glu Leu Thr
1 5 10

<210> 2657
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<400> 2657

Ala Pro Pro Ala Pro Lys Pro Ala Pro Gln Pro Gly Pro Gln
1 5 10

<210> 2658
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<400> 2658

Ala Gln Gly Ile Leu Leu Glu Asn Pro Ala Ala Glu Leu Gln
1 5 10

<210> 2659
<211> 14
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<400> 2659

Ala Arg Trp Thr Gly Ala Thr Arg Ala Val Asp Ser Leu Ser
1 5 10

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<400> 2660

Ala Ser Leu Glu Ala Gly Arg Arg Phe Thr His Ala Asp Gly
1 5 10

<210> 2661
<211> 14
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<400> 2661

Ala Ser Tyr Glu Tyr Ser Lys Gly Pro Lys Leu Ala Met Pro
1 5 10

<210> 2662
<211> 9
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<213> Artificial Sequence

<220>
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<400> 2662

Ala Thr Phe Thr Leu Ala Asn Lys Asp
1 5

<210> 2663
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<220>
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<400> 2663

Ala Thr Phe Thr Leu Ala Asn Lys Asp Gly Lys Val Asp Ile
1   5   10

<210> 2664
<211> 14
<212> PRT
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<220>
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<400> 2664

Ala Thr Arg Ala Val Asp Ser Leu Ser Ile Asp Asn Ala Thr
1   5   10

<210> 2665
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<212> PRT
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<220>
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<400> 2665

Asp Asp Asp Gly Ile Ala Leu Tyr Val Ala Gly Glu Gln Ala Gln
1   5   10   15

<210> 2666
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<400> 2666

Asp Asp Gly Ile Ala Leu Tyr Val Ala Gly Glu Gln Ala Gln
1   5   10

<210> 2667
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<212> PRT
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<400> 2667

Asp Gly Gly His Ile Thr Gly Gly Arg Ala Ala Gly Val Ala
1 5 10

<210> 2668
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<400> 2668

Asp Gly Ile Arg Arg Phe Leu Gly Thr Val Thr Val Lys Ala Gly Lys
1 5 10 15

<210> 2669
<211> 14
<212> PRT
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<400> 2669

Asp Gly Ser Val Asp Phe Gln Gln Pro Ala Glu Ala Gly Arg
1 5 10

<210> 2670
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<220>
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<400> 2670

Asp Gly Tyr Ala Val Lys Gly Lys Tyr Arg Thr His Gly Val
1 5 10

<210> 2671
<211> 14
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<220>
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<400> 2671

Asp Ile Val Ala Thr Glu Leu Pro Ser Ile Pro Gly Thr Ser
1   5   10

<210> 2672
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 2672

Asp Lys Leu Val Val Met Gln Asp Ala Ser Gly Gln His Arg
1   5   10

<210> 2673
<211> 14
<212> PRT
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<220>
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<400> 2673

Asp Leu Gly Leu Ser Asp Lys Leu Val Val Met Gln Asp Ala
1   5   10

<210> 2674
<211> 15
<212> PRT
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<220>
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<400> 2674

Asp Asn Ala Thr Trp Val Met Thr Asp Asn Ser Asn Val Gly Ala
1 5 10 15

<210> 2675
<211> 19
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<220>
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<400> 2675

Asp Asn Ala Thr Trp Val Met Thr Asp Asn Ser Asn Val Gly Ala Leu
1 5 10 15

Arg Leu Ala

<210> 2676
<211> 14
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<220>
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<400> 2676

Asp Asn Arg Ala Gly Arg Arg Phe Asp Gln Lys Val Ala Gly
1 5 10

<210> 2677
<211> 14
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<400> 2677

Glu Ala Gly Arg Phe Lys Val Leu Thr Val Asn Thr Leu Ala
1 5 10

<210> 2678
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<400> 2678

Glu Leu Ala Gln Ser Ile Val Glu Ala Pro Glu Leu Gly Ala
1 5 10

<210> 2679
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<220>
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<400> 2679

Glu Leu Gly Ala Ala Ile Arg Val Gly Arg Gly Ala Arg Val
1 5 10

<210> 2680
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<400> 2680

Glu Leu Gly Ala Asp His Ala Val Ala Val Ala Gly Gly Arg
1 5 10

<210> 2681
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<400> 2681

Glu Leu Pro Ser Ile Pro Gly Thr Ser Ile Gly Pro Leu Asp
1 5 10

<210> 2682
<211> 14
<212> PRT
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<220>
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<400> 2682

Glu Pro Val Lys Leu Thr Leu Thr Gly Gly Ala Asp Ala Gln
1   5   10

<210> 2683
<211> 14
<212> PRT
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<220>
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<400> 2683

Glu Gln Ala Gln Ala Ser Ile Ala Asp Ser Thr Leu Gln Gly
1   5   10

<210> 2684
<211> 14
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<400> 2684

Glu Arg Gly Ala Asn Val Thr Val Gln Arg Ser Ala Ile Val
1   5   10

<210> 2685
<211> 14
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<220>
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<400> 2685

Glu Arg Gln His Gly Ile His Ile Gln Gly Ser Asp Pro Gly

1 5 10

<210> 2686
<211> 14
<212> PRT
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<220>
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<400> 2686

Glu Val Gly Lys Arg Ile Glu Leu Ala Gly Gly Arg Gln Val
1 5 10

<210> 2687
<211> 14
<212> PRT
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<220>
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<400> 2687

Phe Asp Gly Ala Gly Thr Val His Thr Asn Gly Ile Ala His
1 5 10

<210> 2688
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 2688

Phe Gln Gln Pro Ala Glu Ala Gly Arg Phe Lys Val Leu Thr
1 5 10

<210> 2689
<211> 14
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<220>
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<400> 2689

Phe Arg Ala Gly Gly Gly Ala Tyr Arg Ala Ala Asn Gly Leu
1 5 10

<210> 2690
<211> 14
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<220>
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<400> 2690

Gly Ala His Ala Gln Gly Lys Ala Leu Leu Tyr Arg Val Leu
1 5 10

<210> 2691
<211> 14
<212> PRT
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<220>
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<400> 2691

Gly Ala Arg Val Thr Val Ser Gly Gly Ser Leu Ser Ala Pro
1 5 10

<210> 2692
<211> 14
<212> PRT
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<220>
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<400> 2692

Gly Ala Tyr Arg Ala Ala Asn Gly Leu Arg Val Arg Asp Glu
1 5 10

<210> 2693
<211> 14
<212> PRT
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<220>
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<400> 2693

Gly Asp Ala Pro Ala Gly Gly Ala Val Pro Gly Gly Ala Val
1   5   10

<210> 2694
<211> 14
<212> PRT
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<220>
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<400> 2694

Gly Gly Ala Val Pro Gly Gly Ala Val Pro Gly Gly Phe Gly
1   5   10

<210> 2695
<211> 14
<212> PRT
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<220>
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<400> 2695

Gly Gly Ala Val Pro Gly Gly Phe Gly Pro Val Leu Asp Gly
1   5   10

<210> 2696
<211> 14
<212> PRT
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<220>
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<400> 2696

Gly Gly Phe Gly Pro Val Leu Asp Gly Trp Tyr Gly Val Asp
1   5   10

<210> 2697
<211> 14

<212> PRT
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<220>
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<400> 2697

Gly Gly Leu His Ile Gly Ala Leu Gln Ser Leu Gln Pro Glu
1 5 10

<210> 2698
<211> 14
<212> PRT
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<220>
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<400> 2698

Gly Gly Val Gln Ile Glu Arg Gly Ala Asn Val Thr Val Gln
1 5 10

<210> 2699
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<400> 2699

Gly His Ser Leu Tyr Ala Ser Tyr Glu Tyr Ser Lys Gly Pro
1 5 10

<210> 2700
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<400> 2700

Gly His Thr Asp Ser Val His Val Gly Gly Tyr Ala Thr Tyr
1 5 10

<210> 2701
<211> 14
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<400> 2701

Gly Ile Ala His Arg Thr Glu Leu Arg Gly Thr Arg Ala Glu
1   5   10

<210> 2702
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<212> PRT
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<220>
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<400> 2702

Gly Lys Ala Leu Leu Tyr Arg Val Leu Pro Glu Pro Val Lys
1   5   10

<210> 2703
<211> 14
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<220>
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<400> 2703

Gly Leu Gly Met Ala Ala Ala Leu Gly Arg Gly His Ser Leu
1   5   10

<210> 2704
<211> 14
<212> PRT
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<220>
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<400> 2704

Gly Asn Val Ile Glu Thr Gly Gly Ala Arg Arg Phe Ala Pro
1   5   10

<210> 2705
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<400> 2705

Gly Pro Leu Asp Val Ala Leu Ala Ser Gln Ala Arg Trp Thr
1   5   10

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<220>
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<400> 2706

Gly Gln His Arg Leu Trp Val Arg Asn
1   5

<210> 2707
<211> 14
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<220>
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<400> 2707

Gly Arg Gly Phe Ala Gln Arg Gln Gln Leu Asp Asn Arg Ala
1   5   10

<210> 2708
<211> 14
<212> PRT
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<220>
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<400> 2708

Gly Arg Leu Gly Leu Glu Val Gly Lys Arg Ile Glu Leu Ala
1 5 10

<210> 2709
<211> 14
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<220>
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<400> 2709

Gly Arg Gln Val Gln Pro Tyr Ile Lys Ala Ser Val Leu Gln
1 5 10

<210> 2710
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<400> 2710

Gly Arg Arg Phe Thr His Ala Asp Gly Trp Phe Leu Glu Pro Gln Ala
1 5 10 15

Glu Leu Ala

<210> 2711
<211> 14
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<400> 2711

Gly Ser Glu Pro Ala Ser Ala Asn Thr Leu Leu Leu Val Gln
1 5 10

<210> 2712
<211> 14
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<220>
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<400> 2712

Gly Ser Ser Val Leu Gly Arg Leu Gly Leu Glu Val Gly Lys
1 5 10

<210> 2713
<211> 14
<212> PRT
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<220>
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<400> 2713

Gly Thr Thr Ile Lys Val Ser Gly Arg Gln Ala Gln Gly Ile
1 5 10

<210> 2714
<211> 14
<212> PRT
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<220>
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<400> 2714

Gly Thr Val Thr Val Lys Ala Gly Lys Leu Val Ala Asp His
1 5 10

<210> 2715
<211> 14
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<220>
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<400> 2715

His Ala Val Ala Val Ala Gly Gly Arg Trp His Leu Gly Gly

1 5 10

<210> 2716
<211> 14
<212> PRT
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<220>
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<400> 2716

Ile Glu Leu Ala Gly Gly Arg Gln Val Gln Pro Tyr Ile Lys
1 5 10

<210> 2717
<211> 14
<212> PRT
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<220>
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<400> 2717

Ile His Ile Gln Gly Ser Asp Pro Gly Gly Val Arg Thr Ala
1 5 10

<210> 2718
<211> 14
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<220>
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<400> 2718

Ile Arg Arg Phe Leu Gly Thr Val Thr Val Lys Ala Gly Lys
1 5 10

<210> 2719
<211> 14
<212> PRT
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<220>
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<400> 2719

Ile Arg Val Gly Arg Gly Ala Arg Val Thr Val Ser Gly Gly
1 5 10

<210> 2720
<211> 9
<212> PRT
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<220>
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<400> 2720

Ile Thr Leu Gln Ala Gly Ala His Ala
1 5

<210> 2721
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 2721

Ile Thr Leu Gln Ala Gly Ala His Ala Gln Gly Lys Ala Leu
1 5 10

<210> 2722
<211> 14
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<220>
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<400> 2722

Ile Val Glu Ala Pro Glu Leu Gly Ala Ala Ile Arg Val Gly
1 5 10

<210> 2723
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<220>
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<400> 2723

Ile Val Lys Thr Gly Glu Arg Gln His Gly Ile His Ile Gln
1   5   10

<210> 2724
<211> 14
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<220>
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<400> 2724

Lys Ala Gly Lys Leu Val Ala Asp His Ala Thr Leu Ala Asn
1   5   10

<210> 2725
<211> 14
<212> PRT
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<220>
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<400> 2725

Lys Gly Lys Tyr Arg Thr His Gly Val Gly Ala Ser Leu Glu
1   5   10

<210> 2726
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<220>
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<400> 2726

Lys Pro Ala Pro Gln Pro Gly Pro Gln Pro Pro Gln Pro Pro
1   5   10

<210> 2727
<211> 14

<212> PRT
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<220>
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<400> 2727

Lys Val Ala Gly Phe Glu Leu Gly Ala Asp His Ala Val Ala
1 5 10

<210> 2728
<211> 14
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<220>
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<400> 2728

Lys Val Ala Gly Ser Asp Gly Tyr Ala Val Lys Gly Lys Tyr
1 5 10

<210> 2729
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<220>
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<400> 2729

Lys Val Asp Ile Gly Thr Tyr Arg Tyr Arg Leu Ala Ala Asn
1 5 10

<210> 2730
<211> 14
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<220>
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<400> 2730

Lys Val Leu Thr Val Asn Thr Leu Ala Gly Ser Gly Leu Phe
1 5 10

<210> 2731
<211> 14
<212> PRT
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<220>
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<400> 2731

Leu Ala Ala Asn Gly Asn Gly Gln Trp Ser Leu Val Gly Ala
1   5   10

<210> 2732
<211> 14
<212> PRT
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<220>
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<400> 2732

Leu Ala Met Pro Trp Thr Phe His Ala Gly Tyr Arg Tyr Ser
1   5   10

<210> 2733
<211> 14
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<220>
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<400> 2733

Leu Ala Ser Thr Leu Trp Tyr Ala Glu Ser Asn Ala Leu Ser
1   5   10

<210> 2734
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 2734

Leu Glu Asn Asp Phe Lys Val Ala Gly Ser Asp Gly Tyr Ala
1   5   10

<210> 2735
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 2735

Leu Glu Asn Pro Ala Ala Glu Leu Gln Phe Arg Asn Gly Ser
1   5   10

<210> 2736
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 2736

Leu Gly Ala Ala Pro Ala Ala His Ala Asp Trp Asn Asn Gln
1   5   10

<210> 2737
<211> 18
<212> PRT
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<220>
<223> Synthetic

<400> 2737

Leu Gly Gly Leu Ala Gly Tyr Thr Arg Gly Asp Arg Gly Phe Thr Gly
1   5   10   15

Asp Gly

<210> 2738
<211> 5
<212> PRT

<213> Artificial Sequence

<220>
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<400> 2738

Leu Leu Glu Asn Pro
1 5

<210> 2739
<211> 14
<212> PRT
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<220>
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<400> 2739

Leu Leu Val Gln Thr Pro Leu Gly Ser Ala Ala Thr Phe Thr
1 5 10

<210> 2740
<211> 14
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<220>
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<400> 2740

Leu Pro Pro Ser Arg Val Val Leu Arg Asp Thr Asn Val Thr
1 5 10

<210> 2741
<211> 9
<212> PRT
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<220>
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<400> 2741

Leu Gln Pro Glu Asp Leu Pro Pro Ser
1 5

<210> 2742
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 2742

Leu Gln Pro Glu Asp Leu Pro Pro Ser Arg Val Val Leu Arg
1   5   10

<210> 2743
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 2743

Leu Arg Ala Ser Arg Leu Glu Asn Asp Phe Lys Val Ala Gly
1   5   10

<210> 2744
<211> 14
<212> PRT
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<220>
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<400> 2744

Leu Arg Leu Ala Ser Asp Gly Ser Val Asp Phe Gln Gln Pro
1   5   10

<210> 2745
<211> 14
<212> PRT
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<220>
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<400> 2745

Leu Ser Ala Ala Ala Asn Ala Ala Val Asn Thr Gly Gly Val

1 5 10

<210> 2746
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 2746

Leu Ser Ala Pro His Gly Asn Val Ile Glu Thr Gly Gly Ala
1 5 10

<210> 2747
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 2747

Leu Ser Asp Asp Gly Ile Arg Arg Phe Leu Gly Thr Val Thr
1 5 10

<210> 2748
<211> 14
<212> PRT
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<220>
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<400> 2748

Leu Val Gly Ala Lys Ala Pro Pro Ala Pro Lys Pro Ala Pro
1 5 10

<210> 2749
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 2749

Leu Tyr Val Ala Gly Glu Gln Ala Gln Ala Ser Ile Ala Asp
1 5 10

<210> 2750
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 2750

Met Ala Leu Gly Ala Leu Gly Ala Ala Pro Ala Ala His Ala
1 5 10

<210> 2751
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<400> 2751

Met Asn Met Ser Leu Ser Arg Ile Val Lys Ala Ala Pro Leu
1 5 10

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Met Gln Asp Ala Ser Gly Gln His Arg
1 5

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Met Gln Gly Ala Val Val His Leu Gln Arg Ala Thr Ile Arg
1   5   10

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Asn Ala Ala Val Asn Thr Gly Gly Val Gly Leu Ala Ser Thr
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Asn Ala Leu Ser Lys Arg Leu Gly Glu Leu Arg Leu Asn Pro
1   5   10

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Asn Gly Gln Trp Ser Leu Val Gly Ala Lys Ala Pro Pro Ala
1   5   10

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<400> 2757

Asn Thr Leu Ala Gly Ser Gly Leu Phe Arg Met Asn Val Phe
1 5 10

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<400> 2758

Pro Ala Gly Arg Glu Leu Ser Ala Ala Ala Asn Ala Ala Val
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<400> 2759

Pro Ala Pro Gln Pro Pro Ala Gly Arg Glu Leu Ser Ala Ala
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<400> 2760

Pro Gly Pro Gln Pro Pro Gln Pro Pro Gln Pro Gln Pro Glu
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Pro Gly Thr Ser Ile Gly Pro Leu Asp Val Ala Leu Ala Ser
1   5   10

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Pro Leu Gly Ser Ala Ala Thr Phe Thr Leu Ala Asn Lys Asp
1   5   10

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Pro Gln Pro Glu Ala Pro Ala Pro Gln Pro Pro Ala Gly Arg
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Pro Gln Pro Pro Gln Pro Gln Pro Glu Ala Pro Ala Pro Gln
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Pro Tyr Ile Lys Ala Ser Val Leu Gln Glu Phe Asp Gly Ala
1 5 10

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Arg Phe Ala Pro Gln Ala Ala Pro Leu Ser Ile Thr Leu Gln
1 5 10

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<400> 2767

Arg Leu Gly Glu Leu Arg Leu Asn Pro Asp Ala Gly Gly Ala
1 5 10

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<400> 2768

Arg Leu Asn Pro Asp Ala Gly Gly Ala Trp Gly Arg Gly Phe
1 5 10

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<400> 2769

Arg Asn Gly Ser Val Thr Ser Ser Gly Gln Leu Ser Asp Asp
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Arg Arg Phe Asp Gln Lys Val Ala Gly Phe Glu Leu Gly Ala
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Arg Thr Thr Leu Ala Met Ala Leu Gly Ala Leu Gly Ala Ala
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<400> 2772

Ser Ala Ile Val Asp Gly Gly Leu His Ile Gly Ala Leu Gln
1   5   10

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Ser Ala Asn Thr Leu Leu Leu Val Gln Thr Pro Leu Gly Ser
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Ser Asp Pro Gly Gly Val Arg Thr Ala Ser Gly Thr Thr Ile
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<400> 2775

Ser Glu Leu Thr Leu Asp Gly Gly His Ile Thr Gly Gly Arg
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<400> 2776

Ser Gly Leu Phe Arg Met Asn Val Phe
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<400> 2777

Ser Gly Leu Phe Arg Met Asn Val Phe Ala Asp Leu Gly Leu
1 5 10

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<400> 2778

Ser Gly Ser Ser Val Glu Leu Ala Gln Ser Ile Val Glu Ala
1 5 10

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<400> 2779

Ser Ile Ala Asp Ser Thr Leu Gln Gly Ala Gly Gly Val Gln
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Ser Lys Gly Pro Lys Leu Ala Met Pro Trp Thr Phe His Ala
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Ser Asn Val Gly Ala Leu Arg Leu Ala Ser Asp Gly Ser Val
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Ser Arg Ile Val Lys Ala Ala Pro Leu Arg Arg Thr Thr Leu
1   5   10

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Ser Val Leu Gly Ala Ser Glu Leu Thr Leu Asp Gly Gly His
1   5   10

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<400> 2784

Ser Val Leu Gln Glu Phe Asp Gly Ala
1   5

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Ser Val Leu Gln Glu Phe Asp Gly Ala Gly Thr Val His Thr
1   5   10

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Thr Glu Leu Arg
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Thr Glu Leu Arg Gly Thr Arg Ala Glu Leu Gly Leu Gly Met
1 5 10

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<400> 2788

Thr Gly Asp Gly Gly Gly His Thr Asp Ser Val His Val Gly
1 5 10

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Thr Gly Gly Ala Arg Arg Phe Ala Pro Gln Ala Ala Pro Leu
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1 5 10

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<400> 2791

Thr Gly Gly Val Gly Leu Ala Ser Thr Leu Trp Tyr Ala Glu
1 5 10

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Thr His Gly Val Gly Ala Ser Leu Glu Ala Gly Arg Arg Phe
1 5 10

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Thr Ile Arg Arg Gly Asp Ala Pro Ala
1 5

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Thr Leu Ala Asn Val Gly Asp Thr Trp Asp Asp Asp Gly Ile
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<400> 2795

Thr Leu Gln Gly Ala Gly Gly Val Gln Ile Glu Arg Gly Ala
1   5   10

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Thr Leu Thr Gly Gly Ala Asp Ala Gln Gly Asp Ile Val Ala
1   5   10

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<400> 2797

Thr Asn Val Thr Ala Val Pro Ala Ser Gly Ala Pro Ala Ala
1   5   10

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<400> 2798

Thr Arg Ala Glu Leu Gly Leu Gly Met Ala Ala Ala Leu Gly

1 5 10

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<400> 2799

Thr Ser Ser Gly Gln Leu Ser Asp Asp Gly Ile Arg Arg Phe
1 5 10

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<400> 2800

Thr Val His Thr Asn Gly Ile Ala His Arg Thr Glu Leu Arg
1 5 10

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<400> 2801

Thr Tyr Arg Tyr Arg Leu Ala Ala Asn Gly Asn Gly Gln Trp
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<400> 2802

Val Ala Asp His Ala Thr Leu Ala Asn Val Gly Asp Thr Trp
1 5 10

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<400> 2803

Val His Val Gly Gly Tyr Ala Thr Tyr Ile Ala Asp Ser Gly
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<210> 2804
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<400> 2804

Val Leu Asp Gly Trp Tyr Gly Val Asp
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Val Pro Ala Ser Gly Ala Pro Ala Ala Val Ser Val Leu Gly
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<400> 2806

Val Arg Asp Glu Gly Gly Ser Ser Val Leu Gly Arg Leu Gly
1   5   10

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<400> 2807

Val Arg Thr Ala Ser Gly Thr Thr Ile Lys Val Ser Gly Arg
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<400> 2808

Val Ser Gly Gly Ser Leu Ser Ala Pro His Gly Asn Val Ile
1   5   10

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<400> 2809

Val Ser Gly Arg Gln Ala Gln Gly Ile Leu Leu Glu Asn Pro
1   5   10

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<400> 2810

Val Thr Val Gln Arg Ser Ala Ile Val Asp Gly Gly Leu His
1 5 10

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<400> 2811

Val Val Leu Arg Asp Thr Asn Val Thr Ala Val Pro Ala Ser
1 5 10

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<400> 2812

Trp Asn Asn Gln Ser Ile Val Lys Thr Gly Glu Arg Gln His
1 5 10

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<400> 2813

Trp Val Arg Asn Ser Gly Ser Glu Pro Ala Ser Ala Asn Thr
1 5 10

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<400> 2814

Trp Tyr Ala Glu Ser Asn Ala Leu Ser Lys Arg Leu Gly Glu
1   5   10

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<400> 2815

Tyr Ala Thr Tyr Ile Ala Asp Ser Gly Phe Tyr Leu Asp Ala
1   5   10

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<400> 2816

Tyr Gly Val Asp Val Ser Gly Ser Ser
1   5

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<400> 2817

Tyr Gly Val Asp Val Ser Gly Ser Ser Val Glu Leu Ala Gln
1   5   10

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<400> 2818

Tyr Leu Asp Ala Thr Leu Arg Ala Ser Arg Leu Glu Asn Asp
1   5   10

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<400> 2819

Tyr Arg Val Leu Pro Glu Pro Val Lys Leu Thr Leu Thr Gly
1   5   10

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<400> 2820

Val Lys Ala Gln Asn Ile Thr Asn Lys Arg Ala Ala Leu Ile Glu Ala
1   5   10   15

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<400> 2821

Tyr Tyr Ser Asn Val Thr Ala Thr Arg Leu Leu Ser Ser Thr Asn Ser
1 5 10 15

<210> 2822
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<400> 2822

Ser Pro Asn Leu Thr Asp Glu Arg Ala Ala Gln Ala Gly Val Thr
1 5 10 15

<210> 2823
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<400> 2823

Ser Ser Arg Ala Ser Asp Glu Arg Ala Ala His Leu Pro Thr Ser
1 5 10 15

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<400> 2824

Gln Val Val His Asn Ser Tyr Asn Arg Pro Ala Tyr Ser Pro Gly
1 5 10 15

<210> 2825
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<400> 2825

Ala Glu Gly Gly Glu Ile His Glu Leu
1   5

<210> 2826
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<400> 2826

Ala Glu Asn Leu Ile Ser Asn Gly Ile Gly Lys Tyr
1   5   10

<210> 2827
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<400> 2827

Ala Glu Val Asp Gly Asp Val Lys Leu
1   5

<210> 2828
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<400> 2828

Ala Ile Tyr Thr Ala Glu Ile His Lys
1   5

<210> 2829

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<400> 2829

Ala Pro Val Phe His Met Thr Asn Tyr
1 5

<210> 2830
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<400> 2830

Ala Pro Val Phe His Met Thr Asn Tyr Leu Glu Gln Pro Val Ser Asn
1 5 10 15

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<400> 2831

Ala Gln Arg Leu Asn Glu Ile Tyr
1 5

<210> 2832
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<400> 2832

Ala Arg Val Pro His Ala Tyr Ser Leu
1 5

<210> 2833
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<400> 2833

Ala Val Arg Asp Leu Glu Arg Ala Met
1   5

<210> 2834
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Ala Val Arg Asp Leu Glu Arg Ala Met Thr Thr Leu Lys
1   5   10

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<400> 2835

Asp Ala Leu Leu Arg Leu Gln Ala Met
1   5

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<400> 2836

Asp Ile Lys Glu Lys Val Ile Asn Leu
1   5

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<400> 2837

Asp Gln Gly Leu Phe Lys Val Leu
1   5

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<400> 2838

Asp Thr Gly Val Asp Thr Arg Ile Trp
1   5

<210> 2839
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Glu Pro Ile Gly Ser Leu Ala Ile Glu Glu Ala Met
1   5   10

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<400> 2840

Glu Pro Ile Arg Asp Ala Leu Asn Ala Met
1   5   10

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<400> 2841

Phe Pro Lys Leu Gly Lys Thr Leu
1   5

<210> 2842
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<400> 2842

Phe Arg Ser Val Asn Ala Val Ala Phe
1   5

<210> 2843
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<400> 2843

Gly Lys Ile Ile Asp Asn Thr Glu Gln Leu
1   5   10

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<400> 2844

Gly Leu Asn Glu Lys Leu Val Phe Tyr
1 5

<210> 2845
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<400> 2845

Gly Met Tyr Gly Gly Thr Tyr Leu Val Glu Lys
1 5 10

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<400> 2846

Gly Pro Pro Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn
1 5 10

<210> 2847
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<400> 2847

Gly Pro Arg Gln Ala Gln Val Ser Phe Leu
1 5 10

<210> 2848
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<400> 2848

Gly Arg Leu Val Pro Gln Val Arg Val Ile Asp
1   5   10

<210> 2849
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<400> 2849

Gly Ser Ala Pro Ile Ser Met Gly Phe Arg
1   5   10

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<400> 2850

His Ile Leu Ala Lys Ser Thr Ala Leu
1   5

<210> 2851
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<400> 2851

His Tyr Arg Glu Val Asn Leu Val Tyr

1 5

<210> 2852
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<400> 2852

Ile Pro Pro Met Lys Asn Leu Ala Leu
1 5

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<400> 2853

Ile Pro Tyr Gln Gly Ser Gly Lys Gly Val Ser Phe
1 5 10

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<400> 2854

Ile Ser Lys Glu Ser Gln His Val Tyr
1 5

<210> 2855
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<400> 2855

Ile Val Ser Ser His Phe Phe Val Tyr
1 5

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<400> 2856

Lys Glu Ile Lys Glu Thr Gly Arg Leu Phe
1 5 10

<210> 2857
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<400> 2857

Lys Glu Ser Gln His Val Tyr Tyr Leu
1 5

<210> 2858
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<400> 2858

Lys Ile Ile Asp Asn Thr Glu Gln Leu
1 5

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<400> 2859

Lys Lys Gln Ile Asn Arg Gln Asn
1   5

<210> 2860
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<400> 2860

Lys Lys Val Asp Thr Asn Phe Ile Tyr Gln
1   5   10

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<400> 2861

Lys Leu Ile Asp Gly Phe Phe Pro Ala
1   5

<210> 2862
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<400> 2862

Lys Pro Asn Leu Ser Ser Lys Arg Ser Glu Leu
1   5   10

<210> 2863
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<220>
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<400> 2863

Lys Val Ser Pro Tyr Leu Phe Thr Val
1   5

<210> 2864
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<400> 2864

Leu Glu Thr Arg Thr Thr Asn Gln Phe Leu
1   5   10

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<220>
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<400> 2865

Leu Leu Lys Glu Ala Thr Glu Leu
1   5

<210> 2866
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<400> 2866

Leu Leu Lys Lys Gly Asn Ser Leu Tyr
1   5

<210> 2867
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<400> 2867

Leu Pro Ala Pro Ile Gly Gly Met Asn Tyr
1   5   10

<210> 2868
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<210> 3838
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gg 62

<210> 3850
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c 61

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<213> Homo sapiens

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1 5 10 15

Ala Thr Gly Leu Pro Ser Val Glu Pro Glu Ile Ala Glu Leu Ser Leu
20 25 30

Phe Ala Val His Arg Ser Ser Leu Glu Asn Pro Glu His Asp Glu Ser
35 40 45

Gly Ala Leu Val Leu Pro Arg Val Leu Asp Lys Leu Thr Leu Cys Met
50 55 60

Cys Pro Glu Arg Pro Phe Thr Ala Lys Ala Ser Glu Ile Thr Gly Leu
65 70 75 80

Ser Ser Glu Gly Leu Ala Arg Cys Arg Lys Ala Gly Phe Asp Gly Ala
85 90 95

Val Val Arg Thr Leu Gln Ala Phe Leu Ser Arg Gln Ala Gly Pro Ile
100 105 110

Cys Leu Val Ala His Asn Gly Phe Asp Tyr Asp Phe Pro Leu Leu Cys
115 120 125

Ala Glu Leu Arg Arg Leu Gly Ala Arg Leu Pro Arg Asp Thr Val Cys
130 135 140

Leu Asp Thr Leu Pro Ala Leu Arg Gly Leu Asp Arg Ala His Ser His
145 150 155 160

Gly Thr Arg Ala Arg Gly Arg Gln Gly Tyr Ser Leu Gly Ser Leu Phe
165 170 175

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His Arg Tyr Phe Arg Ala Glu Pro Ser Ala Ala His Ser Ala Glu Gly
            180                 185                 190


Asp Val His Thr Leu Leu Leu Ile Phe Leu His Arg Ala Ala Glu Leu
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Leu Ala Trp Ala Asp Glu Gln Ala Arg Gly Trp Ala His Ile Glu Pro
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Met Tyr Leu Pro Pro Asp Asp Pro Ser Leu Glu Ala
225                 230                 235


<210>  3866
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<400>  3866

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Ala Thr Gly Leu Pro Asn Met Asp Pro Glu Ile Ala Glu Ile Ser Leu
            20                  25                  30


Phe Ala Val His Arg Ser Ser Leu Glu Asn Pro Glu Arg Asp Asp Ser
        35                  40                  45


Gly Ser Leu Val Leu Pro Arg Val Leu Asp Lys Leu Thr Leu Cys Met
    50                  55                  60


Cys Pro Glu Arg Pro Phe Thr Ala Lys Ala Ser Glu Ile Thr Gly Leu
65                  70                  75                  80


Ser Ser Glu Ser Leu Met His Cys Gly Lys Ala Gly Phe Asn Gly Ala
                85                  90                  95


Val Val Arg Thr Leu Gln Gly Phe Leu Ser Arg Gln Glu Gly Pro Ile
            100                 105                 110
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Cys Leu Val Ala His Asn Gly Phe Asp Tyr Asp Phe Pro Leu Leu Cys
        115                 120                 125


Thr Glu Leu Gln Arg Leu Gly Ala His Leu Pro Gln Asp Thr Val Cys
    130                 135                 140


Leu Asp Thr Leu Pro Ala Leu Arg Gly Leu Asp Arg Ala His Ser His
145                 150                 155                 160


Gly Thr Arg Ala Gln Gly Arg Lys Ser Tyr Ser Leu Ala Ser Leu Phe
                165                 170                 175


His Arg Tyr Phe Gln Ala Glu Pro Ser Ala Ala His Ser Ala Glu Gly
            180                 185                 190


Asp Val His Thr Leu Leu Leu Ile Phe Leu His Arg Ala Pro Glu Leu
        195                 200                 205


Leu Ala Trp Ala Asp Glu Gln Ala Arg Ser Trp Ala His Ile Glu Pro
    210                 215                 220


Met Tyr Val Pro Pro Asp Gly Pro Ser Leu Glu Ala
225                 230                 235


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<213>  Rattus norvegicus

<400>  3867

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Ala Thr Gly Leu Pro Asn Met Asp Pro Glu Ile Ala Glu Ile Ser Leu
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Phe Ala Val His Arg Ser Ser Leu Glu Asn Pro Glu Arg Asp Asp Ser
        35                  40                  45


Gly Ser Leu Val Leu Pro Arg Val Leu Asp Lys Leu Thr Leu Cys Met
    50                  55                  60
```

```
Cys Pro Glu Arg Pro Phe Thr Ala Lys Ala Ser Glu Ile Thr Gly Leu
65                  70                  75                  80

Ser Ser Glu Gly Leu Met Asn Cys Arg Lys Ala Ala Phe Asn Asp Ala
                85                  90                  95

Val Val Arg Thr Leu Gln Gly Phe Leu Ser Arg Gln Glu Gly Pro Ile
            100                 105                 110

Cys Leu Val Ala His Asn Gly Phe Asp Tyr Asp Phe Pro Leu Leu Cys
        115                 120                 125

Thr Glu Leu Gln Arg Leu Gly Ala His Leu Pro Arg Asp Thr Val Cys
    130                 135                 140

Leu Asp Thr Leu Pro Ala Leu Arg Gly Leu Asp Arg Val His Ser His
145                 150                 155                 160

Gly Thr Arg Ala Gln Gly Arg Lys Ser Tyr Ser Leu Ala Ser Leu Phe
                165                 170                 175

His Arg Tyr Phe Gln Ala Glu Pro Ser Ala Ala His Ser Ala Glu Gly
            180                 185                 190

Asp Val Asn Thr Leu Leu Leu Ile Phe Leu His Arg Ala Pro Glu Leu
        195                 200                 205

Leu Ala Trp Ala Asp Glu Gln Ala Arg Ser Trp Ala His Ile Glu Pro
    210                 215                 220

Met Tyr Val Pro Pro Asp Gly Pro Ser Leu Glu Ala
225                 230                 235
```

<210> 3868
<211> 803
<212> PRT
<213> Homo sapiens

<400> 3868

```
Met Gly Ile Gln Gly Leu Leu Gln Phe Ile Lys Glu Ala Ser Glu Pro
1               5                  10                  15

Ile His Val Arg Lys Tyr Lys Gly Gln Val Val Ala Val Asp Thr Tyr
            20                  25                  30

Cys Trp Leu His Lys Gly Ala Ile Ala Cys Ala Glu Lys Leu Ala Lys
        35                  40                  45

Gly Glu Pro Thr Asp Arg Tyr Val Gly Phe Cys Met Lys Phe Val Asn
    50                  55                  60

Met Leu Leu Ser His Gly Ile Lys Pro Ile Leu Val Phe Asp Gly Cys
65                  70                  75                  80

Thr Leu Pro Ser Lys Lys Glu Val Glu Arg Ser Arg Arg Glu Arg Arg
                85                  90                  95

Gln Ala Asn Leu Leu Lys Gly Lys Gln Leu Leu Arg Glu Gly Lys Val
            100                 105                 110

Ser Glu Ala Arg Glu Cys Phe Thr Arg Ser Ile Asn Ile Thr His Ala
        115                 120                 125

Met Ala His Lys Val Ile Lys Ala Ala Arg Ser Gln Gly Val Asp Cys
    130                 135                 140

Leu Val Ala Pro Tyr Glu Ala Asp Ala Gln Leu Ala Tyr Leu Asn Lys
145                 150                 155                 160

Ala Gly Ile Val Gln Ala Ile Ile Thr Glu Asp Ser Asp Leu Leu Ala
                165                 170                 175

Phe Gly Cys Lys Lys Val Ile Leu Lys Met Asp Gln Phe Gly Asn Gly
            180                 185                 190

Leu Glu Ile Asp Gln Ala Arg Leu Gly Met Cys Arg Gln Leu Gly Asp
        195                 200                 205

Val Phe Thr Glu Glu Lys Phe Arg Tyr Met Cys Ile Leu Ser Gly Cys
```

```
    210                 215                 220

Asp Tyr Leu Ser Ser Leu Arg Gly Ile Gly Leu Ala Lys Ala Cys Lys
225                 230                 235                 240

Val Leu Arg Leu Ala Asn Asn Pro Asp Ile Val Lys Val Ile Lys Lys
                245                 250                 255

Ile Gly His Tyr Leu Lys Met Asn Ile Thr Val Pro Glu Asp Tyr Ile
            260                 265                 270

Asn Gly Phe Ile Arg Ala Asn Asn Thr Phe Leu Tyr Gln Leu Val Phe
        275                 280                 285

Asp Pro Ile Lys Arg Lys Leu Ile Pro Leu Asn Ala Tyr Glu Asp Asp
    290                 295                 300

Val Asp Pro Glu Thr Leu Ser Tyr Ala Gly Gln Tyr Val Asp Asp Ser
305                 310                 315                 320

Ile Ala Leu Gln Ile Ala Leu Gly Asn Lys Asp Ile Asn Thr Phe Glu
                325                 330                 335

Gln Ile Asp Asp Tyr Asn Pro Asp Thr Ala Met Pro Ala His Ser Arg
            340                 345                 350

Ser His Ser Trp Asp Asp Lys Thr Cys Gln Lys Ser Ala Asn Val Ser
        355                 360                 365

Ser Ile Trp His Arg Asn Tyr Ser Pro Arg Pro Glu Ser Gly Thr Val
    370                 375                 380

Ser Asp Ala Pro Gln Leu Lys Glu Asn Pro Ser Thr Val Gly Val Glu
385                 390                 395                 400

Arg Val Ile Ser Thr Lys Gly Leu Asn Leu Pro Arg Lys Ser Ser Ile
                405                 410                 415

Val Lys Arg Pro Arg Ser Ala Glu Leu Ser Glu Asp Asp Leu Leu Ser
            420                 425                 430
```

```
Gln Tyr Ser Leu Ser Phe Thr Lys Lys Thr Lys Lys Asn Ser Ser Glu
        435                 440                 445

Gly Asn Lys Ser Leu Ser Phe Ser Glu Val Phe Val Pro Asp Leu Val
    450                 455                 460

Asn Gly Pro Thr Asn Lys Lys Ser Val Ser Thr Pro Pro Arg Thr Arg
465                 470                 475                 480

Asn Lys Phe Ala Thr Phe Leu Gln Arg Lys Asn Glu Glu Ser Gly Ala
                485                 490                 495

Val Val Val Pro Gly Thr Arg Ser Arg Phe Phe Cys Ser Ser Asp Ser
            500                 505                 510

Thr Asp Cys Val Ser Asn Lys Val Ser Ile Gln Pro Leu Asp Glu Thr
        515                 520                 525

Ala Val Thr Asp Lys Glu Asn Asn Leu His Glu Ser Glu Tyr Gly Asp
    530                 535                 540

Gln Glu Gly Lys Arg Leu Val Asp Thr Asp Val Ala Arg Asn Ser Ser
545                 550                 555                 560

Asp Asp Ile Pro Asn Asn His Ile Pro Gly Asp His Ile Pro Asp Lys
                565                 570                 575

Ala Thr Val Phe Thr Asp Glu Glu Ser Tyr Ser Phe Glu Ser Ser Lys
            580                 585                 590

Phe Thr Arg Thr Ile Ser Pro Pro Thr Leu Gly Thr Leu Arg Ser Cys
        595                 600                 605

Phe Ser Trp Ser Gly Gly Leu Gly Asp Phe Ser Arg Thr Pro Ser Pro
    610                 615                 620

Ser Pro Ser Thr Ala Leu Gln Gln Phe Arg Arg Lys Ser Asp Ser Pro
625                 630                 635                 640
```

Thr Ser Leu Pro Glu Asn Asn Met Ser Asp Val Ser Gln Leu Lys Ser
645 650 655

Glu Glu Ser Ser Asp Asp Glu Ser His Pro Leu Arg Glu Glu Ala Cys
660 665 670

Ser Ser Gln Ser Gln Glu Ser Gly Glu Phe Ser Leu Gln Ser Ser Asn
675 680 685

Ala Ser Lys Leu Ser Gln Cys Ser Ser Lys Asp Ser Asp Ser Glu Glu
690 695 700

Ser Asp Cys Asn Ile Lys Leu Leu Asp Ser Gln Ser Asp Gln Thr Ser
705 710 715 720

Lys Leu Arg Leu Ser His Phe Ser Lys Lys Asp Thr Pro Leu Arg Asn
725 730 735

Lys Val Pro Gly Leu Tyr Lys Ser Ser Ser Ala Asp Ser Leu Ser Thr
740 745 750

Thr Lys Ile Lys Pro Leu Gly Pro Ala Arg Ala Ser Gly Leu Ser Lys
755 760 765

Lys Pro Ala Ser Ile Gln Lys Arg Lys His His Asn Ala Glu Asn Lys
770 775 780

Pro Gly Leu Gln Ile Lys Leu Asn Glu Leu Trp Lys Asn Phe Gly Phe
785 790 795 800

Lys Lys Phe

<210> 3869
<211> 846
<212> PRT
<213> Homo sapiens

<400> 3869

Met Gly Ile Gln Gly Leu Leu Gln Phe Ile Lys Glu Ala Ser Glu Pro

```
1               5                   10                  15

Ile His Val Arg Lys Tyr Lys Gly Gln Val Val Ala Val Asp Thr Tyr
            20                  25                  30

Cys Trp Leu His Lys Gly Ala Ile Ala Cys Ala Glu Lys Leu Ala Lys
        35                  40                  45

Gly Glu Pro Thr Asp Arg Tyr Val Gly Phe Cys Met Lys Phe Val Asn
    50                  55                  60

Met Leu Leu Ser His Gly Ile Lys Pro Ile Leu Val Phe Asp Gly Cys
65                  70                  75                  80

Thr Leu Pro Ser Lys Lys Glu Val Glu Arg Ser Arg Arg Glu Arg Arg
                85                  90                  95

Gln Ala Asn Leu Leu Lys Gly Lys Gln Leu Leu Arg Glu Gly Lys Val
            100                 105                 110

Ser Glu Ala Arg Glu Cys Phe Thr Arg Ser Ile Asn Ile Thr His Ala
        115                 120                 125

Met Ala His Lys Val Ile Lys Ala Ala Arg Ser Gln Gly Val Asp Cys
    130                 135                 140

Leu Val Ala Pro Tyr Glu Ala Asp Ala Gln Leu Ala Tyr Leu Asn Lys
145                 150                 155                 160

Ala Gly Ile Val Gln Ala Ile Ile Thr Glu Asp Ser Asp Leu Leu Ala
                165                 170                 175

Phe Gly Cys Lys Lys Val Ile Leu Lys Met Asp Gln Phe Gly Asn Gly
            180                 185                 190

Leu Glu Ile Asp Gln Ala Arg Leu Gly Met Cys Arg Gln Leu Gly Asp
        195                 200                 205

Val Phe Thr Glu Glu Lys Phe Arg Tyr Met Cys Ile Leu Ser Gly Cys
    210                 215                 220
```

```
Asp Tyr Leu Ser Ser Leu Arg Gly Ile Gly Leu Ala Lys Ala Cys Lys
225                 230                 235                 240

Val Leu Arg Leu Ala Asn Asn Pro Asp Ile Val Lys Val Ile Lys Lys
                245                 250                 255

Ile Gly His Tyr Leu Lys Met Asn Ile Thr Val Pro Glu Asp Tyr Ile
            260                 265                 270

Asn Gly Phe Ile Arg Ala Asn Asn Thr Phe Leu Tyr Gln Leu Val Phe
        275                 280                 285

Asp Pro Ile Lys Arg Lys Leu Ile Pro Leu Asn Ala Tyr Glu Asp Asp
    290                 295                 300

Val Asp Pro Glu Thr Leu Ser Tyr Ala Gly Gln Tyr Val Asp Asp Ser
305                 310                 315                 320

Ile Ala Leu Gln Ile Ala Leu Gly Asn Lys Asp Ile Asn Thr Phe Glu
                325                 330                 335

Gln Ile Asp Asp Tyr Asn Pro Asp Thr Ala Met Pro Ala His Ser Arg
            340                 345                 350

Ser His Ser Trp Asp Asp Lys Thr Cys Gln Lys Ser Ala Asn Val Ser
        355                 360                 365

Ser Ile Trp His Arg Asn Tyr Ser Pro Arg Pro Glu Ser Gly Thr Val
    370                 375                 380

Ser Asp Ala Pro Gln Leu Lys Glu Asn Pro Ser Thr Val Gly Val Glu
385                 390                 395                 400

Arg Val Ile Ser Thr Lys Gly Leu Asn Leu Pro Arg Lys Ser Ser Ile
                405                 410                 415

Val Lys Arg Pro Arg Ser Ala Glu Leu Ser Glu Asp Asp Leu Leu Ser
            420                 425                 430
```

```
Gln Tyr Ser Leu Ser Phe Thr Lys Lys Thr Lys Lys Asn Ser Ser Glu
        435                 440                 445

Gly Asn Lys Ser Leu Ser Phe Ser Glu Val Phe Val Pro Asp Leu Val
    450                 455                 460

Asn Gly Pro Thr Asn Lys Lys Ser Val Ser Thr Pro Pro Arg Thr Arg
465                 470                 475                 480

Asn Lys Phe Ala Thr Phe Leu Gln Arg Lys Asn Glu Glu Ser Gly Ala
                485                 490                 495

Val Val Val Pro Gly Thr Arg Ser Arg Phe Phe Cys Ser Ser Asp Ser
            500                 505                 510

Thr Asp Cys Val Ser Asn Lys Val Ser Ile Gln Pro Leu Asp Glu Thr
        515                 520                 525

Ala Val Thr Asp Lys Glu Asn Asn Leu His Glu Ser Glu Tyr Gly Asp
    530                 535                 540

Gln Glu Gly Lys Arg Leu Val Asp Thr Asp Val Ala Arg Asn Ser Ser
545                 550                 555                 560

Asp Asp Ile Pro Asn Asn His Ile Pro Gly Asp His Ile Pro Asp Lys
                565                 570                 575

Ala Thr Val Phe Thr Asp Glu Glu Ser Tyr Ser Phe Glu Ser Ser Lys
            580                 585                 590

Phe Thr Arg Thr Ile Ser Pro Pro Thr Leu Gly Thr Leu Arg Ser Cys
        595                 600                 605

Phe Ser Trp Ser Gly Gly Leu Gly Asp Phe Ser Arg Thr Pro Ser Pro
    610                 615                 620

Ser Pro Ser Thr Ala Leu Gln Gln Phe Arg Arg Lys Ser Asp Ser Pro
625                 630                 635                 640
```

```
Thr Ser Leu Pro Glu Asn Asn Met Ser Asp Val Ser Gln Leu Lys Ser
                645                 650                 655

Glu Glu Ser Ser Asp Asp Glu Ser His Pro Leu Arg Glu Glu Ala Cys
            660                 665                 670

Ser Ser Gln Ser Gln Glu Ser Gly Glu Phe Ser Leu Gln Ser Ser Asn
        675                 680                 685

Ala Ser Lys Leu Ser Gln Cys Ser Ser Lys Asp Ser Asp Ser Glu Glu
    690                 695                 700

Ser Asp Cys Asn Ile Lys Leu Leu Asp Ser Gln Ser Asp Gln Thr Ser
705                 710                 715                 720

Lys Leu Arg Leu Ser His Phe Ser Lys Lys Asp Thr Pro Leu Arg Asn
                725                 730                 735

Lys Val Pro Gly Leu Tyr Lys Ser Ser Ser Ala Asp Ser Leu Ser Thr
            740                 745                 750

Thr Lys Ile Lys Pro Leu Gly Pro Ala Arg Ala Ser Gly Leu Ser Lys
        755                 760                 765

Lys Pro Ala Ser Ile Gln Lys Arg Lys His His Asn Ala Glu Asn Lys
    770                 775                 780

Pro Gly Leu Gln Ile Lys Leu Asn Glu Leu Trp Lys Asn Phe Gly Phe
785                 790                 795                 800

Lys Lys Asp Ser Glu Lys Leu Pro Pro Cys Lys Lys Pro Leu Ser Pro
                805                 810                 815

Val Arg Asp Asn Ile Gln Leu Thr Pro Glu Ala Glu Glu Asp Ile Phe
            820                 825                 830

Asn Lys Pro Glu Cys Gly Arg Val Gln Arg Ala Ile Phe Gln
        835                 840                 845
```

<210> 3870

<211> 845
<212> PRT
<213> Homo sapiens

<400> 3870

Met Gly Ile Gln Gly Leu Leu Gln Phe Ile Lys Glu Ala Ser Glu Pro
1 5 10 15

Ile His Val Arg Lys Tyr Lys Gly Gln Val Val Ala Val Asp Thr Tyr
20 25 30

Cys Trp Leu His Lys Gly Ala Ile Ala Cys Ala Glu Lys Leu Ala Lys
35 40 45

Gly Glu Pro Thr Asp Arg Tyr Val Gly Phe Cys Met Lys Phe Val Asn
50 55 60

Met Leu Leu Ser His Gly Ile Lys Pro Ile Leu Val Phe Asp Gly Cys
65 70 75 80

Thr Leu Pro Ser Lys Lys Glu Val Glu Arg Ser Arg Arg Glu Arg Arg
85 90 95

Gln Ala Asn Leu Leu Lys Gly Lys Gln Leu Leu Arg Glu Gly Lys Val
100 105 110

Ser Glu Ala Arg Glu Cys Phe Thr Arg Ser Ile Asn Ile Thr His Ala
115 120 125

Met Ala His Lys Val Ile Lys Ala Ala Arg Ser Gln Gly Val Asp Cys
130 135 140

Leu Val Ala Pro Tyr Glu Ala Asp Ala Gln Leu Ala Tyr Leu Asn Lys
145 150 155 160

Ala Gly Ile Val Gln Ala Ile Ile Thr Glu Asp Ser Asp Leu Leu Ala
165 170 175

Phe Gly Cys Lys Lys Val Ile Leu Lys Met Asp Gln Phe Gly Asn Gly
180 185 190

```
Leu Glu Ile Asp Gln Ala Arg Leu Gly Met Cys Arg Gln Leu Gly Asp
        195                 200                 205

Val Phe Thr Glu Glu Lys Phe Arg Tyr Met Cys Ile Leu Ser Gly Cys
    210                 215                 220

Asp Tyr Leu Ser Ser Leu Arg Gly Ile Gly Leu Ala Lys Ala Cys Lys
225                 230                 235                 240

Val Leu Arg Leu Ala Asn Asn Pro Asp Ile Val Lys Val Ile Lys Lys
                245                 250                 255

Ile Gly His Tyr Leu Lys Met Asn Ile Thr Val Pro Glu Asp Tyr Ile
            260                 265                 270

Asn Gly Phe Ile Arg Ala Asn Asn Thr Phe Leu Tyr Gln Leu Val Phe
        275                 280                 285

Asp Pro Ile Lys Arg Lys Leu Ile Pro Leu Asn Ala Tyr Glu Asp Asp
    290                 295                 300

Val Asp Pro Glu Thr Leu Ser Tyr Ala Gly Gln Tyr Val Asp Asp Ser
305                 310                 315                 320

Ile Ala Leu Gln Ile Ala Leu Gly Asn Lys Asp Ile Asn Thr Phe Glu
                325                 330                 335

Gln Ile Asp Asp Tyr Asn Pro Asp Thr Ala Met Pro Ala His Ser Arg
            340                 345                 350

Ser His Ser Trp Asp Asp Lys Thr Cys Gln Lys Ser Ala Asn Val Ser
        355                 360                 365

Ser Ile Trp His Arg Asn Tyr Ser Pro Arg Pro Glu Ser Gly Thr Val
    370                 375                 380

Ser Asp Ala Pro Gln Leu Lys Glu Asn Pro Ser Thr Val Gly Val Glu
385                 390                 395                 400
```

```
Arg Val Ile Ser Thr Lys Gly Leu Asn Leu Pro Arg Lys Ser Ser Ile
                405                 410                 415

Val Lys Arg Pro Arg Ser Glu Leu Ser Glu Asp Asp Leu Leu Ser Gln
            420                 425                 430

Tyr Ser Leu Ser Phe Thr Lys Lys Thr Lys Lys Asn Ser Ser Glu Gly
        435                 440                 445

Asn Lys Ser Leu Ser Phe Ser Glu Val Phe Val Pro Asp Leu Val Asn
    450                 455                 460

Gly Pro Thr Asn Lys Lys Ser Val Ser Thr Pro Pro Arg Thr Arg Asn
465                 470                 475                 480

Lys Phe Ala Thr Phe Leu Gln Arg Lys Asn Glu Glu Ser Gly Ala Val
                485                 490                 495

Val Val Pro Gly Thr Arg Ser Arg Phe Phe Cys Ser Ser Asp Ser Thr
            500                 505                 510

Asp Cys Val Ser Asn Lys Val Ser Ile Gln Pro Leu Asp Glu Thr Ala
        515                 520                 525

Val Thr Asp Lys Glu Asn Asn Leu His Glu Ser Glu Tyr Gly Asp Gln
    530                 535                 540

Glu Gly Lys Arg Leu Val Asp Thr Asp Val Ala Arg Asn Ser Ser Asp
545                 550                 555                 560

Asp Ile Pro Asn Asn His Ile Pro Gly Asp His Ile Pro Asp Lys Ala
                565                 570                 575

Thr Val Phe Thr Asp Glu Glu Ser Tyr Ser Phe Glu Ser Ser Lys Phe
            580                 585                 590

Thr Arg Thr Ile Ser Pro Pro Thr Leu Gly Thr Leu Arg Ser Cys Phe
        595                 600                 605

Ser Trp Ser Gly Gly Leu Gly Asp Phe Ser Arg Thr Pro Ser Pro Ser
```

```
    610                 615                 620

Pro Ser Thr Ala Leu Gln Gln Phe Arg Arg Lys Ser Asp Ser Pro Thr
625                 630                 635                 640

Ser Leu Pro Glu Asn Asn Met Ser Asp Val Ser Gln Leu Lys Ser Glu
                645                 650                 655

Glu Ser Ser Asp Asp Glu Ser His Pro Leu Arg Glu Glu Ala Cys Ser
            660                 665                 670

Ser Gln Ser Gln Glu Ser Gly Glu Phe Ser Leu Gln Ser Ser Asn Ala
        675                 680                 685

Ser Lys Leu Ser Gln Cys Ser Ser Lys Asp Ser Asp Ser Glu Glu Ser
    690                 695                 700

Asp Cys Asn Ile Lys Leu Leu Asp Ser Gln Ser Asp Gln Thr Ser Lys
705                 710                 715                 720

Leu Arg Leu Ser His Phe Ser Lys Lys Asp Thr Pro Leu Arg Asn Lys
                725                 730                 735

Val Pro Gly Leu Tyr Lys Ser Ser Ser Ala Asp Ser Leu Ser Thr Thr
            740                 745                 750

Lys Ile Lys Pro Leu Gly Pro Ala Arg Ala Ser Gly Leu Ser Lys Lys
        755                 760                 765

Pro Ala Ser Ile Gln Lys Arg Lys His His Asn Ala Glu Asn Lys Pro
    770                 775                 780

Gly Leu Gln Ile Lys Leu Asn Glu Leu Trp Lys Asn Phe Gly Phe Lys
785                 790                 795                 800

Lys Asp Ser Glu Lys Leu Pro Pro Cys Lys Lys Pro Leu Ser Pro Val
                805                 810                 815

Arg Asp Asn Ile Gln Leu Thr Pro Glu Ala Glu Glu Asp Ile Phe Asn
            820                 825                 830
```

Lys Pro Glu Cys Gly Arg Val Gln Arg Ala Ile Phe Gln
835 840 845

<210> 3871
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 3871
gccaacatga ggatcaccca tgtctgcagg gcc 33

<210> 3872
<211> 131
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 3872

Gly Ser Ala Ser Asn Phe Thr Gln Phe Val Leu Val Asp Asn Gly Gly
1 5 10 15

Thr Gly Asp Val Thr Val Ala Pro Ser Asn Phe Ala Asn Gly Val Ala
20 25 30

Glu Trp Ile Ser Ser Asn Ser Arg Ser Gln Ala Tyr Lys Val Thr Cys
35 40 45

Ser Val Arg Gln Ser Ser Ala Gln Asn Arg Lys Tyr Thr Ile Lys Val
50 55 60

Glu Val Pro Lys Val Ala Thr Gln Thr Val Gly Gly Glu Glu Leu Pro
65 70 75 80

Val Ala Gly Trp Arg Ser Tyr Leu Asn Met Glu Leu Thr Ile Pro Ile
85 90 95

Phe Ala Thr Asn Ser Asp Cys Glu Leu Ile Val Lys Ala Met Gln Gly

```
            100                 105                 110

Leu Leu Lys Asp Gly Asn Pro Ile Pro Ser Ala Ile Ala Ala Asn Ser
        115                 120                 125

Gly Ile Tyr
    130
```

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