SEQUENCE LISTING

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<120> Compositions and Methods for the Treatment or Prevention of Hepatitis B Virus Infection

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<160> 152

<170> PatentIn version 3.5

<210> 1
<211> 212
<212> PRT
<213> Hepatitis B virus

<400> 1

Met Gln Leu Phe His Leu Cys Leu Ile Ile Ser Cys Thr Cys Pro Thr
1 5 10 15

Phe Gln Ala Ser Lys Leu Cys Leu Gly Trp Leu Trp Gly Met Asp Ile
20 25 30

Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu
35 40 45

Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser
50 55 60

Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro His
65 70 75 80

His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Thr
85 90 95

Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala Ser Arg Asp
100 105 110

Leu Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys Ile Arg Gln
115 120 125

```
Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val
    130                 135                 140

Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala
145                 150                 155                 160

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

Val Val Arg Cys Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro
            180                 185                 190

Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Lys Ser Arg
        195                 200                 205

Glu Ser Gln Cys
    210
```

<210> 2
<211> 845
<212> PRT
<213> Hepatitis B virus

<400> 2

```
Met Pro Leu Ser Tyr Gln His Phe Arg Lys Leu Leu Leu Leu Asp Asp
1               5                   10                  15

Gly Thr Glu Ala Gly Pro Leu Glu Glu Glu Leu Pro Arg Leu Ala Asp
            20                  25                  30

Ala Asp Leu Asn Arg Arg Val Ala Glu Asp Leu Asn Leu Gly Asn Leu
        35                  40                  45

Asn Val Ser Ile Pro Trp Thr His Lys Val Gly Asn Phe Thr Gly Leu
    50                  55                  60

Tyr Ser Ser Thr Val Pro Ile Phe Asn Pro Glu Trp Gln Thr Pro Ser
65                  70                  75                  80

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

Phe Val Gly Pro Leu Thr Val Asn Glu Lys Arg Arg Leu Lys Leu Ile
            100                 105                 110

Met Pro Ala Arg Phe Tyr Pro Thr His Thr Lys Tyr Leu Pro Leu Asp
        115                 120                 125
```

```
Lys Gly Ile Lys Pro Tyr Tyr Pro Asp Gln Val Val Asn His Tyr Phe
    130                 135                 140

Gln Thr Arg His Tyr Leu His Thr Leu Trp Lys Ala Gly Ile Leu Tyr
145                 150                 155                 160

Lys Arg Glu Thr Thr Arg Ser Ala Ser Phe Cys Gly Ser Pro Tyr Ser
                165                 170                 175

Trp Glu Gln Glu Leu Gln His Gly Arg Leu Val Ile Lys Thr Ser Gln
            180                 185                 190

Arg His Gly Asp Glu Ser Phe Cys Ser Gln Pro Ser Gly Ile Leu Ser
        195                 200                 205

Arg Ser Ser Val Gly Pro Cys Ile Arg Ser Gln Leu Lys Gln Ser Arg
    210                 215                 220

Leu Gly Leu Gln Pro His Gln Gly Pro Leu Ala Ser Ser Gln Pro Gly
225                 230                 235                 240

Arg Ser Gly Ser Ile Trp Ala Arg Ala His Pro Ser Thr Arg Arg Tyr
                245                 250                 255

Phe Gly Val Glu Pro Ser Gly Ser Gly His Ile Asp His Ser Val Asn
            260                 265                 270

Asn Ser Ser Ser Cys Leu His Gln Ser Ala Val Arg Lys Ala Ala Tyr
        275                 280                 285

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

Glu Phe His Cys Leu Pro Pro Ser Ser Ala Gly Ser Gln Ser Gln Gly
305                 310                 315                 320

Ser Val Phe Ser Cys Trp Trp Leu Gln Phe Arg Asn Ser Lys Pro Cys
                325                 330                 335

Ser Glu Tyr Cys Leu Ser His Leu Val Asn Leu Arg Glu Asp Trp Gly
            340                 345                 350

Pro Cys Asp Glu His Gly Glu His His Ile Arg Ile Pro Arg Thr Pro
        355                 360                 365

Ala Arg Val Thr Gly Gly Val Phe Leu Val Asp Lys Asn Pro His Asn
```

370 375 380

Thr Ala Glu Ser Arg Leu Val Val Asp Phe Ser Gln Phe Ser Arg Gly
385 390 395 400

Ser Thr Arg Val Ser Trp Pro Lys Phe Ala Val Pro Asn Leu Gln Ser
405 410 415

Leu Thr Asn Leu Leu Ser Ser Asn Leu Ser Trp Leu Ser Leu Asp Val
420 425 430

Ser Ala Ala Phe Tyr His Ile Pro Leu His Pro Ala Ala Met Pro His
435 440 445

Leu Leu Ile Gly Ser Ser Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser
450 455 460

Ser Asn Ser Arg Ile Asn Asn Asn Gln Tyr Gly Thr Met Gln Asn Leu
465 470 475 480

His Asp Ser Cys Ser Arg Gln Leu Tyr Val Ser Leu Met Leu Leu Tyr
485 490 495

Lys Thr Tyr Gly Trp Lys Leu His Leu Tyr Ser His Pro Ile Val Leu
500 505 510

Gly Phe Arg Lys Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Leu
515 520 525

Ala Gln Phe Thr Ser Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro
530 535 540

His Cys Leu Ala Phe Ser Tyr Met Asp Asp Val Val Leu Gly Ala Lys
545 550 555 560

Ser Val Gln His Arg Glu Ser Leu Tyr Thr Ala Val Thr Asn Phe Leu
565 570 575

Leu Ser Leu Gly Ile His Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly
580 585 590

Tyr Ser Leu Asn Phe Met Gly Tyr Ile Ile Gly Ser Trp Gly Thr Leu
595 600 605

Pro Gln Asp His Ile Val Gln Lys Ile Lys His Cys Phe Arg Lys Leu
610 615 620

```
Pro Val Asn Arg Pro Ile Asp Trp Lys Val Cys Gln Arg Ile Val Gly
625                 630                 635                 640

Leu Leu Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu
                645                 650                 655

Met Pro Leu Tyr Ala Cys Ile Gln Ala Lys Gln Ala Phe Thr Phe Ser
            660                 665                 670

Pro Thr Tyr Lys Ala Phe Leu Ser Lys Gln Tyr Met Asn Leu Tyr Pro
        675                 680                 685

Val Ala Arg Gln Arg Pro Gly Leu Cys Gln Val Phe Ala Asp Ala Thr
    690                 695                 700

Pro Thr Gly Trp Gly Leu Ala Ile Gly His Gln Arg Met Arg Gly Thr
705                 710                 715                 720

Phe Val Ala Pro Leu Pro Ile His Thr Ala Glu Leu Leu Ala Ala Cys
                725                 730                 735

Phe Ala Arg Ser Arg Ser Gly Ala Lys Leu Ile Gly Thr Asp Asn Ser
            740                 745                 750

Val Val Leu Ser Arg Lys Tyr Thr Ser Phe Pro Trp Leu Leu Gly Cys
        755                 760                 765

Thr Ala Asn Trp Ile Leu Arg Gly Thr Ser Phe Val Tyr Val Pro Ser
    770                 775                 780

Ala Leu Asn Pro Ala Asp Asp Pro Ser Arg Gly Arg Leu Gly Leu Ser
785                 790                 795                 800

Arg Pro Leu Leu Arg Leu Pro Phe Gln Pro Thr Thr Gly Arg Thr Ser
                805                 810                 815

Leu Tyr Ala Val Ser Pro Ser Val Pro Ser His Leu Pro Val Arg Val
            820                 825                 830

His Phe Ala Ser Pro Leu His Val Ala Trp Arg Pro Pro
        835                 840                 845
```

<210> 3
<211> 400
<212> PRT
<213> Hepatitis B virus

<400> 3

```
Met Gly Gly Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu
1               5                  10                  15

Ser Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro
            20                  25                  30

Ala Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Ile
        35                  40                  45

Lys Asp His Trp Pro Thr Ala Asn Gln Val Gly Val Gly Ala Phe Gly
    50                  55                  60

Pro Gly Leu Thr Pro Pro His Gly Gly Ile Leu Gly Gly Ser Pro Gln
65                  70                  75                  80

Ala Gln Gly Ile Leu Thr Thr Val Ser Thr Ile Pro Pro Pro Ala Ser
                85                  90                  95

Thr Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu
            100                 105                 110

Arg Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Ala Phe His
        115                 120                 125

Gln Ala Leu Gln Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly
    130                 135                 140

Gly Ser Ser Ser Gly Thr Val Asn Pro Ala Pro Asn Ile Ala Ser His
145                 150                 155                 160

Ile Ser Ser Ile Ser Ala Arg Thr Gly Asp Pro Val Ala Asn Met Glu
                165                 170                 175

Asn Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly
            180                 185                 190

Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser
        195                 200                 205

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

Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro
225                 230                 235                 240

Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile
                245                 250                 255
```

```
Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu
            260                 265                 270

Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly Ser Thr
        275                 280                 285

Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Thr Pro Ala Gln Gly
    290                 295                 300

Asn Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Thr Asp Gly Asn
305                 310                 315                 320

Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Lys Tyr Leu
                325                 330                 335

Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro
            340                 345                 350

Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Ala
        355                 360                 365

Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile Val Ser
    370                 375                 380

Pro Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile
385                 390                 395                 400
```

<210> 4
<211> 154
<212> PRT
<213> Hepatitis B virus

<400> 4

```
Met Ala Ala Arg Leu Tyr Cys Gln Leu Asp Ser Ser Arg Asp Val Leu
1               5                   10                  15

Cys Leu Arg Pro Val Gly Ala Glu Ser Arg Gly Arg Pro Leu Ser Gly
            20                  25                  30

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

His Gly Ala His Leu Ser Leu Arg Gly Leu Pro Val Cys Ala Phe Ser
    50                  55                  60

Ser Ala Gly Pro Cys Ala Leu Arg Phe Thr Ser Ala Arg Cys Met Glu
65                  70                  75                  80
```

```
Thr Thr Val Asn Ala His Gln Ile Leu Pro Lys Val Leu His Lys Arg
                85                  90                  95

Thr Leu Gly Leu Pro Ala Met Ser Thr Thr Asp Leu Glu Ala Tyr Phe
            100                 105                 110

Lys Asp Cys Val Phe Lys Asp Trp Glu Glu Leu Gly Glu Glu Ile Arg
        115                 120                 125

Leu Lys Val Phe Val Leu Gly Gly Cys Arg His Lys Leu Val Cys Ala
    130                 135                 140

Pro Ala Pro Cys Asn Phe Phe Thr Ser Ala
145                 150
```

<210> 5
<211> 212
<212> PRT
<213> Hepatitis B virus

<400> 5

```
Met Gln Leu Phe His Leu Cys Leu Ile Ile Ser Cys Ser Cys Pro Thr
1               5                   10                  15

Val Gln Ala Ser Lys Leu Cys Leu Gly Trp Leu Trp Gly Met Asp Ile
            20                  25                  30

Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu
        35                  40                  45

Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ala
    50                  55                  60

Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro His
65                  70                  75                  80

His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Thr
                85                  90                  95

Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala Ser Arg Asp
            100                 105                 110

Leu Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys Ile Arg Gln
        115                 120                 125

Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val
    130                 135                 140
```

```
Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala
145                 150                 155                 160

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

Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro
            180                 185                 190

Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg
        195                 200                 205

Glu Ser Gln Cys
    210
```

<210> 6
<211> 843
<212> PRT
<213> Hepatitis B virus

<400> 6

```
Met Pro Leu Ser Tyr Gln His Phe Arg Lys Leu Leu Leu Leu Asp Asp
1               5                   10                  15

Glu Ala Gly Pro Leu Glu Glu Glu Leu Pro Arg Leu Ala Asp Glu Gly
            20                  25                  30

Leu Asn His Arg Val Ala Glu Asp Leu Asn Leu Gly Asn Pro Asn Val
        35                  40                  45

Ser Ile Pro Trp Thr His Lys Val Gly Asn Phe Thr Gly Leu Tyr Ser
    50                  55                  60

Ser Thr Val Pro Val Phe Asn Pro Glu Trp Gln Thr Pro Ser Phe Pro
65                  70                  75                  80

Asp Ile His Leu Gln Glu Asp Ile Val Asp Arg Cys Lys Gln Phe Val
                85                  90                  95

Gly Pro Leu Thr Val Asn Glu Asn Arg Arg Leu Lys Leu Ile Met Pro
            100                 105                 110

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

Ile Lys Pro Tyr Tyr Pro Glu His Val Val Asn His Tyr Phe Gln Thr
    130                 135                 140
```

```
Arg His Tyr Leu His Thr Leu Trp Lys Ala Gly Ile Leu Tyr Lys Arg
145                 150                 155                 160

Glu Ser Thr His Ser Ala Ser Phe Cys Gly Ser Pro Tyr Ser Trp Glu
                165                 170                 175

Gln Asp Leu Gln His Gly Arg Leu Val Phe Gln Thr Ser Lys Arg His
            180                 185                 190

Gly Asp Lys Ser Phe Cys Pro Gln Ser Pro Gly Ile Leu Pro Arg Ser
        195                 200                 205

Ser Val Gly Pro Cys Ile Gln Ser Gln Leu Arg Lys Ser Arg Leu Gly
    210                 215                 220

Pro Gln Pro Thr Gln Gly Gln Leu Ala Gly Arg Pro Gln Gly Gly Ser
225                 230                 235                 240

Gly Ser Ile Arg Ala Arg Val His Pro Ser Pro Trp Gly Thr Val Gly
                245                 250                 255

Val Glu Pro Ser Gly Ser Gly His Thr His Ile Cys Ala Ser Ser Ser
            260                 265                 270

Ser Ser Cys Leu His Gln Ser Ala Val Arg Lys Ala Ala Tyr Ser Leu
        275                 280                 285

Ile Ser Thr Ser Lys Gly His Ser Ser Ser Gly His Ala Val Glu Leu
    290                 295                 300

His His Phe Pro Pro Asn Ser Ser Arg Ser Gln Ser Gln Gly Ser Val
305                 310                 315                 320

Leu Ser Cys Trp Trp Leu Gln Phe Arg Asn Ser Lys Pro Cys Ser Glu
                325                 330                 335

Tyr Cys Leu Tyr His Ile Val Asn Leu Ile Glu Asp Trp Gly Pro Cys
            340                 345                 350

Ala Glu His Gly Glu His Arg Ile Arg Thr Pro Arg Thr Pro Ala Arg
        355                 360                 365

Val Thr Gly Gly Val Phe Leu Val Asp Lys Asn Pro His Asn Thr Ala
    370                 375                 380

Ala Ser Arg Leu Val Val Asp Phe Ser Gln Phe Ser Arg Gly Asn Thr
385                 390                 395                 400
```

```
Arg Val Ser Trp Pro Lys Phe Ala Val Pro Asn Leu Gln Ser Leu Thr
                405                 410                 415

Asn Leu Leu Ser Ser Asn Leu Ser Trp Leu Ser Leu Asp Val Ser Ala
            420                 425                 430

Ala Phe Tyr His Leu Pro Leu His Pro Ala Ala Met Pro His Leu Leu
        435                 440                 445

Val Gly Ser Ser Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Asn
    450                 455                 460

Ser Arg Ile Ile Asn His Gln His Gly Thr Met Gln Asp Leu His Asn
465                 470                 475                 480

Ser Cys Ser Arg Asn Leu Tyr Val Ser Leu Met Leu Leu Tyr Lys Thr
                485                 490                 495

Tyr Gly Trp Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe
            500                 505                 510

Arg Lys Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln
        515                 520                 525

Phe Thr Ser Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys
    530                 535                 540

Leu Ala Phe Ser Tyr Met Asp Asp Val Val Leu Gly Ala Lys Ser Val
545                 550                 555                 560

Gln His Leu Glu Ser Leu Tyr Ala Ala Val Thr Asn Phe Leu Leu Ser
                565                 570                 575

Leu Gly Ile His Leu Asn Pro His Lys Thr Lys Arg Trp Gly Tyr Ser
            580                 585                 590

Leu Asn Phe Met Gly Tyr Val Ile Gly Ser Trp Gly Thr Leu Pro Gln
        595                 600                 605

Glu His Ile Val Gln Lys Ile Lys Leu Cys Phe Arg Lys Ile Pro Val
    610                 615                 620

Asn Arg Pro Ile Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu
625                 630                 635                 640

Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro
```

645 650 655

Leu Tyr Ala Cys Ile Gln Ala Lys Gln Ala Phe Ser Phe Ser Pro Thr
660 665 670

Tyr Lys Ala Phe Leu Ser Lys Gln Tyr Leu Thr Leu Tyr Pro Val Ala
675 680 685

Arg Gln Arg Pro Gly Leu Cys Gln Val Phe Ala Asp Ala Thr Pro Thr
690 695 700

Gly Trp Gly Leu Ala Ile Gly His Gln Arg Met Arg Gly Thr Phe Val
705 710 715 720

Ser Pro Leu Pro Ile His Thr Ala Glu Leu Leu Ala Ala Cys Phe Ala
725 730 735

Arg Ser Arg Ser Gly Ala Lys Leu Ile Gly Thr Asp Asn Ser Val Val
740 745 750

Leu Ser Arg Lys Tyr Thr Ser Phe Pro Trp Leu Leu Gly Cys Ala Ala
755 760 765

Asn Trp Ile Leu Arg Gly Thr Ser Phe Val Tyr Val Pro Ser Ala Leu
770 775 780

Asn Pro Ala Asp Asp Pro Ser Arg Gly Arg Leu Gly Leu Tyr Arg Pro
785 790 795 800

Leu Leu Arg Leu Pro Tyr Arg Pro Thr Thr Gly Arg Thr Ser Leu Tyr
805 810 815

Pro Asp Ser Pro Ser Val Pro Ser His Leu Pro Asp Arg Val His Phe
820 825 830

Ala Ser Pro Leu His Val Ala Trp Lys Pro Pro
835 840

<210> 7
<211> 400
<212> PRT
<213> Hepatitis B virus

<400> 7

Met Gly Gly Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu
1 5 10 15

Ser Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro

```
            20                  25                  30

Ala Phe Lys Ala Asn Ser Asp Asn Pro Asp Trp Asp Leu Asn Pro His
        35                  40                  45

Lys Asp Asn Trp Pro Asp Ser Asn Lys Val Gly Val Gly Ala Phe Gly
    50                  55                  60

Pro Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln
65                  70                  75                  80

Ala Gln Gly Met Ile Thr Thr Val Pro Ala Ala Pro Pro Pro Ala Ser
                85                  90                  95

Thr Asn Arg Gln Leu Gly Arg Gln Pro Thr Pro Leu Ser Pro Pro Leu
            100                 105                 110

Arg Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His
        115                 120                 125

Lys Thr Leu Gln Asp Pro Arg Val Arg Ala Leu Tyr Phe Pro Ala Gly
    130                 135                 140

Gly Ser Ser Ser Gly Thr Val Asn Pro Val Gln Asn Thr Ala Ser Ser
145                 150                 155                 160

Ile Ser Ser Ile Leu Ser Lys Thr Gly Asp Pro Val Pro Asn Met Glu
                165                 170                 175

Asn Ile Ala Ser Gly Leu Leu Gly Pro Leu Leu Val Leu Gln Ala Gly
            180                 185                 190

Phe Phe Leu Leu Thr Lys Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser
        195                 200                 205

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

Gln Asn Ser Gln Ser Gln Ile Ser Ser His Ser Pro Thr Cys Cys Pro
225                 230                 235                 240

Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile
                245                 250                 255

Phe Leu Cys Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu
            260                 265                 270
```

```
Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly Ser Ser
        275                 280                 285

Thr Thr Ser Thr Gly Pro Cys Arg Thr Cys Thr Thr Pro Ala Gln Gly
    290                 295                 300

Thr Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Thr Asp Gly Asn
305                 310                 315                 320

Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Lys Tyr Leu
                325                 330                 335

Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Ala Pro
            340                 345                 350

Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Val
        355                 360                 365

Ile Trp Met Met Trp Phe Trp Gly Pro Ser Leu Tyr Asn Ile Leu Ser
    370                 375                 380

Pro Phe Met Pro Leu Leu Pro Leu Phe Phe Cys Leu Trp Val Tyr Ile
385                 390                 395                 400
```

<210> 8
<211> 155
<212> PRT
<213> Hepatitis B virus

<400> 8

```
Met Ala Ala Arg Leu Cys Cys Gln Leu Asp Pro Ala Arg Asp Val Leu
1               5                   10                  15

Cys Leu Arg Pro Val Gly Ala Glu Ser Arg Gly Arg Pro Leu Pro Gly
            20                  25                  30

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

His Gly Ala His Leu Ser Leu Pro Gly Leu Pro Val Cys Ala Phe Ser
    50                  55                  60

Ser Ala Gly Pro Cys Ala Leu Arg Phe Thr Ser Ala Arg Arg Met Glu
65                  70                  75                  80

Thr Thr Val Asn Ala His Arg Asn Leu Pro Lys Val Leu His Lys Arg
                85                  90                  95
```

Thr Leu Gly Leu Ser Ala Met Ser Thr Thr Asp Leu Glu Ala Tyr Phe
100 105 110

Lys Asp Cys Val Phe Asn Glu Trp Glu Glu Leu Gly Glu Glu Ile Arg
115 120 125

Leu Lys Val Leu Phe Val Leu Gly Gly Cys Arg His Lys Leu Val Cys
130 135 140

Ser Pro Ala Pro Cys Asn Phe Phe Thr Ser Ala
145 150 155

<210> 9
<211> 212
<212> PRT
<213> Hepatitis B virus

<400> 9

Met Gln Leu Phe Pro Leu Cys Leu Ile Ile Ser Cys Ser Cys Pro Thr
1 5 10 15

Val Gln Ala Ser Lys Leu Cys Leu Gly Trp Leu Trp Gly Met Asp Ile
20 25 30

Asp Pro Tyr Lys Glu Phe Gly Ala Ser Val Glu Leu Leu Ser Phe Leu
35 40 45

Pro Ser Asp Phe Phe Pro Ser Ile Arg Asp Leu Leu Asp Thr Ala Ser
50 55 60

Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro His
65 70 75 80

His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn
85 90 95

Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu
100 105 110

Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln
115 120 125

Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val
130 135 140

Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala
145 150 155 160

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

Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro
            180                 185                 190

Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg
        195                 200                 205

Glu Ser Gln Cys
    210
```

<210> 10
<211> 843
<212> PRT
<213> Hepatitis B virus

<400> 10

```
Met Pro Leu Ser Tyr Gln His Phe Arg Lys Leu Leu Leu Leu Asp Asp
1               5                   10                  15

Glu Ala Gly Pro Leu Glu Glu Glu Leu Pro Arg Leu Ala Asp Glu Gly
            20                  25                  30

Leu Asn Arg Arg Val Ala Glu Asp Leu Asn Leu Gly Asn Leu Asn Val
        35                  40                  45

Ser Ile Pro Trp Thr His Lys Val Gly Asn Phe Thr Gly Leu Tyr Ser
    50                  55                  60

Ser Thr Val Pro Val Phe Asn Pro Glu Trp Gln Thr Pro Ser Phe Pro
65                  70                  75                  80

His Ile His Leu Gln Glu Asp Ile Ile Asn Arg Cys Gln Gln Tyr Val
                85                  90                  95

Gly Pro Leu Thr Val Asn Glu Lys Arg Arg Leu Lys Leu Ile Met Pro
            100                 105                 110

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

Ile Lys Pro Tyr Tyr Pro Glu His Ala Val Asn His Tyr Phe Lys Thr
    130                 135                 140

Arg His Tyr Leu His Thr Leu Trp Lys Ala Gly Ile Leu Tyr Lys Arg
145                 150                 155                 160
```

```
Glu Thr Thr Arg Ser Ala Ser Phe Cys Gly Ser Pro Tyr Ser Trp Glu
                165                 170                 175

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

Gly Asp Glu Ser Phe Cys Ser Gln Ser Ser Gly Ile Leu Ser Arg Ser
        195                 200                 205

Pro Val Gly Pro Cys Val Arg Ser Gln Leu Lys Gln Ser Arg Leu Gly
    210                 215                 220

Leu Gln Pro Gln Gln Gly Ser Leu Ala Arg Gly Lys Ser Gly Arg Ser
225                 230                 235                 240

Gly Ser Ile Arg Ala Arg Val His Pro Thr Thr Arg Arg Ser Phe Gly
                245                 250                 255

Val Glu Pro Ser Gly Ser Gly His Ile Asp Asn Ser Ala Ser Ser Thr
            260                 265                 270

Ser Ser Cys Leu His Gln Ser Ala Val Arg Lys Thr Ala Tyr Ser His
        275                 280                 285

Leu Ser Thr Ser Lys Arg Gln Ser Ser Ser Gly His Ala Val Glu Leu
    290                 295                 300

His Asn Ile Pro Pro Ser Ser Thr Arg Ser Gln Ser Glu Gly Pro Ile
305                 310                 315                 320

Phe Ser Cys Trp Trp Leu Gln Phe Arg Asn Ser Lys Pro Cys Ser Asp
                325                 330                 335

Tyr Cys Leu Thr His Ile Val Asn Leu Leu Glu Asp Trp Gly Pro Cys
            340                 345                 350

Thr Glu His Gly Glu His Asn Ile Arg Ile Pro Arg Thr Pro Ala Arg
        355                 360                 365

Val Thr Gly Gly Val Phe Leu Val Asp Lys Asn Pro His Asn Thr Thr
    370                 375                 380

Glu Ser Arg Leu Val Val Asp Phe Ser Gln Phe Ser Arg Gly Ser Thr
385                 390                 395                 400

His Val Ser Trp Pro Lys Phe Ala Val Pro Asn Leu Gln Ser Leu Thr
                405                 410                 415
```

```
Asn Leu Leu Ser Ser Asn Leu Ser Trp Leu Ser Leu Asp Val Ser Ala
            420                 425                 430

Ala Phe Tyr His Ile Pro Leu His Pro Ala Ala Met Pro His Leu Leu
        435                 440                 445

Val Gly Ser Ser Gly Leu Pro Arg Tyr Val Ala Arg Leu Ser Ser Thr
    450                 455                 460

Ser Arg Asn Ile Asn Tyr Gln His Gly Thr Met Gln Asp Leu His Asp
465                 470                 475                 480

Ser Cys Ser Arg Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Lys Thr
                485                 490                 495

Phe Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe
            500                 505                 510

Arg Lys Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln
        515                 520                 525

Phe Thr Ser Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys
    530                 535                 540

Leu Ala Phe Ser Tyr Met Asp Asp Val Val Leu Gly Ala Lys Ser Val
545                 550                 555                 560

Gln His Leu Glu Ser Leu Phe Thr Ser Ile Thr Asn Phe Leu Leu Ser
                565                 570                 575

Leu Gly Ile His Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser
            580                 585                 590

Leu Asn Phe Met Gly Tyr Val Ile Gly Ser Trp Gly Thr Leu Pro Gln
        595                 600                 605

Glu His Ile Val Gln Lys Leu Lys Gln Cys Phe Arg Lys Leu Pro Val
    610                 615                 620

Asn Arg Pro Ile Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu
625                 630                 635                 640

Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro
                645                 650                 655

Leu Tyr Ala Cys Ile Gln Ala Lys Gln Ala Phe Thr Phe Ser Pro Thr
            660                 665                 670
```

```
Tyr Lys Ala Phe Leu Cys Lys Gln Tyr Leu Asn Leu Tyr Pro Val Ala
        675                 680                 685

Arg Gln Arg Ser Gly Leu Cys Gln Val Phe Ala Asp Ala Thr Pro Thr
    690                 695                 700

Gly Trp Gly Leu Ala Ile Gly His Gln Arg Met Arg Gly Thr Phe Val
705                 710                 715                 720

Ala Pro Leu Pro Ile His Thr Ala Glu Leu Leu Ala Ala Cys Phe Ala
                725                 730                 735

Arg Ser Arg Ser Gly Ala Lys Leu Ile Gly Thr Asp Asn Ser Val Val
            740                 745                 750

Leu Ser Arg Lys Tyr Thr Ser Phe Pro Trp Leu Leu Gly Cys Thr Ala
        755                 760                 765

Asn Trp Ile Leu Arg Gly Thr Ser Phe Val Tyr Val Pro Ser Ala Leu
    770                 775                 780

Asn Pro Ala Asp Asp Pro Ser Arg Gly Arg Leu Gly Leu Tyr Arg Pro
785                 790                 795                 800

Leu Leu Arg Leu Pro Phe Arg Pro Thr Thr Gly Arg Thr Ser Leu Tyr
                805                 810                 815

Ala Asp Ser Pro Ser Val Pro Ser His Leu Pro Asp Arg Val His Phe
            820                 825                 830

Ala Ser Pro Leu His Val Ala Trp Lys Pro Pro
        835                 840


<210>  11
<211>  400
<212>  PRT
<213>  Hepatitis B virus

<400>  11

Met Gly Gly Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu
1               5                   10                  15

Ser Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro
            20                  25                  30

Ala Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Asn
        35                  40                  45
```

```
Lys Asp His Trp Pro Glu Ala Asn Gln Val Gly Val Gly Ala Phe Gly
    50                  55                  60

Pro Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln
65                  70                  75                  80

Ala Gln Gly Ile Leu Thr Thr Val Pro Ala Ala Pro Pro Pro Ala Ser
                85                  90                  95

Thr Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu
            100                 105                 110

Arg Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His
        115                 120                 125

Gln Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly
    130                 135                 140

Gly Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro
145                 150                 155                 160

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

Asn Thr Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly
            180                 185                 190

Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser
        195                 200                 205

Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Ala Pro Thr Cys Pro Gly
    210                 215                 220

Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro
225                 230                 235                 240

Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile
                245                 250                 255

Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu
            260                 265                 270

Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser
        275                 280                 285

Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly
```

290 295 300

Thr Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn
305 310 315 320

Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu
325 330 335

Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro
340 345 350

Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Val
355 360 365

Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Asn Ile Leu Asn
370 375 380

Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile
385 390 395 400

<210> 12
<211> 154
<212> PRT
<213> Hepatitis B virus

<400> 12

Met Ala Ala Arg Val Cys Cys Lys Leu Asp Pro Ala Arg Asp Val Leu
1 5 10 15

Cys Leu Arg Pro Val Gly Ala Glu Ser Ser Gly Arg Pro Val Ser Gly
20 25 30

Pro Phe Gly Thr Leu Pro Ser Pro Ser Ser Ser Ala Val Pro Ala Asp
35 40 45

His Gly Ala His Leu Ser Leu Arg Gly Leu Pro Val Cys Ala Phe Ser
50 55 60

Ser Ala Gly Pro Cys Ala Leu Arg Phe Thr Ser Ala Arg Arg Met Glu
65 70 75 80

Thr Thr Val Asn Ala His Gln Val Leu Pro Lys Val Leu His Lys Arg
85 90 95

Thr Leu Gly Leu Ser Ala Met Ser Thr Thr Asp Leu Glu Ala Tyr Phe
100 105 110

Lys Asp Cys Val Phe Lys Asp Trp Glu Glu Leu Gly Glu Glu Ile Arg

115 120 125

Leu Lys Val Phe Val Leu Gly Gly Cys Arg His Lys Leu Val Cys Ser
130 135 140

Pro Ala Pro Cys Asn Phe Phe Thr Ser Ala
145 150

<210> 13
<211> 212
<212> PRT
<213> Hepatitis B virus

<400> 13

Met Gln Leu Phe His Leu Cys Leu Ile Ile Ser Cys Ser Cys Pro Thr
1 5 10 15

Val Gln Ala Ser Lys Leu Cys Leu Gly Trp Leu Trp Asp Met Asp Ile
20 25 30

Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu
35 40 45

Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser
50 55 60

Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro His
65 70 75 80

His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Thr
85 90 95

Leu Ala Thr Trp Val Gly Val Asn Leu Glu Asp Pro Ala Ser Arg Asp
100 105 110

Leu Val Val Ser Tyr Val Asn Thr Asn Met Gly Leu Lys Phe Arg Gln
115 120 125

Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val
130 135 140

Ile Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala
145 150 155 160

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

Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro

180 185 190

Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg
195 200 205

Glu Ser Gln Cys
210

<210> 14
<211> 832
<212> PRT
<213> Hepatitis B virus

<400> 14

Met Pro Leu Ser Tyr Gln His Phe Arg Arg Leu Leu Leu Leu Asp Pro
1 5 10 15

Asp Ala Gly Pro Leu Glu Glu Glu Leu Pro Arg Leu Ala Asp Glu Gly
20 25 30

Leu Asn Arg Arg Val Ala Glu Asp Leu Asn Leu Gly Asn Leu Asn Val
35 40 45

Ser Ile Pro Trp Thr His Lys Val Gly Asn Phe Thr Gly Leu Tyr Ser
50 55 60

Ser Thr Val Pro Val Phe Asn Pro His Trp Lys Thr Pro Ser Phe Pro
65 70 75 80

Asn Ile His Leu His Gln Asp Ile Ile Lys Lys Cys Glu Gln Phe Val
85 90 95

Gly Pro Leu Thr Val Asn Glu Lys Arg Arg Leu Gln Leu Ile Met Pro
100 105 110

Ala Arg Phe Tyr Pro Asn Val Thr Lys Tyr Leu Pro Leu Glu Lys Gly
115 120 125

Ile Lys Pro Tyr Tyr Pro Glu His Leu Val Asn His Tyr Phe Gln Thr
130 135 140

Arg His Tyr Leu His Thr Leu Trp Lys Ala Gly Ile Leu Tyr Lys Arg
145 150 155 160

Glu Thr Thr Arg Ser Ala Ser Phe Cys Gly Ser Pro Tyr Ser Trp Glu
165 170 175

Gln Glu Leu Gln His Gly Ala Glu Ser Phe His Gln Gln Ser Ser Gly

```
            180                 185                 190

Ile Leu Ser Arg Pro Pro Val Gly Ser Ser Leu Gln Ser Lys His Arg
        195                 200                 205

Lys Ser Arg Leu Gly Leu Gln Ser Gln Gln Gly His Leu Ala Arg Arg
    210                 215                 220

Gln Gln Gly Arg Ser Trp Ser Ile Arg Ala Gly Ile His Pro Thr Ala
225                 230                 235                 240

Arg Arg Pro Phe Gly Val Glu Pro Ser Gly Ser Gly His Thr Ala Asn
                245                 250                 255

Leu Ala Asn Lys Ser Ala Ser Cys Leu Tyr Gln Ser Ser Val Arg Lys
            260                 265                 270

Ala Ala Tyr Ser Ser Val Ser Thr Phe Glu Lys His Ser Ser Ser Ser
        275                 280                 285

Asn Ala Val Glu Leu His Asn Leu Pro Pro Asn Pro Ala Arg Ser Gln
    290                 295                 300

Ser Glu Arg Pro Val Phe Pro Cys Trp Trp Leu Gln Phe Arg Asn Ser
305                 310                 315                 320

Lys Pro Cys Ser Asp Tyr Cys Leu Ser His Ile Val Asn Leu Leu Glu
                325                 330                 335

Asp Trp Gly Pro Cys Ala Glu His Gly Glu His His Ile Arg Ile Pro
            340                 345                 350

Arg Thr Pro Ala Arg Val Thr Gly Gly Val Phe Leu Val Asp Lys Asn
        355                 360                 365

Pro His Asn Thr Val Glu Ser Arg Leu Val Val Asp Phe Ser Gln Phe
    370                 375                 380

Ser Arg Gly Asn His Arg Val Ser Trp Pro Lys Phe Ala Val Pro Asn
385                 390                 395                 400

Leu Gln Ser Leu Thr Asn Leu Leu Ser Ser Asn Leu Ser Trp Leu Ser
                405                 410                 415

Leu Asp Val Ser Ala Ala Phe Tyr His Leu Pro Leu His Pro Ala Ala
            420                 425                 430
```

```
Met Pro His Leu Leu Val Gly Ser Ser Gly Leu Ser Arg Tyr Val Ala
        435                 440                 445

Arg Leu Ser Ser Asn Ser Arg Ile Phe Asn His Gln His Gly Thr Met
    450                 455                 460

Gln Asn Leu His Asp Ser Cys Ser Arg Asn Leu Tyr Val Ser Leu Leu
465                 470                 475                 480

Leu Leu Tyr Gln Thr Phe Gly Arg Lys Leu His Leu Tyr Ser His Pro
                485                 490                 495

Ile Ile Leu Gly Phe Arg Lys Ile Pro Met Gly Val Gly Leu Ser Pro
            500                 505                 510

Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser Val Val Arg Arg
        515                 520                 525

Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp Asp Val Val Leu
    530                 535                 540

Gly Ala Lys Ser Val Gln His Leu Glu Ser Leu Phe Thr Ala Val Thr
545                 550                 555                 560

Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro Asn Lys Thr Lys
                565                 570                 575

Arg Trp Gly Tyr Ser Leu His Phe Met Gly Tyr Val Ile Gly Ser Tyr
            580                 585                 590

Gly Ser Leu Pro Gln Asp His Ile Arg Gln Lys Ile Lys Glu Cys Phe
        595                 600                 605

Arg Lys Leu Pro Val Asn Arg Pro Ile Asp Trp Lys Val Cys Gln Arg
    610                 615                 620

Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr
625                 630                 635                 640

Pro Ala Leu Lys Pro Leu Tyr Ala Cys Ile Gln Ser Lys Gln Ala Phe
                645                 650                 655

Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Cys Lys Gln Tyr Leu Asn
            660                 665                 670

Leu Tyr Pro Val Ala Arg Gln Arg Pro Gly Leu Cys Gln Val Phe Ala
        675                 680                 685
```

```
Asp Ala Thr Pro Thr Gly Trp Gly Leu Val Met Gly His Gln Arg Met
    690                 695                 700

Arg Gly Thr Phe Leu Asp Pro Leu Pro Ile His Thr Ala Glu Leu Leu
705                 710                 715                 720

Ala Ala Cys Phe Ala Arg Ser Arg Ser Gly Ala Asn Ile Leu Gly Thr
                725                 730                 735

Asp Asn Ser Val Val Leu Ser Arg Lys Tyr Thr Ser Phe Pro Trp Leu
            740                 745                 750

Leu Gly Cys Ala Ala Asn Trp Ile Leu Arg Gly Thr Ser Phe Val Tyr
        755                 760                 765

Val Pro Ser Ala Leu Asn Pro Ala Asp Asp Pro Ser Arg Gly Arg Leu
    770                 775                 780

Gly Leu Ser Arg Pro Leu Leu Arg Leu Pro Phe Arg Pro Thr Thr Gly
785                 790                 795                 800

Arg Thr Ser Leu Tyr Ala Asp Ser Pro Ser Val Pro Ser His Leu Pro
                805                 810                 815

Asp Arg Val His Phe Ala Ser Pro Leu His Val Ala Trp Arg Pro Pro
            820                 825                 830
```

<210> 15
<211> 389
<212> PRT
<213> Hepatitis B virus

<400> 15

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

His Gln Leu Asp Pro Ala Phe Arg Ala Asn Thr Ala Asn Pro Asp Trp
            20                  25                  30

Asp Phe Asn Pro Asn Lys Asp Thr Trp Pro Asp Ala Asn Lys Val Gly
        35                  40                  45

Ala Gly Ala Phe Gly Leu Gly Phe Thr Pro Pro His Gly Gly Leu Leu
    50                  55                  60

Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Gln Thr Leu Pro Ala Asn
65                  70                  75                  80
```

```
Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro
                85                  90                  95

Leu Ser Pro Pro Leu Arg Asn Thr His Pro Gln Ala Met Gln Trp Asn
            100                 105                 110

Ser Thr Thr Phe His Gln Thr Leu Gln Asp Pro Arg Val Arg Gly Leu
        115                 120                 125

Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val Asn Pro Val Pro
    130                 135                 140

Thr Thr Val Ser His Thr Ser Ser Ile Phe Ser Arg Ile Gly Asp Pro
145                 150                 155                 160

Ala Leu Asn Met Glu Asn Ile Thr Ser Gly Leu Leu Gly Pro Leu Leu
                165                 170                 175

Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro
            180                 185                 190

Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr
        195                 200                 205

Thr Val Cys Leu Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser
    210                 215                 220

Pro Thr Ser Cys Pro Pro Thr Cys Pro Gly Tyr Arg Trp Met Cys Leu
225                 230                 235                 240

Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe
                245                 250                 255

Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu
            260                 265                 270

Ile Pro Gly Ser Ser Thr Thr Ser Thr Gly Pro Cys Arg Thr Cys Thr
        275                 280                 285

Thr Pro Ala Gln Gly Thr Ser Met Tyr Pro Ser Cys Cys Cys Thr Lys
    290                 295                 300

Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala
305                 310                 315                 320

Phe Gly Lys Phe Leu Trp Glu Trp Ala Ser Ala Arg Phe Ser Trp Leu
                325                 330                 335
```

```
Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr
            340                 345                 350

Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu
        355                 360                 365

Tyr Asn Ile Leu Ser Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys
    370                 375                 380

Leu Trp Val Tyr Ile
385
```

<210> 16
<211> 154
<212> PRT
<213> Hepatitis B virus

<400> 16

```
Met Ala Ala Arg Leu Cys Cys Gln Leu Asp Pro Ala Arg Asp Val Leu
1               5                   10                  15

Cys Leu Arg Pro Val Ser Ala Glu Ser Cys Gly Arg Pro Val Ser Gly
            20                  25                  30

Pro Phe Gly Thr Leu Ser Ser Pro Ser Pro Ser Ala Val Ser Thr Asp
        35                  40                  45

His Gly Ala His Leu Ser Leu Arg Gly Leu Pro Val Cys Ala Phe Ser
    50                  55                  60

Ser Ala Gly Pro Cys Ala Leu Arg Phe Thr Ser Ala Arg Arg Met Glu
65                  70                  75                  80

Thr Thr Val Asn Ala His Gln Phe Leu Pro Lys Val Leu His Lys Arg
                85                  90                  95

Thr Leu Gly Leu Ser Val Met Ser Thr Thr Asp Leu Glu Ala Tyr Phe
            100                 105                 110

Lys Asp Cys Leu Phe Lys Asp Trp Glu Glu Leu Gly Glu Glu Thr Arg
        115                 120                 125

Leu Met Ile Phe Val Leu Gly Gly Cys Arg His Lys Leu Val Cys Ala
    130                 135                 140

Pro Ala Pro Cys Asn Phe Phe Thr Ser Ala
145                 150
```

<210> 17
<211> 212
<212> PRT
<213> Hepatitis B virus

<400> 17

```
Met Gln Leu Phe His Leu Cys Leu Ile Ile Ser Cys Ser Cys Pro Thr
1               5                   10                  15

Val Gln Ala Ser Lys Leu Cys Leu Gly Trp Leu Trp Gly Met Asp Ile
            20                  25                  30

Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu
        35                  40                  45

Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser
    50                  55                  60

Ala Leu Tyr Arg Asp Ala Leu Glu Ser Pro Glu His Cys Ser Pro His
65                  70                  75                  80

His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Thr
                85                  90                  95

Leu Ala Thr Trp Val Gly Val Asn Leu Glu Asp Pro Ala Ser Arg Asp
            100                 105                 110

Leu Val Val Ser Tyr Val Asn Thr Asn Met Gly Leu Lys Phe Arg Gln
        115                 120                 125

Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val
    130                 135                 140

Ile Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala
145                 150                 155                 160

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

Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro
            180                 185                 190

Cys Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro
        195                 200                 205

Ala Ser Gln Cys
    210
```

<210> 18
<211> 842
<212> PRT
<213> Hepatitis B virus

<400> 18

```
Met Pro Leu Ser Tyr Gln His Phe Arg Arg Ile Leu Leu Leu Asp Glu
1               5                   10                  15

Glu Ala Gly Pro Leu Glu Glu Glu Leu Pro Arg Leu Ala Asp Glu Asp
            20                  25                  30

Leu Asn Arg Arg Val Ala Glu Asp Leu Asn Leu Gln Leu Pro Asn Val
        35                  40                  45

Ser Ile Pro Trp Thr His Lys Val Gly Asn Phe Thr Gly Leu Tyr Ser
    50                  55                  60

Ser Thr Val Pro Val Phe Asn Pro Asn Trp Lys Thr Pro Ser Phe Pro
65                  70                  75                  80

Asp Ile His Leu His Gln Asp Ile Ile Asn Lys Cys Glu Gln Leu Val
                85                  90                  95

Gly Pro Leu Thr Val Asn Glu Lys Arg Arg Leu Asn Leu Val Met Pro
            100                 105                 110

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

Ile Lys Pro Tyr Tyr Pro Asp Asn Val Val Asn His Tyr Phe Gln Thr
    130                 135                 140

Arg His Tyr Leu His Thr Leu Trp Lys Ala Gly Ile Leu Tyr Lys Arg
145                 150                 155                 160

Glu Thr Thr Arg Ser Ala Ser Phe Cys Gly Ser Pro Tyr Ser Trp Glu
                165                 170                 175

Gln Glu Leu His His Gly Ala Phe Leu Asp Gly Pro Ser Arg Met Gly
            180                 185                 190

Glu Glu Ser Phe His His Gln Ser Ser Gly Ile Phe Ser Arg Pro Pro
        195                 200                 205

Val Gly Ser Ser Ile Gln Ser Lys His Gln Lys Ser Arg Leu Gly Pro
    210                 215                 220
```

```
Gln Ser Gln Gln Arg Pro Leu Asp Arg Ser Gln Gln Gly Arg Ser Gly
225                 230                 235                 240

Ser Ile Arg Ala Gly Val His Ser Pro Thr Arg Arg Pro Phe Gly Val
                245                 250                 255

Glu Pro Ser Gly Ser Arg His Ala Lys Asn Ile Ala Ser Arg Ser Ala
            260                 265                 270

Ser Cys Leu His Gln Ser Ala Val Arg Lys Ala Ala Tyr Pro Asn His
        275                 280                 285

Ser Thr Phe Glu Arg His Ser Ser Ser Gly His Ala Val Glu Phe His
    290                 295                 300

Asn Ile Pro Pro Ser Ser Ala Gly Ser Gln Ser Lys Arg Pro Val Phe
305                 310                 315                 320

Ser Cys Trp Trp Leu Gln Phe Arg Asn Ser Glu Pro Cys Ser Asp Tyr
                325                 330                 335

Cys Leu Thr His Leu Val Asn Leu Leu Gln Asp Trp Gly Pro Cys Thr
            340                 345                 350

Glu His Gly Lys His His Ile Arg Ile Pro Arg Thr Pro Ala Arg Val
        355                 360                 365

Thr Gly Gly Val Phe Leu Val Asp Lys Asn Pro His Asn Thr Ala Glu
    370                 375                 380

Ser Arg Leu Val Val Asp Phe Ser Gln Phe Ser Arg Gly Ser Ser Arg
385                 390                 395                 400

Val Ser Trp Pro Lys Phe Ala Val Pro Asn Leu Gln Ser Leu Thr Asn
                405                 410                 415

Leu Leu Ser Ser Asn Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala
            420                 425                 430

Phe Tyr His Leu Pro Leu His Pro Ala Ala Met Pro His Leu Leu Val
        435                 440                 445

Gly Ser Ser Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Asn Ser
    450                 455                 460

Arg Ile Ile Asn His Gln Tyr Gly Thr Leu Pro Asn Leu His Asp Ser
```

```
465                 470                 475                 480

Cys Ser Arg Asn Leu Tyr Ile Ser Leu Met Leu Leu Phe Lys Thr Phe
                485                 490                 495

Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Met Gly Phe Arg
            500                 505                 510

Lys Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe
        515                 520                 525

Thr Ser Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu
    530                 535                 540

Ala Phe Ser Tyr Met Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln
545                 550                 555                 560

His Leu Glu Ser Leu Tyr Thr Ala Val Thr Asn Phe Leu Leu Ser Leu
                565                 570                 575

Gly Ile His Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu
            580                 585                 590

Asn Phe Met Gly Tyr Val Ile Gly Ser Trp Gly Ser Leu Pro Gln Glu
        595                 600                 605

His Ile Arg Leu Lys Ile Lys Asp Cys Phe Arg Lys Leu Pro Val Asn
    610                 615                 620

Arg Pro Ile Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu Gly
625                 630                 635                 640

Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu
                645                 650                 655

Tyr Ala Cys Thr Gln Ser Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr
            660                 665                 670

Lys Ala Phe Leu Cys Lys Gln Tyr Met Asn Leu Tyr Pro Val Ala Arg
        675                 680                 685

Gln Arg Pro Gly Leu Cys Gln Val Phe Ala Asp Ala Thr Pro Thr Gly
    690                 695                 700

Trp Gly Leu Ala Ile Gly His Gln Arg Met Arg Gly Thr Phe Val Ala
705                 710                 715                 720
```

```
Pro Leu Pro Ile His Thr Ala Glu Leu Leu Ala Ala Cys Phe Ala Arg
                725                 730                 735

Ser Arg Ser Gly Ala Lys Leu Ile Gly Thr Asp Asn Ser Val Val Leu
            740                 745                 750

Ser Arg Lys Tyr Thr Ser Phe Pro Trp Leu Leu Gly Cys Ala Ala Asn
        755                 760                 765

Trp Ile Leu Arg Gly Thr Ser Phe Val Tyr Val Pro Ser Ala Leu Asn
    770                 775                 780

Pro Ala Asp Asp Pro Ser Arg Gly Arg Leu Gly Ile Ser Arg Pro Leu
785                 790                 795                 800

Leu Arg Leu Pro Phe Gln Pro Thr Thr Gly Arg Thr Ser Leu Tyr Ala
                805                 810                 815

Val Ser Pro Ser Val Pro Ser His Leu Pro Asp Arg Val His Phe Ala
            820                 825                 830

Ser Pro Leu His Val Ala Trp Arg Pro Pro
        835                 840
```

<210> 19
<211> 399
<212> PRT
<213> Hepatitis B virus

<400> 19

```
Met Gly Leu Ser Trp Thr Val Pro Leu Glu Trp Gly Lys Asn His Ser
1               5                   10                  15

Thr Thr Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
            20                  25                  30

Phe Arg Ala Asn Thr Arg Asn Pro Asp Trp Asp His Asn Pro Asn Lys
        35                  40                  45

Asp His Trp Thr Glu Ala Asn Lys Val Gly Val Gly Ala Phe Gly Pro
    50                  55                  60

Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala
65                  70                  75                  80

Gln Gly Met Leu Lys Thr Leu Pro Ala Asn Pro Pro Pro Ala Ser Thr
                85                  90                  95
```

```
Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Thr Pro Pro Leu Arg
            100                 105                 110

Asp Thr His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His Gln
        115                 120                 125

Ala Leu Gln Asp Pro Arg Val Arg Gly Leu Tyr Leu Pro Ala Gly Gly
    130                 135                 140

Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Leu Ile
145                 150                 155                 160

Ser Ser Ile Phe Ser Arg Ile Gly Asp Pro Ala Pro Asn Met Glu Gly
                165                 170                 175

Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly Phe
            180                 185                 190

Phe Leu Leu Thr Lys Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp
        195                 200                 205

Trp Thr Ser Leu Asn Phe Leu Gly Gly Ala Pro Val Cys Leu Gly Gln
    210                 215                 220

Asn Ser Gln Ser Pro Ile Ser Asn His Ser Pro Thr Ser Cys Pro Pro
225                 230                 235                 240

Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile Phe
                245                 250                 255

Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu Asp
            260                 265                 270

Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly Ser Ser Thr
        275                 280                 285

Thr Ser Thr Gly Pro Cys Arg Thr Cys Thr Thr Leu Ala Gln Gly Thr
    290                 295                 300

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

Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Gly Lys Phe Leu Trp
                325                 330                 335

Glu Trp Ala Ser Ala Arg Phe Ser Trp Leu Ser Leu Leu Val Pro Phe
            340                 345                 350
```

```
Val Gln Trp Phe Ala Gly Leu Ser Pro Thr Val Trp Leu Ser Val Ile
        355                 360                 365

Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Asn Ile Leu Ser Pro
    370                 375                 380

Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile
385                 390                 395

<210>  20
<211>  154
<212>  PRT
<213>  Hepatitis B virus

<400>  20

Met Ala Ala Arg Met Cys Cys Gln Leu Asp Pro Ala Arg Asp Val Leu
1               5                   10                  15

Cys Leu Arg Pro Val Ser Ala Glu Ser Cys Gly Arg Pro Val Ser Gly
            20                  25                  30

Ser Leu Gly Asp Leu Ser Ser Pro Ser Pro Ser Ala Val Pro Ala Asp
        35                  40                  45

His Gly Ala His Leu Ser Leu Arg Gly Leu Pro Val Cys Ala Phe Ser
    50                  55                  60

Ser Ala Gly Pro Cys Ala Leu Arg Phe Thr Ser Ala Arg Arg Met Glu
65                  70                  75                  80

Thr Thr Val Asn Ala His Gln Ile Leu Pro Lys Val Leu His Lys Arg
                85                  90                  95

Thr Leu Gly Leu Ser Ala Met Ser Thr Thr Asp Leu Glu Ala Tyr Phe
            100                 105                 110

Lys Asp Cys Leu Phe Lys Asp Trp Glu Glu Leu Gly Glu Glu Ile Arg
        115                 120                 125

Leu Lys Val Phe Val Leu Gly Gly Cys Arg His Lys Leu Val Cys Ala
    130                 135                 140

Pro Ala Pro Cys Asn Phe Phe Thr Ser Ala
145                 150

<210>  21
<211>  212
<212>  PRT
```

<213> Hepatitis B virus

<400> 21

```
Met Gln Leu Phe His Leu Cys Leu Ile Ile Phe Cys Ser Cys Pro Thr
1               5                  10                  15

Val Gln Ala Ser Lys Leu Cys Leu Gly Trp Leu Trp Gly Met Asp Ile
            20                  25                  30

Asp Pro Tyr Lys Glu Phe Gly Ala Ser Val Glu Leu Leu Ser Phe Leu
        35                  40                  45

Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser
    50                  55                  60

Ala Leu Tyr Arg Asp Ala Leu Glu Ser Pro Glu His Cys Thr Pro Asn
65                  70                  75                  80

His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Thr
                85                  90                  95

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

Leu Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys Ile Arg Gln
        115                 120                 125

Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val
    130                 135                 140

Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala
145                 150                 155                 160

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

Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro
            180                 185                 190

Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro
        195                 200                 205

Ala Ser Lys Cys
    210
```

<210> 22
<211> 843
<212> PRT

<213> Hepatitis B virus

<400> 22

```
Met Pro Leu Ser Tyr Pro His Phe Arg Lys Leu Leu Leu Leu Asp Asp
1               5                  10                  15

Glu Ala Gly Pro Leu Glu Glu Glu Leu Pro Arg Leu Ala Asp Glu Gly
            20                  25                  30

Leu Asn Arg Arg Val Ala Glu Asp Leu Asn Leu Gln Leu Pro Asn Val
        35                  40                  45

Ser Ile Pro Trp Thr His Lys Val Gly Asn Phe Thr Gly Leu Tyr Ser
    50                  55                  60

Ser Thr Val Pro Thr Phe Asn Pro Asp Trp Leu Thr Pro Ser Phe Pro
65                  70                  75                  80

Asp Ile His Leu His Gln Asp Leu Ile His Lys Cys Glu Gln Phe Val
                85                  90                  95

Gly Pro Leu Thr Lys Asn Glu Leu Arg Arg Leu Lys Leu Val Met Pro
            100                 105                 110

Ser Arg Phe Phe Pro Lys Val Thr Lys Tyr Phe Pro Met Glu Lys Gly
        115                 120                 125

Ile Lys Pro Tyr Tyr Pro Asp Asn Val Val Asn His Tyr Phe Lys Thr
    130                 135                 140

Arg His Tyr Leu His Thr Leu Trp Lys Ala Gly Ile Leu Tyr Lys Arg
145                 150                 155                 160

Glu Ser Thr Arg Ser Ala Ser Phe Cys Gly Ser Pro Tyr Ser Trp Glu
                165                 170                 175

Gln Glu Leu Gln His Gly Ser Thr Ser Ile Asn Asp Ser Lys Gly His
            180                 185                 190

Gly Thr Glu Ser Leu Cys Thr Gln Ser Ser Gly Ile Leu Ser Arg Pro
        195                 200                 205

Ser Ala Gly Ser Ser Ile Gln Gly Lys Phe Gln Gln Ser Arg Leu Gly
    210                 215                 220

Leu Gln Gln Lys Gln Gly Gln Leu Ala Asn Gly Lys Gln Gly Arg Ser
225                 230                 235                 240
```

```
Gly Arg Ile Arg Ser Trp Val His Thr Pro Thr Arg Trp Pro Val Gly
                245                 250                 255

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

Ala Ser Cys Phe His Gln Ser Ala Val Arg Glu Lys Thr Asn Pro Ser
        275                 280                 285

Leu Ser Thr Ser Lys Arg His Ser Ser Thr Gly His Ala Val Glu Leu
    290                 295                 300

His Ser Val Pro Pro Gly Ser Val Arg Ser Glu Gly Lys Gly Ser Val
305                 310                 315                 320

Phe Ser Cys Trp Trp Leu Gln Phe Arg Asp Thr Glu Pro Cys Ser Asp
                325                 330                 335

Tyr Cys Leu Ser His Ile Ile Asn Leu Leu Glu Asp Trp Gly Pro Cys
            340                 345                 350

Tyr Glu His Gly Gln His His Ile Arg Thr Pro Arg Thr Pro Ala Arg
        355                 360                 365

Val Thr Gly Gly Val Phe Leu Val Asp Lys Asn Pro His Asn Thr Thr
    370                 375                 380

Glu Ser Arg Leu Val Val Asp Phe Ser Gln Phe Ser Arg Gly Asn Thr
385                 390                 395                 400

Arg Val Ser Trp Pro Lys Phe Ala Val Pro Asn Leu Gln Ser Leu Thr
                405                 410                 415

Asn Leu Leu Ser Ser Asn Leu Ser Trp Leu Ser Leu Asp Val Ser Ala
            420                 425                 430

Ala Phe Tyr His Leu Pro Leu His Pro Ala Ala Met Pro His Leu Leu
        435                 440                 445

Val Gly Ser Ser Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Thr
    450                 455                 460

Ser Arg Ile His Asp His Gln His Gly Thr Met Gln Asn Leu His Asn
465                 470                 475                 480

Ser Cys Ser Arg Asn Leu Tyr Val Ser Leu Leu Leu Leu Phe Gln Thr
                485                 490                 495
```

```
Phe Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe
            500                 505                 510

Arg Lys Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln
        515                 520                 525

Phe Thr Ser Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys
    530                 535                 540

Leu Ala Phe Ser Tyr Met Asp Asp Leu Val Leu Gly Ala Lys Ser Val
545                 550                 555                 560

Gln His Leu Glu Ser Leu Tyr Thr Ala Val Thr Asn Phe Leu Leu Ser
                565                 570                 575

Val Gly Ile His Leu Asn Thr Ser Lys Thr Lys Arg Trp Gly Tyr Thr
            580                 585                 590

Leu Asn Phe Met Gly Tyr Val Ile Gly Ser Trp Gly Ser Leu Pro Gln
        595                 600                 605

Asp His Ile Val Gln Lys Leu Lys Asp Cys Phe Arg Lys Leu Pro Val
    610                 615                 620

Asn Arg Pro Ile Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu
625                 630                 635                 640

Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro
                645                 650                 655

Leu Tyr Ala Cys Ile Thr Ala Lys Gln Ala Phe Val Phe Ser Pro Thr
            660                 665                 670

Tyr Lys Ala Phe Leu Cys Gln Gln Tyr Met Asn Leu Tyr Pro Val Ala
        675                 680                 685

Arg Gln Arg Pro Gly Leu Cys Gln Val Phe Ala Asp Ala Thr Pro Thr
    690                 695                 700

Gly Trp Gly Leu Ala Ile Gly His Gln Arg Met Arg Gly Thr Phe Val
705                 710                 715                 720

Ala Pro Leu Pro Ile His Thr Ala Glu Leu Leu Ala Ala Cys Phe Ala
                725                 730                 735

Arg Ser Arg Ser Gly Ala Lys Leu Ile Gly Thr Asp Asn Ser Val Val
```

740 745 750

Leu Ser Arg Lys Tyr Thr Ser Phe Pro Trp Leu Leu Gly Cys Ala Ala
755 760 765

Asn Trp Ile Leu Arg Gly Thr Ser Phe Val Tyr Val Pro Ser Ala Leu
770 775 780

Asn Pro Ala Asp Asp Pro Ser Arg Gly Arg Leu Gly Leu Tyr Arg Pro
785 790 795 800

Leu Leu Arg Leu Pro Phe Gln Pro Thr Thr Gly Arg Thr Ser Leu Tyr
805 810 815

Ala Ala Ser Pro Ser Val Pro Ser His Leu Pro Asp Arg Val His Phe
820 825 830

Ala Ser Pro Leu His Val Ala Trp Arg Pro Pro
835 840

<210> 23
<211> 400
<212> PRT
<213> Hepatitis B virus

<400> 23

Met Gly Ala Pro Leu Ser Thr Thr Arg Arg Gly Met Gly Gln Asn Leu
1 5 10 15

Ser Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro
20 25 30

Leu Phe Lys Ala Asn Ser Ser Ser Pro Asp Trp Asp Phe Asn Lys Asn
35 40 45

Lys Asp Thr Trp Pro Met Ala Asn Lys Val Gly Val Gly Ala Tyr Gly
50 55 60

Pro Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln
65 70 75 80

Ala Gln Gly Val Leu Thr Thr Leu Pro Ala Asp Pro Pro Pro Ala Ser
85 90 95

Thr Asn Arg Arg Ser Gly Arg Lys Pro Thr Pro Val Ser Pro Pro Leu
100 105 110

Arg Asp Thr His Pro Gln Ala Met Gln Trp Asn Ser Thr Gln Phe His

```
        115                 120                 125

Gln Ala Leu Leu Asp Pro Arg Val Arg Ala Leu Ser Pro Pro Ala Gly
    130                 135                 140

Gly Ser Ser Ser Glu Thr Gln Asn Pro Ala Pro Thr Ile Ala Ser Leu
145                 150                 155                 160

Thr Ser Ser Ile Phe Ser Lys Thr Gly Gly Pro Ala Met Asn Met Asp
                165                 170                 175

Asn Ile Thr Ser Gly Leu Leu Gly Pro Leu Leu Val Leu Gln Ala Val
            180                 185                 190

Cys Phe Leu Leu Thr Lys Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser
        195                 200                 205

Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Leu Pro Gly Cys Pro Gly
    210                 215                 220

Gln Asn Ser Gln Ser Pro Thr Ser Asn His Leu Pro Thr Ser Cys Pro
225                 230                 235                 240

Pro Thr Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile
                245                 250                 255

Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu
            260                 265                 270

Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly Ser Thr
        275                 280                 285

Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Thr Leu Ala Gln Gly
    290                 295                 300

Thr Ser Met Phe Pro Ser Cys Cys Cys Ser Lys Pro Ser Asp Gly Asn
305                 310                 315                 320

Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Leu Gly Lys Tyr Leu
                325                 330                 335

Trp Glu Trp Ala Ser Ala Arg Phe Ser Trp Leu Ser Leu Leu Val Gln
            340                 345                 350

Phe Val Gln Trp Cys Val Gly Leu Ser Pro Thr Val Trp Leu Leu Ile
        355                 360                 365
```

Ile Trp Met Ile Trp Tyr Trp Gly Pro Asn Leu Cys Ser Ile Leu Ser
370 375 380

Pro Phe Ile Pro Leu Leu Pro Ile Phe Cys Tyr Leu Trp Val Ser Ile
385 390 395 400

<210> 24
<211> 154
<212> PRT
<213> Hepatitis B virus

<400> 24

Met Ala Ala Arg Leu Cys Cys Gln Leu Asp Pro Thr Arg Asp Val Leu
1 5 10 15

Cys Leu Arg Pro Val Gly Ala Glu Ser Arg Gly Arg Ser Leu Ser Gly
20 25 30

Ser Leu Gly Ala Val Pro Pro Pro Ser Pro Ser Ala Val Pro Ala Asn
35 40 45

Asp Gly Ser His Leu Ser Leu Arg Gly Leu Pro Val Cys Ser Phe Ser
50 55 60

Ser Ala Gly Pro Cys Ala Leu Arg Phe Thr Ser Ala Arg Arg Met Glu
65 70 75 80

Thr Thr Val Asn Ala Pro Arg Ser Leu Pro Thr Val Leu His Lys Arg
85 90 95

Thr Leu Gly Leu Ser Gly Arg Ser Met Thr Trp Ile Glu Asp Tyr Ile
100 105 110

Lys Asp Cys Val Phe Lys Asp Trp Glu Glu Leu Gly Glu Glu Ile Arg
115 120 125

Leu Lys Val Phe Val Leu Gly Gly Cys Arg His Lys Leu Val Cys Ser
130 135 140

Pro Ala Pro Cys Asn Phe Phe Thr Ser Ala
145 150

<210> 25
<211> 194
<212> PRT
<213> Hepatitis B virus

<400> 25

Met Asp Arg Thr Thr Leu Pro Tyr Gly Leu Phe Gly Leu Asp Ile Asp

1 5 10 15

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

Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser Ala
35 40 45

Leu Tyr Arg Glu Ser Leu Glu Ser Ser Asp His Cys Ser Pro His His
50 55 60

Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Thr Leu
65 70 75 80

Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala Ser Arg Asp Leu
85 90 95

Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys Ile Arg Gln Leu
100 105 110

Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu
115 120 125

Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr
130 135 140

Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val
145 150 155 160

Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg
165 170 175

Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Ala Ser Pro Ala
180 185 190

Ser Gln

<210> 26
<211> 842
<212> PRT
<213> Hepatitis B virus

<400> 26

Met Pro Leu Ser Tyr Gln His Phe Arg Arg Leu Leu Leu Leu Asp Glu
1 5 10 15

Glu Ala Gly Pro Leu Glu Glu Glu Leu Pro Arg Leu Ala Asp Glu Asp

```
            20                  25                  30

Leu Asn Arg Arg Val Ala Glu Asp Leu His Leu Gln Leu Pro Asn Asp
        35                  40                  45

Ser Ile Pro Trp Thr His Lys Val Gly Asn Phe Thr Gly Leu Tyr Ser
    50                  55                  60

Ser Thr Ile Pro Val Phe Asn Pro Asp Trp Gln Thr Pro Ser Phe Pro
65                  70                  75                  80

Asn Ile His Leu His Gln Asp Ile Ile Thr Lys Cys Glu Gln Phe Val
                85                  90                  95

Gly Pro Leu Thr Val Asn Glu Lys Arg Arg Leu Lys Leu Val Met Pro
            100                 105                 110

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

Ile Lys Pro Tyr Tyr Pro Glu Asn Val Val Asn His Tyr Phe Gln Thr
    130                 135                 140

Arg His Tyr Leu His Thr Leu Trp Lys Thr Gly Ile Leu Tyr Lys Arg
145                 150                 155                 160

Glu Thr Ser Arg Ser Ala Ser Phe Cys Gly Ser Pro Tyr Thr Trp Glu
                165                 170                 175

Gln Asp Leu Gln His Gly Ala Phe Leu Asp Gly Pro Ser Arg Val Gly
            180                 185                 190

Lys Glu Pro Phe His Gln Gln Ser Ser Arg Ile Pro Ser Arg Ser Pro
        195                 200                 205

Val Gly Pro Ser Ile Gln Ser Lys Tyr Gln Gln Ser Arg Leu Gly Leu
    210                 215                 220

Gln Ser Gln Lys Gly Pro Leu Ala Arg Gly Gln Gln Gly Arg Ser Trp
225                 230                 235                 240

Ser Leu Trp Thr Arg Val His Pro Ser Thr Arg Arg Pro Phe Gly Val
                245                 250                 255

Glu Pro Ser Val Ser Gly His Thr Asn Asn Phe Ala Ser Arg Ser Ala
            260                 265                 270
```

```
Ser Cys Leu His Gln Ser Ser Val Arg Glu Ala Ala Tyr Ser His Leu
        275                 280                 285

Ser Thr Thr Lys Arg Gln Ser Ser Ser Gly His Ala Val Glu Leu Tyr
    290                 295                 300

Ser Ile Pro Pro Ser Ser Thr Lys Ser Gln Ser Gln Gly Pro Val Ser
305                 310                 315                 320

Ser Cys Trp Trp Leu Gln Phe Arg Asp Ser Glu Pro Cys Ser Asp Tyr
                325                 330                 335

Cys Leu Ser His Leu Val Asn Leu Leu Gln Asp Trp Gly Pro Cys Thr
            340                 345                 350

Glu His Gly Glu His His Ile Arg Ile Pro Arg Thr Pro Ala Arg Val
        355                 360                 365

Thr Gly Gly Val Phe Leu Val Asp Lys Asn Pro His Asn Thr Ala Glu
    370                 375                 380

Ser Arg Leu Val Val Asp Phe Ser Gln Phe Ser Arg Gly Ser Ala Arg
385                 390                 395                 400

Val Ser Trp Pro Lys Phe Ala Val Pro Asn Leu Gln Ser Leu Thr Asn
                405                 410                 415

Leu Leu Ser Ser Asn Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala
            420                 425                 430

Phe Tyr His Ile Pro Leu His Pro Ala Ala Met Pro His Leu Leu Val
        435                 440                 445

Gly Ser Ser Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Asp Ser
    450                 455                 460

Arg Ile Leu Asp His Gln Tyr Gly Thr Leu Gln Asn Leu His Asp Ser
465                 470                 475                 480

Cys Ser Arg Gln Leu Tyr Val Ser Leu Met Leu Leu Tyr Lys Thr Phe
                485                 490                 495

Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg
            500                 505                 510

Lys Ile Pro Met Gly Leu Gly Leu Ser Pro Phe Leu Met Ala Gln Phe
        515                 520                 525
```

```
Thr Ser Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu
    530                 535                 540

Ala Phe Ser Tyr Val Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln
545                 550                 555                 560

His Leu Glu Ser Leu Tyr Thr Ala Val Thr Asn Phe Leu Leu Ser Leu
                565                 570                 575

Gly Ile His Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu
            580                 585                 590

Asn Phe Met Gly Tyr Val Ile Gly Ser Trp Gly Thr Leu Pro Gln Glu
        595                 600                 605

His Ile Thr Gln Lys Ile Lys Gln Cys Phe Arg Lys Leu Pro Val Asn
    610                 615                 620

Arg Pro Ile Asp Trp Lys Val Cys Gln Arg Ile Thr Gly Leu Leu Gly
625                 630                 635                 640

Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu
                645                 650                 655

Tyr Ala Cys Ile Gln Ala Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr
            660                 665                 670

Lys Ala Phe Leu Cys Lys Gln Tyr Met Asn Leu Tyr Pro Val Ala Arg
        675                 680                 685

Gln Arg Pro Gly Leu Cys Gln Val Phe Ala Asp Ala Thr Pro Thr Gly
    690                 695                 700

Trp Gly Leu Ala Ile Gly His Gln Arg Met Arg Gly Thr Phe Val Ala
705                 710                 715                 720

Pro Leu Pro Ile His Thr Ala Glu Leu Leu Ala Ala Cys Phe Ala Arg
                725                 730                 735

Ser Arg Ser Gly Ala Lys Leu Ile Gly Thr Asp Asn Ser Val Val Leu
            740                 745                 750

Ser Arg Lys Tyr Thr Ser Phe Pro Trp Leu Leu Gly Cys Ala Ala Asn
        755                 760                 765

Trp Ile Leu Arg Gly Thr Ser Phe Val Tyr Val Pro Ser Ala Leu Asn
    770                 775                 780
```

```
Pro Ala Asp Asp Pro Ser Arg Gly Arg Leu Gly Leu Tyr Arg Pro Leu
785                 790                 795                 800

Leu Arg Leu Pro Phe Leu Pro Thr Thr Gly Arg Thr Ser Leu Tyr Ala
                805                 810                 815

Val Ser Pro Ser Val Pro Ser His Leu Pro Asp Arg Val His Phe Ala
            820                 825                 830

Ser Pro Leu His Val Thr Trp Lys Pro Pro
        835                 840
```

<210> 27
<211> 399
<212> PRT
<213> Hepatitis B virus

<400> 27

```
Met Gly Leu Ser Trp Thr Val Pro Leu Glu Trp Gly Lys Asn Leu Ser
1               5                   10                  15

Thr Ser Asn Pro Leu Gly Phe Leu Pro Asp His Gln Leu Asp Pro Ala
            20                  25                  30

Phe Arg Ala Asn Thr Asn Asn Pro Asp Trp Asp Phe Asn Pro Lys Lys
        35                  40                  45

Asp Pro Trp Pro Glu Ala Asn Lys Val Gly Val Gly Ala Tyr Gly Pro
    50                  55                  60

Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Pro Ser
65                  70                  75                  80

Gln Gly Thr Leu Thr Thr Leu Pro Ala Asp Pro Pro Pro Ala Ser Thr
                85                  90                  95

Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
            100                 105                 110

Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Ala Phe His Gln
        115                 120                 125

Ala Leu Gln Asn Pro Lys Val Arg Gly Leu Tyr Leu Pro Ala Gly Gly
    130                 135                 140

Ser Ser Ser Gly Ile Val Asn Pro Val Pro Thr Ile Ala Ser His Ile
145                 150                 155                 160
```

```
Ser Ser Ile Phe Ser Arg Ile Gly Asp Pro Ala Pro Asn Met Glu Asn
                165                 170                 175

Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly Phe
            180                 185                 190

Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp
        195                 200                 205

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

Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Ile Ser Cys Pro Pro
225                 230                 235                 240

Thr Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile Phe
                245                 250                 255

Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu Asp
            260                 265                 270

Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly Ser Ser Thr
        275                 280                 285

Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Thr Pro Ala Gln Gly Asn
    290                 295                 300

Ser Met Tyr Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys
305                 310                 315                 320

Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Lys Tyr Leu Trp
                325                 330                 335

Asp Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro Phe
            340                 345                 350

Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Ala Met
        355                 360                 365

Trp Met Met Trp Tyr Trp Gly Pro Asn Leu Tyr Asn Ile Leu Ser Pro
    370                 375                 380

Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile
385                 390                 395
```

<210> 28

<211> 154
<212> PRT
<213> Hepatitis B virus

<400> 28

Met Ala Ala Arg Leu Cys Arg Gln Leu Asp Pro Ser Arg Asp Val Leu
1 5 10 15

Cys Leu Arg Pro Val Ser Ala Glu Ser Ser Gly Arg Pro Leu Pro Gly
20 25 30

Pro Phe Gly Ala Leu Ser Pro Pro Ser Pro Ser Ala Val Pro Ala Asp
35 40 45

His Gly Ala His Leu Ser Leu Arg Gly Leu Pro Val Cys Ser Phe Ser
50 55 60

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

Thr Ala Met Asn Thr Ser His His Leu Pro Arg Gln Leu Tyr Lys Arg
85 90 95

Thr Leu Gly Leu Phe Val Met Ser Thr Thr Gly Val Glu Lys Tyr Phe
100 105 110

Lys Asp Cys Val Phe Ala Glu Trp Glu Glu Leu Gly Asn Glu Ser Arg
115 120 125

Leu Met Thr Phe Val Leu Gly Gly Cys Arg His Lys Leu Val Cys Ala
130 135 140

Pro Ala Pro Cys Asn Phe Phe Thr Ser Ala
145 150

<210> 29
<211> 212
<212> PRT
<213> Hepatitis B virus

<400> 29

Met Ser Leu Phe His Leu Cys Leu Ile Ile Phe Cys Ser Cys Pro Thr
1 5 10 15

Val Gln Ala Ser Lys Leu Cys Leu Gly Trp Leu Trp Gly Met Asp Ile
20 25 30

Asp Pro Tyr Lys Glu Phe Gly Ala Ser Ala Glu Leu Leu Ser Phe Leu
35 40 45

```
Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser
    50                  55                  60

Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Thr Pro Asn
65                  70                  75                  80

His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Thr
                85                  90                  95

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

Leu Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys Ile Arg Gln
        115                 120                 125

Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val
    130                 135                 140

Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala
145                 150                 155                 160

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

Val Val Arg Gln Arg Gly Arg Ala Pro Arg Arg Arg Thr Pro Ser Pro
            180                 185                 190

Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro
        195                 200                 205

Ala Ser Gln Cys
    210
```

<210> 30
<211> 843
<212> PRT
<213> Hepatitis B virus

<400> 30

```
Met Pro Leu Ser Tyr Gln His Phe Arg Arg Leu Leu Leu Leu Asp Asn
1               5                   10                  15

Glu Ala Gly Pro Leu Glu Glu Glu Leu Pro Arg Leu Ala Asp Glu Asp
            20                  25                  30

Leu Asn Leu Arg Val Ala Glu Asp Leu Asn Leu Gln Leu Pro Asn Val
        35                  40                  45
```

```
Ser Ile Pro Trp Thr His Lys Val Gly Asn Phe Thr Gly Leu Tyr Ser
    50                  55                  60

Ser Thr Ile Pro Val Phe Asn Pro Asp Trp Leu Thr Pro Ser Phe Pro
65                  70                  75                  80

Asp Ile His Leu His Gln Asp Leu Ile Gln Lys Cys Glu Gln Phe Val
                85                  90                  95

Gly Pro Leu Thr Thr Asn Glu Arg Arg Arg Leu Lys Leu Ile Met Pro
            100                 105                 110

Ala Arg Phe Tyr Pro Lys Val Thr Lys Tyr Phe Pro Leu Asp Lys Gly
        115                 120                 125

Ile Lys Pro Tyr Tyr Pro Glu Asn Val Val Asn His Tyr Phe Lys Thr
    130                 135                 140

Arg His Tyr Leu His Thr Leu Trp Lys Ala Gly Ile Leu Tyr Lys Arg
145                 150                 155                 160

Glu Ser Thr His Ser Ala Ser Phe Cys Gly Ser Pro Tyr Ser Trp Glu
                165                 170                 175

Gln Glu Leu Gln His Gly Ser Thr Ser Leu Asn Gly Glu Lys Gly His
            180                 185                 190

Gly Thr Glu Ser Phe Cys Ala Gln Ser Ser Gly Ile Leu Ser Arg Pro
        195                 200                 205

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

Leu Gln His Lys Gln Gly Gln Leu Ala Asn Gly Lys Gln Gly Arg Ser
225                 230                 235                 240

Gly Arg Leu Arg Ser Arg Val His Thr Pro Thr Arg Trp Pro Ser Gly
                245                 250                 255

Val Glu Pro Ser Gly Thr Gly His Ser Asn Asn Leu Ala Thr Arg Ser
            260                 265                 270

Thr Ser Cys Phe His Gln Ser Glu Val Arg Glu Lys Ala Asn Pro Ser
        275                 280                 285

Leu Ser Thr Ser Lys Gly His Thr Ser Thr Gly His Ala Val Glu Leu
```

```
    290                 295                 300

Asn Thr Val Pro Pro Ser Thr Val Gly Ser Glu Ser Lys Gly Ala Val
305                 310                 315                 320

Ser Ser Cys Trp Trp Leu Gln Phe Arg Asn Thr Glu Pro Cys Ser Asp
                325                 330                 335

Tyr Cys Leu Ser His Ile Ile Asn Leu Leu Glu Asp Trp Gly Pro Cys
            340                 345                 350

Tyr Glu His Gly Glu His His Ile Arg Thr Pro Arg Thr Pro Ser Arg
        355                 360                 365

Val Thr Gly Gly Val Phe Leu Val Asp Lys Asn Pro His Asn Thr Lys
    370                 375                 380

Glu Ser Arg Leu Val Val Asp Phe Ser Gln Phe Ser Arg Gly Thr Thr
385                 390                 395                 400

Arg Val Ser Trp Pro Lys Phe Ala Val Pro Asn Leu Gln Ser Leu Thr
                405                 410                 415

Asn Leu Leu Ser Ser Asn Leu Ser Trp Leu Ser Leu Asp Val Ser Ala
            420                 425                 430

Ala Phe Tyr His Leu Pro Leu His Pro Ala Ala Met Pro His Leu Leu
        435                 440                 445

Val Gly Ser Ser Gly Leu Ser Arg Tyr Val Ala Arg Val Ser Ser Thr
    450                 455                 460

Ser Arg Ile Tyr Asn His Gln His Gly Thr Leu Gln Asn Leu His His
465                 470                 475                 480

Ser Cys Ser Arg Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Gln Thr
                485                 490                 495

Phe Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe
            500                 505                 510

Arg Lys Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln
        515                 520                 525

Phe Thr Ser Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys
    530                 535                 540
```

```
Leu Ala Phe Ser Tyr Met Asp Asp Leu Val Leu Gly Ala Lys Ser Val
545                 550                 555                 560

Gln His Leu Glu Ser Leu Tyr Thr Ala Val Thr Asn Phe Leu Leu Ser
                565                 570                 575

Val Gly Ile His Leu Asn Thr Ala Lys Thr Lys Trp Trp Gly Tyr Ser
            580                 585                 590

Leu His Phe Met Gly Tyr Val Ile Gly Ser Trp Gly Thr Leu Pro Gln
        595                 600                 605

Glu His Ile Val His Lys Ile Lys Asp Cys Phe Arg Lys Leu Pro Val
    610                 615                 620

Asn Arg Pro Ile Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu
625                 630                 635                 640

Gly Leu Ala Ala Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro
                645                 650                 655

Leu Tyr Ala Cys Ile Thr Ala Lys Gln Ala Phe Val Phe Ser Pro Thr
            660                 665                 670

Tyr Lys Ala Phe Leu Cys Lys Gln Tyr Met Asn Leu Tyr Pro Val Ala
        675                 680                 685

Arg Gln Arg Pro Gly Leu Cys Gln Val Phe Ala Asp Ala Pro Pro Thr
    690                 695                 700

Gly Trp Gly Leu Ala Ile Gly His Gln Arg Met Arg Gly Thr Phe Val
705                 710                 715                 720

Ala Pro Leu Pro Ile His Thr Ala Glu Leu Leu Ala Ala Cys Phe Ala
                725                 730                 735

Arg Ser Arg Ser Gly Ala Asp Ile Ile Gly Thr Asp Asn Ser Val Val
            740                 745                 750

Leu Ser Arg Lys Tyr Thr Ser Phe Pro Trp Leu Leu Gly Cys Ala Ala
        755                 760                 765

Asn Trp Ile Leu Arg Gly Thr Ser Phe Val Tyr Val Pro Ser Ala Leu
    770                 775                 780

Asn Pro Ala Asp Asp Pro Ser Arg Gly Arg Leu Gly Leu Cys Arg Pro
785                 790                 795                 800
```

```
Leu Leu Arg Leu Pro Phe Arg Pro Thr Thr Gly Arg Thr Ser Leu Tyr
                805                 810                 815

Ala Asp Ser Pro Pro Val Pro Ser His Leu Pro Ala Arg Val His Phe
            820                 825                 830

Ala Ser Pro Leu His Val Ala Trp Arg Pro Pro
        835                 840
```

<210> 31
<211> 400
<212> PRT
<213> Hepatitis B virus

<400> 31

```
Met Gly Ala Pro Leu Ser Thr Ala Arg Arg Gly Met Gly Gln Asn Leu
1               5                   10                  15

Ser Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro
            20                  25                  30

Leu Phe Arg Ala Asn Ser Ser Ser Pro Asp Trp Asp Phe Asn Thr Asn
        35                  40                  45

Lys Asp Asn Trp Pro Met Ala Asn Lys Val Gly Val Gly Gly Phe Gly
    50                  55                  60

Pro Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln
65                  70                  75                  80

Ala Gln Gly Ile Leu Thr Thr Ser Pro Pro Asp Pro Pro Pro Ala Ser
                85                  90                  95

Thr Asn Arg Arg Ser Gly Arg Lys Pro Thr Pro Val Ser Pro Pro Leu
            100                 105                 110

Arg Asp Thr His Pro Gln Ala Met Gln Trp Asn Ser Thr Gln Phe His
        115                 120                 125

Gln Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Leu Pro Ala Gly
    130                 135                 140

Gly Ser Ser Ser Glu Thr Gln Asn Pro Ala Pro Thr Ile Ala Ser Leu
145                 150                 155                 160

Thr Ser Ser Ile Phe Ser Lys Thr Gly Asp Pro Ala Met Asn Met Glu
                165                 170                 175
```

```
Asn Ile Thr Ser Gly Leu Leu Gly Pro Leu Leu Val Leu Gln Ala Val
            180                 185                 190

Cys Phe Leu Leu Thr Lys Ile Leu Thr Ile Pro Lys Ser Leu Asp Ser
        195                 200                 205

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

Gln Asn Ser Gln Ser Pro Ile Ser Asn His Leu Pro Thr Ser Cys Pro
225                 230                 235                 240

Pro Thr Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile
                245                 250                 255

Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu
            260                 265                 270

Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Ser Thr
        275                 280                 285

Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Thr Leu Ala Gln Gly
    290                 295                 300

Thr Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn
305                 310                 315                 320

Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Gly Lys Tyr Leu
                325                 330                 335

Trp Glu Trp Ala Ser Ala Arg Phe Ser Trp Leu Ser Leu Leu Val Gln
            340                 345                 350

Phe Val Gln Trp Cys Val Gly Leu Ser Pro Thr Val Trp Leu Leu Val
        355                 360                 365

Ile Trp Met Ile Trp Tyr Trp Gly Pro Asn Leu Cys Ser Ile Leu Ser
    370                 375                 380

Pro Phe Ile Pro Leu Leu Pro Ile Phe Cys Tyr Leu Trp Ala Ser Ile
385                 390                 395                 400
```

<210> 32
<211> 154
<212> PRT
<213> Hepatitis B virus

<400> 32

```
Met Ala Ala Arg Met Cys Cys Gln Leu Asp Pro Ala Arg Asp Val Leu
1               5                   10                  15

Cys Leu Arg Pro Val Gly Ala Glu Ser Cys Gly Arg Pro Leu Ser Trp
            20                  25                  30

Ser Leu Gly Ala Leu Pro Pro Ser Ser Pro Pro Ala Val Pro Ala Asp
        35                  40                  45

Asp Gly Ser His Leu Ser Leu Arg Gly Leu Pro Ala Cys Ala Phe Ser
    50                  55                  60

Ser Ala Gly Pro Cys Ala Leu Arg Phe Thr Ser Ala Arg Arg Met Glu
65                  70                  75                  80

Thr Thr Val Asn Ala Pro Trp Asn Leu Pro Thr Thr Leu His Lys Arg
                85                  90                  95

Thr Leu Gly Leu Ser Pro Arg Ser Thr Thr Trp Ile Glu Glu Tyr Ile
            100                 105                 110

Lys Asp Cys Val Phe Lys Asp Trp Glu Glu Ser Gly Glu Glu Leu Arg
        115                 120                 125

Leu Lys Val Phe Val Leu Gly Gly Cys Arg His Lys Leu Val Cys Ser
    130                 135                 140

Pro Ala Pro Cys Asn Phe Phe Thr Ser Ala
145                 150
```

<210> 33
<211> 1808
<212> DNA
<213> Artificial

<220>
<223> synthetic DNA

<220>
<221> CDS
<222> (13)..(1800)

<400> 33

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gaattcgcca cc atg gcc gat gaa gct cca act agt ggt ggg tgg tca tcc       51
              Met Ala Asp Glu Ala Pro Thr Ser Gly Gly Trp Ser Ser
              1               5                   10

aaa cct aga aag gga atg ggt aca aac tta tct gta cca aat cct tta         99
Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser Val Pro Asn Pro Leu
    15                  20                  25
```

```
ggc ttt ttc cca gac cat cag ttg gac cca gct ttt ggg gcc aac tct        147
Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala Phe Gly Ala Asn Ser
30                  35                  40                  45

aac aac cca gat tgg gat ttc aat cct aac aaa gac cac tgg cca gaa        195
Asn Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys Asp His Trp Pro Glu
                50                  55                  60

gcc aat caa gta ggt gtt ggc gca ttt ggt cct ggt ttt aca cct cca        243
Ala Asn Gln Val Gly Val Gly Ala Phe Gly Pro Gly Phe Thr Pro Pro
            65                  70                  75

cat gga ggc ttg tta ggc tgg tca cct caa gca caa ggt att ctg act        291
His Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Thr
        80                  85                  90

act gtc cca gct gca cca cca cct gcc tca act aat agg caa tct ggt        339
Thr Val Pro Ala Ala Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly
    95                  100                 105

aga cag cct acc cct att agt cca cca ttg aga gac tca cat cct caa        387
Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln
110                 115                 120                 125

gcc atg cag tgg aat agt act act ttc cat caa gcc tta ctg gat cca        435
Ala Met Gln Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu Asp Pro
                130                 135                 140

aga gta aga gga cta tac ttc cca gca ggt ggt tca tca tca ggc aca        483
Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr
            145                 150                 155

gtg aac cct gtt cca aca aca gca tcc cct ata tct tct atc ttt tct        531
Val Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Phe Ser
        160                 165                 170

aga aca gga gat cca gct cca aac atg gaa aac act aca tct gga ttc        579
Arg Thr Gly Asp Pro Ala Pro Asn Met Glu Asn Thr Thr Ser Gly Phe
    175                 180                 185

ctt ggg cct cta tta gta tta caa gct ggg ttt ttc ctg cta acc cgt        627
Leu Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg
190                 195                 200                 205

att cta act ata cca caa tca tta gat tcc tgg tgg act tca ttg aat        675
Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn
                210                 215                 220

ttc cta gga ggt gcc cca aca tgt cca ggt caa aac tcc cag tct cct        723
Phe Leu Gly Gly Ala Pro Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro
            225                 230                 235

aca tct aat cac tct cct acc agt tgc cca cca ata tgt cct ggc tac        771
Thr Ser Asn His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr
        240                 245                 250

aga tgg atg tgc tta cgt aga ttc atc atc ttc ctt ttc att ttg ctt        819
Arg Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu
    255                 260                 265

ttg tgc ctt atc ttt ttg cta gtg cta ctg gac tac caa gga atg ttg        867
Leu Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu
270                 275                 280                 285
```

```
cca gtt tgt cct tta ctg cct gga aca tca act act tct aca ggc cct        915
Pro Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro
                290                 295                 300

tgc aag aca tgt aca atc cca gca caa ggc act tca atg ttt cca tcc        963
Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser
            305                 310                 315

tgt tgc tgt aca aaa cca agt gat ggt aac tgt aca tgt ata cca atc       1011
Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile
        320                 325                 330

cct tca tct tgg gct ttt gct aga ttc ctt tgg gag tgg gcc tct gtt       1059
Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val
    335                 340                 345

aga ttc tcc tgg cta tct ctt caa gct cca ttt gtt caa tgg ttt gtc       1107
Arg Phe Ser Trp Leu Ser Leu Gln Ala Pro Phe Val Gln Trp Phe Val
350                 355                 360                 365

gga ttg tca cca act gtt tgg ttg tca gtg atc tgg atg atg tgg tac       1155
Gly Leu Ser Pro Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr
                370                 375                 380

tgg ggt cca tct ttg tac aat atc tta aac cca ttt cta cca ttg ttg       1203
Trp Gly Pro Ser Leu Tyr Asn Ile Leu Asn Pro Phe Leu Pro Leu Leu
            385                 390                 395

cca atc ttt ttc tgt ctt tgg gtc tac att gat att gat cca tac aaa       1251
Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp Ile Asp Pro Tyr Lys
        400                 405                 410

gag ttt ggt gca tct gtc gaa tta cta tcc ttt ttg cca tca gac ttt       1299
Glu Phe Gly Ala Ser Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe
    415                 420                 425

ttc cct agt ata aga gac tta ttg gat act gct tct gct ttg tat aga       1347
Phe Pro Ser Ile Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg
430                 435                 440                 445

gaa gca tta gaa tct cca gag cac tgt tct cca cat cat acc gca ttg       1395
Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu
                450                 455                 460

aga caa gca att ctg tgc tgg ggc gag tta atg aac tta gct acc tgg       1443
Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp
            465                 470                 475

gtt ggt tct aat ctg gaa gat cct gct tct aga gaa ttg gta gtt tcc       1491
Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser
        480                 485                 490

tac gtg aat gta aac atg ggt ttg aag att agg caa cta ctt tgg ttt       1539
Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe
    495                 500                 505

cac atc agt tgt ctg act ttc ggg aga gaa aca gtg ttg gaa tat ctt       1587
His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu
510                 515                 520                 525

gtc tct ttt ggt gtg tgg att aga aca cca cca gct tat aga cct cct       1635
Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro
```

```
                530                 535                 540

aat gct cca atc ctg agt aca ttg cca gag act acc gtt gtt aga agg       1683
Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg
            545                 550                 555

aga ggt aga tcc cca aga cgt aga acc cct tct cca agg agg aga aga       1731
Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg
        560                 565                 570

tca caa agt cct cgt cgt aga aga tcc cag agt aga gaa tct caa tgc       1779
Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys
    575                 580                 585

cat cat cat cac cac cat taa gcggccgc                                 1808
His His His His His His
590                 595


<210>  34
<211>  595
<212>  PRT
<213>  Artificial

<220>
<223>  Synthetic Construct

<400>  34

Met Ala Asp Glu Ala Pro Thr Ser Gly Gly Trp Ser Ser Lys Pro Arg
1               5                   10                  15


Lys Gly Met Gly Thr Asn Leu Ser Val Pro Asn Pro Leu Gly Phe Phe
            20                  25                  30


Pro Asp His Gln Leu Asp Pro Ala Phe Gly Ala Asn Ser Asn Asn Pro
        35                  40                  45


Asp Trp Asp Phe Asn Pro Asn Lys Asp His Trp Pro Glu Ala Asn Gln
    50                  55                  60


Val Gly Val Gly Ala Phe Gly Pro Gly Phe Thr Pro Pro His Gly Gly
65                  70                  75                  80


Leu Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Thr Thr Val Pro
                85                  90                  95


Ala Ala Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg Gln Pro
            100                 105                 110


Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala Met Gln
        115                 120                 125


Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu Asp Pro Arg Val Arg
    130                 135                 140
```

```
Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val Asn Pro
145                 150                 155                 160

Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Phe Ser Arg Thr Gly
                165                 170                 175

Asp Pro Ala Pro Asn Met Glu Asn Thr Thr Ser Gly Phe Leu Gly Pro
            180                 185                 190

Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr
        195                 200                 205

Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly
    210                 215                 220

Gly Ala Pro Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn
225                 230                 235                 240

His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met
                245                 250                 255

Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu
            260                 265                 270

Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys
        275                 280                 285

Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys Lys Thr
    290                 295                 300

Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys Cys Cys
305                 310                 315                 320

Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser
                325                 330                 335

Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg Phe Ser
            340                 345                 350

Trp Leu Ser Leu Gln Ala Pro Phe Val Gln Trp Phe Val Gly Leu Ser
        355                 360                 365

Pro Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp Gly Pro
    370                 375                 380

Ser Leu Tyr Asn Ile Leu Asn Pro Phe Leu Pro Leu Leu Pro Ile Phe
```

385 390 395 400

Phe Cys Leu Trp Val Tyr Ile Asp Ile Asp Pro Tyr Lys Glu Phe Gly
405 410 415

Ala Ser Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser
420 425 430

Ile Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu
435 440 445

Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg Gln Ala
450 455 460

Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val Gly Ser
465 470 475 480

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

Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His Ile Ser
500 505 510

Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe
515 520 525

Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro
530 535 540

Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg Gly Arg
545 550 555 560

Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser
565 570 575

Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys His His His
580 585 590

His His His
595

<210> 35
<211> 2841
<212> DNA
<213> Artificial

<220>
<223> synthetic DNA

<220>
<221> CDS
<222> (1)..(2841)

<400> 35

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atg gcc gat gaa gct cct tta ggg ttt ttc cct gat cat caa tta gac          48
Met Ala Asp Glu Ala Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp
1               5                   10                  15

cca gca ttc ggt gcc aat tcc aac aat cct gat tgg gac ttt aac cca          96
Pro Ala Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro
            20                  25                  30

gag aat aca aca tct ggg ttc ctt ggt cca ctt ttg gtg ctg caa gct         144
Glu Asn Thr Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala
        35                  40                  45

ggc ttt ttc ctg tta act aga atc cta aca att cca caa agt ttg gat         192
Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp
    50                  55                  60

tca tgg tgg aca tct ttg aac ttt ttg gga ggt gct cca acc tgt cct         240
Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Ala Pro Thr Cys Pro
65                  70                  75                  80

gga caa aac tcc caa tcc cca act tct aat cat tca cct aca tcc tgc         288
Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys
                85                  90                  95

cca cct att tgt cct ggt tat cgt tgg atg tgt ctt aga cgt ttc att         336
Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile
            100                 105                 110

atc ttt ttg ttc ata cta ctg ttg tgt ctg att ttc ctg ttg gta ttg         384
Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu
        115                 120                 125

ttg gat tac caa ggc atg ttg cca gtc tgt cct tta ctt cca ggc act         432
Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr
    130                 135                 140

tct act aca tca act ggc cct tgt aaa aca tgt act atc cca gct caa         480
Ser Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln
145                 150                 155                 160

ggt act tca atg ttt cct agt tgt tgt tgt acc aaa cca tcc gat ggt         528
Gly Thr Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly
                165                 170                 175

aat tgt aca tgc ata cca ata cca tct tca tgg gca ttt gca aga ttc         576
Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe
            180                 185                 190

ctt tgg gaa tgg gct tct gtg cgt ttt tcc tgg ctg tct ttg tta gtt         624
Leu Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val
        195                 200                 205

cct ttt gtc caa tgg ttt gtc ggt tta tct cca aca gta tgg ctg tct         672
Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser
    210                 215                 220

gct atc tgg atg atg tgg tat tgg gga cct tcc ttg tac aac att ctg         720
```

```
Ala Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Asn Ile Leu
225                 230                 235                 240

tct cca ttt ctg cct ttg tta cca atc ttt ttc tgt ctt tgg gtg tac        768
Ser Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr
                245                 250                 255

atc ctc gag gaa gat tgg ggt cct tgt act gaa cac ggt gaa cat aac        816
Ile Leu Glu Glu Asp Trp Gly Pro Cys Thr Glu His Gly Glu His Asn
            260                 265                 270

atc aga ata cct aga act cca gct aga gtg aca gga ggt gtt ttc ctg        864
Ile Arg Ile Pro Arg Thr Pro Ala Arg Val Thr Gly Gly Val Phe Leu
        275                 280                 285

gta gac aaa aac cca cac aac aca gca gaa tct aga ctt gtc gtt gac        912
Val Asp Lys Asn Pro His Asn Thr Ala Glu Ser Arg Leu Val Val Asp
    290                 295                 300

ttc agt caa ttc tcc aga ggg tct act cat gtt tca tgg cca aag ttt        960
Phe Ser Gln Phe Ser Arg Gly Ser Thr His Val Ser Trp Pro Lys Phe
305                 310                 315                 320

gca gtt cca aac ttg caa tca ttg act aat cta cta tct tca aat ctt       1008
Ala Val Pro Asn Leu Gln Ser Leu Thr Asn Leu Leu Ser Ser Asn Leu
                325                 330                 335

agt tgg ttg tcc ttg gat gtc tct gct gca ttc tat cat ata cca ttg       1056
Ser Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr His Ile Pro Leu
            340                 345                 350

cat cct gca gcc atg cca cat ttg tta gtg ggt agt tct ggt ctg tca       1104
His Pro Ala Ala Met Pro His Leu Leu Val Gly Ser Ser Gly Leu Ser
        355                 360                 365

agg tac gtt gca aga cta tct tct act tct agg aat atc aat tac aaa       1152
Arg Tyr Val Ala Arg Leu Ser Ser Thr Ser Arg Asn Ile Asn Tyr Lys
    370                 375                 380

cat ggg aca atg caa gac cta cat gat tca tgt tct aga aac ttg tac       1200
His Gly Thr Met Gln Asp Leu His Asp Ser Cys Ser Arg Asn Leu Tyr
385                 390                 395                 400

gta tcc ctt tta cta ctt tac aaa aca ttt ggt aga aag ttg cac tta       1248
Val Ser Leu Leu Leu Leu Tyr Lys Thr Phe Gly Arg Lys Leu His Leu
                405                 410                 415

tac tca cat cca atc atc tta ggt ttc aga aag ata cct atg ggc gtc       1296
Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro Met Gly Val
            420                 425                 430

ggg tta tct cct ttt cta tta gca cag ttt acc tct gcc att tgt tca       1344
Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser
        435                 440                 445

gtg gtt cgt aga gca ttt cct cat tgt cta gca ttt tca tac atg gac       1392
Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp
    450                 455                 460

gat gtt gtc tta ggc gct aag tct gtt caa cac ctt gaa tca ctg ttt       1440
Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu Glu Ser Leu Phe
465                 470                 475                 480
```

```
acc agt ata acc aat ttc ctt ttg agt cta ggc att cat ctg aat cct       1488
Thr Ser Ile Thr Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro
                485                 490                 495

aac aaa act aaa aga tgg gga tac tct ctt aac ttt atg ggt tac gtt       1536
Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe Met Gly Tyr Val
            500                 505                 510

atc gga tca tgg ggc acc ctt cca caa gag cat att gtc ctg aaa atc       1584
Ile Gly Ser Trp Gly Thr Leu Pro Gln Glu His Ile Val Leu Lys Ile
        515                 520                 525

aag cag tgt ttt aga aaa ctg cca gtg aat aga cca att gat tgg aaa       1632
Lys Gln Cys Phe Arg Lys Leu Pro Val Asn Arg Pro Ile Asp Trp Lys
    530                 535                 540

gtt tgc cag aga atc gta ggt tta ctt ggt ttt gcc gct cct ttc act       1680
Val Cys Gln Arg Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe Thr
545                 550                 555                 560

cag tgc ggc tat cca gct ttg atg cca ttg tac gct tgt atc caa gct       1728
Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile Gln Ala
                565                 570                 575

aag caa gct ttc aca ttc tct cca acc tat aag gct ttt cta tgc aag       1776
Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Cys Lys
            580                 585                 590

cag tac tta aac ctt tat cca gtg gct aga caa aga gat att gac cca       1824
Gln Tyr Leu Asn Leu Tyr Pro Val Ala Arg Gln Arg Asp Ile Asp Pro
        595                 600                 605

tac aaa gag ttt ggg gca tca gtt gaa tta cta tcc ttc cta cca tca       1872
Tyr Lys Glu Phe Gly Ala Ser Val Glu Leu Leu Ser Phe Leu Pro Ser
    610                 615                 620

gac ttt ttc cca tca atc aga gat ttg tta gat act gcc tct gca ttg       1920
Asp Phe Phe Pro Ser Ile Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu
625                 630                 635                 640

tac aga gaa gct cta gaa tct cct gaa cat tgc tct cca cac cat act       1968
Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr
                645                 650                 655

gcc ctt aga caa gca atc ttg tgt tgg ggc gaa ctt atg aat ttg gcc       2016
Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala
            660                 665                 670

aca tgg gtt gga agt aat cta gaa gat cca gcc tca aga gag cta gtt       2064
Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val
        675                 680                 685

gta tct tac gtc aac gtt aac atg ggt cta aag att agg caa tta cta       2112
Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu
    690                 695                 700

tgg ttt cac att agt tgc tta act ttc ggt aga gaa aca gtg cta gag       2160
Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu
705                 710                 715                 720

tat ttg gta tca ttt gga gta tgg atc aga act cca cct gca tat aga       2208
Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg
                725                 730                 735
```

```
cca cca aat gct cca atc tta tct aca ctg cct gaa aca act gta gtc       2256
Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val
            740                 745                 750

agg aga aga gga aga tca cca agg agg aga act cca tct cca agg aga       2304
Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg
        755                 760                 765

cgt cgt tct cag tcc cct cgt aga cgt aga tct caa tca aga gaa tct       2352
Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser
    770                 775                 780

caa tgc gca gcc aga gtt tgc tgt aaa ctt gac cca gcc aga gat gta       2400
Gln Cys Ala Ala Arg Val Cys Cys Lys Leu Asp Pro Ala Arg Asp Val
785                 790                 795                 800

cta tgt ctt aga cca gtt ggc gct gaa tca tct ggt aga cca gtc tca       2448
Leu Cys Leu Arg Pro Val Gly Ala Glu Ser Ser Gly Arg Pro Val Ser
                805                 810                 815

ggc cca ttt ggg aca tta cca tcc cct tca agt agt gcc gta cct gca       2496
Gly Pro Phe Gly Thr Leu Pro Ser Pro Ser Ser Ser Ala Val Pro Ala
            820                 825                 830

gat cac gga gca cat ctg tct cta aga gga ctt cct gtt tgt gct ttt       2544
Asp His Gly Ala His Leu Ser Leu Arg Gly Leu Pro Val Cys Ala Phe
        835                 840                 845

agt tca gca gga cct tgc gcc ttg aga ttc aca tca gct agg aga atg       2592
Ser Ser Ala Gly Pro Cys Ala Leu Arg Phe Thr Ser Ala Arg Arg Met
    850                 855                 860

gaa aca aca gtt aat gct cat caa gtt ttg cca aaa gta tta cac aag       2640
Glu Thr Thr Val Asn Ala His Gln Val Leu Pro Lys Val Leu His Lys
865                 870                 875                 880

aga aca ttg ggt ttg tct gcc atg agt acc act gac tta gaa gct tac       2688
Arg Thr Leu Gly Leu Ser Ala Met Ser Thr Thr Asp Leu Glu Ala Tyr
                885                 890                 895

ttt aag gat tgc gtt ttc aaa gat tgg gag gaa tta ggt gag gaa atc       2736
Phe Lys Asp Cys Val Phe Lys Asp Trp Glu Glu Leu Gly Glu Glu Ile
            900                 905                 910

aga cta aaa gtt ttt gtg tta ggt ggt tgc aga cac aaa ttg gtc tgt       2784
Arg Leu Lys Val Phe Val Leu Gly Gly Cys Arg His Lys Leu Val Cys
        915                 920                 925

tcc cct gct cca tgc aac ttt ttc acc tcc gcc cac cat cat cat cac       2832
Ser Pro Ala Pro Cys Asn Phe Phe Thr Ser Ala His His His His His
    930                 935                 940

cat tga taa                                                          2841
His
945
```

<210> 36
<211> 945
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 36

```
Met Ala Asp Glu Ala Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp
1               5                  10                  15

Pro Ala Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro
            20                  25                  30

Glu Asn Thr Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala
        35                  40                  45

Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp
    50                  55                  60

Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Ala Pro Thr Cys Pro
65                  70                  75                  80

Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys
                85                  90                  95

Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile
            100                 105                 110

Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu
        115                 120                 125

Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr
    130                 135                 140

Ser Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln
145                 150                 155                 160

Gly Thr Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly
                165                 170                 175

Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe
            180                 185                 190

Leu Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val
        195                 200                 205

Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser
    210                 215                 220

Ala Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Asn Ile Leu
225                 230                 235                 240
```

```
Ser Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr
                245                 250                 255

Ile Leu Glu Glu Asp Trp Gly Pro Cys Thr Glu His Gly Glu His Asn
            260                 265                 270

Ile Arg Ile Pro Arg Thr Pro Ala Arg Val Thr Gly Gly Val Phe Leu
        275                 280                 285

Val Asp Lys Asn Pro His Asn Thr Ala Glu Ser Arg Leu Val Val Asp
    290                 295                 300

Phe Ser Gln Phe Ser Arg Gly Ser Thr His Val Ser Trp Pro Lys Phe
305                 310                 315                 320

Ala Val Pro Asn Leu Gln Ser Leu Thr Asn Leu Leu Ser Ser Asn Leu
                325                 330                 335

Ser Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr His Ile Pro Leu
            340                 345                 350

His Pro Ala Ala Met Pro His Leu Leu Val Gly Ser Ser Gly Leu Ser
        355                 360                 365

Arg Tyr Val Ala Arg Leu Ser Ser Thr Ser Arg Asn Ile Asn Tyr Lys
    370                 375                 380

His Gly Thr Met Gln Asp Leu His Asp Ser Cys Ser Arg Asn Leu Tyr
385                 390                 395                 400

Val Ser Leu Leu Leu Leu Tyr Lys Thr Phe Gly Arg Lys Leu His Leu
                405                 410                 415

Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro Met Gly Val
            420                 425                 430

Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser
        435                 440                 445

Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp
    450                 455                 460

Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu Glu Ser Leu Phe
465                 470                 475                 480

Thr Ser Ile Thr Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro
```

485 490 495

Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe Met Gly Tyr Val
500 505 510

Ile Gly Ser Trp Gly Thr Leu Pro Gln Glu His Ile Val Leu Lys Ile
515 520 525

Lys Gln Cys Phe Arg Lys Leu Pro Val Asn Arg Pro Ile Asp Trp Lys
530 535 540

Val Cys Gln Arg Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe Thr
545 550 555 560

Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile Gln Ala
565 570 575

Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Cys Lys
580 585 590

Gln Tyr Leu Asn Leu Tyr Pro Val Ala Arg Gln Arg Asp Ile Asp Pro
595 600 605

Tyr Lys Glu Phe Gly Ala Ser Val Glu Leu Leu Ser Phe Leu Pro Ser
610 615 620

Asp Phe Phe Pro Ser Ile Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu
625 630 635 640

Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr
645 650 655

Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala
660 665 670

Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val
675 680 685

Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu
690 695 700

Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu
705 710 715 720

Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg
725 730 735

Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val
740 745 750

Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg
755 760 765

Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser
770 775 780

Gln Cys Ala Ala Arg Val Cys Cys Lys Leu Asp Pro Ala Arg Asp Val
785 790 795 800

Leu Cys Leu Arg Pro Val Gly Ala Glu Ser Ser Gly Arg Pro Val Ser
805 810 815

Gly Pro Phe Gly Thr Leu Pro Ser Pro Ser Ser Ser Ala Val Pro Ala
820 825 830

Asp His Gly Ala His Leu Ser Leu Arg Gly Leu Pro Val Cys Ala Phe
835 840 845

Ser Ser Ala Gly Pro Cys Ala Leu Arg Phe Thr Ser Ala Arg Arg Met
850 855 860

Glu Thr Thr Val Asn Ala His Gln Val Leu Pro Lys Val Leu His Lys
865 870 875 880

Arg Thr Leu Gly Leu Ser Ala Met Ser Thr Thr Asp Leu Glu Ala Tyr
885 890 895

Phe Lys Asp Cys Val Phe Lys Asp Trp Glu Glu Leu Gly Glu Glu Ile
900 905 910

Arg Leu Lys Val Phe Val Leu Gly Gly Cys Arg His Lys Leu Val Cys
915 920 925

Ser Pro Ala Pro Cys Asn Phe Phe Thr Ser Ala His His His His His
930 935 940

His
945

<210> 37
<211> 6
<212> PRT
<213> Artificial

<220>
<223> synthetic peptide

<400> 37

Met Ala Asp Glu Ala Pro
1 5

<210> 38
<211> 539
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 38

Met Ala Asp Glu Ala Pro Glu Asp Trp Gly Pro Cys Thr Glu His Gly
1 5 10 15

Glu His Asn Ile Arg Ile Pro Arg Thr Pro Ala Arg Val Thr Gly Gly
20 25 30

Val Phe Leu Val Asp Lys Asn Pro His Asn Thr Ala Glu Ser Arg Leu
35 40 45

Val Val Asp Phe Ser Gln Phe Ser Arg Gly Ser Thr His Val Ser Trp
50 55 60

Pro Lys Phe Ala Val Pro Asn Leu Gln Ser Leu Thr Asn Leu Leu Ser
65 70 75 80

Ser Asn Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr His
85 90 95

Ile Pro Leu His Pro Ala Ala Met Pro His Leu Leu Val Gly Ser Ser
100 105 110

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

Asn Tyr Lys His Gly Thr Met Gln Asp Leu His Asp Ser Cys Ser Arg
130 135 140

Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Lys Thr Phe Gly Arg Lys
145 150 155 160

Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro
165 170 175

Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala
180 185 190

```
Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser
        195                 200                 205

Tyr Met Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu Glu
    210                 215                 220

Ser Leu Phe Thr Ser Ile Thr Asn Phe Leu Leu Ser Leu Gly Ile His
225                 230                 235                 240

Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe Met
                245                 250                 255

Gly Tyr Val Ile Gly Ser Trp Gly Thr Leu Pro Gln Glu His Ile Val
            260                 265                 270

Leu Lys Ile Lys Gln Cys Phe Arg Lys Leu Pro Val Asn Arg Pro Ile
        275                 280                 285

Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu Gly Phe Ala Ala
    290                 295                 300

Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys
305                 310                 315                 320

Ile Gln Ala Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe
                325                 330                 335

Leu Cys Lys Gln Tyr Leu Asn Leu Tyr Pro Val Ala Arg Gln Arg Asp
            340                 345                 350

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

Leu Pro Ser Asp Phe Phe Pro Ser Ile Arg Asp Leu Leu Asp Thr Ala
    370                 375                 380

Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro
385                 390                 395                 400

His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met
                405                 410                 415

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

Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg
```

435 440 445

Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr
450 455 460

Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro
465 470 475 480

Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr
485 490 495

Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser
500 505 510

Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser
515 520 525

Arg Glu Ser Gln Cys His His His His His His
530 535

<210> 39
<211> 347
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 39

Met Ala Asp Glu Ala Pro Ala Ala Arg Val Cys Cys Lys Leu Asp Pro
1 5 10 15

Ala Arg Asp Val Leu Cys Leu Arg Pro Val Gly Ala Glu Ser Ser Gly
20 25 30

Arg Pro Val Ser Gly Pro Phe Gly Thr Leu Pro Ser Pro Ser Ser Ser
35 40 45

Ala Val Pro Ala Asp His Gly Ala His Leu Ser Leu Arg Gly Leu Pro
50 55 60

Val Cys Ala Phe Ser Ser Ala Gly Pro Cys Ala Leu Arg Phe Thr Ser
65 70 75 80

Ala Arg Arg Met Glu Thr Thr Val Asn Ala His Gln Val Leu Pro Lys
85 90 95

Val Leu His Lys Arg Thr Leu Gly Leu Ser Ala Met Ser Thr Thr Asp
100 105 110

```
Leu Glu Ala Tyr Phe Lys Asp Cys Val Phe Lys Asp Trp Glu Glu Leu
        115                 120                 125

Gly Glu Glu Ile Arg Leu Lys Val Phe Val Leu Gly Gly Cys Arg His
    130                 135                 140

Lys Leu Val Cys Ser Pro Ala Pro Cys Asn Phe Phe Thr Ser Ala Asp
145                 150                 155                 160

Ile Asp Pro Tyr Lys Glu Phe Gly Ala Ser Val Glu Leu Leu Ser Phe
                165                 170                 175

Leu Pro Ser Asp Phe Phe Pro Ser Ile Arg Asp Leu Leu Asp Thr Ala
            180                 185                 190

Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro
        195                 200                 205

His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met
    210                 215                 220

Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg
225                 230                 235                 240

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

Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr
            260                 265                 270

Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro
        275                 280                 285

Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr
    290                 295                 300

Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser
305                 310                 315                 320

Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser
                325                 330                 335

Arg Glu Ser Gln Cys His His His His His His
            340                 345
```

<210> 40

<211> 357
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 40

```
Met Ala Asp Glu Ala Pro Glu Asp Trp Gly Pro Cys Thr Glu His Gly
1               5                   10                  15

Glu His Asn Ile Arg Ile Pro Arg Thr Pro Ala Arg Val Thr Gly Gly
            20                  25                  30

Val Phe Leu Val Asp Lys Asn Pro His Asn Thr Ala Glu Ser Arg Leu
        35                  40                  45

Val Val Asp Phe Ser Gln Phe Ser Arg Gly Ser Thr His Val Ser Trp
    50                  55                  60

Pro Lys Phe Ala Val Pro Asn Leu Gln Ser Leu Thr Asn Leu Leu Ser
65                  70                  75                  80

Ser Asn Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr His
                85                  90                  95

Ile Pro Leu His Pro Ala Ala Met Pro His Leu Leu Val Gly Ser Ser
            100                 105                 110

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

Asn Tyr Lys His Gly Thr Met Gln Asp Leu His Asp Ser Cys Ser Arg
    130                 135                 140

Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Lys Thr Phe Gly Arg Lys
145                 150                 155                 160

Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro
                165                 170                 175

Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala
            180                 185                 190

Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser
        195                 200                 205

Tyr Met Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu Glu
    210                 215                 220
```

```
Ser Leu Phe Thr Ser Ile Thr Asn Phe Leu Leu Ser Leu Gly Ile His
225                 230                 235                 240

Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe Met
                245                 250                 255

Gly Tyr Val Ile Gly Ser Trp Gly Thr Leu Pro Gln Glu His Ile Val
            260                 265                 270

Leu Lys Ile Lys Gln Cys Phe Arg Lys Leu Pro Val Asn Arg Pro Ile
        275                 280                 285

Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu Gly Phe Ala Ala
    290                 295                 300

Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys
305                 310                 315                 320

Ile Gln Ala Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe
                325                 330                 335

Leu Cys Lys Gln Tyr Leu Asn Leu Tyr Pro Val Ala Arg Gln Arg His
            340                 345                 350

His His His His His
        355
```

<210> 41
<211> 792
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 41

```
Met Ala Asp Glu Ala Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp
1               5                   10                  15

Pro Ala Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro
            20                  25                  30

Glu Asn Thr Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala
        35                  40                  45

Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp
    50                  55                  60
```

```
Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Ala Pro Thr Cys Pro
65                  70                  75                  80

Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys
                85                  90                  95

Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile
            100                 105                 110

Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu
        115                 120                 125

Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr
    130                 135                 140

Ser Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln
145                 150                 155                 160

Gly Thr Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly
                165                 170                 175

Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe
            180                 185                 190

Leu Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val
        195                 200                 205

Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser
    210                 215                 220

Ala Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Asn Ile Leu
225                 230                 235                 240

Ser Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr
                245                 250                 255

Ile Leu Glu Glu Asp Trp Gly Pro Cys Thr Glu His Gly Glu His Asn
            260                 265                 270

Ile Arg Ile Pro Arg Thr Pro Ala Arg Val Thr Gly Gly Val Phe Leu
        275                 280                 285

Val Asp Lys Asn Pro His Asn Thr Ala Glu Ser Arg Leu Val Val Asp
    290                 295                 300

Phe Ser Gln Phe Ser Arg Gly Ser Thr His Val Ser Trp Pro Lys Phe
305                 310                 315                 320
```

```
Ala Val Pro Asn Leu Gln Ser Leu Thr Asn Leu Leu Ser Ser Asn Leu
                325                 330                 335

Ser Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr His Ile Pro Leu
            340                 345                 350

His Pro Ala Ala Met Pro His Leu Leu Val Gly Ser Ser Gly Leu Ser
        355                 360                 365

Arg Tyr Val Ala Arg Leu Ser Ser Thr Ser Arg Asn Ile Asn Tyr Lys
    370                 375                 380

His Gly Thr Met Gln Asp Leu His Asp Ser Cys Ser Arg Asn Leu Tyr
385                 390                 395                 400

Val Ser Leu Leu Leu Leu Tyr Lys Thr Phe Gly Arg Lys Leu His Leu
                405                 410                 415

Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro Met Gly Val
            420                 425                 430

Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser
        435                 440                 445

Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp
    450                 455                 460

Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu Glu Ser Leu Phe
465                 470                 475                 480

Thr Ser Ile Thr Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro
                485                 490                 495

Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe Met Gly Tyr Val
            500                 505                 510

Ile Gly Ser Trp Gly Thr Leu Pro Gln Glu His Ile Val Leu Lys Ile
        515                 520                 525

Lys Gln Cys Phe Arg Lys Leu Pro Val Asn Arg Pro Ile Asp Trp Lys
    530                 535                 540

Val Cys Gln Arg Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe Thr
545                 550                 555                 560

Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile Gln Ala
```

565 570 575

Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Cys Lys
580 585 590

Gln Tyr Leu Asn Leu Tyr Pro Val Ala Arg Gln Arg Asp Ile Asp Pro
595 600 605

Tyr Lys Glu Phe Gly Ala Ser Val Glu Leu Leu Ser Phe Leu Pro Ser
610 615 620

Asp Phe Phe Pro Ser Ile Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu
625 630 635 640

Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr
645 650 655

Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala
660 665 670

Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val
675 680 685

Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu
690 695 700

Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu
705 710 715 720

Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg
725 730 735

Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val
740 745 750

Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg
755 760 765

Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser
770 775 780

Gln Cys His His His His His His
785 790

<210> 42
<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 42

Phe Leu Leu Thr Arg Ile Leu Thr Ile
1 5

<210> 43
<211> 10
<212> PRT
<213> Hepatitis B virus

<400> 43

Gly Leu Ser Pro Thr Val Trp Leu Ser Val
1 5 10

<210> 44
<211> 10
<212> PRT
<213> Hepatitis B virus

<400> 44

Phe Leu Pro Ser Asp Phe Phe Pro Ser Ile
1 5 10

<210> 45
<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 45

Phe Leu Leu Ser Leu Gly Ile His Leu
1 5

<210> 46
<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 46

Trp Leu Ser Leu Leu Val Pro Phe Val
1 5

<210> 47
<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 47

Lys Tyr Thr Ser Phe Pro Trp Leu Leu
1 5

<210> 48

<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 48

Tyr Val Asn Val Asn Met Gly Leu Lys
1 5

<210> 49
<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 49

Glu Tyr Leu Val Ser Phe Gly Val Trp
1 5

<210> 50
<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 50

Gly Leu Ser Arg Tyr Val Ala Arg Leu
1 5

<210> 51
<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 51

Cys Leu Phe Lys Asp Trp Glu Glu Leu
1 5

<210> 52
<211> 8
<212> PRT
<213> Hepatitis B virus

<400> 52

Pro Leu Gly Phe Phe Pro Asp His
1 5

<210> 53
<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 53

Ile Pro Ile Pro Ser Ser Trp Ala Phe
1 5

<210> 54
<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 54

Leu Pro Ser Asp Phe Phe Pro Ser Val
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Met Gln Trp Asn Ser Thr Ala Leu His Gln Ala Leu Gln Asp Pro
1 5 10 15

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Leu Leu Asp Pro Arg Val Arg Gly Leu
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Ser Ile Leu Ser Lys Thr Gly Asp Pro Val
1 5 10

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Val Leu Gln Ala Gly Phe Phe Leu Leu
1 5

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Phe Leu Leu Thr Arg Ile Leu Thr Ile
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Phe Leu Gly Gly Thr Pro Val Cys Leu
1 5

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Leu Leu Cys Leu Ile Phe Leu Leu Val
1 5

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Leu Val Leu Leu Asp Tyr Gln Gly Met Leu
1 5 10

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Leu Leu Asp Tyr Gln Gly Met Leu Pro Val
1 5 10

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Ser Ile Val Ser Pro Phe Ile Pro Leu Leu
1 5 10

<210> 65
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<400> 65

Ile Leu Ser Pro Phe Leu Pro Leu Leu
1 5

<210> 66
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<400> 66

Thr Pro Ala Arg Val Thr Gly Gly Val Phe
1 5 10

<210> 67
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Leu Val Val Asp Phe Ser Gln Phe Ser Arg
1 5 10

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Ser Ala Ile Cys Ser Val Val Arg Arg
1 5

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Tyr Met Asp Asp Val Val Leu Gly Ala
1 5

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Ala Leu Met Pro Leu Tyr Ala Cys Ile
1 5

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Gln Ala Phe Thr Phe Ser Pro Thr Tyr Lys
1 5 10

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Ala Thr Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser
1 5 10 15

Val

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Leu Pro Ser Asp Phe Phe Pro Ser Val
1 5

<210> 74
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Cys Leu Thr Phe Gly Arg Glu Thr Val
1 5

<210> 75
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Val Leu Glu Tyr Leu Val Ser Phe Gly Val
1 5 10

<210> 76
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<400> 76

Ile Leu Ser Thr Leu Pro Glu Thr Thr Val
1 5 10

<210> 77
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<400> 77

Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg
1 5 10

<210> 78
<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 78

His Leu Ser Leu Arg Gly Leu Phe Val
1 5

<210> 79
<211> 9
<212> PRT
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<400> 79

Val Leu His Lys Arg Thr Leu Gly Leu
1 5

<210> 80
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<400> 80

Gly Leu Ser Ala Met Ser Thr Thr Asp Leu
1 5 10

<210> 81
<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 81

Val Leu Gly Gly Cys Arg His Lys Leu
1 5

<210> 82

<211> 8
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<400> 82

Asn Val Ser Ile Trp Thr His Lys
1 5

<210> 83
<211> 9
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<400> 83

Lys Val Gly Asn Phe Thr Gly Leu Tyr
1 5

<210> 84
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<400> 84

Gly Leu Tyr Ser Ser Thr Val Pro Val
1 5

<210> 85
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<400> 85

Thr Leu Trp Lys Ala Gly Ile Leu Tyr Lys
1 5 10

<210> 86
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<400> 86

Lys Tyr Thr Ser Phe Pro Trp Leu Leu
1 5

<210> 87
<211> 10
<212> PRT
<213> Hepatitis B virus

<400> 87

Ile Leu Arg Gly Thr Ser Phe Val Tyr Val
1 5 10

<210> 88
<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 88

Ser Leu Tyr Ala Asp Ser Pro Ser Val
1 5

<210> 89
<211> 89
<212> PRT
<213> Saccharomyces cerevisiae

<400> 89

Met Arg Phe Pro Ser Ile Phe Thr Ala Val Leu Phe Ala Ala Ser Ser
1 5 10 15

Ala Ser Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln
20 25 30

Ile Pro Ala Glu Ala Val Ile Gly Tyr Leu Asp Leu Glu Gly Asp Phe
35 40 45

Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
50 55 60

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

Ser Leu Asp Lys Arg Glu Ala Glu Ala
85

<210> 90
<211> 89
<212> PRT
<213> Saccharomyces cerevisiae

<400> 90

Met Arg Phe Pro Ser Ile Phe Thr Ala Val Leu Phe Ala Ala Ser Ser
1 5 10 15

Ala Leu Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln
20 25 30

Ile Pro Ala Glu Ala Val Ile Gly Tyr Leu Asp Leu Glu Gly Asp Phe
35 40 45

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Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
    50                  55                  60

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

Ser Leu Asp Lys Arg Glu Ala Glu Ala
                85
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<211> 3107
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<220>
<221> CDS
<222> (1)..(3096)

<400> 91

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Met Arg Phe Pro Ser Ile Phe Thr Ala Val Leu Phe Ala Ala Ser Ser
1               5                   10                  15

gca tca gct gct cca gtc aac act aca aca gaa gat gaa acg gca caa         96
Ala Ser Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln
            20                  25                  30

att ccg gct gaa gct gtc atc ggt tac tta gat tta gaa ggg gat ttc        144
Ile Pro Ala Glu Ala Val Ile Gly Tyr Leu Asp Leu Glu Gly Asp Phe
        35                  40                  45

gat gtt gct gtt ttg cca ttt tcc aac agc aca aat aac ggg tta ttg        192
Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
    50                  55                  60

ttt ata aat act act att gcc agc att gct gct aaa gaa gaa ggg gta        240
Phe Ile Asn Thr Thr Ile Ala Ser Ile Ala Ala Lys Glu Glu Gly Val
65                  70                  75                  80

tct cta gat aaa aga gag gct gaa gct act agt cct tta ggg ttt ttc        288
Ser Leu Asp Lys Arg Glu Ala Glu Ala Thr Ser Pro Leu Gly Phe Phe
                85                  90                  95

cct gat cat caa tta gac cca gca ttc ggt gcc aat tcc aac aat cct        336
Pro Asp His Gln Leu Asp Pro Ala Phe Gly Ala Asn Ser Asn Asn Pro
            100                 105                 110

gat tgg gac ttt aac cca gag aat aca aca tct ggg ttc ctt ggt cca        384
Asp Trp Asp Phe Asn Pro Glu Asn Thr Thr Ser Gly Phe Leu Gly Pro
        115                 120                 125

ctt ttg gtg ctg caa gct ggc ttt ttc ctg tta act aga atc cta aca        432
Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr
    130                 135                 140

att cca caa agt ttg gat tca tgg tgg aca tct ttg aac ttt ttg gga        480
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Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly
145                 150                 155                 160

ggt gct cca acc tgt cct gga caa aac tcc caa tcc cca act tct aat        528
Gly Ala Pro Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn
                165                 170                 175

cat tca cct aca tcc tgc cca cct att tgt cct ggt tat cgt tgg atg        576
His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met
            180                 185                 190

tgt ctt aga cgt ttc att atc ttt ttg ttc ata cta ctg ttg tgt ctg        624
Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu
        195                 200                 205

att ttc ctg ttg gta ttg ttg gat tac caa ggc atg ttg cca gtc tgt        672
Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys
    210                 215                 220

cct tta ctt cca ggc act tct act aca tca act ggc cct tgt aaa aca        720
Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys Lys Thr
225                 230                 235                 240

tgt act atc cca gct caa ggt act tca atg ttt cct agt tgt tgt tgt        768
Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys Cys Cys
                245                 250                 255

acc aaa cca tcc gat ggt aat tgt aca tgc ata cca ata cca tct tca        816
Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser
            260                 265                 270

tgg gca ttt gca aga ttc ctt tgg gaa tgg gct tct gtg cgt ttt tcc        864
Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg Phe Ser
        275                 280                 285

tgg ctg tct ttg tta gtt cct ttt gtc caa tgg ttt gtc ggt tta tct        912
Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser
    290                 295                 300

cca aca gta tgg ctg tct gct atc tgg atg atg tgg tat tgg gga cct        960
Pro Thr Val Trp Leu Ser Ala Ile Trp Met Met Trp Tyr Trp Gly Pro
305                 310                 315                 320

tcc ttg tac aac att ctg tct cca ttt ctg cct ttg tta cca atc ttt       1008
Ser Leu Tyr Asn Ile Leu Ser Pro Phe Leu Pro Leu Leu Pro Ile Phe
                325                 330                 335

ttc tgt ctt tgg gtg tac atc ctc gag gaa gat tgg ggt cct tgt act       1056
Phe Cys Leu Trp Val Tyr Ile Leu Glu Glu Asp Trp Gly Pro Cys Thr
            340                 345                 350

gaa cac ggt gaa cat aac atc aga ata cct aga act cca gct aga gtg       1104
Glu His Gly Glu His Asn Ile Arg Ile Pro Arg Thr Pro Ala Arg Val
        355                 360                 365

aca gga ggt gtt ttc ctg gta gac aaa aac cca cac aac aca gca gaa       1152
Thr Gly Gly Val Phe Leu Val Asp Lys Asn Pro His Asn Thr Ala Glu
    370                 375                 380

tct aga ctt gtc gtt gac ttc agt caa ttc tcc aga ggg tct act cat       1200
Ser Arg Leu Val Val Asp Phe Ser Gln Phe Ser Arg Gly Ser Thr His
385                 390                 395                 400
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gtt tca tgg cca aag ttt gca gtt cca aac ttg caa tca ttg act aat       1248
Val Ser Trp Pro Lys Phe Ala Val Pro Asn Leu Gln Ser Leu Thr Asn
                405                 410                 415

cta cta tct tca aat ctt agt tgg ttg tcc ttg gat gtc tct gct gca       1296
Leu Leu Ser Ser Asn Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala
            420                 425                 430

ttc tat cat ata cca ttg cat cct gca gcc atg cca cat ttg tta gtg       1344
Phe Tyr His Ile Pro Leu His Pro Ala Ala Met Pro His Leu Leu Val
        435                 440                 445

ggt agt tct ggt ctg tca agg tac gtt gca aga cta tct tct act tct       1392
Gly Ser Ser Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Thr Ser
    450                 455                 460

agg aat atc aat tac aaa cat ggg aca atg caa gac cta cat gat tca       1440
Arg Asn Ile Asn Tyr Lys His Gly Thr Met Gln Asp Leu His Asp Ser
465                 470                 475                 480

tgt tct aga aac ttg tac gta tcc ctt tta cta ctt tac aaa aca ttt       1488
Cys Ser Arg Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Lys Thr Phe
                485                 490                 495

ggt aga aag ttg cac tta tac tca cat cca atc atc tta ggt ttc aga       1536
Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg
            500                 505                 510

aag ata cct atg ggc gtc ggg tta tct cct ttt cta tta gca cag ttt       1584
Lys Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe
        515                 520                 525

acc tct gcc att tgt tca gtg gtt cgt aga gca ttt cct cat tgt cta       1632
Thr Ser Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu
    530                 535                 540

gca ttt tca tac atg gac gat gtt gtc tta ggc gct aag tct gtt caa       1680
Ala Phe Ser Tyr Met Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln
545                 550                 555                 560

cac ctt gaa tca ctg ttt acc agt ata acc aat ttc ctt ttg agt cta       1728
His Leu Glu Ser Leu Phe Thr Ser Ile Thr Asn Phe Leu Leu Ser Leu
                565                 570                 575

ggc att cat ctg aat cct aac aaa act aaa aga tgg gga tac tct ctt       1776
Gly Ile His Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu
            580                 585                 590

aac ttt atg ggt tac gtt atc gga tca tgg ggc acc ctt cca caa gag       1824
Asn Phe Met Gly Tyr Val Ile Gly Ser Trp Gly Thr Leu Pro Gln Glu
        595                 600                 605

cat att gtc ctg aaa atc aag cag tgt ttt aga aaa ctg cca gtg aat       1872
His Ile Val Leu Lys Ile Lys Gln Cys Phe Arg Lys Leu Pro Val Asn
    610                 615                 620

aga cca att gat tgg aaa gtt tgc cag aga atc gta ggt tta ctt ggt       1920
Arg Pro Ile Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu Gly
625                 630                 635                 640

ttt gcc gct cct ttc act cag tgc ggc tat cca gct ttg atg cca ttg       1968
Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu
                645                 650                 655
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tac gct tgt atc caa gct aag caa gct ttc aca ttc tct cca acc tat       2016
Tyr Ala Cys Ile Gln Ala Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr
            660                 665                 670

aag gct ttt cta tgc aag cag tac tta aac ctt tat cca gtg gct aga       2064
Lys Ala Phe Leu Cys Lys Gln Tyr Leu Asn Leu Tyr Pro Val Ala Arg
        675                 680                 685

caa aga gat att gac cca tac aaa gag ttt ggg gca tca gtt gaa tta       2112
Gln Arg Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Ser Val Glu Leu
    690                 695                 700

cta tcc ttc cta cca tca gac ttt ttc cca tca atc aga gat ttg tta       2160
Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Ile Arg Asp Leu Leu
705                 710                 715                 720

gat act gcc tct gca ttg tac aga gaa gct cta gaa tct cct gaa cat       2208
Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His
                725                 730                 735

tgc tct cca cac cat act gcc ctt aga caa gca atc ttg tgt tgg ggc       2256
Cys Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly
            740                 745                 750

gaa ctt atg aat ttg gcc aca tgg gtt gga agt aat cta gaa gat cca       2304
Glu Leu Met Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro
        755                 760                 765

gcc tca aga gag cta gtt gta tct tac gtc aac gtt aac atg ggt cta       2352
Ala Ser Arg Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu
    770                 775                 780

aag att agg caa tta cta tgg ttt cac att agt tgc tta act ttc ggt       2400
Lys Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly
785                 790                 795                 800

aga gaa aca gtg cta gag tat ttg gta tca ttt gga gta tgg atc aga       2448
Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg
                805                 810                 815

act cca cct gca tat aga cca cca aat gct cca atc tta tct aca ctg       2496
Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu
            820                 825                 830

cct gaa aca act gta gtc agg aga aga gga aga tca cca agg agg aga       2544
Pro Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg
        835                 840                 845

act cca tct cca agg aga cgt cgt tct cag tcc cct cgt aga cgt aga       2592
Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg
    850                 855                 860

tct caa tca aga gaa tct caa tgc gca gcc aga gtt tgc tgt aaa ctt       2640
Ser Gln Ser Arg Glu Ser Gln Cys Ala Ala Arg Val Cys Cys Lys Leu
865                 870                 875                 880

gac cca gcc aga gat gta cta tgt ctt aga cca gtt ggc gct gaa tca       2688
Asp Pro Ala Arg Asp Val Leu Cys Leu Arg Pro Val Gly Ala Glu Ser
                885                 890                 895

tct ggt aga cca gtc tca ggc cca ttt ggg aca tta cca tcc cct tca       2736
Ser Gly Arg Pro Val Ser Gly Pro Phe Gly Thr Leu Pro Ser Pro Ser
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            900                 905                 910

agt agt gcc gta cct gca gat cac gga gca cat ctg tct cta aga gga       2784
Ser Ser Ala Val Pro Ala Asp His Gly Ala His Leu Ser Leu Arg Gly
        915                 920                 925

ctt cct gtt tgt gct ttt agt tca gca gga cct tgc gcc ttg aga ttc       2832
Leu Pro Val Cys Ala Phe Ser Ser Ala Gly Pro Cys Ala Leu Arg Phe
    930                 935                 940

aca tca gct agg aga atg gaa aca aca gtt aat gct cat caa gtt ttg       2880
Thr Ser Ala Arg Arg Met Glu Thr Thr Val Asn Ala His Gln Val Leu
945                 950                 955                 960

cca aaa gta tta cac aag aga aca ttg ggt ttg tct gcc atg agt acc       2928
Pro Lys Val Leu His Lys Arg Thr Leu Gly Leu Ser Ala Met Ser Thr
                965                 970                 975

act gac tta gaa gct tac ttt aag gat tgc gtt ttc aaa gat tgg gag       2976
Thr Asp Leu Glu Ala Tyr Phe Lys Asp Cys Val Phe Lys Asp Trp Glu
            980                 985                 990

gaa tta ggt gag gaa atc aga cta  aaa gtt ttt gtg tta  ggt ggt tgc     3024
Glu Leu Gly Glu Glu Ile Arg Leu  Lys Val Phe Val Leu  Gly Gly Cys
        995                 1000                1005

aga cac  aaa ttg gtc tgt tcc  cct gct cca tgc aac  ttt ttc acc       3069
Arg His  Lys Leu Val Cys Ser  Pro Ala Pro Cys Asn  Phe Phe Thr
    1010                1015                1020

tcc gcc  cac cat cat cat cac  cat tga taagcggccg c                   3107
Ser Ala  His His His His His  His
    1025                1030


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<212>  PRT
<213>  Artificial

<220>
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<400>  92

Met Arg Phe Pro Ser Ile Phe Thr Ala Val Leu Phe Ala Ala Ser Ser
1               5                   10                  15


Ala Ser Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln
            20                  25                  30


Ile Pro Ala Glu Ala Val Ile Gly Tyr Leu Asp Leu Glu Gly Asp Phe
        35                  40                  45


Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
    50                  55                  60


Phe Ile Asn Thr Thr Ile Ala Ser Ile Ala Ala Lys Glu Glu Gly Val
65                  70                  75                  80
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Ser Leu Asp Lys Arg Glu Ala Glu Ala Thr Ser Pro Leu Gly Phe Phe
                85                  90                  95

Pro Asp His Gln Leu Asp Pro Ala Phe Gly Ala Asn Ser Asn Asn Pro
            100                 105                 110

Asp Trp Asp Phe Asn Pro Glu Asn Thr Thr Ser Gly Phe Leu Gly Pro
        115                 120                 125

Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr
    130                 135                 140

Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly
145                 150                 155                 160

Gly Ala Pro Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn
                165                 170                 175

His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met
            180                 185                 190

Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu
        195                 200                 205

Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys
    210                 215                 220

Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys Lys Thr
225                 230                 235                 240

Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys Cys Cys
                245                 250                 255

Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser
            260                 265                 270

Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg Phe Ser
        275                 280                 285

Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser
    290                 295                 300

Pro Thr Val Trp Leu Ser Ala Ile Trp Met Met Trp Tyr Trp Gly Pro
305                 310                 315                 320

Ser Leu Tyr Asn Ile Leu Ser Pro Phe Leu Pro Leu Leu Pro Ile Phe
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325 330 335

Phe Cys Leu Trp Val Tyr Ile Leu Glu Glu Asp Trp Gly Pro Cys Thr
340 345 350

Glu His Gly Glu His Asn Ile Arg Ile Pro Arg Thr Pro Ala Arg Val
355 360 365

Thr Gly Gly Val Phe Leu Val Asp Lys Asn Pro His Asn Thr Ala Glu
370 375 380

Ser Arg Leu Val Val Asp Phe Ser Gln Phe Ser Arg Gly Ser Thr His
385 390 395 400

Val Ser Trp Pro Lys Phe Ala Val Pro Asn Leu Gln Ser Leu Thr Asn
405 410 415

Leu Leu Ser Ser Asn Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala
420 425 430

Phe Tyr His Ile Pro Leu His Pro Ala Ala Met Pro His Leu Leu Val
435 440 445

Gly Ser Ser Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Thr Ser
450 455 460

Arg Asn Ile Asn Tyr Lys His Gly Thr Met Gln Asp Leu His Asp Ser
465 470 475 480

Cys Ser Arg Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Lys Thr Phe
485 490 495

Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg
500 505 510

Lys Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe
515 520 525

Thr Ser Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu
530 535 540

Ala Phe Ser Tyr Met Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln
545 550 555 560

His Leu Glu Ser Leu Phe Thr Ser Ile Thr Asn Phe Leu Leu Ser Leu
565 570 575

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Gly Ile His Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu
            580                 585                 590

Asn Phe Met Gly Tyr Val Ile Gly Ser Trp Gly Thr Leu Pro Gln Glu
        595                 600                 605

His Ile Val Leu Lys Ile Lys Gln Cys Phe Arg Lys Leu Pro Val Asn
    610                 615                 620

Arg Pro Ile Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu Gly
625                 630                 635                 640

Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu
                645                 650                 655

Tyr Ala Cys Ile Gln Ala Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr
            660                 665                 670

Lys Ala Phe Leu Cys Lys Gln Tyr Leu Asn Leu Tyr Pro Val Ala Arg
        675                 680                 685

Gln Arg Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Ser Val Glu Leu
    690                 695                 700

Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Ile Arg Asp Leu Leu
705                 710                 715                 720

Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His
                725                 730                 735

Cys Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly
            740                 745                 750

Glu Leu Met Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro
        755                 760                 765

Ala Ser Arg Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu
    770                 775                 780

Lys Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly
785                 790                 795                 800

Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg
                805                 810                 815

Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu
            820                 825                 830
```

```
Pro Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg
        835                 840                 845

Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg
    850                 855                 860

Ser Gln Ser Arg Glu Ser Gln Cys Ala Ala Arg Val Cys Cys Lys Leu
865                 870                 875                 880

Asp Pro Ala Arg Asp Val Leu Cys Leu Arg Pro Val Gly Ala Glu Ser
                885                 890                 895

Ser Gly Arg Pro Val Ser Gly Pro Phe Gly Thr Leu Pro Ser Pro Ser
            900                 905                 910

Ser Ser Ala Val Pro Ala Asp His Gly Ala His Leu Ser Leu Arg Gly
        915                 920                 925

Leu Pro Val Cys Ala Phe Ser Ser Ala Gly Pro Cys Ala Leu Arg Phe
    930                 935                 940

Thr Ser Ala Arg Arg Met Glu Thr Thr Val Asn Ala His Gln Val Leu
945                 950                 955                 960

Pro Lys Val Leu His Lys Arg Thr Leu Gly Leu Ser Ala Met Ser Thr
                965                 970                 975

Thr Asp Leu Glu Ala Tyr Phe Lys Asp Cys Val Phe Lys Asp Trp Glu
            980                 985                 990

Glu Leu Gly Glu Glu Ile Arg Leu  Lys Val Phe Val Leu  Gly Gly Cys
        995                 1000                1005

Arg His  Lys Leu Val Cys Ser  Pro Ala Pro Cys Asn  Phe Phe Thr
    1010                1015                1020

Ser Ala  His His His His His  His
    1025                1030
```

<210> 93
<211> 494
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 93

```
Met Arg Phe Pro Ser Ile Phe Thr Ala Val Leu Phe Ala Ala Ser Ser
1               5                  10                  15

Ala Ser Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln
            20                  25                  30

Ile Pro Ala Glu Ala Val Ile Gly Tyr Leu Asp Leu Glu Gly Asp Phe
        35                  40                  45

Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
    50                  55                  60

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

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

Arg Lys Gly Met Gly Thr Asn Leu Ser Val Pro Asn Pro Leu Gly Phe
            100                 105                 110

Phe Pro Asp His Gln Leu Asp Pro Ala Phe Gly Ala Asn Ser Asn Asn
        115                 120                 125

Pro Asp Trp Asp Phe Asn Pro Asn Lys Asp His Trp Pro Glu Ala Asn
    130                 135                 140

Gln Val Gly Val Gly Ala Phe Gly Pro Gly Phe Thr Pro Pro His Gly
145                 150                 155                 160

Gly Leu Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Thr Thr Val
                165                 170                 175

Pro Ala Ala Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg Gln
            180                 185                 190

Pro Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala Met
        195                 200                 205

Gln Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu Asp Pro Arg Val
    210                 215                 220

Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val Asn
225                 230                 235                 240

Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Phe Ser Arg Thr
                245                 250                 255
```

```
Gly Asp Pro Ala Pro Asn Met Glu Asn Thr Thr Ser Gly Phe Leu Gly
            260                 265                 270

Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu
        275                 280                 285

Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu
    290                 295                 300

Gly Gly Ala Pro Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr Ser
305                 310                 315                 320

Asn His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg Trp
                325                 330                 335

Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys
            340                 345                 350

Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro Val
        355                 360                 365

Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys Lys
    370                 375                 380

Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys Cys
385                 390                 395                 400

Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser
                405                 410                 415

Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg Phe
            420                 425                 430

Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly Leu
        435                 440                 445

Ser Pro Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp Gly
    450                 455                 460

Pro Ser Leu Tyr Asn Ile Leu Asn Pro Phe Leu Pro Leu Leu Pro Ile
465                 470                 475                 480

Phe Phe Cys Leu Trp Val Tyr Ile His His His His His His
                485                 490
```

<210> 94
<211> 440

<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 94

```
Met Arg Phe Pro Ser Ile Phe Thr Ala Val Leu Phe Ala Ala Ser Ser
1               5                  10                  15

Ala Ser Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln
            20                  25                  30

Ile Pro Ala Glu Ala Val Ile Gly Tyr Leu Asp Leu Glu Gly Asp Phe
        35                  40                  45

Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
    50                  55                  60

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

Ser Leu Asp Lys Arg Glu Ala Glu Ala Glu Asp Trp Gly Pro Cys Thr
                85                  90                  95

Glu His Gly Glu His Asn Ile Arg Ile Pro Arg Thr Pro Ala Arg Val
            100                 105                 110

Thr Gly Gly Val Phe Leu Val Asp Lys Asn Pro His Asn Thr Ala Glu
        115                 120                 125

Ser Arg Leu Val Val Asp Phe Ser Gln Phe Ser Arg Gly Ser Thr His
    130                 135                 140

Val Ser Trp Pro Lys Phe Ala Val Pro Asn Leu Gln Ser Leu Thr Asn
145                 150                 155                 160

Leu Leu Ser Ser Asn Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala
                165                 170                 175

Phe Tyr His Ile Pro Leu His Pro Ala Ala Met Pro His Leu Leu Val
            180                 185                 190

Gly Ser Ser Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Thr Ser
        195                 200                 205

Arg Asn Ile Asn Tyr Lys His Gly Thr Met Gln Asp Leu His Asp Ser
    210                 215                 220
```

```
Cys Ser Arg Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Lys Thr Phe
225                 230                 235                 240

Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg
                245                 250                 255

Lys Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe
            260                 265                 270

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

Ala Phe Ser Tyr Met Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln
    290                 295                 300

His Leu Glu Ser Leu Phe Thr Ser Ile Thr Asn Phe Leu Leu Ser Leu
305                 310                 315                 320

Gly Ile His Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu
                325                 330                 335

Asn Phe Met Gly Tyr Val Ile Gly Ser Trp Gly Thr Leu Pro Gln Glu
            340                 345                 350

His Ile Val Leu Lys Ile Lys Gln Cys Phe Arg Lys Leu Pro Val Asn
        355                 360                 365

Arg Pro Ile Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu Gly
    370                 375                 380

Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu
385                 390                 395                 400

Tyr Ala Cys Ile Gln Ala Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr
                405                 410                 415

Lys Ala Phe Leu Cys Lys Gln Tyr Leu Asn Leu Tyr Pro Val Ala Arg
            420                 425                 430

Gln Arg His His His His His His
        435                 440
```

<210> 95
<211> 277
<212> PRT
<213> Artificial

<220>

<223> Synthetic Construct

<400> 95

```
Met Arg Phe Pro Ser Ile Phe Thr Ala Val Leu Phe Ala Ala Ser Ser
1               5                  10                  15

Ala Ser Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln
            20                  25                  30

Ile Pro Ala Glu Ala Val Ile Gly Tyr Leu Asp Leu Glu Gly Asp Phe
        35                  40                  45

Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
    50                  55                  60

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

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

Phe Gly Ala Ser Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe
            100                 105                 110

Pro Ser Ile Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu
        115                 120                 125

Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg
    130                 135                 140

Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val
145                 150                 155                 160

Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr
                165                 170                 175

Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His
            180                 185                 190

Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val
        195                 200                 205

Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn
    210                 215                 220

Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg
225                 230                 235                 240
```

Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser
245 250 255

Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys His
260 265 270

His His His His His
275

<210> 96
<211> 248
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 96

Met Arg Phe Pro Ser Ile Phe Thr Ala Val Leu Phe Ala Ala Ser Ser
1 5 10 15

Ala Ser Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln
20 25 30

Ile Pro Ala Glu Ala Val Ile Gly Tyr Leu Asp Leu Glu Gly Asp Phe
35 40 45

Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
50 55 60

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

Ser Leu Asp Lys Arg Glu Ala Glu Ala Ala Ala Arg Val Cys Cys Lys
85 90 95

Leu Asp Pro Ala Arg Asp Val Leu Cys Leu Arg Pro Val Gly Ala Glu
100 105 110

Ser Ser Gly Arg Pro Val Ser Gly Pro Phe Gly Thr Leu Pro Ser Pro
115 120 125

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

Gly Leu Pro Val Cys Ala Phe Ser Ser Ala Gly Pro Cys Ala Leu Arg
145 150 155 160

```
Phe Thr Ser Ala Arg Arg Met Glu Thr Thr Val Asn Ala His Gln Val
                165                 170                 175

Leu Pro Lys Val Leu His Lys Arg Thr Leu Gly Leu Ser Ala Met Ser
            180                 185                 190

Thr Thr Asp Leu Glu Ala Tyr Phe Lys Asp Cys Val Phe Lys Asp Trp
        195                 200                 205

Glu Glu Leu Gly Glu Glu Ile Arg Leu Lys Val Phe Val Leu Gly Gly
    210                 215                 220

Cys Arg His Lys Leu Val Cys Ser Pro Ala Pro Cys Asn Phe Phe Thr
225                 230                 235                 240

Ser Ala His His His His His His
                245
```

<210> 97
<211> 249
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 97

```
Met Gln Trp Asn Ser Thr Ala Leu His Gln Ala Leu Leu Asp Pro Arg
1               5                   10                  15

Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val
            20                  25                  30

Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Leu Ser Lys
        35                  40                  45

Thr Gly Asp Pro Val Pro Asn Met Glu Asn Thr Thr Ser Gly Phe Leu
    50                  55                  60

Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile
65                  70                  75                  80

Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe
                85                  90                  95

Leu Gly Gly Thr Pro Val Cys Leu Gly Gln Asn Ser Gln Ser Pro Thr
            100                 105                 110

Ser Asn His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg
```

115 120 125

Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu
130 135 140

Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro
145 150 155 160

Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys
165 170 175

Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys
180 185 190

Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro
195 200 205

Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg
210 215 220

Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly
225 230 235 240

Leu Ser Pro Thr Val Trp Leu Ser Val
245

<210> 98
<211> 228
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 98

Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Thr Ser Arg Asn Ile
1 5 10 15

Asn Tyr Gln His Gly Thr Met Gln Asp Leu His Asp Ser Cys Ser Arg
20 25 30

Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Lys Thr Phe Gly Arg Lys
35 40 45

Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro
50 55 60

Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala
65 70 75 80

```
Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser
                85                  90                  95

Tyr Met Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu Glu
            100                 105                 110

Ser Leu Phe Thr Ser Ile Thr Asn Phe Leu Leu Ser Leu Gly Ile His
        115                 120                 125

Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe Met
    130                 135                 140

Gly Tyr Val Ile Gly Ser Trp Gly Thr Leu Pro Gln Glu His Ile Val
145                 150                 155                 160

Gln Lys Leu Lys Gln Cys Phe Arg Lys Leu Pro Val Asn Arg Pro Ile
                165                 170                 175

Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu Gly Phe Ala Ala
            180                 185                 190

Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys
        195                 200                 205

Ile Gln Ala Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe
    210                 215                 220

Leu Cys Lys Gln
225
```

<210> 99
<211> 152
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 99

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

Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg
            20                  25                  30

Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu
        35                  40                  45
```

Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp
50 55 60

Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser
65 70 75 80

Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe
85 90 95

His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu
100 105 110

Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro
115 120 125

Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg
130 135 140

Arg Gly Arg Ser Pro Arg Arg Arg
145 150

<210> 100
<211> 60
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 100

His Leu Ser Leu Arg Gly Leu Phe Val Cys Ala Phe Ser Ser Ala Gly
1 5 10 15

Pro Asn Ala His Gln Val Leu Pro Lys Val Leu His Lys Arg Thr Leu
20 25 30

Gly Leu Ser Ala Met Ser Thr Thr Asp Leu Glu Ala Tyr Phe Lys Asp
35 40 45

Cys Leu Phe Lys Asp Trp Glu Glu Leu Gly Glu Glu
50 55 60

<210> 101
<211> 784
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 101

```
Met Arg Phe Pro Ser Ile Phe Thr Ala Val Leu Phe Ala Ala Ser Ser
1               5                  10                  15

Ala Ser Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln
            20                  25                  30

Ile Pro Ala Glu Ala Val Ile Gly Tyr Leu Asp Leu Glu Gly Asp Phe
        35                  40                  45

Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
    50                  55                  60

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

Ser Leu Asp Lys Arg Glu Ala Glu Ala Met Gln Trp Asn Ser Thr Ala
                85                  90                  95

Leu His Gln Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro
            100                 105                 110

Ala Gly Gly Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala
        115                 120                 125

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

Met Glu Asn Thr Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln
145                 150                 155                 160

Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu
                165                 170                 175

Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr Pro Val Cys
            180                 185                 190

Leu Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser
        195                 200                 205

Cys Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe
    210                 215                 220

Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val
225                 230                 235                 240

Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly
```

245 250 255

Thr Ser Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala
260 265 270

Gln Gly Thr Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp
275 280 285

Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg
290 295 300

Phe Leu Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu
305 310 315 320

Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu
325 330 335

Ser Val Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Thr Ser Arg
340 345 350

Asn Ile Asn Tyr Gln His Gly Thr Met Gln Asp Leu His Asp Ser Cys
355 360 365

Ser Arg Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Lys Thr Phe Gly
370 375 380

Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys
385 390 395 400

Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr
405 410 415

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

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

Leu Glu Ser Leu Phe Thr Ser Ile Thr Asn Phe Leu Leu Ser Leu Gly
450 455 460

Ile His Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn
465 470 475 480

Phe Met Gly Tyr Val Ile Gly Ser Trp Gly Thr Leu Pro Gln Glu His
485 490 495

```
Ile Val Gln Lys Leu Lys Gln Cys Phe Arg Lys Leu Pro Val Asn Arg
            500                 505                 510

Pro Ile Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu Gly Phe
        515                 520                 525

Ala Ala Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu Tyr
    530                 535                 540

Ala Cys Ile Gln Ala Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr Lys
545                 550                 555                 560

Ala Phe Leu Cys Lys Gln Glu Phe Gly Ala Ser Val Glu Leu Leu Ser
                565                 570                 575

Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr
            580                 585                 590

Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser
        595                 600                 605

Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu
    610                 615                 620

Met Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser
625                 630                 635                 640

Arg Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile
                645                 650                 655

Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu
            660                 665                 670

Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro
        675                 680                 685

Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu
    690                 695                 700

Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg His Leu
705                 710                 715                 720

Ser Leu Arg Gly Leu Phe Val Cys Ala Phe Ser Ser Ala Gly Pro Asn
                725                 730                 735

Ala His Gln Val Leu Pro Lys Val Leu His Lys Arg Thr Leu Gly Leu
            740                 745                 750
```

Ser Ala Met Ser Thr Thr Asp Leu Glu Ala Tyr Phe Lys Asp Cys Leu
        755   760   765

Phe Lys Asp Trp Glu Glu Leu Gly Glu Glu His His His His His His
    770   775   780

<210> 102
<211> 700
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 102

Met Ala Asp Glu Ala Pro Gln Trp Asn Ser Thr Ala Leu His Gln Ala
1   5   10   15

Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser
            20   25   30

Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser
        35   40   45

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

Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe
65   70   75   80

Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp
                85   90   95

Thr Ser Leu Asn Phe Leu Gly Gly Thr Pro Val Cys Leu Gly Gln Asn
            100   105   110

Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro Pro Ile
        115   120   125

Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu
    130   135   140

Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr
145   150   155   160

Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr
                165   170   175

```
Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser
            180                 185                 190

Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr
        195                 200                 205

Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu
    210                 215                 220

Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val
225                 230                 235                 240

Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Val Gly Leu
                245                 250                 255

Ser Arg Tyr Val Ala Arg Leu Ser Ser Thr Ser Arg Asn Ile Asn Tyr
            260                 265                 270

Gln His Gly Thr Met Gln Asp Leu His Asp Ser Cys Ser Arg Asn Leu
        275                 280                 285

Tyr Val Ser Leu Leu Leu Leu Tyr Lys Thr Phe Gly Arg Lys Leu His
    290                 295                 300

Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro Met Gly
305                 310                 315                 320

Val Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys
                325                 330                 335

Ser Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met
            340                 345                 350

Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu Glu Ser Leu
        355                 360                 365

Phe Thr Ser Ile Thr Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn
    370                 375                 380

Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe Met Gly Tyr
385                 390                 395                 400

Val Ile Gly Ser Trp Gly Thr Leu Pro Gln Glu His Ile Val Gln Lys
                405                 410                 415

Leu Lys Gln Cys Phe Arg Lys Leu Pro Val Asn Arg Pro Ile Asp Trp
            420                 425                 430
```

```
Lys Val Cys Gln Arg Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe
        435                 440                 445

Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile Gln
    450                 455                 460

Ala Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Cys
465                 470                 475                 480

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

Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu
            500                 505                 510

Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr
        515                 520                 525

Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala
    530                 535                 540

Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val
545                 550                 555                 560

Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu
                565                 570                 575

Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu
            580                 585                 590

Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg
        595                 600                 605

Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val
    610                 615                 620

Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg His Leu Ser Leu Arg Gly
625                 630                 635                 640

Leu Phe Val Cys Ala Phe Ser Ser Ala Gly Pro Asn Ala His Gln Val
                645                 650                 655

Leu Pro Lys Val Leu His Lys Arg Thr Leu Gly Leu Ser Ala Met Ser
            660                 665                 670

Thr Thr Asp Leu Glu Ala Tyr Phe Lys Asp Cys Leu Phe Lys Asp Trp
        675                 680                 685
```

Glu Glu Leu Gly Glu Glu His His His His His His
690 695 700

<210> 103
<211> 8
<212> PRT
<213> Artificial

<220>
<223> Synthetic peptide

<400> 103

Gly Tyr His Gly Ser Ser Leu Tyr
1 5

<210> 104
<211> 8
<212> PRT
<213> Artificial

<220>
<223> Synthetic peptide

<400> 104

Met Gly Leu Lys Phe Arg Gln Leu
1 5

<210> 105
<211> 767
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 105

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
35 40 45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
50 55 60

Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala
65 70 75 80

```
Ser Arg Asp Leu Val Val Asn Tyr Val Asn Val Asn Met Gly Leu Lys
                85                  90                  95

Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
            100                 105                 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
        115                 120                 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
    130                 135                 140

Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr
145                 150                 155                 160

Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser
                165                 170                 175

Lys Ser Arg Glu Ser Gln Cys Met Gln Leu Phe His Leu Cys Leu Ile
            180                 185                 190

Ile Ser Cys Ser Cys Pro Thr Val Gln Ala Ser Lys Leu Cys Leu Gly
        195                 200                 205

Trp Leu Trp Gly Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr
    210                 215                 220

Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg
225                 230                 235                 240

Asp Leu Leu Asp Thr Ala Ala Ala Leu Tyr Arg Glu Ala Leu Glu Ser
                245                 250                 255

Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu
            260                 265                 270

Cys Trp Gly Glu Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu
        275                 280                 285

Glu Asp Pro Ala Ser Arg Asp Leu Val Val Asn Tyr Val Asn Val Asn
    290                 295                 300

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

Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val
                325                 330                 335
```

```
Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu
            340                 345                 350

Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro
        355                 360                 365

Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg
    370                 375                 380

Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys Met Asp Ile Asp Pro
385                 390                 395                 400

Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu Pro Ser
                405                 410                 415

Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu
            420                 425                 430

Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr
        435                 440                 445

Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala
    450                 455                 460

Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val
465                 470                 475                 480

Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu
                485                 490                 495

Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu
            500                 505                 510

Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg
        515                 520                 525

Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val
    530                 535                 540

Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg
545                 550                 555                 560

Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser
                565                 570                 575

Gln Cys Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu
```

580 585 590

Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu
595 600 605

Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu
610 615 620

His Cys Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp
625 630 635 640

Gly Glu Leu Met Thr Leu Ala Thr Trp Val Gly Val Asn Leu Glu Asp
645 650 655

Pro Ala Ser Arg Asp Leu Val Val Ser Tyr Val Asn Val Asn Met Gly
660 665 670

Leu Lys Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe
675 680 685

Gly Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile
690 695 700

Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr
705 710 715 720

Leu Pro Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg
725 730 735

Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Lys
740 745 750

Arg Ser Gln Ser Arg Glu Ser Gln Cys His His His His His His
755 760 765

<210> 106
<211> 680
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 106

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
20 25 30

```
Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
        35                  40                  45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
    50                  55                  60

Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala
65                  70                  75                  80

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

Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
            100                 105                 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
        115                 120                 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
    130                 135                 140

Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr
145                 150                 155                 160

Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser
                165                 170                 175

Lys Ser Arg Glu Ser Gln Cys Met Ala Ala Arg Leu Tyr Cys Gln Leu
            180                 185                 190

Asp Ser Ser Arg Asp Val Leu Cys Leu Arg Pro Val Gly Ala Glu Ser
        195                 200                 205

Arg Gly Arg Pro Leu Ser Gly Pro Leu Gly Thr Leu Ser Ser Pro Ser
    210                 215                 220

Pro Ser Ala Val Pro Ala Asp His Gly Ala His Leu Ser Leu Arg Gly
225                 230                 235                 240

Leu Phe Val Cys Ala Phe Ser Ser Ala Gly Pro Cys Ala Leu Arg Phe
                245                 250                 255

Thr Ser Ala Arg Cys Met Glu Thr Thr Val Asn Ala His Gln Ile Leu
            260                 265                 270

Pro Lys Val Leu His Lys Arg Thr Leu Gly Leu Ser Ala Met Ser Thr
```

```
        275                 280                 285

Thr Asp Leu Glu Ala Tyr Phe Lys Asp Cys Leu Phe Lys Asp Trp Glu
    290                 295                 300

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

Arg His Lys Leu Val Cys Ala Pro Ala Pro Cys Asn Phe Phe Thr Ser
                325                 330                 335

Ala Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu
            340                 345                 350

Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu
        355                 360                 365

Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His
    370                 375                 380

Cys Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly
385                 390                 395                 400

Glu Leu Met Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro
                405                 410                 415

Ala Ser Arg Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu
            420                 425                 430

Lys Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly
        435                 440                 445

Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg
    450                 455                 460

Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu
465                 470                 475                 480

Pro Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg
                485                 490                 495

Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg
            500                 505                 510

Ser Gln Ser Arg Glu Ser Gln Cys Met Ala Ala Arg Leu Cys Cys Gln
        515                 520                 525
```

Leu Asp Pro Ala Arg Asp Val Leu Cys Leu Arg Pro Val Gly Thr Glu
530 535 540

Ser Arg Gly Arg Pro Val Ser Arg Pro Phe Gly Thr Leu Ser Ser Pro
545 550 555 560

Ser Ala Ser Ala Val Pro Ala Asp His Gly Ala His Leu Ser Leu Arg
565 570 575

Gly Leu Phe Val Cys Ala Phe Ser Ser Ala Gly Pro Cys Ala Leu Arg
580 585 590

Phe Thr Ser Ala Arg Arg Met Glu Thr Thr Val Asn Ala His Gln Val
595 600 605

Leu Pro Lys Val Leu His Lys Arg Thr Leu Gly Leu Pro Ala Met Ser
610 615 620

Thr Thr Asp Leu Glu Ala Tyr Phe Lys Asp Cys Leu Phe Lys Asp Trp
625 630 635 640

Glu Glu Leu Gly Glu Glu Ile Arg Leu Met Ile Phe Val Leu Gly Gly
645 650 655

Cys Arg His Lys Leu Val Cys Ser Pro Ala Pro Cys Asn Phe Phe Thr
660 665 670

Ser Ala His His His His His His
675 680

<210> 107
<211> 689
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 107

Met Gln Trp Asn Ser Thr Ala Leu His Gln Ala Leu Leu Asp Pro Arg
1 5 10 15

Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val
20 25 30

Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Leu Ser Lys
35 40 45

Thr Gly Asp Pro Val Pro Asn Met Glu Asn Thr Thr Ser Gly Phe Leu

```
    50                  55                  60

Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile
65                  70                  75                  80

Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe
                85                  90                  95

Leu Gly Gly Thr Pro Val Cys Leu Gly Gln Asn Ser Gln Ser Pro Thr
            100                 105                 110

Ser Asn His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg
        115                 120                 125

Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu
    130                 135                 140

Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro
145                 150                 155                 160

Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys
                165                 170                 175

Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys
            180                 185                 190

Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro
        195                 200                 205

Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg
    210                 215                 220

Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly
225                 230                 235                 240

Leu Ser Pro Thr Val Trp Leu Ser Val Gly Leu Ser Arg Tyr Val Ala
                245                 250                 255

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

Gln Asn Leu His Asp Ser Cys Ser Arg Gln Leu Tyr Val Ser Leu Met
        275                 280                 285

Leu Leu Tyr Lys Thr Tyr Gly Trp Lys Leu His Leu Tyr Ser His Pro
    290                 295                 300
```

```
Ile Val Leu Gly Phe Arg Lys Ile Pro Met Gly Val Gly Leu Ser Pro
305                 310                 315                 320

Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser Val Val Arg Arg
                325                 330                 335

Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp Asp Val Val Leu
            340                 345                 350

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

Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro Asn Lys Thr Lys
    370                 375                 380

Arg Trp Gly Tyr Ser Leu Asn Phe Met Gly Tyr Ile Ile Gly Ser Trp
385                 390                 395                 400

Gly Thr Leu Pro Gln Asp His Ile Val Gln Lys Ile Lys His Cys Phe
                405                 410                 415

Arg Lys Leu Pro Val Asn Arg Pro Ile Asp Trp Lys Val Cys Gln Arg
            420                 425                 430

Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr
        435                 440                 445

Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile Gln Ala Lys Gln Ala Phe
    450                 455                 460

Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Ser Lys Gln Glu Phe Gly
465                 470                 475                 480

Ala Ser Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser
                485                 490                 495

Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu
            500                 505                 510

Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg Gln Ala
        515                 520                 525

Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val Gly Ser
    530                 535                 540

Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr Val Asn
545                 550                 555                 560
```

Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His Ile Ser
565 570 575

Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe
580 585 590

Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro
595 600 605

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

Ser Pro Arg Arg Arg His Leu Ser Leu Arg Gly Leu Phe Val Cys Ala
625 630 635 640

Phe Ser Ser Ala Gly Pro Asn Ala His Gln Ile Leu Pro Lys Val Leu
645 650 655

His Lys Arg Thr Leu Gly Leu Ser Ala Met Ser Thr Thr Asp Leu Glu
660 665 670

Ala Tyr Phe Lys Asp Cys Leu Phe Lys Asp Trp Glu Glu Leu Gly Glu
675 680 685

Glu

<210> 108
<211> 689
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 108

Met Gln Trp Asn Ser Thr Ala Leu His Gln Ala Leu Leu Asp Pro Arg
1 5 10 15

Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val
20 25 30

Asn Pro Val Gln Thr Thr Ala Ser Pro Ile Ser Ser Ile Leu Ser Lys
35 40 45

Thr Gly Asp Pro Val Pro Asn Met Glu Asn Ile Ala Ser Gly Phe Leu
50 55 60

```
Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile
65                  70                  75                  80

Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe
                85                  90                  95

Leu Gly Gly Thr Pro Val Cys Leu Gly Gln Asn Ser Gln Ser Pro Thr
            100                 105                 110

Ser Ser His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg
        115                 120                 125

Trp Met Cys Leu Arg Arg Cys Ile Ile Phe Leu Phe Ile Leu Leu Leu
    130                 135                 140

Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro
145                 150                 155                 160

Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys
                165                 170                 175

Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys
            180                 185                 190

Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro
        195                 200                 205

Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg
    210                 215                 220

Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly
225                 230                 235                 240

Leu Ser Pro Thr Val Trp Leu Ser Val Gly Leu Ser Arg Tyr Val Ala
                245                 250                 255

Arg Leu Ser Ser Asn Ser Arg Ile Ile Asn His Gln His Arg Thr Met
            260                 265                 270

Gln Asn Leu His Asn Ser Cys Ser Arg Asn Leu Tyr Val Ser Leu Met
        275                 280                 285

Leu Leu Tyr Lys Thr Tyr Gly Arg Lys Leu His Leu Tyr Ser His Pro
    290                 295                 300

Ile Ile Leu Gly Phe Arg Lys Ile Pro Met Gly Val Gly Leu Ser Pro
305                 310                 315                 320
```

```
Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser Val Val Arg Arg
                325                 330                 335

Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp Asp Val Val Leu
            340                 345                 350

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

Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro His Lys Thr Lys
    370                 375                 380

Arg Trp Gly Tyr Ser Leu Asn Phe Met Gly Tyr Val Ile Gly Ser Trp
385                 390                 395                 400

Gly Thr Leu Pro Gln Glu His Ile Val Gln Lys Ile Lys Met Cys Phe
                405                 410                 415

Arg Lys Leu Pro Val Asn Arg Pro Ile Asp Trp Lys Val Cys Gln Arg
            420                 425                 430

Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr
        435                 440                 445

Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile Gln Ala Lys Gln Ala Phe
    450                 455                 460

Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Ser Lys Gln Glu Phe Gly
465                 470                 475                 480

Ala Ser Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser
                485                 490                 495

Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu
            500                 505                 510

Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg Gln Ala
        515                 520                 525

Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val Gly Ser
    530                 535                 540

Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr Val Asn
545                 550                 555                 560

Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His Ile Ser
                565                 570                 575
```

```
Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe
            580                 585                 590

Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro
        595                 600                 605

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

Ser Pro Arg Arg Arg His Leu Ser Leu Arg Gly Leu Phe Val Cys Ala
625                 630                 635                 640

Phe Ser Ser Ala Gly Pro Asn Ala His Arg Asn Leu Pro Lys Val Leu
                645                 650                 655

His Lys Arg Thr Leu Gly Leu Ser Ala Met Ser Thr Thr Asp Leu Glu
            660                 665                 670

Ala Tyr Phe Lys Asp Cys Leu Phe Lys Asp Trp Glu Glu Leu Gly Glu
        675                 680                 685

Glu
```

<210> 109
<211> 689
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 109

```
Met Gln Trp Asn Ser Thr Ala Leu His Gln Ala Leu Leu Asp Pro Arg
1               5                   10                  15

Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val
            20                  25                  30

Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Leu Ser Lys
        35                  40                  45

Thr Gly Asp Pro Val Pro Asn Met Glu Asn Thr Thr Ser Gly Phe Leu
    50                  55                  60

Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile
65                  70                  75                  80
```

```
Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe
                85                  90                  95

Leu Gly Gly Thr Pro Val Cys Leu Gly Gln Asn Ser Gln Ser Pro Thr
            100                 105                 110

Ser Asn His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg
        115                 120                 125

Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu
    130                 135                 140

Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro
145                 150                 155                 160

Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys
                165                 170                 175

Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys
            180                 185                 190

Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro
        195                 200                 205

Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg
    210                 215                 220

Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly
225                 230                 235                 240

Leu Ser Pro Thr Val Trp Leu Ser Val Gly Leu Ser Arg Tyr Val Ala
                245                 250                 255

Arg Leu Ser Ser Thr Ser Arg Asn Ile Asn Tyr Gln His Gly Thr Met
            260                 265                 270

Gln Asp Leu His Asp Ser Cys Ser Arg Asn Leu Tyr Val Ser Leu Leu
        275                 280                 285

Leu Leu Tyr Lys Thr Phe Gly Arg Lys Leu His Leu Tyr Ser His Pro
    290                 295                 300

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

Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser Val Val Arg Arg
                325                 330                 335
```

```
Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp Asp Val Val Leu
            340                 345                 350

Gly Ala Lys Ser Val Gln His Leu Glu Ser Leu Phe Thr Ser Ile Thr
        355                 360                 365

Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro Asn Lys Thr Lys
    370                 375                 380

Arg Trp Gly Tyr Ser Leu Asn Phe Met Gly Tyr Val Ile Gly Ser Trp
385                 390                 395                 400

Gly Thr Leu Pro Gln Glu His Ile Val Leu Lys Ile Lys Gln Cys Phe
                405                 410                 415

Arg Lys Leu Pro Val Asn Arg Pro Ile Asp Trp Lys Val Cys Gln Arg
            420                 425                 430

Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr
        435                 440                 445

Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile Gln Ser Lys Gln Ala Phe
    450                 455                 460

Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Cys Lys Gln Glu Phe Gly
465                 470                 475                 480

Ala Ser Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser
                485                 490                 495

Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu
            500                 505                 510

Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg Gln Ala
        515                 520                 525

Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val Gly Ser
    530                 535                 540

Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr Val Asn
545                 550                 555                 560

Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His Ile Ser
                565                 570                 575

Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe
```

580 585 590

Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro
595 600 605

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

Ser Pro Arg Arg Arg His Leu Ser Leu Arg Gly Leu Phe Val Cys Ala
625 630 635 640

Phe Ser Ser Ala Gly Pro Asn Ala His Gln Val Leu Pro Lys Val Leu
645 650 655

His Lys Arg Thr Leu Gly Leu Ser Ala Met Ser Thr Thr Asp Leu Glu
660 665 670

Ala Tyr Phe Lys Asp Cys Leu Phe Lys Asp Trp Glu Glu Leu Gly Glu
675 680 685

Glu

<210> 110
<211> 689
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 110

Met Gln Trp Asn Ser Thr Ala Leu His Gln Ala Leu Leu Asp Pro Arg
1 5 10 15

Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val
20 25 30

Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Leu Ser Lys
35 40 45

Thr Gly Asp Pro Val Pro Asn Met Glu Asn Thr Thr Ser Gly Phe Leu
50 55 60

Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile
65 70 75 80

Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe
85 90 95

```
Leu Gly Gly Thr Pro Val Cys Leu Gly Gln Asn Ser Gln Ser Pro Thr
            100                 105                 110

Ser Asn His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg
        115                 120                 125

Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu
    130                 135                 140

Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro
145                 150                 155                 160

Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys
                165                 170                 175

Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys
            180                 185                 190

Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro
        195                 200                 205

Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg
    210                 215                 220

Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly
225                 230                 235                 240

Leu Ser Pro Thr Val Trp Leu Ser Val Gly Leu Ser Arg Tyr Val Ala
                245                 250                 255

Arg Leu Ser Ser Asn Ser Arg Ile Phe Asn His Gln His Gly Thr Met
            260                 265                 270

Gln Asn Leu His Asp Ser Cys Ser Arg Asn Leu Tyr Val Ser Leu Leu
        275                 280                 285

Leu Leu Tyr Gln Thr Phe Gly Arg Lys Leu His Leu Tyr Ser His Pro
    290                 295                 300

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

Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser Val Val Arg Arg
                325                 330                 335

Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp Asp Val Val Leu
```

```
            340                 345                 350

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

Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro Asn Lys Thr Lys
    370                 375                 380

Arg Trp Gly Tyr Ser Leu His Phe Met Gly Tyr Val Ile Gly Cys Tyr
385                 390                 395                 400

Gly Ser Leu Pro Gln Asp His Ile Ile Gln Lys Ile Lys Glu Cys Phe
                405                 410                 415

Arg Lys Leu Pro Val Asn Arg Pro Ile Asp Trp Lys Val Cys Gln Arg
            420                 425                 430

Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr
        435                 440                 445

Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile Gln Ser Lys Gln Ala Phe
    450                 455                 460

Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Cys Lys Gln Glu Phe Gly
465                 470                 475                 480

Ala Ser Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser
                485                 490                 495

Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu
            500                 505                 510

Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg Gln Ala
        515                 520                 525

Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val Gly Ser
    530                 535                 540

Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr Val Asn
545                 550                 555                 560

Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His Ile Ser
                565                 570                 575

Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe
            580                 585                 590
```

```
Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro
        595                 600                 605

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

Ser Pro Arg Arg Arg His Leu Ser Leu Arg Gly Leu Phe Val Cys Ala
625                 630                 635                 640

Phe Ser Ser Ala Gly Pro Asn Ala His Gln Phe Leu Pro Lys Val Leu
                645                 650                 655

His Lys Arg Thr Leu Gly Leu Ser Ala Met Ser Thr Thr Asp Leu Glu
            660                 665                 670

Ala Tyr Phe Lys Asp Cys Leu Phe Lys Asp Trp Glu Glu Leu Gly Glu
        675                 680                 685

Glu
```

<210> 111
<211> 1808
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<220>
<221> CDS
<222> (37)..(1779)

<400> 111

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gaattcgcca ccatggccga cgaggcacca actagt gga ggt tgg tcc tca aag         54
                                        Gly Gly Trp Ser Ser Lys
                                        1               5

cca agg aaa ggt atg ggt aca aac ttg tct gtt cct aac cca ctt gga        102
Pro Arg Lys Gly Met Gly Thr Asn Leu Ser Val Pro Asn Pro Leu Gly
            10                  15                  20

ttc ttt cca gac cat caa ctt gat cca gca ttt ggt gca aac tct aac        150
Phe Phe Pro Asp His Gln Leu Asp Pro Ala Phe Gly Ala Asn Ser Asn
        25                  30                  35

aat cca gac tgg gat ttc aat cct atc aag gat cac tgg cct gaa gca        198
Asn Pro Asp Trp Asp Phe Asn Pro Ile Lys Asp His Trp Pro Glu Ala
    40                  45                  50

aat caa gtt gga gtg ggg gca ttt ggt cca ggc ttc act cca cca cac        246
Asn Gln Val Gly Val Gly Ala Phe Gly Pro Gly Phe Thr Pro Pro His
55                  60                  65                  70

gga ggg gta ctt gga tgg agt cca cag gct caa ggt att ttg act act        294
```

```
Gly Gly Val Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Thr Thr
                75                  80                  85

gtt cca gct gtc cct cct cct gcg tca acc aat aga caa tct ggt aga        342
Val Pro Ala Val Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg
            90                  95                 100

caa cct aca cca att tca cct cca ctt aga gac tct cat cct cag gca        390
Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala
        105                 110                 115

atg caa tgg aac tca act acc ttc cat caa gct ctg ttg gat cct aga        438
Met Gln Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu Asp Pro Arg
    120                 125                 130

gtt aga ggt ctg tat ttt cca gct ggc gga tca tct agt ggt acc gtg        486
Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val
135                 140                 145                 150

aat cca gta cct act aca gcc tct cca atc agt tcc atc tca agt aga        534
Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Ser Ser Arg
                155                 160                 165

act ggc gac cct gcc cca aat atg gaa aat atc aca tct gga ttt tta        582
Thr Gly Asp Pro Ala Pro Asn Met Glu Asn Ile Thr Ser Gly Phe Leu
            170                 175                 180

ggg cca ttg cta gtc cta caa gct ggg ttt ttc cta ttg act aga atc        630
Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile
        185                 190                 195

ttg acg att cca cag agt tta gac tcc tgg tgg act agc cta aac ttt        678
Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe
    200                 205                 210

ttg ggt ggc tcc cca aca tgt cct ggc caa aac tct cag tct cca aca        726
Leu Gly Gly Ser Pro Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr
215                 220                 225                 230

agt aac cac tct cct act tca tgt cca cca att tgt cct ggt tac aga        774
Ser Asn His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg
                235                 240                 245

tgg atg tgc ctc aga agg ttt atc att ttc ctt ttc ata ttg tta ttg        822
Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu
            250                 255                 260

tgc ctc ata ttc cta ttg gta tta ttg gat tac caa ggg atg ctt cct        870
Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro
        265                 270                 275

gtc tgt cca ttg ctc cct ggt acg agt aca aca tct act ggc cca tgc        918
Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys
    280                 285                 290

aaa aca tgc acc ata cca gcg caa ggt aca agc atg ttt cca tcc tgt        966
Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys
295                 300                 305                 310

tgt tgc aca aaa cca tcc gat ggc aat tgc aca tgc att cca ata cca       1014
Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro
                315                 320                 325
```

```
tct tca tgg gcc ttc gct cgt ttc cta tgg gaa tgg gcc tca gtt aga       1062
Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg
            330                 335                 340

ttt tcc tgg tta tca ttg ttg gtc cca ttt gtg caa tgg ttt gta ggt       1110
Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly
        345                 350                 355

tta tcc cca acc gtc tgg tta tct gta ata tgg atg atg tgg tat tgg       1158
Leu Ser Pro Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp
    360                 365                 370

ggt cca agt tta tac tca atc gtt tca cct ttt atc cct ttg ctg cca       1206
Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro Phe Ile Pro Leu Leu Pro
375                 380                 385                 390

atc ttt ttc tgt ttg tgg gtt tac att gat att gat cct tac aag gag       1254
Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp Ile Asp Pro Tyr Lys Glu
                395                 400                 405

ttt ggt gct act gtt gag tta cta tcc ttt tta cct tct gac ttt ttc       1302
Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe
            410                 415                 420

cct tct gtc aga gat ctt ttg gat act gct tct gct tta tac aga gaa       1350
Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu
        425                 430                 435

gct ttg gaa tca cca gaa cat tgt tca cct cat cat acc gcc tta aga       1398
Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg
    440                 445                 450

caa gca att ctg tgt tgg ggc gaa tta atg aac cta gca aca tgg gtg       1446
Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val
455                 460                 465                 470

ggt tcc aat ttg gaa gat cca gca tcc aga gag tta gtg gtt agc tac       1494
Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr
                475                 480                 485

gtg aat gtc aac atg ggc ttg aaa atc aga cag tta ctt tgg ttc cat       1542
Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His
            490                 495                 500

atc tct tgt ctg aca ttt ggt aga gaa aca gtt ctg gaa tat ctc gtt       1590
Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val
        505                 510                 515

agc ttt gga gta tgg att aga act cca cca gcc tac aga cca cct aat       1638
Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn
    520                 525                 530

gca cca ata ttg tca acc ctc cca gag aca aca gtt gtg agg aga aga       1686
Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg
535                 540                 545                 550

gga aga tct cct cgt cgt aga act cca tct cca aga cga agg aga tca       1734
Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser
                555                 560                 565

caa agt cct aga cga cgt aga tct caa tct aga gag tct caa tgt           1779
Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys
            570                 575                 580
```

caccaccatc accatcatta agcggccgc 1808

<210> 112
<211> 581
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 112

Gly Gly Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser
1 5 10 15

Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
20 25 30

Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Ile Lys
35 40 45

Asp His Trp Pro Glu Ala Asn Gln Val Gly Val Gly Ala Phe Gly Pro
50 55 60

Gly Phe Thr Pro Pro His Gly Gly Val Leu Gly Trp Ser Pro Gln Ala
65 70 75 80

Gln Gly Ile Leu Thr Thr Val Pro Ala Val Pro Pro Pro Ala Ser Thr
85 90 95

Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
100 105 110

Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His Gln
115 120 125

Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly
130 135 140

Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro Ile
145 150 155 160

Ser Ser Ile Ser Ser Arg Thr Gly Asp Pro Ala Pro Asn Met Glu Asn
165 170 175

Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly Phe
180 185 190

Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp

195 200 205

Trp Thr Ser Leu Asn Phe Leu Gly Gly Ser Pro Thr Cys Pro Gly Gln
210 215 220

Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro Pro
225 230 235 240

Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile Phe
245 250 255

Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu Asp
260 265 270

Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser Thr
275 280 285

Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr
290 295 300

Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys
305 310 315 320

Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp
325 330 335

Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro Phe
340 345 350

Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Val Ile
355 360 365

Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro
370 375 380

Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp
385 390 395 400

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

Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala
420 425 430

Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro
435 440 445

```
His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met
    450                 455                 460

Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg
465                 470                 475                 480

Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg
                485                 490                 495

Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr
            500                 505                 510

Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro
        515                 520                 525

Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr
    530                 535                 540

Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser
545                 550                 555                 560

Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser
                565                 570                 575

Arg Glu Ser Gln Cys
            580
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<210> 113
<211> 1808
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<220>
<221> CDS
<222> (37)..(1779)

<400> 113

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gaattcgcca ccatggccga cgaggcacca actagt gga ggt tgg tca agt aaa         54
                                        Gly Gly Trp Ser Ser Lys
                                        1               5

cct agg aaa ggt atg gga act aac cta tcc gtc cct aac cct ctt ggg        102
Pro Arg Lys Gly Met Gly Thr Asn Leu Ser Val Pro Asn Pro Leu Gly
            10                  15                  20

ttt ttc cct gat cac caa cta gat cca gct ttt aag gcc aat agt gaa        150
Phe Phe Pro Asp His Gln Leu Asp Pro Ala Phe Lys Ala Asn Ser Glu
        25                  30                  35

aat cct gat tgg gac ttg aac cca cac aag gat aat tgg cca gag gcg        198
```

```
Asn Pro Asp Trp Asp Leu Asn Pro His Lys Asp Asn Trp Pro Glu Ala
    40                  45                  50

aat cag gta ggc gtt ggg gcc ttt ggc cca ggc ttc acc cca cca cat        246
Asn Gln Val Gly Val Gly Ala Phe Gly Pro Gly Phe Thr Pro Pro His
55                  60                  65                  70

ggc ggc tta ctc ggt tgg tca cca caa gcc caa ggc ata ttg acg act        294
Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Thr Thr
                75                  80                  85

gtg cca gct gct cct cca cca gct agt aca aat aga caa tct ggt aga        342
Val Pro Ala Ala Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg
            90                  95                  100

caa cct aca cca att tct cca cca ctt aga gat tct cat cct caa gca        390
Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala
        105                 110                 115

atg cag tgg aac agc act aca ttc cat caa gcc ctg tta gac cca aga        438
Met Gln Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu Asp Pro Arg
    120                 125                 130

gtt aga ggt ttg tac ttt cct gca ggt ggt tca tct tct gga act gtc        486
Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val
135                 140                 145                 150

aat cct gtt cag aca aca gct tca cca atc tct tcc att tta tcc aga        534
Asn Pro Val Gln Thr Thr Ala Ser Pro Ile Ser Ser Ile Leu Ser Arg
                155                 160                 165

act ggt gac cca gca cca aac atg gaa aac atc gca tca ggt ttt cta        582
Thr Gly Asp Pro Ala Pro Asn Met Glu Asn Ile Ala Ser Gly Phe Leu
            170                 175                 180

gga cca tta ttg gta ctt caa gct ggt ttc ttt ttg tta aca cgt atc        630
Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile
        185                 190                 195

ttg acc att cca caa agc ttg gat tca tgg tgg act tct ctg aat ttc        678
Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe
    200                 205                 210

ctc ggg gga acc cct aca tgt cct ggt caa aat tct caa tcc cca aca        726
Leu Gly Gly Thr Pro Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr
215                 220                 225                 230

agt tca cat tct cct acg tgc tgt cca cca att tgt cct ggt tac aga        774
Ser Ser His Ser Pro Thr Cys Cys Pro Pro Ile Cys Pro Gly Tyr Arg
                235                 240                 245

tgg atg tgc ctc aga agg ttt atc att ttc ctt ttc ata ttg tta ttg        822
Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu
            250                 255                 260

tgc ctc ata ttc cta ttg gta tta ttg gat tac caa ggg atg ctt cct        870
Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro
        265                 270                 275

gtc tgt cca ttg ctc cct ggt acg agt aca aca tct act ggc cca tgc        918
Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys
    280                 285                 290
```

```
aaa aca tgc acc ata cca gcg caa ggt aca agc atg ttt cca tcc tgt        966
Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys
295                 300                 305                 310

tgt tgc aca aaa cca tcc gat ggc aat tgc aca tgc att cca ata cca       1014
Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro
                315                 320                 325

tct tca tgg gcc ttc gct cgt ttc cta tgg gaa tgg gcc tca gtt aga       1062
Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg
            330                 335                 340

ttt tcc tgg tta tca ttg ttg gtc cca ttt gtg caa tgg ttt gta ggt       1110
Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly
        345                 350                 355

tta tcc cca acc gtc tgg tta tct gta ata tgg atg atg tgg tat tgg       1158
Leu Ser Pro Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp
    360                 365                 370

ggt cca agt tta tac tca atc gtt tca cct ttt atc cct ttg ctg cca       1206
Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro Phe Ile Pro Leu Leu Pro
375                 380                 385                 390

atc ttt ttc tgt ttg tgg gtt tac att gat att gat cct tac aag gag       1254
Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp Ile Asp Pro Tyr Lys Glu
                395                 400                 405

ttt ggt gct act gtt gag tta cta tcc ttt tta cct tct gac ttt ttc       1302
Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe
            410                 415                 420

cct tct gtc aga gat ctt ttg gat act gct tct gct tta tac aga gaa       1350
Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu
        425                 430                 435

gct ttg gaa tca cca gaa cat tgt tca cct cat cat acc gcc tta aga       1398
Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg
    440                 445                 450

caa gca att ctg tgt tgg ggc gaa tta atg aac cta gca aca tgg gtg       1446
Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val
455                 460                 465                 470

ggt tcc aat ttg gaa gat cca gca tcc aga gag tta gtg gtt agc tac       1494
Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr
                475                 480                 485

gtg aat gtc aac atg ggc ttg aaa atc aga cag tta ctt tgg ttc cat       1542
Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His
            490                 495                 500

atc tct tgt ctg aca ttt ggt aga gaa aca gtt ctg gaa tat ctc gtt       1590
Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val
        505                 510                 515

agc ttt gga gta tgg att aga act cca cca gcc tac aga cca cct aat       1638
Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn
    520                 525                 530

gca cca ata ttg tca acc ctc cca gag aca aca gtt gtg agg aga aga       1686
Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg
535                 540                 545                 550
```

```
gga aga tct cct cgt cgt aga act cca tct cca aga cga agg aga tca       1734
Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser
                555                 560                 565

caa agt cct aga cga cgt aga tct caa tct aga gag tct caa tgt           1779
Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys
            570                 575                 580

caccaccatc accatcatta agcggccgc                                      1808
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<210> 114
<211> 581
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 114

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Gly Gly Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser
1               5                   10                  15

Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
            20                  25                  30

Phe Lys Ala Asn Ser Glu Asn Pro Asp Trp Asp Leu Asn Pro His Lys
        35                  40                  45

Asp Asn Trp Pro Glu Ala Asn Gln Val Gly Val Gly Ala Phe Gly Pro
    50                  55                  60

Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala
65                  70                  75                  80

Gln Gly Ile Leu Thr Thr Val Pro Ala Ala Pro Pro Pro Ala Ser Thr
                85                  90                  95

Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
            100                 105                 110

Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His Gln
        115                 120                 125

Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly
    130                 135                 140

Ser Ser Ser Gly Thr Val Asn Pro Val Gln Thr Thr Ala Ser Pro Ile
145                 150                 155                 160

Ser Ser Ile Leu Ser Arg Thr Gly Asp Pro Ala Pro Asn Met Glu Asn
```

```
                165                 170                 175

Ile Ala Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly Phe
            180                 185                 190

Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp
        195                 200                 205

Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr Pro Thr Cys Pro Gly Gln
    210                 215                 220

Asn Ser Gln Ser Pro Thr Ser Ser His Ser Pro Thr Cys Cys Pro Pro
225                 230                 235                 240

Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile Phe
                245                 250                 255

Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu Asp
            260                 265                 270

Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser Thr
        275                 280                 285

Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr
    290                 295                 300

Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys
305                 310                 315                 320

Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp
                325                 330                 335

Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro Phe
            340                 345                 350

Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Val Ile
        355                 360                 365

Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro
    370                 375                 380

Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp
385                 390                 395                 400

Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu Ser Phe
                405                 410                 415
```

```
Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala
            420                 425                 430

Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro
        435                 440                 445

His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met
    450                 455                 460

Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg
465                 470                 475                 480

Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg
                485                 490                 495

Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr
            500                 505                 510

Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro
        515                 520                 525

Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr
    530                 535                 540

Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser
545                 550                 555                 560

Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser
                565                 570                 575

Arg Glu Ser Gln Cys
            580
```

<210> 115
<211> 1808
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<220>
<221> CDS
<222> (37)..(1779)

<400> 115

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gaattcgcca ccatggccga cgaggcacca actagt ggt ggc tgg tct agt aaa         54
                                        Gly Gly Trp Ser Ser Lys
                                        1               5

cct aga aag ggt atg gga aca aac tta tca gtt cct aac cca ctg gga        102
```

```
Pro Arg Lys Gly Met Gly Thr Asn Leu Ser Val Pro Asn Pro Leu Gly
            10                  15                  20

ttt ttc cca gat cac caa ttg gat cca gct ttt ggt gca aat agt aac        150
Phe Phe Pro Asp His Gln Leu Asp Pro Ala Phe Gly Ala Asn Ser Asn
        25                  30                  35

aat cca gat tgg gac ttt aat cct aac aaa gat cat tgg cca gaa gca        198
Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys Asp His Trp Pro Glu Ala
    40                  45                  50

aat cag gtg gga gtc gga gct ttc ggt cca ggc ttt acc cct cca cat        246
Asn Gln Val Gly Val Gly Ala Phe Gly Pro Gly Phe Thr Pro Pro His
55                  60                  65                  70

ggt ggg ttg tta ggc tgg tcc cca caa gca cag ggg att ttg act act        294
Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Thr Thr
                75                  80                  85

gtt cct gcc gct cct cct cct gcc tcc aca aat aga caa agt ggt agg        342
Val Pro Ala Ala Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg
            90                  95                  100

caa cca acc cca att tca cct cca ctt aga gat tct cat cca cag gca        390
Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala
        105                 110                 115

atg caa tgg aac tcc act act ttt cac caa gca tta ctt gat cca aga        438
Met Gln Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu Asp Pro Arg
    120                 125                 130

gta cgt ggt cta tac ttc cca gct ggg ggt tcc tct tca ggt aca gtt        486
Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val
135                 140                 145                 150

aac cca gta cct aca aca gcc tct cca atc tca agc atc ttt tct aga        534
Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Phe Ser Arg
                155                 160                 165

aca ggt gat cca gct cct aat atg gag aat acg act tct ggt ttc ctc        582
Thr Gly Asp Pro Ala Pro Asn Met Glu Asn Thr Thr Ser Gly Phe Leu
            170                 175                 180

ggc cca ctg tta gtc ttg caa gct ggc ttt ttc cta ttg acc aga ata        630
Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile
        185                 190                 195

ctt act atc cca caa tca cta gac agc tgg tgg aca tct ctc aac ttt        678
Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe
    200                 205                 210

ttg gga gga gcg cca aca tgt cca ggc caa aat tca caa tct cct aca        726
Leu Gly Gly Ala Pro Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr
215                 220                 225                 230

tca aat cat tct cct aca agt tgt cca cca att tgt cct ggt tac aga        774
Ser Asn His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg
                235                 240                 245

tgg atg tgc ctc aga agg ttt atc att ttc ctt ttc ata ttg tta ttg        822
Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu
            250                 255                 260
```

```
tgc ctc ata ttc cta ttg gta tta ttg gat tac caa ggg atg ctt cct        870
Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro
        265                 270                 275

gtc tgt cca ttg ctc cct ggt acg agt aca aca tct act ggc cca tgc        918
Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys
    280                 285                 290

aaa aca tgc acc ata cca gcg caa ggt aca agc atg ttt cca tcc tgt        966
Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys
295                 300                 305                 310

tgt tgc aca aaa cca tcc gat ggc aat tgc aca tgc att cca ata cca       1014
Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro
                315                 320                 325

tct tca tgg gcc ttc gct cgt ttc cta tgg gaa tgg gcc tca gtt aga       1062
Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg
            330                 335                 340

ttt tcc tgg tta tca ttg ttg gtc cca ttt gtg caa tgg ttt gta ggt       1110
Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly
        345                 350                 355

tta tcc cca acc gtc tgg tta tct gta ata tgg atg atg tgg tat tgg       1158
Leu Ser Pro Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp
    360                 365                 370

ggt cca agt tta tac tca atc gtt tca cct ttt atc cct ttg ctg cca       1206
Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro Phe Ile Pro Leu Leu Pro
375                 380                 385                 390

atc ttt ttc tgt ttg tgg gtt tac att gat att gat cct tac aag gag       1254
Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp Ile Asp Pro Tyr Lys Glu
                395                 400                 405

ttt ggt gct act gtt gag tta cta tcc ttt tta cct tct gac ttt ttc       1302
Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe
            410                 415                 420

cct tct gtc aga gat ctt ttg gat act gct tct gct tta tac aga gaa       1350
Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu
        425                 430                 435

gct ttg gaa tca cca gaa cat tgt tca cct cat cat acc gcc tta aga       1398
Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg
    440                 445                 450

caa gca att ctg tgt tgg ggc gaa tta atg aac cta gca aca tgg gtg       1446
Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val
455                 460                 465                 470

ggt tcc aat ttg gaa gat cca gca tcc aga gag tta gtg gtt agc tac       1494
Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr
                475                 480                 485

gtg aat gtc aac atg ggc ttg aaa atc aga cag tta ctt tgg ttc cat       1542
Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His
            490                 495                 500

atc tct tgt ctg aca ttt ggt aga gaa aca gtt ctg gaa tat ctc gtt       1590
Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val
        505                 510                 515
```

```
agc ttt gga gta tgg att aga act cca cca gcc tac aga cca cct aat       1638
Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn
    520                 525                 530

gca cca ata ttg tca acc ctc cca gag aca aca gtt gtg agg aga aga       1686
Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg
535                 540                 545                 550

gga aga tct cct cgt cgt aga act cca tct cca aga cga agg aga tca       1734
Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser
                555                 560                 565

caa agt cct aga cga cgt aga tct caa tct aga gag tct caa tgt           1779
Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys
            570                 575                 580

caccaccatc accatcatta agcggccgc                                      1808
```

<210> 116
<211> 581
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 116

```
Gly Gly Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser
1               5                   10                  15

Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
            20                  25                  30

Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys
        35                  40                  45

Asp His Trp Pro Glu Ala Asn Gln Val Gly Val Gly Ala Phe Gly Pro
    50                  55                  60

Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala
65                  70                  75                  80

Gln Gly Ile Leu Thr Thr Val Pro Ala Ala Pro Pro Pro Ala Ser Thr
                85                  90                  95

Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
            100                 105                 110

Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His Gln
        115                 120                 125

Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly
```

```
    130                 135                 140

Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro Ile
145                 150                 155                 160

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

Thr Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly Phe
            180                 185                 190

Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp
        195                 200                 205

Trp Thr Ser Leu Asn Phe Leu Gly Gly Ala Pro Thr Cys Pro Gly Gln
    210                 215                 220

Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro Pro
225                 230                 235                 240

Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile Phe
                245                 250                 255

Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu Asp
            260                 265                 270

Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser Thr
        275                 280                 285

Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr
    290                 295                 300

Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys
305                 310                 315                 320

Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp
                325                 330                 335

Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro Phe
            340                 345                 350

Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Val Ile
        355                 360                 365

Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro
    370                 375                 380
```

Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp
385 390 395 400

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

Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala
420 425 430

Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro
435 440 445

His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met
450 455 460

Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg
465 470 475 480

Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg
485 490 495

Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr
500 505 510

Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro
515 520 525

Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr
530 535 540

Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser
545 550 555 560

Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser
565 570 575

Arg Glu Ser Gln Cys
580

<210> 117
<211> 1808
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<220>
<221> CDS

<222> (37)..(1779)

<400> 117

```
gaattcgcca ccatggctga tgaagctcca actagt gga caa tgg tcc tca aag          54
                                        Gly Gln Trp Ser Ser Lys
                                        1               5

cca agg aaa ggt atg ggt aca aac ttg agt gtt tca aac cca ctt ggc         102
Pro Arg Lys Gly Met Gly Thr Asn Leu Ser Val Ser Asn Pro Leu Gly
            10                  15                  20

ttt ttc cca gac cat caa ctt gat cca gca ttc aga gca aac tct gcc         150
Phe Phe Pro Asp His Gln Leu Asp Pro Ala Phe Arg Ala Asn Ser Ala
        25                  30                  35

aac cca gac tgg gat ttc aat cca aac aaa gat acc tgg cct gaa gca         198
Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys Asp Thr Trp Pro Glu Ala
    40                  45                  50

aat caa gtt gga gtg ggg gca ttt ggt ttg ggc ttc act cca cca cac         246
Asn Gln Val Gly Val Gly Ala Phe Gly Leu Gly Phe Thr Pro Pro His
55                  60                  65                  70

gga ggg ttg ctt gga tgg agt cca cag gct caa ggc att ttg caa act         294
Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Gln Thr
                75                  80                  85

gtt cca gct aat cct cct cct gct tca acc aat aga caa tct ggt aga         342
Val Pro Ala Asn Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg
            90                  95                  100

caa cct aca cca att tca cct cca ctt aga gac tct cat cct cag gca         390
Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala
        105                 110                 115

atg caa tgg aac tca act acc ttc cat caa gct ctg ttg gat cct aga         438
Met Gln Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu Asp Pro Arg
    120                 125                 130

gtt aga ggt ctg tat ttc cca gct ggc gga tca tct agt ggt acc gtg         486
Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val
135                 140                 145                 150

aat cca gta cct act aca gcc tct cca atc agt tcc atc ttt agt aga         534
Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Phe Ser Arg
                155                 160                 165

act ggc gac cct gcc ttg aat atg gag aac atc aca tct gga ttc ctg         582
Thr Gly Asp Pro Ala Leu Asn Met Glu Asn Ile Thr Ser Gly Phe Leu
            170                 175                 180

ggg cca ttg cta gtc cta caa gct ggg ttt ttc cta ttg act aga atc         630
Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile
        185                 190                 195

ttg aca att cca cag agt tta gac tcc tgg tgg acc agt cta aac ttt         678
Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe
    200                 205                 210

ttg ggt ggc aca aca aca tgt cct ggc caa aac tct cag tct cca aca         726
Leu Gly Gly Thr Thr Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr
215                 220                 225                 230
```

```
agt aac cac tct cct act tca tgt cca cca att tgt cct ggt tac aga        774
Ser Asn His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg
               235                 240                 245

tgg atg tgc ctc aga agg ttt atc att ttc ctt ttc ata ttg tta ttg        822
Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu
           250                 255                 260

tgc ctc ata ttc cta ttg gta tta ttg gat tac caa ggg atg ctt cct        870
Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro
       265                 270                 275

gtc tgt cca ttg ctc cct ggt acg agt aca aca tct act ggc cca tgc        918
Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys
   280                 285                 290

aaa aca tgc acc ata cca gcg caa ggt aca agc atg ttt cca tcc tgt        966
Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys
295                 300                 305                 310

tgt tgc aca aaa cca tcc gat ggc aat tgc aca tgc att cca ata cca       1014
Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro
               315                 320                 325

tct tca tgg gcc ttc gct cgt ttc cta tgg gaa tgg gcc tca gtt aga       1062
Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg
           330                 335                 340

ttt tcc tgg tta tca ttg ttg gtc cca ttt gtg caa tgg ttt gta ggt       1110
Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly
       345                 350                 355

tta tcc cca acc gtc tgg tta tct gta ata tgg atg atg tgg tat tgg       1158
Leu Ser Pro Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp
   360                 365                 370

ggt cca agt tta tac tca atc gtt tca cct ttt atc cct ttg ctg cca       1206
Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro Phe Ile Pro Leu Leu Pro
375                 380                 385                 390

atc ttt ttc tgt ttg tgg gtt tac att gat att gat cct tac aag gag       1254
Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp Ile Asp Pro Tyr Lys Glu
               395                 400                 405

ttt ggt gct act gtt gag tta cta tcc ttt tta cct tct gac ttt ttc       1302
Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe
           410                 415                 420

cct tct gtc aga gat ctt ttg gat act gct tct gct tta tac aga gaa       1350
Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu
       425                 430                 435

gct ttg gaa tca cca gaa cat tgt tca cct cat cat acc gcc tta aga       1398
Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg
   440                 445                 450

caa gca att ctg tgt tgg ggc gaa tta atg aac cta gca aca tgg gtg       1446
Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val
455                 460                 465                 470

ggt tcc aat ttg gaa gat cca gca tcc aga gag tta gtg gtt agc tac       1494
Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr
               475                 480                 485
```

```
gtg aat gtc aac atg ggc ttg aaa atc aga cag tta ctt tgg ttc cat       1542
Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His
            490                 495                 500

atc tct tgt ctg aca ttt ggt aga gaa aca gtt ctg gaa tat ctc gtt       1590
Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val
        505                 510                 515

agc ttt gga gta tgg att aga act cca cca gcc tac aga cca cct aat       1638
Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn
    520                 525                 530

gca cca ata ttg tca acc ctc cca gag aca aca gtt gtg agg aga aga       1686
Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg
535                 540                 545                 550

gga aga tct cct cgt cgt aga act cca tct cca aga cga agg aga tca       1734
Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser
                555                 560                 565

caa agt cct aga cga cgt aga tct caa tct aga gag tct caa tgt           1779
Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys
            570                 575                 580

caccaccatc accatcatta agcggccgc                                      1808
```

<210> 118
<211> 581
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 118

```
Gly Gln Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser
1               5                   10                  15

Val Ser Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
            20                  25                  30

Phe Arg Ala Asn Ser Ala Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys
        35                  40                  45

Asp Thr Trp Pro Glu Ala Asn Gln Val Gly Val Gly Ala Phe Gly Leu
    50                  55                  60

Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala
65                  70                  75                  80

Gln Gly Ile Leu Gln Thr Val Pro Ala Asn Pro Pro Pro Ala Ser Thr
                85                  90                  95

Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
```

```
            100                 105                 110

Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His Gln
        115                 120                 125

Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly
    130                 135                 140

Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro Ile
145                 150                 155                 160

Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro Ala Leu Asn Met Glu Asn
                165                 170                 175

Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly Phe
            180                 185                 190

Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp
        195                 200                 205

Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr Thr Thr Cys Pro Gly Gln
    210                 215                 220

Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro Pro
225                 230                 235                 240

Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile Phe
                245                 250                 255

Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu Asp
            260                 265                 270

Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser Thr
        275                 280                 285

Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr
    290                 295                 300

Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys
305                 310                 315                 320

Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp
                325                 330                 335

Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro Phe
            340                 345                 350
```

```
Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Val Ile
        355                 360                 365

Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro
    370                 375                 380

Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp
385                 390                 395                 400

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

Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala
            420                 425                 430

Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro
        435                 440                 445

His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met
    450                 455                 460

Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg
465                 470                 475                 480

Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg
                485                 490                 495

Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr
            500                 505                 510

Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro
        515                 520                 525

Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr
    530                 535                 540

Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser
545                 550                 555                 560

Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser
                565                 570                 575

Arg Glu Ser Gln Cys
            580
```

<210> 119
<211> 2492
<212> DNA

<213> Artificial

<220>
<223> Synthetic Construct

<220>
<221> CDS
<222> (37)..(2463)

<400> 119

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gaattcgcca ccatggctga tgaagctcct actagt ggt cag tgg tcc tcc aaa          54
                                        Gly Gln Trp Ser Ser Lys
                                        1               5

cct aga aag ggt atg ggt act aat ttg tct gta tct aac cct ctc gga         102
Pro Arg Lys Gly Met Gly Thr Asn Leu Ser Val Ser Asn Pro Leu Gly
            10                  15                  20

ttc ttt cca gat cac cag tta gat cca gct ttt cgt gct aac agt gcc         150
Phe Phe Pro Asp His Gln Leu Asp Pro Ala Phe Arg Ala Asn Ser Ala
        25                  30                  35

aac cca gat tgg gat ttc aat cct aat aag gat acc tgg cca gag gct         198
Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys Asp Thr Trp Pro Glu Ala
    40                  45                  50

aac cag gta gga gtt gga gcc ttc ggt cta ggt ttt acc cca cct cac         246
Asn Gln Val Gly Val Gly Ala Phe Gly Leu Gly Phe Thr Pro Pro His
55                  60                  65                  70

ggt gga cta tta ggc tgg agc cca caa gca caa ggt atc ttg caa acc         294
Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Gln Thr
                75                  80                  85

gtt cca gct aac cct cca cca gcg tca aca aat aga cag tct ggt aga         342
Val Pro Ala Asn Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg
            90                  95                  100

caa cca acc cct att tct cct cct tta aga gac tct cat cct cag gcg         390
Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala
        105                 110                 115

atg caa tgg aac tca acg acc ttt cat caa gct ctt ttg gac cct aga         438
Met Gln Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu Asp Pro Arg
    120                 125                 130

gtc agg ggt tta tac ttc cca gct ggt gga tcc tca tcc ggc act gtt         486
Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val
135                 140                 145                 150

aat cct gtc cca act aca gca tca cca att tca tcc ata ttt tct aga         534
Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Phe Ser Arg
                155                 160                 165

act ggg gat cct gct ctt aat atg gaa aac att aca agc ggc ttc cta         582
Thr Gly Asp Pro Ala Leu Asn Met Glu Asn Ile Thr Ser Gly Phe Leu
            170                 175                 180

gga cca tta tta gtt cta caa gcc gga ttt ttc cta ttg act aga atc         630
Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile
        185                 190                 195
```

```
cta act att cct caa agt ctt gac tcc tgg tgg aca tcc ttg aat ttc        678
Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe
    200                 205                 210

ctt ggc ggt aca aca aca tgt cca ggc caa aac tct caa tca cca act        726
Leu Gly Gly Thr Thr Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr
215                 220                 225                 230

tct aat cac tct cca aca tct tgc cct cca att tgc cca ggt tac aga        774
Ser Asn His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg
                235                 240                 245

tgg atg tgc ttg aga agg ttc atc att ttt ctg ttc atc ctc ttg ttg        822
Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu
            250                 255                 260

tgt ttg att ttc ctc tta gta ttg ctg gac tac caa ggc atg ctt cca        870
Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro
        265                 270                 275

gtc tgc cct cta ttg cca gga act tct aca acc tca aca gga cca tgt        918
Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys
    280                 285                 290

aaa aca tgt act atc cct gct caa gga aca tca atg ttt cca tct tgt        966
Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys
295                 300                 305                 310

tgc tgt aca aaa cca tca gat ggt aat tgt act tgt ata cca ata cca       1014
Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro
                315                 320                 325

agt tca tgg gca ttt gcc cgt ttc ctt tgg gag tgg gct tct gta aga       1062
Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg
            330                 335                 340

ttc tct tgg tta agt ttg cta gtc cca ttc gtg cag tgg ttt gtt ggc       1110
Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly
        345                 350                 355

ctg tct cca act gtt tgg tta tct gtt att tgg atg atg tgg tac tgg       1158
Leu Ser Pro Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp
    360                 365                 370

ggt cca agc cta tac tca atc gtg tca cct ttt atc cca ttg cta cct       1206
Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro Phe Ile Pro Leu Leu Pro
375                 380                 385                 390

atc ttt ttc tgc ctc tgg gtt tac atc gat att gac cct tac aag gaa       1254
Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp Ile Asp Pro Tyr Lys Glu
                395                 400                 405

ttt ggc gca aca gtt gaa ttg tta tca ttt tta cca tca gat ttc ttt       1302
Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe
            410                 415                 420

cca tca gtg cgt gat ttg tta gat acg gca tcc gct ttg tac aga gaa       1350
Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu
        425                 430                 435

gca ctg gaa tca cca gaa cac tgt tct cca cat cac act gct ctc aga       1398
Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg
    440                 445                 450
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caa gct ata ttg tgt tgg gga gag ttg atg aat cta gcc act tgg gta       1446
Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val
455                 460                 465                 470

ggg tcc aat ctg gaa gat cct gcc tct aga gaa ctg gtg gta tct tac       1494
Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr
                475                 480                 485

gtc aat gtt aac atg ggg ttg aag att aga caa ctt tta tgg ttc cat       1542
Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His
            490                 495                 500

att tca tgt tta acg ttt ggt aga gaa aca gta ctg gaa tac tta gtt       1590
Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val
        505                 510                 515

agt ttc ggt gtc tgg att aga aca cca cca gca tat aga cca cca aat       1638
Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn
    520                 525                 530

gcg cct ata ttg agt acg ctc cca gaa acg acg gtc gtt agg aga aga       1686
Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg
535                 540                 545                 550

ggt aga tca cct agg aga agg aca cct tca cct aga cgt aga cgt tct       1734
Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser
                555                 560                 565

caa tct cca aga cgt aga aga tct caa tct aga gaa tca caa tgc ggt       1782
Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys Gly
            570                 575                 580

cta tct aga tat gtc gcc cga cta tca tct aat tct cgt atc ttt aac       1830
Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Asn Ser Arg Ile Phe Asn
        585                 590                 595

cat caa cac ggc acc atg caa aat ctg cat gac tcc tgt agt aga aat       1878
His Gln His Gly Thr Met Gln Asn Leu His Asp Ser Cys Ser Arg Asn
    600                 605                 610

ctt tat gtg agt ctc ttg ctt ttg tac caa act ttc ggc aga aaa ttg       1926
Leu Tyr Val Ser Leu Leu Leu Leu Tyr Gln Thr Phe Gly Arg Lys Leu
615                 620                 625                 630

cac ctt tac tct cat cca att ata cta ggt ttt aga aaa atc cca atg       1974
His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro Met
                635                 640                 645

ggg gtg ggt tta tct cca ttt ttg ctt gcg caa ttc aca agt gca atc       2022
Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile
            650                 655                 660

tgt tct gtg gtt agg aga gct ttt cct cat tgc ctc gca ttt tca tac       2070
Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser Tyr
        665                 670                 675

atg gat gat gtt gtc tta ggt gcc aaa agt gta caa cat ttg gag agt       2118
Met Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu Glu Ser
    680                 685                 690

ttg ttt aca gcc gta act aac ttt ctc ttg tca tta ggg atc cat ttg       2166
Leu Phe Thr Ala Val Thr Asn Phe Leu Leu Ser Leu Gly Ile His Leu
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695 700 705 710

aac cct aac aaa aca aaa aga tgg ggg tac tct cta cat ttt atg ggt 2214
Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu His Phe Met Gly
715 720 725

tat gtt ata ggc tgc tat gga tcc tta cct caa gac cat atc att cag 2262
Tyr Val Ile Gly Cys Tyr Gly Ser Leu Pro Gln Asp His Ile Ile Gln
730 735 740

aaa atc aaa gag tgc ttt aga aag ttg cct gtt aat aga cca atc gac 2310
Lys Ile Lys Glu Cys Phe Arg Lys Leu Pro Val Asn Arg Pro Ile Asp
745 750 755

tgg aag gtt tgt caa agg atc gtt ggt tta ctt ggt ttt gca gca cca 2358
Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu Gly Phe Ala Ala Pro
760 765 770

ttc acc caa tgt ggc tac cct gct ctg atg cct tta tat gct tgt ata 2406
Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile
775 780 785 790

caa tct aag caa gct ttt aca ttc tct cca acg tac aag gcc ttt tta 2454
Gln Ser Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu
795 800 805

tgc aaa caa catcaccatc accatcacta agcggccgc 2492
Cys Lys Gln

<210> 120
<211> 809
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 120

Gly Gln Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser
1 5 10 15

Val Ser Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
20 25 30

Phe Arg Ala Asn Ser Ala Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys
35 40 45

Asp Thr Trp Pro Glu Ala Asn Gln Val Gly Val Gly Ala Phe Gly Leu
50 55 60

Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala
65 70 75 80

Gln Gly Ile Leu Gln Thr Val Pro Ala Asn Pro Pro Pro Ala Ser Thr
85 90 95

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Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
            100                 105                 110

Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His Gln
        115                 120                 125

Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly
    130                 135                 140

Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro Ile
145                 150                 155                 160

Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro Ala Leu Asn Met Glu Asn
                165                 170                 175

Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly Phe
            180                 185                 190

Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp
        195                 200                 205

Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr Thr Thr Cys Pro Gly Gln
    210                 215                 220

Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro Pro
225                 230                 235                 240

Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile Phe
                245                 250                 255

Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu Asp
            260                 265                 270

Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser Thr
        275                 280                 285

Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr
    290                 295                 300

Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys
305                 310                 315                 320

Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp
                325                 330                 335

Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro Phe
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            340                 345                 350

Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Val Ile
        355                 360                 365

Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro
    370                 375                 380

Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp
385                 390                 395                 400

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

Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala
            420                 425                 430

Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro
        435                 440                 445

His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met
    450                 455                 460

Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg
465                 470                 475                 480

Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg
                485                 490                 495

Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr
            500                 505                 510

Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro
        515                 520                 525

Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr
    530                 535                 540

Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser
545                 550                 555                 560

Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser
                565                 570                 575

Arg Glu Ser Gln Cys Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser
            580                 585                 590
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Asn Ser Arg Ile Phe Asn His Gln His Gly Thr Met Gln Asn Leu His
        595                 600                 605

Asp Ser Cys Ser Arg Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Gln
    610                 615                 620

Thr Phe Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly
625                 630                 635                 640

Phe Arg Lys Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala
                645                 650                 655

Gln Phe Thr Ser Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro His
            660                 665                 670

Cys Leu Ala Phe Ser Tyr Met Asp Asp Val Val Leu Gly Ala Lys Ser
        675                 680                 685

Val Gln His Leu Glu Ser Leu Phe Thr Ala Val Thr Asn Phe Leu Leu
    690                 695                 700

Ser Leu Gly Ile His Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr
705                 710                 715                 720

Ser Leu His Phe Met Gly Tyr Val Ile Gly Cys Tyr Gly Ser Leu Pro
                725                 730                 735

Gln Asp His Ile Ile Gln Lys Ile Lys Glu Cys Phe Arg Lys Leu Pro
            740                 745                 750

Val Asn Arg Pro Ile Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu
        755                 760                 765

Leu Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met
    770                 775                 780

Pro Leu Tyr Ala Cys Ile Gln Ser Lys Gln Ala Phe Thr Phe Ser Pro
785                 790                 795                 800

Thr Tyr Lys Ala Phe Leu Cys Lys Gln
                805
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<210> 121
<211> 1988
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<220>
<221> CDS
<222> (37)..(1959)

<400> 121
gaattcgcca ccatggccga tgaggcacct actagt ggt cag tgg tcc tcc aaa 54
Gly Gln Trp Ser Ser Lys
1 5

cct aga aag ggt atg ggt act aat ttg tct gta tct aac cct ctc gga 102
Pro Arg Lys Gly Met Gly Thr Asn Leu Ser Val Ser Asn Pro Leu Gly
10 15 20

ttc ttt cca gat cac cag tta gat cca gct ttt cgt gct aac agt gcc 150
Phe Phe Pro Asp His Gln Leu Asp Pro Ala Phe Arg Ala Asn Ser Ala
25 30 35

aac cca gat tgg gat ttc aat cct aat aag gat acc tgg cca gag gct 198
Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys Asp Thr Trp Pro Glu Ala
40 45 50

aac cag gta gga gtt gga gcc ttc ggt cta ggt ttt acc cca cct cac 246
Asn Gln Val Gly Val Gly Ala Phe Gly Leu Gly Phe Thr Pro Pro His
55 60 65 70

ggt gga cta tta ggc tgg agc cca caa gca caa ggt atc ttg caa acc 294
Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Gln Thr
75 80 85

gtt cca gct aac cct cca cca gcg tca aca aat aga cag tct ggt aga 342
Val Pro Ala Asn Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg
90 95 100

caa cca acc cct att tct cct cct tta aga gac tct cat cct cag gcg 390
Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala
105 110 115

atg caa tgg aac tca acg acc ttt cat caa gct ctt ttg gac cct aga 438
Met Gln Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu Asp Pro Arg
120 125 130

gtc agg ggt tta tac ttc cca gct ggt gga tcc tca tcc ggc act gtt 486
Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val
135 140 145 150

aat cct gtc cca act aca gca tca cca att tca tcc ata ttt tct aga 534
Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Phe Ser Arg
155 160 165

act ggg gat cct gct ctt aat atg gaa aac att aca agc ggc ttc cta 582
Thr Gly Asp Pro Ala Leu Asn Met Glu Asn Ile Thr Ser Gly Phe Leu
170 175 180

gga cca tta tta gtt cta caa gcc gga ttt ttc cta ttg act aga atc 630
Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile
185 190 195

cta act att cct caa agt ctt gac tcc tgg tgg aca tcc ttg aat ttc 678
Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe
200 205 210

```
ctt ggc ggt aca aca aca tgt cca ggc caa aac tct caa tca cca act        726
Leu Gly Gly Thr Thr Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr
215                 220                 225                 230

tct aat cac tct cca aca tct tgc cct cca att tgc cca ggt tac aga        774
Ser Asn His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg
                235                 240                 245

tgg atg tgc ttg aga agg ttc atc att ttt ctg ttc atc ctc ttg ttg        822
Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu
            250                 255                 260

tgt ttg att ttc ctc tta gta ttg ctg gac tac caa ggc atg ctt cca        870
Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro
        265                 270                 275

gtc tgc cct cta ttg cca gga act tct aca acc tca aca gga cca tgt        918
Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys
    280                 285                 290

aaa aca tgt act atc cct gct caa gga aca tca atg ttt cca tct tgt        966
Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys
295                 300                 305                 310

tgc tgt aca aaa cca tca gat ggt aat tgt act tgt ata cca ata cca       1014
Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro
                315                 320                 325

agt tca tgg gca ttt gcc cgt ttc ctt tgg gag tgg gct tct gta aga       1062
Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg
            330                 335                 340

ttc tct tgg tta agt ttg cta gtc cca ttc gtg cag tgg ttt gtt ggc       1110
Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly
        345                 350                 355

ctg tct cca act gtt tgg tta tct gtt att tgg atg atg tgg tac tgg       1158
Leu Ser Pro Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp
    360                 365                 370

ggt cca agc cta tac tca atc gtg tca cct ttt atc cca ttg cta cct       1206
Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro Phe Ile Pro Leu Leu Pro
375                 380                 385                 390

atc ttt ttc tgc ctc tgg gtt tac atc gat att gac cct tac aag gaa       1254
Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp Ile Asp Pro Tyr Lys Glu
                395                 400                 405

ttt ggc gca aca gtt gaa ttg tta tca ttt tta cca tca gat ttc ttt       1302
Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe
            410                 415                 420

cca tca gtg cgt gat ttg tta gat acg gca tcc gct ttg tac aga gaa       1350
Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu
        425                 430                 435

gca ctg gaa tca cca gaa cac tgt tct cca cat cac act gct ctc aga       1398
Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg
    440                 445                 450

caa gct ata ttg tgt tgg gga gag ttg atg aat cta gcc act tgg gta       1446
Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val
455                 460                 465                 470
```

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ggg tcc aat ctg gaa gat cct gcc tct aga gaa ctg gtg gta tct tac       1494
Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr
                475                 480                 485

gtc aat gtt aac atg ggg ttg aag att aga caa ctt tta tgg ttc cat       1542
Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His
            490                 495                 500

att tca tgt tta acg ttt ggt aga gaa aca gta ctg gaa tac tta gtt       1590
Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val
        505                 510                 515

agt ttc ggt gtc tgg att aga aca cca cca gca tat aga cca cca aat       1638
Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn
    520                 525                 530

gcg cct ata ttg agt acg ctc cca gaa acg acg gtc gtt agg aga aga       1686
Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg
535                 540                 545                 550

ggt aga tca cct agg aga agg aca cct tca cct aga cgt aga cgt tct       1734
Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser
                555                 560                 565

caa tct cca aga cgt aga aga tct caa tct aga gaa tca caa tgc cac       1782
Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys His
            570                 575                 580

ctc tca tta aga ggc cta ttt gtt tgt gca ttc tcc tct gct ggt cca       1830
Leu Ser Leu Arg Gly Leu Phe Val Cys Ala Phe Ser Ser Ala Gly Pro
        585                 590                 595

aat gct cac caa ttc ctt cct aaa gtc ctg cat aaa cgt acc ctc ggg       1878
Asn Ala His Gln Phe Leu Pro Lys Val Leu His Lys Arg Thr Leu Gly
    600                 605                 610

cta agt gca atg tct act act gac ctt gag gca tat ttc aaa gac tgc       1926
Leu Ser Ala Met Ser Thr Thr Asp Leu Glu Ala Tyr Phe Lys Asp Cys
615                 620                 625                 630

ttg ttt aaa gat tgg gaa gag ctt ggc gaa gag catcaccatc accatcacta     1979
Leu Phe Lys Asp Trp Glu Glu Leu Gly Glu Glu
                635                 640

agcggccgc                                                            1988
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<210> 122
<211> 641
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 122

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Gly Gln Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser
1               5                   10                  15

Val Ser Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
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```
            20                  25                  30

Phe Arg Ala Asn Ser Ala Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys
        35                  40                  45

Asp Thr Trp Pro Glu Ala Asn Gln Val Gly Val Gly Ala Phe Gly Leu
    50                  55                  60

Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala
65                  70                  75                  80

Gln Gly Ile Leu Gln Thr Val Pro Ala Asn Pro Pro Pro Ala Ser Thr
                85                  90                  95

Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
            100                 105                 110

Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His Gln
        115                 120                 125

Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly
    130                 135                 140

Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro Ile
145                 150                 155                 160

Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro Ala Leu Asn Met Glu Asn
                165                 170                 175

Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly Phe
            180                 185                 190

Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp
        195                 200                 205

Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr Thr Thr Cys Pro Gly Gln
    210                 215                 220

Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro Pro
225                 230                 235                 240

Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile Phe
                245                 250                 255

Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu Asp
            260                 265                 270
```

```
Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser Thr
        275                 280                 285

Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr
    290                 295                 300

Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys
305                 310                 315                 320

Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp
                325                 330                 335

Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro Phe
            340                 345                 350

Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Val Ile
        355                 360                 365

Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro
    370                 375                 380

Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp
385                 390                 395                 400

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

Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala
            420                 425                 430

Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro
        435                 440                 445

His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met
    450                 455                 460

Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg
465                 470                 475                 480

Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg
                485                 490                 495

Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr
            500                 505                 510

Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro
        515                 520                 525
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```
Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr
    530                 535                 540

Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser
545                 550                 555                 560

Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser
                565                 570                 575

Arg Glu Ser Gln Cys His Leu Ser Leu Arg Gly Leu Phe Val Cys Ala
            580                 585                 590

Phe Ser Ser Ala Gly Pro Asn Ala His Gln Phe Leu Pro Lys Val Leu
        595                 600                 605

His Lys Arg Thr Leu Gly Leu Ser Ala Met Ser Thr Thr Asp Leu Glu
    610                 615                 620

Ala Tyr Phe Lys Asp Cys Leu Phe Lys Asp Trp Glu Glu Leu Gly Glu
625                 630                 635                 640

Glu
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<210> 123
<211> 2672
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<220>
<221> CDS
<222> (37)..(2643)

<400> 123

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gaattcgcca ccatggctga tgaagctcct actagt ggt cag tgg tcc tcc aaa         54
                                        Gly Gln Trp Ser Ser Lys
                                        1               5

cct aga aag ggt atg ggt act aat ttg tct gta tct aac cct ctc gga        102
Pro Arg Lys Gly Met Gly Thr Asn Leu Ser Val Ser Asn Pro Leu Gly
            10                  15                  20

ttc ttt cca gat cac cag tta gat cca gct ttt cgt gct aac agt gcc        150
Phe Phe Pro Asp His Gln Leu Asp Pro Ala Phe Arg Ala Asn Ser Ala
        25                  30                  35

aac cca gat tgg gat ttc aat cct aat aag gat acc tgg cca gag gct        198
Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys Asp Thr Trp Pro Glu Ala
    40                  45                  50
```

```
aac cag gta gga gtt gga gcc ttc ggt cta ggt ttt acc cca cct cac        246
Asn Gln Val Gly Val Gly Ala Phe Gly Leu Gly Phe Thr Pro Pro His
55                  60                  65                  70

ggt gga cta tta ggc tgg agc cca caa gca caa ggt atc ttg caa acc        294
Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Gln Thr
                75                  80                  85

gtt cca gct aac cct cca cca gcg tca aca aat aga cag tct ggt aga        342
Val Pro Ala Asn Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg
            90                  95                  100

caa cca acc cct att tct cct cct tta aga gac tct cat cct cag gcg        390
Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala
        105                 110                 115

atg caa tgg aac tca acg acc ttt cat caa gct ctt ttg gac cct aga        438
Met Gln Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu Asp Pro Arg
    120                 125                 130

gtc agg ggt tta tac ttc cca gct ggt gga tcc tca tcc ggc act gtt        486
Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val
135                 140                 145                 150

aat cct gtc cca act aca gca tca cca att tca tcc ata ttt tct aga        534
Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Phe Ser Arg
                155                 160                 165

act ggg gat cct gct ctt aat atg gaa aac att aca agc ggc ttc cta        582
Thr Gly Asp Pro Ala Leu Asn Met Glu Asn Ile Thr Ser Gly Phe Leu
            170                 175                 180

gga cca tta tta gtt cta caa gcc gga ttt ttc cta ttg act aga atc        630
Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile
        185                 190                 195

cta act att cct caa agt ctt gac tcc tgg tgg aca tcc ttg aat ttc        678
Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe
    200                 205                 210

ctt ggc ggt aca aca aca tgt cca ggc caa aac tct caa tca cca act        726
Leu Gly Gly Thr Thr Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr
215                 220                 225                 230

tct aat cac tct cca aca tct tgc cct cca att tgc cca ggt tac aga        774
Ser Asn His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg
                235                 240                 245

tgg atg tgc ttg aga agg ttc atc att ttt ctg ttc atc ctc ttg ttg        822
Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu
            250                 255                 260

tgt ttg att ttc ctc tta gta ttg ctg gac tac caa ggc atg ctt cca        870
Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro
        265                 270                 275

gtc tgc cct cta ttg cca gga act tct aca acc tca aca gga cca tgt        918
Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys
    280                 285                 290

aaa aca tgt act atc cct gct caa gga aca tca atg ttt cca tct tgt        966
Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys
295                 300                 305                 310
```

```
tgc tgt aca aaa cca tca gat ggt aat tgt act tgt ata cca ata cca       1014
Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro
                315                 320                 325

agt tca tgg gca ttt gcc cgt ttc ctt tgg gag tgg gct tct gta aga       1062
Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg
            330                 335                 340

ttc tct tgg tta agt ttg cta gtc cca ttc gtg cag tgg ttt gtt ggc       1110
Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly
        345                 350                 355

ctg tct cca act gtt tgg tta tct gtt att tgg atg atg tgg tac tgg       1158
Leu Ser Pro Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp
    360                 365                 370

ggt cca agc cta tac tca atc gtg tca cct ttt atc cca ttg cta cct       1206
Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro Phe Ile Pro Leu Leu Pro
375                 380                 385                 390

atc ttt ttc tgc ctc tgg gtt tac atc gat att gac cct tac aag gaa       1254
Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp Ile Asp Pro Tyr Lys Glu
                395                 400                 405

ttt ggc gca aca gtt gaa ttg tta tca ttt tta cca tca gat ttc ttt       1302
Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe
            410                 415                 420

cca tca gtg cgt gat ttg tta gat acg gca tcc gct ttg tac aga gaa       1350
Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu
        425                 430                 435

gca ctg gaa tca cca gaa cac tgt tct cca cat cac act gct ctc aga       1398
Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg
    440                 445                 450

caa gct ata ttg tgt tgg gga gag ttg atg aat cta gcc act tgg gta       1446
Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val
455                 460                 465                 470

ggg tcc aat ctg gaa gat cct gcc tct aga gaa ctg gtg gta tct tac       1494
Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr
                475                 480                 485

gtc aat gtt aac atg ggg ttg aag att aga caa ctt tta tgg ttc cat       1542
Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His
            490                 495                 500

att tca tgt tta acg ttt ggt aga gaa aca gta ctg gaa tac tta gtt       1590
Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val
        505                 510                 515

agt ttc ggt gtc tgg att aga aca cca cca gca tat aga cca cca aat       1638
Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn
    520                 525                 530

gcg cct ata ttg agt acg ctc cca gaa acg acg gtc gtt agg aga aga       1686
Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg
535                 540                 545                 550

ggt aga tca cct agg aga agg aca cct tca cct aga cgt aga cgt tct       1734
Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser
```

```
                555                 560                 565

caa tct cca aga cgt aga aga tct caa tct aga gaa tca caa tgc ggt       1782
Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys Gly
            570                 575                 580

cta tct aga tat gtc gcc cga cta tca tct aat tct cgt atc ttt aac       1830
Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Asn Ser Arg Ile Phe Asn
        585                 590                 595

cat caa cac ggc acc atg caa aat ctg cat gac tcc tgt agt aga aat       1878
His Gln His Gly Thr Met Gln Asn Leu His Asp Ser Cys Ser Arg Asn
    600                 605                 610

ctt tat gtg agt ctc ttg ctt ttg tac caa act ttc ggc aga aaa ttg       1926
Leu Tyr Val Ser Leu Leu Leu Leu Tyr Gln Thr Phe Gly Arg Lys Leu
615                 620                 625                 630

cac ctt tac tct cat cca att ata cta ggt ttt aga aaa atc cca atg       1974
His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro Met
                635                 640                 645

ggg gtg ggt tta tct cca ttt ttg ctt gcg caa ttc aca agt gca atc       2022
Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile
            650                 655                 660

tgt tct gtg gtt agg aga gct ttt cct cat tgc ctc gca ttt tca tac       2070
Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser Tyr
        665                 670                 675

atg gat gat gtt gtc tta ggt gcc aaa agt gta caa cat ttg gag agt       2118
Met Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu Glu Ser
    680                 685                 690

ttg ttt aca gcc gta act aac ttt ctc ttg tca tta ggg atc cat ttg       2166
Leu Phe Thr Ala Val Thr Asn Phe Leu Leu Ser Leu Gly Ile His Leu
695                 700                 705                 710

aac cct aac aaa aca aaa aga tgg ggg tac tct cta cat ttt atg ggt       2214
Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu His Phe Met Gly
                715                 720                 725

tat gtt ata ggc tgc tat gga tcc tta cct caa gac cat atc att cag       2262
Tyr Val Ile Gly Cys Tyr Gly Ser Leu Pro Gln Asp His Ile Ile Gln
            730                 735                 740

aaa atc aaa gag tgc ttt aga aag ttg cct gtt aat aga cca atc gac       2310
Lys Ile Lys Glu Cys Phe Arg Lys Leu Pro Val Asn Arg Pro Ile Asp
        745                 750                 755

tgg aag gtt tgt caa agg atc gtt ggt tta ctt ggt ttt gca gca cca       2358
Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu Gly Phe Ala Ala Pro
    760                 765                 770

ttc acc caa tgt ggc tac cct gct ctg atg cct tta tat gct tgt ata       2406
Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile
775                 780                 785                 790

caa tct aag caa gct ttt aca ttc tct cca acg tac aag gcc ttt tta       2454
Gln Ser Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu
                795                 800                 805

tgc aaa caa cac tta tca cta aga gga ctt ttt gtg tgt gct ttc tct       2502
```

```
Cys Lys Gln His Leu Ser Leu Arg Gly Leu Phe Val Cys Ala Phe Ser
            810                 815                 820

tct gca ggc cca aat gca cac cag ttt ttg cct aaa gtg ttg cat aag       2550
Ser Ala Gly Pro Asn Ala His Gln Phe Leu Pro Lys Val Leu His Lys
        825                 830                 835

aga act cta ggc ttg tcc gca atg tcc aca act gat cta gaa gca tat       2598
Arg Thr Leu Gly Leu Ser Ala Met Ser Thr Thr Asp Leu Glu Ala Tyr
    840                 845                 850

ttc aaa gac tgt ctt ttt aag gat tgg gaa gag ttg ggt gaa gag           2643
Phe Lys Asp Cys Leu Phe Lys Asp Trp Glu Glu Leu Gly Glu Glu
855                 860                 865

catcaccatc atcatcatta agcggccgc                                      2672
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<210> 124
<211> 869
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 124

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Gly Gln Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser
1               5                   10                  15

Val Ser Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
            20                  25                  30

Phe Arg Ala Asn Ser Ala Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys
        35                  40                  45

Asp Thr Trp Pro Glu Ala Asn Gln Val Gly Val Gly Ala Phe Gly Leu
    50                  55                  60

Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala
65                  70                  75                  80

Gln Gly Ile Leu Gln Thr Val Pro Ala Asn Pro Pro Pro Ala Ser Thr
                85                  90                  95

Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
            100                 105                 110

Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His Gln
        115                 120                 125

Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly
    130                 135                 140
```

```
Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro Ile
145                 150                 155                 160

Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro Ala Leu Asn Met Glu Asn
                165                 170                 175

Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly Phe
            180                 185                 190

Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp
        195                 200                 205

Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr Thr Thr Cys Pro Gly Gln
    210                 215                 220

Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro Pro
225                 230                 235                 240

Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile Phe
                245                 250                 255

Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu Asp
            260                 265                 270

Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser Thr
        275                 280                 285

Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr
    290                 295                 300

Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys
305                 310                 315                 320

Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp
                325                 330                 335

Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro Phe
            340                 345                 350

Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Val Ile
        355                 360                 365

Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro
    370                 375                 380

Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp
385                 390                 395                 400
```

```
Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu Ser Phe
                405                 410                 415

Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala
            420                 425                 430

Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro
        435                 440                 445

His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met
    450                 455                 460

Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg
465                 470                 475                 480

Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg
                485                 490                 495

Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr
            500                 505                 510

Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro
        515                 520                 525

Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr
    530                 535                 540

Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser
545                 550                 555                 560

Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser
                565                 570                 575

Arg Glu Ser Gln Cys Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser
            580                 585                 590

Asn Ser Arg Ile Phe Asn His Gln His Gly Thr Met Gln Asn Leu His
        595                 600                 605

Asp Ser Cys Ser Arg Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Gln
    610                 615                 620

Thr Phe Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly
625                 630                 635                 640

Phe Arg Lys Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala
```

645 650 655

Gln Phe Thr Ser Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro His
660 665 670

Cys Leu Ala Phe Ser Tyr Met Asp Asp Val Val Leu Gly Ala Lys Ser
675 680 685

Val Gln His Leu Glu Ser Leu Phe Thr Ala Val Thr Asn Phe Leu Leu
690 695 700

Ser Leu Gly Ile His Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr
705 710 715 720

Ser Leu His Phe Met Gly Tyr Val Ile Gly Cys Tyr Gly Ser Leu Pro
725 730 735

Gln Asp His Ile Ile Gln Lys Ile Lys Glu Cys Phe Arg Lys Leu Pro
740 745 750

Val Asn Arg Pro Ile Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu
755 760 765

Leu Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met
770 775 780

Pro Leu Tyr Ala Cys Ile Gln Ser Lys Gln Ala Phe Thr Phe Ser Pro
785 790 795 800

Thr Tyr Lys Ala Phe Leu Cys Lys Gln His Leu Ser Leu Arg Gly Leu
805 810 815

Phe Val Cys Ala Phe Ser Ser Ala Gly Pro Asn Ala His Gln Phe Leu
820 825 830

Pro Lys Val Leu His Lys Arg Thr Leu Gly Leu Ser Ala Met Ser Thr
835 840 845

Thr Asp Leu Glu Ala Tyr Phe Lys Asp Cys Leu Phe Lys Asp Trp Glu
850 855 860

Glu Leu Gly Glu Glu
865

<210> 125
<211> 2672
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<220>
<221> CDS
<222> (37)..(2643)

<400> 125
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gaattcgcca ccatggccga tgaggcacct actagt ggt cag tgg tcc tcc aaa          54
                                        Gly Gln Trp Ser Ser Lys
                                        1               5

cct aga aag ggt atg ggt act aat ttg tct gta tct aac cct ctc gga         102
Pro Arg Lys Gly Met Gly Thr Asn Leu Ser Val Ser Asn Pro Leu Gly
            10                  15                  20

ttc ttt cca gat cac cag tta gat cca gct ttt cgt gct aac agt gcc         150
Phe Phe Pro Asp His Gln Leu Asp Pro Ala Phe Arg Ala Asn Ser Ala
        25                  30                  35

aac cca gat tgg gat ttc aat cct aat aag gat acc tgg cca gag gct         198
Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys Asp Thr Trp Pro Glu Ala
    40                  45                  50

aac cag gta gga gtt gga gcc ttc ggt cta ggt ttt acc cca cct cac         246
Asn Gln Val Gly Val Gly Ala Phe Gly Leu Gly Phe Thr Pro Pro His
55                  60                  65                  70

ggt gga cta tta ggc tgg agc cca caa gca caa ggt atc ttg caa acc         294
Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Gln Thr
                75                  80                  85

gtt cca gct aac cct cca cca gcg tca aca aat aga cag tct ggt aga         342
Val Pro Ala Asn Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg
            90                  95                  100

caa cca acc cct att tct cct cct tta aga gac tct cat cct cag gcg         390
Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala
        105                 110                 115

atg caa tgg aac tca acg acc ttt cat caa gct ctt ttg gac cct aga         438
Met Gln Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu Asp Pro Arg
    120                 125                 130

gtc agg ggt tta tac ttc cca gct ggt gga tcc tca tcc ggc act gtt         486
Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val
135                 140                 145                 150

aat cct gtc cca act aca gca tca cca att tca tcc ata ttt tct aga         534
Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Phe Ser Arg
                155                 160                 165

act ggg gat cct gct ctt aat atg gaa aac att aca agc ggc ttc cta         582
Thr Gly Asp Pro Ala Leu Asn Met Glu Asn Ile Thr Ser Gly Phe Leu
            170                 175                 180

gga cca tta tta gtt cta caa gcc gga ttt ttc cta ttg act aga atc         630
Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile
        185                 190                 195

cta act att cct caa agt ctt gac tcc tgg tgg aca tcc ttg aat ttc         678
```

```
Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe
    200                 205                 210

ctt ggc ggt aca aca aca tgt cca ggc caa aac tct caa tca cca act        726
Leu Gly Gly Thr Thr Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr
215                 220                 225                 230

tct aat cac tct cca aca tct tgc cct cca att tgc cca ggt tac aga        774
Ser Asn His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg
                235                 240                 245

tgg atg tgc ttg aga agg ttc atc att ttt ctg ttc atc ctc ttg ttg        822
Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu
            250                 255                 260

tgt ttg att ttc ctc tta gta ttg ctg gac tac caa ggc atg ctt cca        870
Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro
        265                 270                 275

gtc tgc cct cta ttg cca gga act tct aca acc tca aca gga cca tgt        918
Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys
    280                 285                 290

aaa aca tgt act atc cct gct caa gga aca tca atg ttt cca tct tgt        966
Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys
295                 300                 305                 310

tgc tgt aca aaa cca tca gat ggt aat tgt act tgt ata cca ata cca       1014
Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro
                315                 320                 325

agt tca tgg gca ttt gcc cgt ttc ctt tgg gag tgg gct tct gta aga       1062
Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg
            330                 335                 340

ttc tct tgg tta agt ttg cta gtc cca ttc gtg cag tgg ttt gtt ggc       1110
Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly
        345                 350                 355

ctg tct cca act gtt tgg tta tct gtt att tgg atg atg tgg tac tgg       1158
Leu Ser Pro Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp
    360                 365                 370

ggt cca agc cta tac tca atc gtg tca cct ttt atc cca ttg cta cct       1206
Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro Phe Ile Pro Leu Leu Pro
375                 380                 385                 390

atc ttt ttc tgc ctc tgg gtt tac atc gat att gac cct tac aag gaa       1254
Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp Ile Asp Pro Tyr Lys Glu
                395                 400                 405

ttt ggc gca aca gtt gaa ttg tta tca ttt tta cca tca gat ttc ttt       1302
Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe
            410                 415                 420

cca tca gtg cgt gat ttg tta gat acg gca tcc gct ttg tac aga gaa       1350
Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu
        425                 430                 435

gca ctg gaa tca cca gaa cac tgt tct cca cat cac act gct ctc aga       1398
Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg
    440                 445                 450
```

```
caa gct ata ttg tgt tgg gga gag ttg atg aat cta gcc act tgg gta       1446
Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val
455                 460                 465                 470

ggg tcc aat ctg gaa gat cct gcc tct aga gaa ctg gtg gta tct tac       1494
Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr
                475                 480                 485

gtc aat gtt aac atg ggg ttg aag att aga caa ctt tta tgg ttc cat       1542
Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His
            490                 495                 500

att tca tgt tta acg ttt ggt aga gaa aca gta ctg gaa tac tta gtt       1590
Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val
        505                 510                 515

agt ttc ggt gtc tgg att aga aca cca cca gca tat aga cca cca aat       1638
Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn
    520                 525                 530

gcg cct ata ttg agt acg ctc cca gaa acg acg gtc gtt agg aga aga       1686
Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg
535                 540                 545                 550

ggt aga tca cct agg aga agg aca cct tca cct aga cgt aga cgt tct       1734
Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser
                555                 560                 565

caa tct cca aga cgt aga aga tct caa tct aga gaa tca caa tgc cac       1782
Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys His
            570                 575                 580

ctc tca tta aga ggc cta ttt gtt tgt gca ttc tcc tct gct ggt cca       1830
Leu Ser Leu Arg Gly Leu Phe Val Cys Ala Phe Ser Ser Ala Gly Pro
        585                 590                 595

aat gct cac caa ttc ctt cct aaa gtc ctg cat aaa cgt acc ctc ggg       1878
Asn Ala His Gln Phe Leu Pro Lys Val Leu His Lys Arg Thr Leu Gly
    600                 605                 610

cta agt gca atg tct act act gac ctt gag gca tat ttc aaa gac tgc       1926
Leu Ser Ala Met Ser Thr Thr Asp Leu Glu Ala Tyr Phe Lys Asp Cys
615                 620                 625                 630

ttg ttt aaa gat tgg gaa gag ctt ggc gaa gag ggc ctt agt aga tat       1974
Leu Phe Lys Asp Trp Glu Glu Leu Gly Glu Glu Gly Leu Ser Arg Tyr
                635                 640                 645

gtt gcc cga tta tca tct aac tct aga atc ttt aat cat caa cat ggt       2022
Val Ala Arg Leu Ser Ser Asn Ser Arg Ile Phe Asn His Gln His Gly
            650                 655                 660

aca atg caa aac cta cat gat tca tgc tct aga aac ttg tac gtg tcc       2070
Thr Met Gln Asn Leu His Asp Ser Cys Ser Arg Asn Leu Tyr Val Ser
        665                 670                 675

tta ttg ctt cta tat caa act ttt ggt aga aag ttg cac ctg tac agt       2118
Leu Leu Leu Leu Tyr Gln Thr Phe Gly Arg Lys Leu His Leu Tyr Ser
    680                 685                 690

cac cca atc atc tta ggc ttt aga aag atc cca atg ggt gta ggt tta       2166
His Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro Met Gly Val Gly Leu
695                 700                 705                 710
```

```
tcc cca ttt ttg ctg gca caa ttc aca tct gca atc tgt agt gtt gta       2214
Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser Val Val
                715                 720                 725

cga aga gcc ttt cca cat tgt ttg gct ttt agc tat atg gat gac gtt       2262
Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp Asp Val
            730                 735                 740

gta ttg ggg gct aaa agc gtg caa cat ctc gaa tct ctg ttt aca gcg       2310
Val Leu Gly Ala Lys Ser Val Gln His Leu Glu Ser Leu Phe Thr Ala
        745                 750                 755

gtt act aat ttt ctg ctt tca ttg gga ata cat cta aac cct aat aag       2358
Val Thr Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro Asn Lys
    760                 765                 770

aca aaa aga tgg ggc tac tct ttg cat ttt atg gga tac gtg ata ggg       2406
Thr Lys Arg Trp Gly Tyr Ser Leu His Phe Met Gly Tyr Val Ile Gly
775                 780                 785                 790

tgt tat ggt agt tta cca caa gac cat atc atc caa aag ata aag gaa       2454
Cys Tyr Gly Ser Leu Pro Gln Asp His Ile Ile Gln Lys Ile Lys Glu
                795                 800                 805

tgt ttt aga aag tta cca gtc aat aga cct att gat tgg aaa gtg tgt       2502
Cys Phe Arg Lys Leu Pro Val Asn Arg Pro Ile Asp Trp Lys Val Cys
            810                 815                 820

cag aga atc gtt ggt ttg tta ggg ttt gct gct cca ttc aca caa tgt       2550
Gln Arg Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe Thr Gln Cys
        825                 830                 835

ggt tac cct gcc ctt atg cct ttg tat gca tgc att caa tcc aaa cag       2598
Gly Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile Gln Ser Lys Gln
    840                 845                 850

gct ttt aca ttt tct cca act tac aaa gcc ttc ctt tgc aaa caa           2643
Ala Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Cys Lys Gln
855                 860                 865

catcatcacc atcatcatta agcggccgc                                      2672
```

<210> 126
<211> 869
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 126

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Gly Gln Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser
1               5                   10                  15

Val Ser Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
            20                  25                  30

Phe Arg Ala Asn Ser Ala Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys
```

```
        35                  40                  45

Asp Thr Trp Pro Glu Ala Asn Gln Val Gly Val Gly Ala Phe Gly Leu
    50                  55                  60

Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala
65                  70                  75                  80

Gln Gly Ile Leu Gln Thr Val Pro Ala Asn Pro Pro Pro Ala Ser Thr
                85                  90                  95

Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
            100                 105                 110

Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His Gln
        115                 120                 125

Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly
    130                 135                 140

Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro Ile
145                 150                 155                 160

Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro Ala Leu Asn Met Glu Asn
                165                 170                 175

Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly Phe
            180                 185                 190

Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp
        195                 200                 205

Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr Thr Thr Cys Pro Gly Gln
    210                 215                 220

Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro Pro
225                 230                 235                 240

Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile Phe
                245                 250                 255

Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu Asp
            260                 265                 270

Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser Thr
        275                 280                 285
```

```
Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr
    290                 295                 300

Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys
305                 310                 315                 320

Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp
                325                 330                 335

Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro Phe
            340                 345                 350

Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Val Ile
        355                 360                 365

Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro
    370                 375                 380

Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp
385                 390                 395                 400

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

Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala
            420                 425                 430

Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro
        435                 440                 445

His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met
    450                 455                 460

Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg
465                 470                 475                 480

Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg
                485                 490                 495

Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr
            500                 505                 510

Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro
        515                 520                 525

Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr
    530                 535                 540
```

```
Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser
545                 550                 555                 560

Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser
                565                 570                 575

Arg Glu Ser Gln Cys His Leu Ser Leu Arg Gly Leu Phe Val Cys Ala
            580                 585                 590

Phe Ser Ser Ala Gly Pro Asn Ala His Gln Phe Leu Pro Lys Val Leu
        595                 600                 605

His Lys Arg Thr Leu Gly Leu Ser Ala Met Ser Thr Thr Asp Leu Glu
    610                 615                 620

Ala Tyr Phe Lys Asp Cys Leu Phe Lys Asp Trp Glu Glu Leu Gly Glu
625                 630                 635                 640

Glu Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Asn Ser Arg Ile
                645                 650                 655

Phe Asn His Gln His Gly Thr Met Gln Asn Leu His Asp Ser Cys Ser
            660                 665                 670

Arg Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Gln Thr Phe Gly Arg
        675                 680                 685

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

Pro Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser
705                 710                 715                 720

Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe
                725                 730                 735

Ser Tyr Met Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu
            740                 745                 750

Glu Ser Leu Phe Thr Ala Val Thr Asn Phe Leu Leu Ser Leu Gly Ile
        755                 760                 765

His Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu His Phe
    770                 775                 780

Met Gly Tyr Val Ile Gly Cys Tyr Gly Ser Leu Pro Gln Asp His Ile
785                 790                 795                 800
```

```
Ile Gln Lys Ile Lys Glu Cys Phe Arg Lys Leu Pro Val Asn Arg Pro
                805                 810                 815

Ile Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu Gly Phe Ala
            820                 825                 830

Ala Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu Tyr Ala
        835                 840                 845

Cys Ile Gln Ser Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr Lys Ala
    850                 855                 860

Phe Leu Cys Lys Gln
865
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<210> 127
<211> 2498
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<220>
<221> CDS
<222> (37)..(2469)

<400> 127

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gaattcgcca ccatggccga cgaggcacca actagt gga ttg tct aga tat gtt         54
                                        Gly Leu Ser Arg Tyr Val
                                        1               5

gct aga ctg tca tct aac tct cgt atc ttt aac cac caa cat ggt aca        102
Ala Arg Leu Ser Ser Asn Ser Arg Ile Phe Asn His Gln His Gly Thr
            10                  15                  20

atg caa aat cta cat gac tca tgt tca agg aat ctt tac gtt tca tta        150
Met Gln Asn Leu His Asp Ser Cys Ser Arg Asn Leu Tyr Val Ser Leu
        25                  30                  35

cta ctt ttg tac caa acc ttc ggc aga aaa ctg cac ctt tac tca cat        198
Leu Leu Leu Tyr Gln Thr Phe Gly Arg Lys Leu His Leu Tyr Ser His
    40                  45                  50

cct atc atc tta ggc ttc aga aag atc cca atg ggt gtg ggg tta tct        246
Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro Met Gly Val Gly Leu Ser
55                  60                  65                  70

cca ttt ctg tta gcc cag ttt aca tca gct att tgc agt gtg gtt cgt        294
Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser Val Val Arg
                75                  80                  85

aga gct ttt cca cat tgt ttg gcc ttt tcc tat atg gat gat gtt gtc        342
Arg Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp Asp Val Val
            90                  95                  100
```

```
tta gga gct aaa agt gtc caa cac tta gaa tct ctt ttc aca gct gtc        390
Leu Gly Ala Lys Ser Val Gln His Leu Glu Ser Leu Phe Thr Ala Val
        105                 110                 115

aca aac ttc cta ctt tca tta ggt att cac tta aac cca aac aaa acc        438
Thr Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro Asn Lys Thr
    120                 125                 130

aag aga tgg ggt tac tca ttg cac ttt atg ggt tac gta atc gga tgt        486
Lys Arg Trp Gly Tyr Ser Leu His Phe Met Gly Tyr Val Ile Gly Cys
135                 140                 145                 150

tat ggc tct tta cct cag gat cac atc atc cag aag ata aag gaa tgt        534
Tyr Gly Ser Leu Pro Gln Asp His Ile Ile Gln Lys Ile Lys Glu Cys
                155                 160                 165

ttt aga aag cta cct gtc aat aga cct att gat tgg aaa gtt tgt cag        582
Phe Arg Lys Leu Pro Val Asn Arg Pro Ile Asp Trp Lys Val Cys Gln
            170                 175                 180

aga ata gta ggt ttg cta ggg ttt gct gct cca ttc act caa tgc ggg        630
Arg Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly
        185                 190                 195

tac cct gca cta atg cct ttg tac gct tgc atc caa tca aaa caa gca        678
Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile Gln Ser Lys Gln Ala
    200                 205                 210

ttc acc ttc tca cca act tac aag gca ttc ctt tgc aaa caa ctc gag        726
Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Cys Lys Gln Leu Glu
215                 220                 225                 230

gga caa tgg tcc tca aag cca agg aaa ggt atg ggt aca aac ttg agt        774
Gly Gln Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser
                235                 240                 245

gtt tca aac cca ctt ggc ttt ttc cca gac cat caa ctt gat cca gca        822
Val Ser Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
            250                 255                 260

ttc aga gca aac tct gcc aac cca gac tgg gat ttc aat cca aac aaa        870
Phe Arg Ala Asn Ser Ala Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys
        265                 270                 275

gat acc tgg cct gaa gca aat caa gtt gga gtg ggg gca ttt ggt ttg        918
Asp Thr Trp Pro Glu Ala Asn Gln Val Gly Val Gly Ala Phe Gly Leu
    280                 285                 290

ggc ttc act cca cca cac gga ggg ttg ctt gga tgg agt cca cag gct        966
Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala
295                 300                 305                 310

caa ggc att ttg caa act gtt cca gct aat cct cct cct gct tca acc       1014
Gln Gly Ile Leu Gln Thr Val Pro Ala Asn Pro Pro Pro Ala Ser Thr
                315                 320                 325

aat aga caa tct ggt aga caa cct aca cca att tca cct cca ctt aga       1062
Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
            330                 335                 340

gac tct cat cct cag gca atg caa tgg aac tca act acc ttc cat caa       1110
Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His Gln
```

```
        345                 350                 355

gct ctg ttg gat cct aga gtt aga ggt ctg tat ttc cca gct ggc gga       1158
Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly
    360                 365                 370

tca tct agt ggt acc gtg aat cca gta cct act aca gcc tct cca atc       1206
Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro Ile
375                 380                 385                 390

agt tcc atc ttt agt aga act ggc gac cct gcc ttg aat atg gag aac       1254
Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro Ala Leu Asn Met Glu Asn
                395                 400                 405

atc aca tct gga ttc ctg ggg cca ttg cta gtc cta caa gct ggg ttt       1302
Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly Phe
            410                 415                 420

ttc cta ttg act aga atc ttg aca att cca cag agt tta gac tcc tgg       1350
Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp
        425                 430                 435

tgg acc agt cta aac ttt ttg ggt ggc aca aca aca tgt cct ggc caa       1398
Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr Thr Thr Cys Pro Gly Gln
    440                 445                 450

aac tct cag tct cca aca agt aac cac tct cct act tca tgt cca cca       1446
Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro Pro
455                 460                 465                 470

att tgt cct ggt tac aga tgg atg tgc ctc aga agg ttt atc att ttc       1494
Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile Phe
                475                 480                 485

ctt ttc ata ttg tta ttg tgc ctc ata ttc cta ttg gta tta ttg gat       1542
Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu Asp
            490                 495                 500

tac caa ggg atg ctt cct gtc tgt cca ttg ctc cct ggt acg agt aca       1590
Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser Thr
        505                 510                 515

aca tct act ggc cca tgc aaa aca tgc acc ata cca gcg caa ggt aca       1638
Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr
    520                 525                 530

agc atg ttt cca tcc tgt tgt tgc aca aaa cca tcc gat ggc aat tgc       1686
Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys
535                 540                 545                 550

aca tgc att cca ata cca tct tca tgg gcc ttc gct cgt ttc cta tgg       1734
Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp
                555                 560                 565

gaa tgg gcc tca gtt aga ttt tcc tgg tta tca ttg ttg gtc cca ttt       1782
Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro Phe
            570                 575                 580

gtg caa tgg ttt gta ggt tta tcc cca acc gtc tgg tta tct gta ata       1830
Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Val Ile
        585                 590                 595

tgg atg atg tgg tat tgg ggt cca agt tta tac tca atc gtt tca cct       1878
```

```
Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro
    600                 605                 610

ttt atc cct ttg ctg cca atc ttt ttc tgt ttg tgg gtt tac att gat       1926
Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp
615                 620                 625                 630

att gat cct tac aag gag ttt ggt gct act gtt gag tta cta tcc ttt       1974
Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu Ser Phe
                635                 640                 645

tta cct tct gac ttt ttc cct tct gtc aga gat ctt ttg gat act gct       2022
Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala
            650                 655                 660

tct gct tta tac aga gaa gct ttg gaa tca cca gaa cat tgt tca cct       2070
Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro
        665                 670                 675

cat cat acc gcc tta aga caa gca att ctg tgt tgg ggc gaa tta atg       2118
His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met
    680                 685                 690

aac cta gca aca tgg gtg ggt tcc aat ttg gaa gat cca gca tcc aga       2166
Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg
695                 700                 705                 710

gag tta gtg gtt agc tac gtg aat gtc aac atg ggc ttg aaa atc aga       2214
Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg
                715                 720                 725

cag tta ctt tgg ttc cat atc tct tgt ctg aca ttt ggt aga gaa aca       2262
Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr
            730                 735                 740

gtt ctg gaa tat ctc gtt agc ttt gga gta tgg att aga act cca cca       2310
Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro
        745                 750                 755

gcc tac aga cca cct aat gca cca ata ttg tca acc ctc cca gag aca       2358
Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr
    760                 765                 770

aca gtt gtg agg aga aga gga aga tct cct cgt cgt aga act cca tct       2406
Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser
775                 780                 785                 790

cca aga cga agg aga tca caa agt cct aga cga cgt aga tct caa tct       2454
Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser
                795                 800                 805

aga gag tct caa tgt caccaccatc accatcatta agcggccgc                  2498
Arg Glu Ser Gln Cys
            810
```

<210> 128
<211> 811
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 128

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Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Asn Ser Arg Ile Phe
1               5                  10                  15

Asn His Gln His Gly Thr Met Gln Asn Leu His Asp Ser Cys Ser Arg
            20                  25                  30

Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Gln Thr Phe Gly Arg Lys
        35                  40                  45

Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro
    50                  55                  60

Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala
65                  70                  75                  80

Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser
                85                  90                  95

Tyr Met Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu Glu
            100                 105                 110

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

Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu His Phe Met
    130                 135                 140

Gly Tyr Val Ile Gly Cys Tyr Gly Ser Leu Pro Gln Asp His Ile Ile
145                 150                 155                 160

Gln Lys Ile Lys Glu Cys Phe Arg Lys Leu Pro Val Asn Arg Pro Ile
                165                 170                 175

Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu Gly Phe Ala Ala
            180                 185                 190

Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys
        195                 200                 205

Ile Gln Ser Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe
    210                 215                 220

Leu Cys Lys Gln Leu Glu Gly Gln Trp Ser Ser Lys Pro Arg Lys Gly
225                 230                 235                 240
```

```
Met Gly Thr Asn Leu Ser Val Ser Asn Pro Leu Gly Phe Phe Pro Asp
                245                 250                 255

His Gln Leu Asp Pro Ala Phe Arg Ala Asn Ser Ala Asn Pro Asp Trp
            260                 265                 270

Asp Phe Asn Pro Asn Lys Asp Thr Trp Pro Glu Ala Asn Gln Val Gly
        275                 280                 285

Val Gly Ala Phe Gly Leu Gly Phe Thr Pro Pro His Gly Gly Leu Leu
    290                 295                 300

Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Gln Thr Val Pro Ala Asn
305                 310                 315                 320

Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro
                325                 330                 335

Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala Met Gln Trp Asn
            340                 345                 350

Ser Thr Thr Phe His Gln Ala Leu Leu Asp Pro Arg Val Arg Gly Leu
        355                 360                 365

Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val Asn Pro Val Pro
    370                 375                 380

Thr Thr Ala Ser Pro Ile Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro
385                 390                 395                 400

Ala Leu Asn Met Glu Asn Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu
                405                 410                 415

Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro
            420                 425                 430

Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr
        435                 440                 445

Thr Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser
    450                 455                 460

Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu
465                 470                 475                 480

Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe
                485                 490                 495
```

```
Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu
            500                 505                 510

Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr
        515                 520                 525

Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys Cys Cys Thr Lys
    530                 535                 540

Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala
545                 550                 555                 560

Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu
                565                 570                 575

Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr
            580                 585                 590

Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu
        595                 600                 605

Tyr Ser Ile Val Ser Pro Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys
    610                 615                 620

Leu Trp Val Tyr Ile Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr
625                 630                 635                 640

Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg
                645                 650                 655

Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser
            660                 665                 670

Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu
        675                 680                 685

Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val Gly Ser Asn Leu
    690                 695                 700

Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr Val Asn Val Asn
705                 710                 715                 720

Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu
                725                 730                 735

Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val
            740                 745                 750
```

```
Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu
        755                 760                 765

Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro
    770                 775                 780

Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg
785                 790                 795                 800

Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys
                805                 810
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<210> 129
<211> 1994
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<220>
<221> CDS
<222> (37)..(1965)

<400> 129

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gaattcgcca ccatggccga cgaggcacca actagt cat ttg tct cta aga gga         54
                                          His Leu Ser Leu Arg Gly
                                          1               5

ttg ttt gtg tgt gct ttt agt tcc gct gga cca aat gcc cat cag ttc        102
Leu Phe Val Cys Ala Phe Ser Ser Ala Gly Pro Asn Ala His Gln Phe
            10                  15                  20

ctt cca aaa gtt ttg cat aag aga aca ctt ggt ctt tca gca atg agt        150
Leu Pro Lys Val Leu His Lys Arg Thr Leu Gly Leu Ser Ala Met Ser
        25                  30                  35

act aca gat ctt gag gct tac ttt aag gat tgt ttg ttt aag gac tgg        198
Thr Thr Asp Leu Glu Ala Tyr Phe Lys Asp Cys Leu Phe Lys Asp Trp
    40                  45                  50

gag gaa tta ggt gaa gag ctc gag gga caa tgg tcc tca aag cca agg        246
Glu Glu Leu Gly Glu Glu Leu Glu Gly Gln Trp Ser Ser Lys Pro Arg
55                  60                  65                  70

aaa ggt atg ggt aca aac ttg agt gtt tca aac cca ctt ggc ttt ttc        294
Lys Gly Met Gly Thr Asn Leu Ser Val Ser Asn Pro Leu Gly Phe Phe
                75                  80                  85

cca gac cat caa ctt gat cca gca ttc aga gca aac tct gcc aac cca        342
Pro Asp His Gln Leu Asp Pro Ala Phe Arg Ala Asn Ser Ala Asn Pro
            90                  95                  100

gac tgg gat ttc aat cca aac aaa gat acc tgg cct gaa gca aat caa        390
Asp Trp Asp Phe Asn Pro Asn Lys Asp Thr Trp Pro Glu Ala Asn Gln
        105                 110                 115
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gtt gga gtg ggg gca ttt ggt ttg ggc ttc act cca cca cac gga ggg        438
Val Gly Val Gly Ala Phe Gly Leu Gly Phe Thr Pro Pro His Gly Gly
    120                 125                 130

ttg ctt gga tgg agt cca cag gct caa ggc att ttg caa act gtt cca        486
Leu Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Gln Thr Val Pro
135                 140                 145                 150

gct aat cct cct cct gct tca acc aat aga caa tct ggt aga caa cct        534
Ala Asn Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg Gln Pro
                155                 160                 165

aca cca att tca cct cca ctt aga gac tct cat cct cag gca atg caa        582
Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala Met Gln
            170                 175                 180

tgg aac tca act acc ttc cat caa gct ctg ttg gat cct aga gtt aga        630
Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu Asp Pro Arg Val Arg
        185                 190                 195

ggt ctg tat ttc cca gct ggc gga tca tct agt ggt acc gtg aat cca        678
Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val Asn Pro
    200                 205                 210

gta cct act aca gcc tct cca atc agt tcc atc ttt agt aga act ggc        726
Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Phe Ser Arg Thr Gly
215                 220                 225                 230

gac cct gcc ttg aat atg gag aac atc aca tct gga ttc ctg ggg cca        774
Asp Pro Ala Leu Asn Met Glu Asn Ile Thr Ser Gly Phe Leu Gly Pro
                235                 240                 245

ttg cta gtc cta caa gct ggg ttt ttc cta ttg act aga atc ttg aca        822
Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr
            250                 255                 260

att cca cag agt tta gac tcc tgg tgg acc agt cta aac ttt ttg ggt        870
Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly
        265                 270                 275

ggc aca aca aca tgt cct ggc caa aac tct cag tct cca aca agt aac        918
Gly Thr Thr Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn
    280                 285                 290

cac tct cct act tca tgt cca cca att tgt cct ggt tac aga tgg atg        966
His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met
295                 300                 305                 310

tgc ctc aga agg ttt atc att ttc ctt ttc ata ttg tta ttg tgc ctc       1014
Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu
                315                 320                 325

ata ttc cta ttg gta tta ttg gat tac caa ggg atg ctt cct gtc tgt       1062
Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys
            330                 335                 340

cca ttg ctc cct ggt acg agt aca aca tct act ggc cca tgc aaa aca       1110
Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys Lys Thr
        345                 350                 355

tgc acc ata cca gcg caa ggt aca agc atg ttt cca tcc tgt tgt tgc       1158
Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys Cys Cys
```

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    360                 365                 370

aca aaa cca tcc gat ggc aat tgc aca tgc att cca ata cca tct tca       1206
Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser
375                 380                 385                 390

tgg gcc ttc gct cgt ttc cta tgg gaa tgg gcc tca gtt aga ttt tcc       1254
Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg Phe Ser
                395                 400                 405

tgg tta tca ttg ttg gtc cca ttt gtg caa tgg ttt gta ggt tta tcc       1302
Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser
            410                 415                 420

cca acc gtc tgg tta tct gta ata tgg atg atg tgg tat tgg ggt cca       1350
Pro Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp Gly Pro
        425                 430                 435

agt tta tac tca atc gtt tca cct ttt atc cct ttg ctg cca atc ttt       1398
Ser Leu Tyr Ser Ile Val Ser Pro Phe Ile Pro Leu Leu Pro Ile Phe
    440                 445                 450

ttc tgt ttg tgg gtt tac att gat att gat cct tac aag gag ttt ggt       1446
Phe Cys Leu Trp Val Tyr Ile Asp Ile Asp Pro Tyr Lys Glu Phe Gly
455                 460                 465                 470

gct act gtt gag tta cta tcc ttt tta cct tct gac ttt ttc cct tct       1494
Ala Thr Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser
                475                 480                 485

gtc aga gat ctt ttg gat act gct tct gct tta tac aga gaa gct ttg       1542
Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu
            490                 495                 500

gaa tca cca gaa cat tgt tca cct cat cat acc gcc tta aga caa gca       1590
Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg Gln Ala
        505                 510                 515

att ctg tgt tgg ggc gaa tta atg aac cta gca aca tgg gtg ggt tcc       1638
Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val Gly Ser
    520                 525                 530

aat ttg gaa gat cca gca tcc aga gag tta gtg gtt agc tac gtg aat       1686
Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr Val Asn
535                 540                 545                 550

gtc aac atg ggc ttg aaa atc aga cag tta ctt tgg ttc cat atc tct       1734
Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His Ile Ser
                555                 560                 565

tgt ctg aca ttt ggt aga gaa aca gtt ctg gaa tat ctc gtt agc ttt       1782
Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe
            570                 575                 580

gga gta tgg att aga act cca cca gcc tac aga cca cct aat gca cca       1830
Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro
        585                 590                 595

ata ttg tca acc ctc cca gag aca aca gtt gtg agg aga aga gga aga       1878
Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg Gly Arg
    600                 605                 610

tct cct cgt cgt aga act cca tct cca aga cga agg aga tca caa agt       1926
```

```
Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser
615                 620                 625                 630

cct aga cga cgt aga tct caa tct aga gag tct caa tgt caccaccatc        1975
Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys
                635                 640

accatcatta agcggccgc                                                  1994
```

<210> 130
<211> 643
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 130

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His Leu Ser Leu Arg Gly Leu Phe Val Cys Ala Phe Ser Ser Ala Gly
1               5                   10                  15

Pro Asn Ala His Gln Phe Leu Pro Lys Val Leu His Lys Arg Thr Leu
            20                  25                  30

Gly Leu Ser Ala Met Ser Thr Thr Asp Leu Glu Ala Tyr Phe Lys Asp
        35                  40                  45

Cys Leu Phe Lys Asp Trp Glu Glu Leu Gly Glu Glu Leu Glu Gly Gln
    50                  55                  60

Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser Val Ser
65                  70                  75                  80

Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala Phe Arg
                85                  90                  95

Ala Asn Ser Ala Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys Asp Thr
            100                 105                 110

Trp Pro Glu Ala Asn Gln Val Gly Val Gly Ala Phe Gly Leu Gly Phe
        115                 120                 125

Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala Gln Gly
    130                 135                 140

Ile Leu Gln Thr Val Pro Ala Asn Pro Pro Pro Ala Ser Thr Asn Arg
145                 150                 155                 160

Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser
                165                 170                 175
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His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His Gln Ala Leu
            180                 185                 190

Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser
        195                 200                 205

Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Ser
    210                 215                 220

Ile Phe Ser Arg Thr Gly Asp Pro Ala Leu Asn Met Glu Asn Ile Thr
225                 230                 235                 240

Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu
                245                 250                 255

Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr
            260                 265                 270

Ser Leu Asn Phe Leu Gly Gly Thr Thr Thr Cys Pro Gly Gln Asn Ser
        275                 280                 285

Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro Pro Ile Cys
    290                 295                 300

Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe
305                 310                 315                 320

Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln
                325                 330                 335

Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser
            340                 345                 350

Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met
        355                 360                 365

Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys
    370                 375                 380

Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp
385                 390                 395                 400

Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln
                405                 410                 415

Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Val Ile Trp Met
            420                 425                 430
```

```
Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro Phe Ile
        435                 440                 445

Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp Ile Asp
    450                 455                 460

Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu Pro
465                 470                 475                 480

Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser Ala
                485                 490                 495

Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His
            500                 505                 510

Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu
        515                 520                 525

Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu
    530                 535                 540

Val Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu
545                 550                 555                 560

Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu
                565                 570                 575

Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr
            580                 585                 590

Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val
        595                 600                 605

Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg
    610                 615                 620

Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu
625                 630                 635                 640

Ser Gln Cys
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<210> 131
<211> 2672
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<220>
<221> CDS
<222> (37)..(2643)

<400> 131
gaattcgcca ccatggcaga tgaagcacca actagt ggt cta agt cga tat gtt 54
Gly Leu Ser Arg Tyr Val
1 5

gcc aga tta agt tct aat tcc agg atc ttt aac cat caa cat ggc act 102
Ala Arg Leu Ser Ser Asn Ser Arg Ile Phe Asn His Gln His Gly Thr
10 15 20

atg caa aac tta cac gat tca tgt tct aga aac ttg tac gtt agt ttg 150
Met Gln Asn Leu His Asp Ser Cys Ser Arg Asn Leu Tyr Val Ser Leu
25 30 35

tta ctt tta tac caa act ttt ggg aga aaa ctg cat ctc tat tcc cat 198
Leu Leu Leu Tyr Gln Thr Phe Gly Arg Lys Leu His Leu Tyr Ser His
40 45 50

cct att atc cta ggt ttt aga aaa ata cct atg ggg gta ggg ttg tcc 246
Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro Met Gly Val Gly Leu Ser
55 60 65 70

cct ttt ctg ttg gca caa ttc acc tca gcc ata tgt tct gtc gtg aga 294
Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser Val Val Arg
75 80 85

aga gct ttt cca cat tgt ctg gcc ttt tcc tat atg gac gat gtg gtg 342
Arg Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp Asp Val Val
90 95 100

ttg gga gct aag tct gta caa cat ctt gaa agt ttg ttt aca gcc gtt 390
Leu Gly Ala Lys Ser Val Gln His Leu Glu Ser Leu Phe Thr Ala Val
105 110 115

act aat ttc ctt tta tct ttg ggt ata cat ctt aat cca aat aag act 438
Thr Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro Asn Lys Thr
120 125 130

aag aga tgg ggc tac tct ttg cac ttt atg ggc tac gtt att ggg tgt 486
Lys Arg Trp Gly Tyr Ser Leu His Phe Met Gly Tyr Val Ile Gly Cys
135 140 145 150

tac ggc agt tta cca caa gat cat atc atc cag aaa atc aaa gag tgt 534
Tyr Gly Ser Leu Pro Gln Asp His Ile Ile Gln Lys Ile Lys Glu Cys
155 160 165

ttt aga aag tta cca gtt aac aga cca atc gac tgg aaa gtg tgc caa 582
Phe Arg Lys Leu Pro Val Asn Arg Pro Ile Asp Trp Lys Val Cys Gln
170 175 180

cgt atc gta ggt ttg ctt ggt ttt gca gca cct ttt aca cag tgt ggt 630
Arg Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly
185 190 195

tat cca gct tta atg cca ctt tat gct tgt atc caa tct aaa caa gct 678
Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile Gln Ser Lys Gln Ala

```
    200                 205                 210

ttt aca ttt tcc cca aca tat aaa gcc ttc ctg tgc aaa caa cat ctc        726
Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Cys Lys Gln His Leu
215                 220                 225                 230

tct tta aga ggc cta ttc gtc tgc gct ttt tca tcc gct ggt cct aat        774
Ser Leu Arg Gly Leu Phe Val Cys Ala Phe Ser Ser Ala Gly Pro Asn
                235                 240                 245

gca cac caa ttt ctg cct aaa gtt ctg cat aaa cga aca ttg ggt ttg        822
Ala His Gln Phe Leu Pro Lys Val Leu His Lys Arg Thr Leu Gly Leu
            250                 255                 260

tct gca atg agc act acc gac tta gag gcg tac ttc aag gac tgc ttg        870
Ser Ala Met Ser Thr Thr Asp Leu Glu Ala Tyr Phe Lys Asp Cys Leu
        265                 270                 275

ttt aag gat tgg gaa gag ctt gga gag gaa ggt cag tgg tcc tcc aaa        918
Phe Lys Asp Trp Glu Glu Leu Gly Glu Glu Gly Gln Trp Ser Ser Lys
    280                 285                 290

cct aga aag ggt atg ggt act aat ttg tct gta tct aac cct ctc gga        966
Pro Arg Lys Gly Met Gly Thr Asn Leu Ser Val Ser Asn Pro Leu Gly
295                 300                 305                 310

ttc ttt cca gat cac cag tta gat cca gct ttt cgt gct aac agt gcc       1014
Phe Phe Pro Asp His Gln Leu Asp Pro Ala Phe Arg Ala Asn Ser Ala
                315                 320                 325

aac cca gat tgg gat ttc aat cct aat aag gat acc tgg cca gag gct       1062
Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys Asp Thr Trp Pro Glu Ala
            330                 335                 340

aac cag gta gga gtt gga gcc ttc ggt cta ggt ttt acc cca cct cac       1110
Asn Gln Val Gly Val Gly Ala Phe Gly Leu Gly Phe Thr Pro Pro His
        345                 350                 355

ggt gga cta tta ggc tgg agc cca caa gca caa ggt atc ttg caa acc       1158
Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Gln Thr
    360                 365                 370

gtt cca gct aac cct cca cca gcg tca aca aat aga cag tct ggt aga       1206
Val Pro Ala Asn Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg
375                 380                 385                 390

caa cca acc cct att tct cct cct tta aga gac tct cat cct cag gcg       1254
Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala
                395                 400                 405

atg caa tgg aac tca acg acc ttt cat caa gct ctt ttg gac cct aga       1302
Met Gln Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu Asp Pro Arg
            410                 415                 420

gtc agg ggt tta tac ttc cca gct ggt gga tcc tca tcc ggc act gtt       1350
Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val
        425                 430                 435

aat cct gtc cca act aca gca tca cca att tca tcc ata ttt tct aga       1398
Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Phe Ser Arg
    440                 445                 450

act ggg gat cct gct ctt aat atg gaa aac att aca agc ggc ttc cta       1446
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Thr Gly Asp Pro Ala Leu Asn Met Glu Asn Ile Thr Ser Gly Phe Leu
455                 460                 465                 470

gga cca tta tta gtt cta caa gcc gga ttt ttc cta ttg act aga atc       1494
Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile
                475                 480                 485

cta act att cct caa agt ctt gac tcc tgg tgg aca tcc ttg aat ttc       1542
Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe
            490                 495                 500

ctt ggc ggt aca aca aca tgt cca ggc caa aac tct caa tca cca act       1590
Leu Gly Gly Thr Thr Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr
        505                 510                 515

tct aat cac tct cca aca tct tgc cct cca att tgc cca ggt tac aga       1638
Ser Asn His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg
    520                 525                 530

tgg atg tgc ttg aga agg ttc atc att ttt ctg ttc atc ctc ttg ttg       1686
Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu
535                 540                 545                 550

tgt ttg att ttc ctc tta gta ttg ctg gac tac caa ggc atg ctt cca       1734
Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro
                555                 560                 565

gtc tgc cct cta ttg cca gga act tct aca acc tca aca gga cca tgt       1782
Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys
            570                 575                 580

aaa aca tgt act atc cct gct caa gga aca tca atg ttt cca tct tgt       1830
Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys
        585                 590                 595

tgc tgt aca aaa cca tca gat ggt aat tgt act tgt ata cca ata cca       1878
Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro
    600                 605                 610

agt tca tgg gca ttt gcc cgt ttc ctt tgg gag tgg gct tct gta aga       1926
Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg
615                 620                 625                 630

ttc tct tgg tta agt ttg cta gtc cca ttc gtg cag tgg ttt gtt ggc       1974
Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly
                635                 640                 645

ctg tct cca act gtt tgg tta tct gtt att tgg atg atg tgg tac tgg       2022
Leu Ser Pro Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp
            650                 655                 660

ggt cca agc cta tac tca atc gtg tca cct ttt atc cca ttg cta cct       2070
Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro Phe Ile Pro Leu Leu Pro
        665                 670                 675

atc ttt ttc tgc ctc tgg gtt tac atc gat att gac cct tac aag gaa       2118
Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp Ile Asp Pro Tyr Lys Glu
    680                 685                 690

ttt ggc gca aca gtt gaa ttg tta tca ttt tta cca tca gat ttc ttt       2166
Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe
695                 700                 705                 710
```

```
cca tca gtg cgt gat ttg tta gat acg gca tcc gct ttg tac aga gaa       2214
Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu
                715                 720                 725

gca ctg gaa tca cca gaa cac tgt tct cca cat cac act gct ctc aga       2262
Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg
            730                 735                 740

caa gct ata ttg tgt tgg gga gag ttg atg aat cta gcc act tgg gta       2310
Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val
        745                 750                 755

ggg tcc aat ctg gaa gat cct gcc tct aga gaa ctg gtg gta tct tac       2358
Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr
    760                 765                 770

gtc aat gtt aac atg ggg ttg aag att aga caa ctt tta tgg ttc cat       2406
Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His
775                 780                 785                 790

att tca tgt tta acg ttt ggt aga gaa aca gta ctg gaa tac tta gtt       2454
Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val
                795                 800                 805

agt ttc ggt gtc tgg att aga aca cca cca gca tat aga cca cca aat       2502
Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn
            810                 815                 820

gcg cct ata ttg agt acg ctc cca gaa acg acg gtc gtt agg aga aga       2550
Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg
        825                 830                 835

ggt aga tca cct agg aga agg aca cct tca cct aga cgt aga cgt tct       2598
Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser
    840                 845                 850

caa tct cca aga cgt aga aga tct caa tct aga gaa tca caa tgc           2643
Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys
855                 860                 865

catcaccacc atcatcatta agcggccgc                                      2672
```

<210> 132
<211> 869
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 132

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Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Asn Ser Arg Ile Phe
1               5                   10                  15

Asn His Gln His Gly Thr Met Gln Asn Leu His Asp Ser Cys Ser Arg
            20                  25                  30

Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Gln Thr Phe Gly Arg Lys
        35                  40                  45
```

```
Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro
    50                  55                  60

Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala
65                  70                  75                  80

Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser
                85                  90                  95

Tyr Met Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu Glu
            100                 105                 110

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

Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu His Phe Met
    130                 135                 140

Gly Tyr Val Ile Gly Cys Tyr Gly Ser Leu Pro Gln Asp His Ile Ile
145                 150                 155                 160

Gln Lys Ile Lys Glu Cys Phe Arg Lys Leu Pro Val Asn Arg Pro Ile
                165                 170                 175

Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu Gly Phe Ala Ala
            180                 185                 190

Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys
        195                 200                 205

Ile Gln Ser Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe
    210                 215                 220

Leu Cys Lys Gln His Leu Ser Leu Arg Gly Leu Phe Val Cys Ala Phe
225                 230                 235                 240

Ser Ser Ala Gly Pro Asn Ala His Gln Phe Leu Pro Lys Val Leu His
                245                 250                 255

Lys Arg Thr Leu Gly Leu Ser Ala Met Ser Thr Thr Asp Leu Glu Ala
            260                 265                 270

Tyr Phe Lys Asp Cys Leu Phe Lys Asp Trp Glu Glu Leu Gly Glu Glu
        275                 280                 285

Gly Gln Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser
```

290 295 300

Val Ser Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
305 310 315 320

Phe Arg Ala Asn Ser Ala Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys
325 330 335

Asp Thr Trp Pro Glu Ala Asn Gln Val Gly Val Gly Ala Phe Gly Leu
340 345 350

Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala
355 360 365

Gln Gly Ile Leu Gln Thr Val Pro Ala Asn Pro Pro Pro Ala Ser Thr
370 375 380

Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
385 390 395 400

Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His Gln
405 410 415

Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly
420 425 430

Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro Ile
435 440 445

Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro Ala Leu Asn Met Glu Asn
450 455 460

Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly Phe
465 470 475 480

Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp
485 490 495

Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr Thr Thr Cys Pro Gly Gln
500 505 510

Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro Pro
515 520 525

Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile Phe
530 535 540

```
Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu Asp
545                 550                 555                 560

Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser Thr
                565                 570                 575

Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr
            580                 585                 590

Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys
        595                 600                 605

Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp
    610                 615                 620

Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro Phe
625                 630                 635                 640

Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Val Ile
                645                 650                 655

Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro
            660                 665                 670

Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp
        675                 680                 685

Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu Ser Phe
    690                 695                 700

Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala
705                 710                 715                 720

Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro
                725                 730                 735

His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met
            740                 745                 750

Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg
        755                 760                 765

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

Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr
785                 790                 795                 800
```

```
Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro
                805                 810                 815

Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr
            820                 825                 830

Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser
        835                 840                 845

Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser
    850                 855                 860

Arg Glu Ser Gln Cys
865
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<210> 133
<211> 2672
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<220>
<221> CDS
<222> (37)..(2643)

<400> 133

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gaattcgcca ccatggccga cgaggcacct actagt cat ctt tca ctt aga ggg         54
                                        His Leu Ser Leu Arg Gly
                                        1               5

ctc ttt gtt tgt gca ttc agt tct gca ggc cca aac gcc cac caa ttt        102
Leu Phe Val Cys Ala Phe Ser Ser Ala Gly Pro Asn Ala His Gln Phe
            10                  15                  20

ttg cct aag gta ttg cat aaa cgt aca cta gga tta agt gca atg tct        150
Leu Pro Lys Val Leu His Lys Arg Thr Leu Gly Leu Ser Ala Met Ser
        25                  30                  35

act act gat ttg gaa gcc tat ttc aaa gat tgt ctg ttt aaa gat tgg        198
Thr Thr Asp Leu Glu Ala Tyr Phe Lys Asp Cys Leu Phe Lys Asp Trp
    40                  45                  50

gag gaa ttg ggc gag gaa gga ttg tcc aga tat gtt gct aga cta tct        246
Glu Glu Leu Gly Glu Glu Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser
55                  60                  65                  70

tct aat agt aga atc ttt aat cat cag cat ggc aca atg cag aat ttg        294
Ser Asn Ser Arg Ile Phe Asn His Gln His Gly Thr Met Gln Asn Leu
                75                  80                  85

cat gat tca tgt tct aga aat ttg tac gtg tca tta ttg ctt ttg tat        342
His Asp Ser Cys Ser Arg Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr
            90                  95                  100
```

```
caa act ttt ggt aga aag tta cat ctc tat tct cat cca ata atc ctc        390
Gln Thr Phe Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu
        105                 110                 115

ggc ttt cga aaa atc cct atg ggg gtt ggc tta tcc cca ttt ctg ctg        438
Gly Phe Arg Lys Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Leu
    120                 125                 130

gcc caa ttc act tct gca att tgt tcc gtg gtt aga aga gct ttt cct        486
Ala Gln Phe Thr Ser Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro
135                 140                 145                 150

cac tgt tta gct ttt agt tac atg gac gat gtg gtc ctt ggg gca aag        534
His Cys Leu Ala Phe Ser Tyr Met Asp Asp Val Val Leu Gly Ala Lys
                155                 160                 165

tca gtc caa cac tta gaa tca ctt ttt acc gcc gta acc aac ttc ctt        582
Ser Val Gln His Leu Glu Ser Leu Phe Thr Ala Val Thr Asn Phe Leu
            170                 175                 180

cta agt ttg ggt ata cat ctg aac cct aac aaa aca aaa cga tgg ggt        630
Leu Ser Leu Gly Ile His Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly
        185                 190                 195

tac agc tta cat ttt atg ggg tac gtg atc ggt tgc tat ggt tcc ctt        678
Tyr Ser Leu His Phe Met Gly Tyr Val Ile Gly Cys Tyr Gly Ser Leu
    200                 205                 210

cct caa gac cac att atc caa aag ata aaa gag tgc ttt aga aag ctt        726
Pro Gln Asp His Ile Ile Gln Lys Ile Lys Glu Cys Phe Arg Lys Leu
215                 220                 225                 230

cca gtt aat aga cca atc gac tgg aaa gtt tgc caa cga atc gtg ggt        774
Pro Val Asn Arg Pro Ile Asp Trp Lys Val Cys Gln Arg Ile Val Gly
                235                 240                 245

ctg ctg ggt ttt gct gct cca ttc aca caa tgt ggt tac cca gct cta        822
Leu Leu Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu
            250                 255                 260

atg cca tta tat gca tgc atc caa tcc aaa caa gct ttt aca ttt tca        870
Met Pro Leu Tyr Ala Cys Ile Gln Ser Lys Gln Ala Phe Thr Phe Ser
        265                 270                 275

cct act tac aaa gcg ttt ttg tgt aag caa ggt cag tgg tcc tcc aaa        918
Pro Thr Tyr Lys Ala Phe Leu Cys Lys Gln Gly Gln Trp Ser Ser Lys
    280                 285                 290

cct aga aag ggt atg ggt act aat ttg tct gta tct aac cct ctc gga        966
Pro Arg Lys Gly Met Gly Thr Asn Leu Ser Val Ser Asn Pro Leu Gly
295                 300                 305                 310

ttc ttt cca gat cac cag tta gat cca gct ttt cgt gct aac agt gcc       1014
Phe Phe Pro Asp His Gln Leu Asp Pro Ala Phe Arg Ala Asn Ser Ala
                315                 320                 325

aac cca gat tgg gat ttc aat cct aat aag gat acc tgg cca gag gct       1062
Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys Asp Thr Trp Pro Glu Ala
            330                 335                 340

aac cag gta gga gtt gga gcc ttc ggt cta ggt ttt acc cca cct cac       1110
Asn Gln Val Gly Val Gly Ala Phe Gly Leu Gly Phe Thr Pro Pro His
        345                 350                 355
```

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ggt gga cta tta ggc tgg agc cca caa gca caa ggt atc ttg caa acc       1158
Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Gln Thr
    360                 365                 370

gtt cca gct aac cct cca cca gcg tca aca aat aga cag tct ggt aga       1206
Val Pro Ala Asn Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg
375                 380                 385                 390

caa cca acc cct att tct cct cct tta aga gac tct cat cct cag gcg       1254
Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala
                395                 400                 405

atg caa tgg aac tca acg acc ttt cat caa gct ctt ttg gac cct aga       1302
Met Gln Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu Asp Pro Arg
            410                 415                 420

gtc agg ggt tta tac ttc cca gct ggt gga tcc tca tcc ggc act gtt       1350
Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val
        425                 430                 435

aat cct gtc cca act aca gca tca cca att tca tcc ata ttt tct aga       1398
Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Phe Ser Arg
    440                 445                 450

act ggg gat cct gct ctt aat atg gaa aac att aca agc ggc ttc cta       1446
Thr Gly Asp Pro Ala Leu Asn Met Glu Asn Ile Thr Ser Gly Phe Leu
455                 460                 465                 470

gga cca tta tta gtt cta caa gcc gga ttt ttc cta ttg act aga atc       1494
Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile
                475                 480                 485

cta act att cct caa agt ctt gac tcc tgg tgg aca tcc ttg aat ttc       1542
Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe
            490                 495                 500

ctt ggc ggt aca aca aca tgt cca ggc caa aac tct caa tca cca act       1590
Leu Gly Gly Thr Thr Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr
        505                 510                 515

tct aat cac tct cca aca tct tgc cct cca att tgc cca ggt tac aga       1638
Ser Asn His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg
    520                 525                 530

tgg atg tgc ttg aga agg ttc atc att ttt ctg ttc atc ctc ttg ttg       1686
Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu
535                 540                 545                 550

tgt ttg att ttc ctc tta gta ttg ctg gac tac caa ggc atg ctt cca       1734
Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro
                555                 560                 565

gtc tgc cct cta ttg cca gga act tct aca acc tca aca gga cca tgt       1782
Val Cys Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys
            570                 575                 580

aaa aca tgt act atc cct gct caa gga aca tca atg ttt cca tct tgt       1830
Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys
        585                 590                 595

tgc tgt aca aaa cca tca gat ggt aat tgt act tgt ata cca ata cca       1878
Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro
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    600                 605                 610

agt tca tgg gca ttt gcc cgt ttc ctt tgg gag tgg gct tct gta aga       1926
Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg
615                 620                 625                 630

ttc tct tgg tta agt ttg cta gtc cca ttc gtg cag tgg ttt gtt ggc       1974
Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly
                635                 640                 645

ctg tct cca act gtt tgg tta tct gtt att tgg atg atg tgg tac tgg       2022
Leu Ser Pro Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp
            650                 655                 660

ggt cca agc cta tac tca atc gtg tca cct ttt atc cca ttg cta cct       2070
Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro Phe Ile Pro Leu Leu Pro
        665                 670                 675

atc ttt ttc tgc ctc tgg gtt tac atc gat att gac cct tac aag gaa       2118
Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp Ile Asp Pro Tyr Lys Glu
    680                 685                 690

ttt ggc gca aca gtt gaa ttg tta tca ttt tta cca tca gat ttc ttt       2166
Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe
695                 700                 705                 710

cca tca gtg cgt gat ttg tta gat acg gca tcc gct ttg tac aga gaa       2214
Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu
                715                 720                 725

gca ctg gaa tca cca gaa cac tgt tct cca cat cac act gct ctc aga       2262
Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg
            730                 735                 740

caa gct ata ttg tgt tgg gga gag ttg atg aat cta gcc act tgg gta       2310
Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val
        745                 750                 755

ggg tcc aat ctg gaa gat cct gcc tct aga gaa ctg gtg gta tct tac       2358
Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr
    760                 765                 770

gtc aat gtt aac atg ggg ttg aag att aga caa ctt tta tgg ttc cat       2406
Val Asn Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His
775                 780                 785                 790

att tca tgt tta acg ttt ggt aga gaa aca gta ctg gaa tac tta gtt       2454
Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val
                795                 800                 805

agt ttc ggt gtc tgg att aga aca cca cca gca tat aga cca cca aat       2502
Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn
            810                 815                 820

gcg cct ata ttg agt acg ctc cca gaa acg acg gtc gtt agg aga aga       2550
Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg
        825                 830                 835

ggt aga tca cct agg aga agg aca cct tca cct aga cgt aga cgt tct       2598
Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser
    840                 845                 850

caa tct cca aga cgt aga aga tct caa tct aga gaa tca caa tgc           2643
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Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys
855 860 865

catcatcatc accatcatta agcggccgc 2672

<210> 134
<211> 869
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 134

His Leu Ser Leu Arg Gly Leu Phe Val Cys Ala Phe Ser Ser Ala Gly
1 5 10 15

Pro Asn Ala His Gln Phe Leu Pro Lys Val Leu His Lys Arg Thr Leu
20 25 30

Gly Leu Ser Ala Met Ser Thr Thr Asp Leu Glu Ala Tyr Phe Lys Asp
35 40 45

Cys Leu Phe Lys Asp Trp Glu Glu Leu Gly Glu Glu Gly Leu Ser Arg
50 55 60

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

Gly Thr Met Gln Asn Leu His Asp Ser Cys Ser Arg Asn Leu Tyr Val
85 90 95

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

Ser His Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro Met Gly Val Gly
115 120 125

Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser Val
130 135 140

Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp Asp
145 150 155 160

Val Val Leu Gly Ala Lys Ser Val Gln His Leu Glu Ser Leu Phe Thr
165 170 175

Ala Val Thr Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro Asn
180 185 190

```
Lys Thr Lys Arg Trp Gly Tyr Ser Leu His Phe Met Gly Tyr Val Ile
        195                 200                 205

Gly Cys Tyr Gly Ser Leu Pro Gln Asp His Ile Ile Gln Lys Ile Lys
    210                 215                 220

Glu Cys Phe Arg Lys Leu Pro Val Asn Arg Pro Ile Asp Trp Lys Val
225                 230                 235                 240

Cys Gln Arg Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe Thr Gln
                245                 250                 255

Cys Gly Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile Gln Ser Lys
            260                 265                 270

Gln Ala Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Cys Lys Gln
        275                 280                 285

Gly Gln Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser
    290                 295                 300

Val Ser Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
305                 310                 315                 320

Phe Arg Ala Asn Ser Ala Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys
                325                 330                 335

Asp Thr Trp Pro Glu Ala Asn Gln Val Gly Val Gly Ala Phe Gly Leu
            340                 345                 350

Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala
        355                 360                 365

Gln Gly Ile Leu Gln Thr Val Pro Ala Asn Pro Pro Pro Ala Ser Thr
    370                 375                 380

Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
385                 390                 395                 400

Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His Gln
                405                 410                 415

Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly
            420                 425                 430

Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro Ile
        435                 440                 445
```

```
Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro Ala Leu Asn Met Glu Asn
    450                 455                 460

Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly Phe
465                 470                 475                 480

Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp
                485                 490                 495

Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr Thr Thr Cys Pro Gly Gln
            500                 505                 510

Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro Pro
        515                 520                 525

Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile Phe
    530                 535                 540

Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu Asp
545                 550                 555                 560

Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser Thr
                565                 570                 575

Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly Thr
            580                 585                 590

Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys
        595                 600                 605

Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu Trp
    610                 615                 620

Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro Phe
625                 630                 635                 640

Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Val Ile
                645                 650                 655

Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile Val Ser Pro
            660                 665                 670

Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile Asp
        675                 680                 685

Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu Ser Phe
```

690 695 700

Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala
705 710 715 720

Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro
725 730 735

His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met
740 745 750

Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala Ser Arg
755 760 765

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

Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr
785 790 795 800

Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro
805 810 815

Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr
820 825 830

Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser
835 840 845

Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser
850 855 860

Arg Glu Ser Gln Cys
865

<210> 135
<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 135

Lys Leu His Leu Tyr Ser His Pro Ile
1 5

<210> 136
<211> 10
<212> PRT
<213> Hepatitis B virus

<400> 136

Leu Leu Val Pro Phe Val Gln Trp Phe Val
1 5 10

<210> 137
<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 137

His Leu Tyr Ser His Pro Ile Ile Leu
1 5

<210> 138
<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 138

Trp Ser Pro Gln Ala Gln Gly Ile Leu
1 5

<210> 139
<211> 8
<212> PRT
<213> Hepatitis B virus

<400> 139

Val Leu Leu Asp Tyr Gln Gly Met
1 5

<210> 140
<211> 8
<212> PRT
<213> Hepatitis B virus

<400> 140

Ala Ser Val Arg Phe Ser Trp Leu
1 5

<210> 141
<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 141

Thr Val Pro Ala Asn Pro Pro Pro Ala
1 5

<210> 142
<211> 9

<212> PRT
<213> Hepatitis B virus

<400> 142

Gly Met Leu Pro Val Cys Pro Leu Leu
1 5

<210> 143
<211> 9
<212> PRT
<213> Hepatitis B virus

<400> 143

Met Gly Leu Lys Ile Arg Gln Leu Leu
1 5

<210> 144
<211> 8
<212> PRT
<213> Hepatitis B virus

<400> 144

Ile Cys Pro Gly Tyr Arg Trp Met
1 5

<210> 145
<211> 8
<212> PRT
<213> Hepatitis B virus

<400> 145

Ile Ile Phe Leu Phe Ile Leu Leu
1 5

<210> 146
<211> 8
<212> PRT
<213> Hepatitis B virus

<400> 146

Phe Val Gln Trp Phe Val Gly Leu
1 5

<210> 147
<211> 8
<212> PRT
<213> Hepatitis B virus

<400> 147

Leu Leu Pro Ile Phe Phe Cys Leu
1 5

<210> 148
<211> 21
<212> PRT
<213> Hepatitis B virus

<400> 148

Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro
1 5 10 15

Asn Ala Pro Ile Leu
20

<210> 149
<211> 8
<212> PRT
<213> Hepatitis B virus

<400> 149

Ile Leu Ser Pro Phe Leu Pro Leu
1 5

<210> 150
<211> 657
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 150

Met Ala Asp Glu Ala Pro Thr Ser His Leu Ser Leu Arg Gly Leu Phe
1 5 10 15

Val Cys Ala Phe Ser Ser Ala Gly Pro Asn Ala His Gln Phe Leu Pro
20 25 30

Lys Val Leu His Lys Arg Thr Leu Gly Leu Ser Ala Met Ser Thr Thr
35 40 45

Asp Leu Glu Ala Tyr Phe Lys Asp Cys Leu Phe Lys Asp Trp Glu Glu
50 55 60

Leu Gly Glu Glu Leu Glu Gly Gln Trp Ser Ser Lys Pro Arg Lys Gly
65 70 75 80

Met Gly Thr Asn Leu Ser Val Ser Asn Pro Leu Gly Phe Phe Pro Asp
85 90 95

His Gln Leu Asp Pro Ala Phe Arg Ala Asn Ser Ala Asn Pro Asp Trp
100 105 110

```
Asp Phe Asn Pro Asn Lys Asp Thr Trp Pro Glu Ala Asn Gln Val Gly
        115                 120                 125

Val Gly Ala Phe Gly Leu Gly Phe Thr Pro Pro His Gly Gly Leu Leu
    130                 135                 140

Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Gln Thr Val Pro Ala Asn
145                 150                 155                 160

Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro
                165                 170                 175

Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala Met Gln Trp Asn
            180                 185                 190

Ser Thr Thr Phe His Gln Ala Leu Leu Asp Pro Arg Val Arg Gly Leu
        195                 200                 205

Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val Asn Pro Val Pro
    210                 215                 220

Thr Thr Ala Ser Pro Ile Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro
225                 230                 235                 240

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

Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro
            260                 265                 270

Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr
        275                 280                 285

Thr Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser
    290                 295                 300

Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu
305                 310                 315                 320

Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe
                325                 330                 335

Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu
            340                 345                 350

Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr
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        355                 360                 365

Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys Cys Cys Thr Lys
    370                 375                 380

Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala
385                 390                 395                 400

Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu
                405                 410                 415

Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr
            420                 425                 430

Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu
        435                 440                 445

Tyr Ser Ile Val Ser Pro Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys
    450                 455                 460

Leu Trp Val Tyr Ile Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr
465                 470                 475                 480

Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg
                485                 490                 495

Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser
            500                 505                 510

Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu
        515                 520                 525

Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val Gly Ser Asn Leu
    530                 535                 540

Glu Asp Pro Ala Ser Arg Glu Leu Val Val Ser Tyr Val Asn Val Asn
545                 550                 555                 560

Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu
                565                 570                 575

Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val
            580                 585                 590

Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu
        595                 600                 605
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Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro
610 615 620

Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg
625 630 635 640

Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys His His His His His
645 650 655

His

<210> 151
<211> 595
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 151

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

Pro Asp His Gln Leu Asp Pro Ala Phe Arg Ala Asn Ser Ala Asn Pro
35 40 45

Asp Trp Asp Phe Asn Pro Asn Lys Asp Thr Trp Pro Glu Ala Asn Gln
50 55 60

Val Gly Val Gly Ala Phe Gly Leu Gly Phe Thr Pro Pro His Gly Gly
65 70 75 80

Leu Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Gln Thr Val Pro
85 90 95

Ala Asn Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg Gln Pro
100 105 110

Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala Met Gln
115 120 125

Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu Asp Pro Arg Val Arg
130 135 140

Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val Asn Pro

```
145                 150                 155                 160

Val Pro Thr Thr Ala Ser Pro Ile Ser Ser Ile Phe Ser Arg Thr Gly
                165                 170                 175

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

Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr
        195                 200                 205

Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly
    210                 215                 220

Gly Thr Thr Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn
225                 230                 235                 240

His Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met
                245                 250                 255

Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu
            260                 265                 270

Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys
        275                 280                 285

Pro Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys Lys Thr
    290                 295                 300

Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys Cys Cys
305                 310                 315                 320

Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser
                325                 330                 335

Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg Phe Ser
            340                 345                 350

Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser
        355                 360                 365

Pro Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp Gly Pro
    370                 375                 380

Ser Leu Tyr Ser Ile Val Ser Pro Phe Ile Pro Leu Leu Pro Ile Phe
385                 390                 395                 400
```

```
Phe Cys Leu Trp Val Tyr Ile Asp Ile Asp Pro Tyr Lys Glu Phe Gly
                405                 410                 415

Ala Thr Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser
            420                 425                 430

Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu
        435                 440                 445

Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg Gln Ala
    450                 455                 460

Ile Leu Cys Trp Gly Glu Leu Met Asn Leu Ala Thr Trp Val Gly Ser
465                 470                 475                 480

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

Val Asn Met Gly Leu Lys Ile Arg Gln Leu Leu Trp Phe His Ile Ser
            500                 505                 510

Cys Leu Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe
        515                 520                 525

Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro
    530                 535                 540

Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg Gly Arg
545                 550                 555                 560

Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser
                565                 570                 575

Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser Gln Cys His His His
            580                 585                 590

His His His
        595
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<210> 152
<211> 8
<212> PRT
<213> Hepatitis B virus

<400> 152

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Val Trp Leu Ser Val Ile Trp Met
1               5
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