SEQUENCE LISTING

<110> ProBioGen AG

<120> Transposase with enhanced insertion site selection properties

<130> 513-33 PCT

<160> 34

<170> PatentIn version 3.5

<210> 1
<211> 2120
<212> DNA
<213> Artificial Sequence

<220>
<223> Taf3-haPB

<220>
<221> CDS
<222> (16)..(2109)

<400> 1
```
accggtggat ccggc atg gtc atc aga gat gag tgg ggc aat cag atc tgg        51
                Met Val Ile Arg Asp Glu Trp Gly Asn Gln Ile Trp
                1               5                   10

atc tgt ccc ggc tgc aac aag cct gac gac ggc tct cct atg atc ggc         99
Ile Cys Pro Gly Cys Asn Lys Pro Asp Asp Gly Ser Pro Met Ile Gly
        15                  20                  25

tgc gac gac tgt gac gac tgg tat cac tgg cct tgc gtg ggc atc atg        147
Cys Asp Asp Cys Asp Asp Trp Tyr His Trp Pro Cys Val Gly Ile Met
    30                  35                  40

acc gct cca cct gaa gag atg cag tgg ttc tgc ccc aag tgc gcc aac        195
Thr Ala Pro Pro Glu Glu Met Gln Trp Phe Cys Pro Lys Cys Ala Asn
45                  50                  55                  60

aag aag aag gat aag aag cac aag aag cgg aag cac aga gcc cac aag        243
Lys Lys Lys Asp Lys Lys His Lys Lys Arg Lys His Arg Ala His Lys
                65                  70                  75

ctt gga ggt ggt gct cct gct gtt ggc ggc gga cct aaa aaa ctt gga        291
Leu Gly Gly Gly Ala Pro Ala Val Gly Gly Gly Pro Lys Lys Leu Gly
            80                  85                  90

ggc gga gca cca gct gtc ggc gga ggt cct aaa gcc atg gga tct tct        339
Gly Gly Ala Pro Ala Val Gly Gly Gly Pro Lys Ala Met Gly Ser Ser
        95                  100                 105
```

```
ctg gac gac gag cac atc ctg tct gcc ctg ctg cag tct gac gat gaa        387
Leu Asp Asp Glu His Ile Leu Ser Ala Leu Leu Gln Ser Asp Asp Glu
    110                 115                 120

ctc gtg ggc gaa gat tcc gac tcc gag gtg tcc gac cat gtg tct gag        435
Leu Val Gly Glu Asp Ser Asp Ser Glu Val Ser Asp His Val Ser Glu
125                 130                 135                 140

gac gac gtg cag tcc gat acc gag gaa gcc ttc atc gac gag gtg cac        483
Asp Asp Val Gln Ser Asp Thr Glu Glu Ala Phe Ile Asp Glu Val His
                145                 150                 155

gaa gtg cag cct acc tct tcc ggc tct gag atc ctg gac gag cag aac        531
Glu Val Gln Pro Thr Ser Ser Gly Ser Glu Ile Leu Asp Glu Gln Asn
            160                 165                 170

gtg atc gag cag cct gga tct tcc ctg gcc tcc aac aga atc ctg aca        579
Val Ile Glu Gln Pro Gly Ser Ser Leu Ala Ser Asn Arg Ile Leu Thr
        175                 180                 185

ctg cct cag cgg acc atc cgg ggc aag aac aag cac tgc tgg tcc acc        627
Leu Pro Gln Arg Thr Ile Arg Gly Lys Asn Lys His Cys Trp Ser Thr
    190                 195                 200

tct aag agc acc cgg cgg tct aga gtg tcc gct ctg aat att gtg cgg        675
Ser Lys Ser Thr Arg Arg Ser Arg Val Ser Ala Leu Asn Ile Val Arg
205                 210                 215                 220

tcc cag agg ggc ccc acc aga atg tgc cgg aac atc tac gac cct ctg        723
Ser Gln Arg Gly Pro Thr Arg Met Cys Arg Asn Ile Tyr Asp Pro Leu
                225                 230                 235

ctg tgc ttc aag ctg ttc ttc acc gac gag atc atc tcc gag atc gtg        771
Leu Cys Phe Lys Leu Phe Phe Thr Asp Glu Ile Ile Ser Glu Ile Val
            240                 245                 250

aag tgg acc aac gcc gag atc tct ctg aag cgg cgc gag tct atg acc        819
Lys Trp Thr Asn Ala Glu Ile Ser Leu Lys Arg Arg Glu Ser Met Thr
        255                 260                 265

tct gcc acc ttc cgg gac acc aac gag gat gag atc tac gcc ttc ttc        867
Ser Ala Thr Phe Arg Asp Thr Asn Glu Asp Glu Ile Tyr Ala Phe Phe
    270                 275                 280

ggc atc ctg gtc atg aca gcc gtg cgg aag gac aac cac atg tcc acc        915
Gly Ile Leu Val Met Thr Ala Val Arg Lys Asp Asn His Met Ser Thr
285                 290                 295                 300

gac gac ctg ttc gac aga tcc ctg tcc atg gtg tac gtg tcc gtg atg        963
Asp Asp Leu Phe Asp Arg Ser Leu Ser Met Val Tyr Val Ser Val Met
                305                 310                 315

tcc agg gac aga ttc gac ttc ctg atc cgg tgc ctg cgg atg gac gac       1011
Ser Arg Asp Arg Phe Asp Phe Leu Ile Arg Cys Leu Arg Met Asp Asp
```

```
            320                 325                 330

aag tct atc aga ccc aca ctg cgc gag aac gac gtg ttc aca cct gtg       1059
Lys Ser Ile Arg Pro Thr Leu Arg Glu Asn Asp Val Phe Thr Pro Val
        335                 340                 345

cgg aag atc tgg gac ctg ttc atc cac cag tgc atc cag aac tac acc       1107
Arg Lys Ile Trp Asp Leu Phe Ile His Gln Cys Ile Gln Asn Tyr Thr
    350                 355                 360

cct ggc gct cac ctg acc atc gac gaa cag ctg ctg ggc ttc aga ggc       1155
Pro Gly Ala His Leu Thr Ile Asp Glu Gln Leu Leu Gly Phe Arg Gly
365                 370                 375                 380

aga tgc cct ttc cgg gtg tac atc ccc aac aag ccc tct aag tac ggc       1203
Arg Cys Pro Phe Arg Val Tyr Ile Pro Asn Lys Pro Ser Lys Tyr Gly
                385                 390                 395

atc aag atc ctg atg atg tgc gac tcc ggc acc aag tac atg atc aac       1251
Ile Lys Ile Leu Met Met Cys Asp Ser Gly Thr Lys Tyr Met Ile Asn
            400                 405                 410

ggc atg ccc tac ctc ggc aga ggc acc caa aca aat ggc gtg cca ctg       1299
Gly Met Pro Tyr Leu Gly Arg Gly Thr Gln Thr Asn Gly Val Pro Leu
        415                 420                 425

ggc gag tac tac gtg aaa gaa ctg tcc aag cct gtg cac ggc tcc tgc       1347
Gly Glu Tyr Tyr Val Lys Glu Leu Ser Lys Pro Val His Gly Ser Cys
    430                 435                 440

aga aac atc acc tgt gat aac tgg ttc acc tcc att cct ctg gcc aag       1395
Arg Asn Ile Thr Cys Asp Asn Trp Phe Thr Ser Ile Pro Leu Ala Lys
445                 450                 455                 460

aac ctg ctg caa gag cct tac aag ctg aca atc gtg ggc acc gtg cgg       1443
Asn Leu Leu Gln Glu Pro Tyr Lys Leu Thr Ile Val Gly Thr Val Arg
                465                 470                 475

tcc aac aag cgg gaa att cct gag gtg ctg aag aac tct cgg tcc aga       1491
Ser Asn Lys Arg Glu Ile Pro Glu Val Leu Lys Asn Ser Arg Ser Arg
            480                 485                 490

cct gtg ggc acc tcc atg ttc tgt ttc gac ggc cct ctg aca ctg gtg       1539
Pro Val Gly Thr Ser Met Phe Cys Phe Asp Gly Pro Leu Thr Leu Val
        495                 500                 505

tcc tac aag cct aag cct gcc aag atg gtg tac ctg ctg tcc tcc tgt       1587
Ser Tyr Lys Pro Lys Pro Ala Lys Met Val Tyr Leu Leu Ser Ser Cys
    510                 515                 520

gac gag gac gcc agc atc aat gag tcc acc ggc aag ccc cag atg gtc       1635
Asp Glu Asp Ala Ser Ile Asn Glu Ser Thr Gly Lys Pro Gln Met Val
525                 530                 535                 540
```

```
atg tac tac aac cag acc aaa ggc ggc gtg gac acc ctg gac cag atg       1683
Met Tyr Tyr Asn Gln Thr Lys Gly Gly Val Asp Thr Leu Asp Gln Met
                545                 550                 555

tgc tct gtg atg acc tgc tcc aga aag acc aac aga tgg ccc atg gct       1731
Cys Ser Val Met Thr Cys Ser Arg Lys Thr Asn Arg Trp Pro Met Ala
            560                 565                 570

ctg ctg tac ggc atg atc aat atc gcc tgc atc aac agc ttc atc atc       1779
Leu Leu Tyr Gly Met Ile Asn Ile Ala Cys Ile Asn Ser Phe Ile Ile
        575                 580                 585

tac tcc cac aac gtg tcc tcc aag ggc gag aag gtg cag tcc cgg aaa       1827
Tyr Ser His Asn Val Ser Ser Lys Gly Glu Lys Val Gln Ser Arg Lys
    590                 595                 600

aag ttc atg cgg aac ctg tat atg tcc ctg acc tcc agc ttc atg aga       1875
Lys Phe Met Arg Asn Leu Tyr Met Ser Leu Thr Ser Ser Phe Met Arg
605                 610                 615                 620

aag cgg ctg gaa gcc cct aca ctg aag cgc tac ctg cgg gac aac atc       1923
Lys Arg Leu Glu Ala Pro Thr Leu Lys Arg Tyr Leu Arg Asp Asn Ile
                625                 630                 635

tcc aac atc ctg cct aaa gag gtg ccc ggc acc agc gac gac tct aca       1971
Ser Asn Ile Leu Pro Lys Glu Val Pro Gly Thr Ser Asp Asp Ser Thr
            640                 645                 650

gag gaa ccc gtg atg aag aag agg acc tac tgc acc tac tgt ccc tcc       2019
Glu Glu Pro Val Met Lys Lys Arg Thr Tyr Cys Thr Tyr Cys Pro Ser
        655                 660                 665

aag atc cgg cgg aag gcc aac gcc tct tgc aaa aag tgc aag aaa gtg       2067
Lys Ile Arg Arg Lys Ala Asn Ala Ser Cys Lys Lys Cys Lys Lys Val
    670                 675                 680

atc tgc cgc gag cac aac atc gat atg tgc cag tcc tgc ttc               2109
Ile Cys Arg Glu His Asn Ile Asp Met Cys Gln Ser Cys Phe
685                 690                 695

tgagcggccg c                                                         2120
```

<210> 2
<211> 698
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 2

```
Met Val Ile Arg Asp Glu Trp Gly Asn Gln Ile Trp Ile Cys Pro Gly
```

```
1               5                   10                  15

Cys Asn Lys Pro Asp Asp Gly Ser Pro Met Ile Gly Cys Asp Asp Cys
            20                  25                  30

Asp Asp Trp Tyr His Trp Pro Cys Val Gly Ile Met Thr Ala Pro Pro
        35                  40                  45

Glu Glu Met Gln Trp Phe Cys Pro Lys Cys Ala Asn Lys Lys Lys Asp
    50                  55                  60

Lys Lys His Lys Lys Arg Lys His Arg Ala His Lys Leu Gly Gly Gly
65                  70                  75                  80

Ala Pro Ala Val Gly Gly Gly Pro Lys Lys Leu Gly Gly Gly Ala Pro
                85                  90                  95

Ala Val Gly Gly Gly Pro Lys Ala Met Gly Ser Ser Leu Asp Asp Glu
            100                 105                 110

His Ile Leu Ser Ala Leu Leu Gln Ser Asp Asp Glu Leu Val Gly Glu
        115                 120                 125

Asp Ser Asp Ser Glu Val Ser Asp His Val Ser Glu Asp Asp Val Gln
    130                 135                 140

Ser Asp Thr Glu Glu Ala Phe Ile Asp Glu Val His Glu Val Gln Pro
145                 150                 155                 160

Thr Ser Ser Gly Ser Glu Ile Leu Asp Glu Gln Asn Val Ile Glu Gln
                165                 170                 175

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

Thr Ile Arg Gly Lys Asn Lys His Cys Trp Ser Thr Ser Lys Ser Thr
        195                 200                 205

Arg Arg Ser Arg Val Ser Ala Leu Asn Ile Val Arg Ser Gln Arg Gly
    210                 215                 220
```

```
Pro Thr Arg Met Cys Arg Asn Ile Tyr Asp Pro Leu Leu Cys Phe Lys
225                 230                 235                 240

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

Ala Glu Ile Ser Leu Lys Arg Arg Glu Ser Met Thr Ser Ala Thr Phe
            260                 265                 270

Arg Asp Thr Asn Glu Asp Glu Ile Tyr Ala Phe Phe Gly Ile Leu Val
        275                 280                 285

Met Thr Ala Val Arg Lys Asp Asn His Met Ser Thr Asp Asp Leu Phe
    290                 295                 300

Asp Arg Ser Leu Ser Met Val Tyr Val Ser Val Met Ser Arg Asp Arg
305                 310                 315                 320

Phe Asp Phe Leu Ile Arg Cys Leu Arg Met Asp Asp Lys Ser Ile Arg
                325                 330                 335

Pro Thr Leu Arg Glu Asn Asp Val Phe Thr Pro Val Arg Lys Ile Trp
            340                 345                 350

Asp Leu Phe Ile His Gln Cys Ile Gln Asn Tyr Thr Pro Gly Ala His
        355                 360                 365

Leu Thr Ile Asp Glu Gln Leu Leu Gly Phe Arg Gly Arg Cys Pro Phe
    370                 375                 380

Arg Val Tyr Ile Pro Asn Lys Pro Ser Lys Tyr Gly Ile Lys Ile Leu
385                 390                 395                 400

Met Met Cys Asp Ser Gly Thr Lys Tyr Met Ile Asn Gly Met Pro Tyr
                405                 410                 415

Leu Gly Arg Gly Thr Gln Thr Asn Gly Val Pro Leu Gly Glu Tyr Tyr
            420                 425                 430

Val Lys Glu Leu Ser Lys Pro Val His Gly Ser Cys Arg Asn Ile Thr
```

```
        435                 440                 445

Cys Asp Asn Trp Phe Thr Ser Ile Pro Leu Ala Lys Asn Leu Leu Gln
    450                 455                 460

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

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

Ser Met Phe Cys Phe Asp Gly Pro Leu Thr Leu Val Ser Tyr Lys Pro
            500                 505                 510

Lys Pro Ala Lys Met Val Tyr Leu Leu Ser Ser Cys Asp Glu Asp Ala
        515                 520                 525

Ser Ile Asn Glu Ser Thr Gly Lys Pro Gln Met Val Met Tyr Tyr Asn
    530                 535                 540

Gln Thr Lys Gly Gly Val Asp Thr Leu Asp Gln Met Cys Ser Val Met
545                 550                 555                 560

Thr Cys Ser Arg Lys Thr Asn Arg Trp Pro Met Ala Leu Leu Tyr Gly
                565                 570                 575

Met Ile Asn Ile Ala Cys Ile Asn Ser Phe Ile Ile Tyr Ser His Asn
            580                 585                 590

Val Ser Ser Lys Gly Glu Lys Val Gln Ser Arg Lys Lys Phe Met Arg
        595                 600                 605

Asn Leu Tyr Met Ser Leu Thr Ser Ser Phe Met Arg Lys Arg Leu Glu
    610                 615                 620

Ala Pro Thr Leu Lys Arg Tyr Leu Arg Asp Asn Ile Ser Asn Ile Leu
625                 630                 635                 640

Pro Lys Glu Val Pro Gly Thr Ser Asp Asp Ser Thr Glu Glu Pro Val
                645                 650                 655
```

```
Met Lys Lys Arg Thr Tyr Cys Thr Tyr Cys Pro Ser Lys Ile Arg Arg
            660                 665                 670


Lys Ala Asn Ala Ser Cys Lys Lys Cys Lys Lys Val Ile Cys Arg Glu
        675                 680                 685


His Asn Ile Asp Met Cys Gln Ser Cys Phe
    690                 695


<210>  3
<211>  2546
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  KAT2A-PBw-Taf3


<220>
<221>  CDS
<222>  (16)..(2538)

<400>  3
accggtggat ccggc atg aag gaa aag ggc aaa gag ctg aag gac ccc gac        51
                Met Lys Glu Lys Gly Lys Glu Leu Lys Asp Pro Asp
                1               5                   10

cag ctg tac acc aca ctg aag aat ctg ctg gcc cag atc aag tct cac         99
Gln Leu Tyr Thr Thr Leu Lys Asn Leu Leu Ala Gln Ile Lys Ser His
        15                  20                  25

ccc tcc gcc tgg cct ttc atg gaa ccc gtg aag aag tct gag gcc cct        147
Pro Ser Ala Trp Pro Phe Met Glu Pro Val Lys Lys Ser Glu Ala Pro
    30                  35                  40

gac tac tac gaa gtg atc aga ttc ccc atc gac ctc aag acc atg acc        195
Asp Tyr Tyr Glu Val Ile Arg Phe Pro Ile Asp Leu Lys Thr Met Thr
45                  50                  55                  60

gag cgg ctg aga tcc cgg tac tac gtg acc aga aag ctg ttc gtg gcc        243
Glu Arg Leu Arg Ser Arg Tyr Tyr Val Thr Arg Lys Leu Phe Val Ala
                65                  70                  75

gac ctg cag aga gtg atc gcc aac tgt aga gag tac aac cct cct gac        291
Asp Leu Gln Arg Val Ile Ala Asn Cys Arg Glu Tyr Asn Pro Pro Asp
            80                  85                  90

tcc gag tac tgc aga tgc gcc tcc gct ctg gaa aag ttc ttc tac ttc        339
Ser Glu Tyr Cys Arg Cys Ala Ser Ala Leu Glu Lys Phe Phe Tyr Phe
        95                  100                 105
```

```
aag ctg aaa gaa ggc ggc ctg atc gac aag aag ctt gga ggc gga gca        387
Lys Leu Lys Glu Gly Gly Leu Ile Asp Lys Lys Leu Gly Gly Gly Ala
    110                 115                 120

cca gct gtt ggc gga gga cct aaa aaa ctc gga ggt ggc gct cct gct        435
Pro Ala Val Gly Gly Gly Pro Lys Lys Leu Gly Gly Gly Ala Pro Ala
125                 130                 135                 140

gtc gga ggc gga cct aaa gct atg ggc agc tct ctg gac gac gag cac        483
Val Gly Gly Gly Pro Lys Ala Met Gly Ser Ser Leu Asp Asp Glu His
                145                 150                 155

atc ctg tct gcc ctg ctg cag tcc gac gat gaa cta gtg ggc gaa gat        531
Ile Leu Ser Ala Leu Leu Gln Ser Asp Asp Glu Leu Val Gly Glu Asp
            160                 165                 170

tcc gac tcc gag atc tcc gat cac gtg tcc gag gac gac gtg cag tct        579
Ser Asp Ser Glu Ile Ser Asp His Val Ser Glu Asp Asp Val Gln Ser
        175                 180                 185

gat acc gag gaa gcc ttc atc gac gag gtg cac gaa gtg cag cct acc        627
Asp Thr Glu Glu Ala Phe Ile Asp Glu Val His Glu Val Gln Pro Thr
    190                 195                 200

tct tcc ggc tct gag atc ctg gac gag cag aac gtg atc gag cag cct        675
Ser Ser Gly Ser Glu Ile Leu Asp Glu Gln Asn Val Ile Glu Gln Pro
205                 210                 215                 220

gga tcc tct ctg gcc tcc aac aga atc ctg aca ctg ccc cag aga acc        723
Gly Ser Ser Leu Ala Ser Asn Arg Ile Leu Thr Leu Pro Gln Arg Thr
                225                 230                 235

atc cgg ggc aag aac aag cac tgc tgg tcc acc tcc aag tct acc cgg        771
Ile Arg Gly Lys Asn Lys His Cys Trp Ser Thr Ser Lys Ser Thr Arg
            240                 245                 250

cgg tct aga gtg tcc gct ctg aat att gtg cgg tcc cag agg ggc ccc        819
Arg Ser Arg Val Ser Ala Leu Asn Ile Val Arg Ser Gln Arg Gly Pro
        255                 260                 265

acc aga atg tgc cgg aac atc tac gac cct ctg ctg tgt ttc aag ctg        867
Thr Arg Met Cys Arg Asn Ile Tyr Asp Pro Leu Leu Cys Phe Lys Leu
    270                 275                 280

ttc ttc acc gac gag atc atc agc gag atc gtg aag tgg acc aac gcc        915
Phe Phe Thr Asp Glu Ile Ile Ser Glu Ile Val Lys Trp Thr Asn Ala
285                 290                 295                 300

gag atc agc ctg aag cgg cgg gaa tct atg acc ggc gcc acc ttc aga        963
Glu Ile Ser Leu Lys Arg Arg Glu Ser Met Thr Gly Ala Thr Phe Arg
                305                 310                 315

gac acc aac gag gat gag atc tac gcc ttc ttc ggc atc ctg gtc atg       1011
```

```
Asp Thr Asn Glu Asp Glu Ile Tyr Ala Phe Phe Gly Ile Leu Val Met
            320                 325                 330

aca gcc gtg cgg aag gac aac cac atg tcc acc gac gac ctg ttc gac       1059
Thr Ala Val Arg Lys Asp Asn His Met Ser Thr Asp Asp Leu Phe Asp
        335                 340                 345

aga tcc ctg tcc atg gtg tac gtg tcc gtg atg agc cgg gac aga ttc       1107
Arg Ser Leu Ser Met Val Tyr Val Ser Val Met Ser Arg Asp Arg Phe
    350                 355                 360

gac ttc ctg atc cgg tgc ctg cgg atg gac gac aag tcc atc aga ccc       1155
Asp Phe Leu Ile Arg Cys Leu Arg Met Asp Asp Lys Ser Ile Arg Pro
365                 370                 375                 380

aca ctg cgc gag aac gac gtg ttc aca cct gtg cgg aag atc tgg gac       1203
Thr Leu Arg Glu Asn Asp Val Phe Thr Pro Val Arg Lys Ile Trp Asp
                385                 390                 395

ctg ttc atc cac cag tgc atc cag aac tac acc cct ggc gct cac ctg       1251
Leu Phe Ile His Gln Cys Ile Gln Asn Tyr Thr Pro Gly Ala His Leu
            400                 405                 410

acc atc gat gaa cag ctg ctg ggc ttc aga ggc aga tgc ccc ttc aga       1299
Thr Ile Asp Glu Gln Leu Leu Gly Phe Arg Gly Arg Cys Pro Phe Arg
        415                 420                 425

atg tac atc ccc aac aag ccc tct aag tac ggc atc aag atc ctg atg       1347
Met Tyr Ile Pro Asn Lys Pro Ser Lys Tyr Gly Ile Lys Ile Leu Met
    430                 435                 440

atg tgc gac tcc ggc acc aag tac atg atc aac ggc atg ccc tac ctc       1395
Met Cys Asp Ser Gly Thr Lys Tyr Met Ile Asn Gly Met Pro Tyr Leu
445                 450                 455                 460

ggc aga ggc acc caa aca aat ggc gtg cca ctg ggc gag tac tat gtg       1443
Gly Arg Gly Thr Gln Thr Asn Gly Val Pro Leu Gly Glu Tyr Tyr Val
                465                 470                 475

aaa gaa ctg tcc aag cct gtg cac ggc tcc tgc aga aac atc acc tgt       1491
Lys Glu Leu Ser Lys Pro Val His Gly Ser Cys Arg Asn Ile Thr Cys
            480                 485                 490

gac aac tgg ttc acc agc att cct ctg gcc aag aac ctg ctg caa gag       1539
Asp Asn Trp Phe Thr Ser Ile Pro Leu Ala Lys Asn Leu Leu Gln Glu
        495                 500                 505

ccc tac aag ctg aca atc gtg ggc acc gtg cgg tcc aac aag cgg gaa       1587
Pro Tyr Lys Leu Thr Ile Val Gly Thr Val Arg Ser Asn Lys Arg Glu
    510                 515                 520

att cct gag gtg ctg aag aac tct cgg tcc aga cct gtg ggc acc tcc       1635
Ile Pro Glu Val Leu Lys Asn Ser Arg Ser Arg Pro Val Gly Thr Ser
525                 530                 535                 540
```

```
atg ttc tgt ttc gac ggc cct ctg aca ctg gtg tcc tac aag cct aag       1683
Met Phe Cys Phe Asp Gly Pro Leu Thr Leu Val Ser Tyr Lys Pro Lys
                545                 550                 555

cct gcc aag atg gtg tac ctg ctg tcc tcc tgt gac gag gac gcc agc       1731
Pro Ala Lys Met Val Tyr Leu Leu Ser Ser Cys Asp Glu Asp Ala Ser
            560                 565                 570

atc aat gag tcc acc ggc aag ccc cag atg gtc atg tac tac aac cag       1779
Ile Asn Glu Ser Thr Gly Lys Pro Gln Met Val Met Tyr Tyr Asn Gln
        575                 580                 585

acc aaa ggc ggc gtg gac acc ctg gac cag atg tgc tct gtg atg acc       1827
Thr Lys Gly Gly Val Asp Thr Leu Asp Gln Met Cys Ser Val Met Thr
    590                 595                 600

tgc tcc aga aag acc aac aga tgg ccc atg gct ctg ctg tac ggc atg       1875
Cys Ser Arg Lys Thr Asn Arg Trp Pro Met Ala Leu Leu Tyr Gly Met
605                 610                 615                 620

atc aat atc gcc tgc atc aac agc ttc atc atc tac tcc cac aac gtg       1923
Ile Asn Ile Ala Cys Ile Asn Ser Phe Ile Ile Tyr Ser His Asn Val
                625                 630                 635

tcc tcc aag ggc gag aag gtg cag tcc cgg aag aaa ttc atg cgg aac       1971
Ser Ser Lys Gly Glu Lys Val Gln Ser Arg Lys Lys Phe Met Arg Asn
            640                 645                 650

ctg tat atg tcc ctg acc tcc agc ttc atg aga aag cgg ctg gaa gcc       2019
Leu Tyr Met Ser Leu Thr Ser Ser Phe Met Arg Lys Arg Leu Glu Ala
        655                 660                 665

cct act ctg aag aga tac ctg cgg gac aac atc tcc aac atc ctg cct       2067
Pro Thr Leu Lys Arg Tyr Leu Arg Asp Asn Ile Ser Asn Ile Leu Pro
    670                 675                 680

aac gag gtg ccc ggc acc agc gac gat tct aca gag gaa cct gtg atg       2115
Asn Glu Val Pro Gly Thr Ser Asp Asp Ser Thr Glu Glu Pro Val Met
685                 690                 695                 700

aag aag cgg acc tac tgc acc tac tgt ccc tcc aag atc cgg cgg aag       2163
Lys Lys Arg Thr Tyr Cys Thr Tyr Cys Pro Ser Lys Ile Arg Arg Lys
                705                 710                 715

gcc aac gcc tct tgc aaa aag tgc aag aaa gtg atc tgc cgc gag cac       2211
Ala Asn Ala Ser Cys Lys Lys Cys Lys Lys Val Ile Cys Arg Glu His
            720                 725                 730

aac atc gac atg tgc cag tct tgt ttc gcc gct gct aaa ctt ggt ggt       2259
Asn Ile Asp Met Cys Gln Ser Cys Phe Ala Ala Ala Lys Leu Gly Gly
        735                 740                 745

ggc gcg ccg gca gtc ggc gga ggt cca aaa gct gct gat aag ggc gct       2307
```

```
Gly Ala Pro Ala Val Gly Gly Gly Pro Lys Ala Ala Asp Lys Gly Ala
    750                 755                 760

gcc gtg atc aga gat gag tgg ggc aat cag atc tgg atc tgt cct ggc       2355
Ala Val Ile Arg Asp Glu Trp Gly Asn Gln Ile Trp Ile Cys Pro Gly
765                 770                 775                 780

tgc aac aag cct gac gac ggc tct cct atg atc ggc tgc gac gac tgt       2403
Cys Asn Lys Pro Asp Asp Gly Ser Pro Met Ile Gly Cys Asp Asp Cys
                785                 790                 795

gac gat tgg tat cac tgg ccc tgc gtg ggc atc atg acc gct cca cct       2451
Asp Asp Trp Tyr His Trp Pro Cys Val Gly Ile Met Thr Ala Pro Pro
            800                 805                 810

gaa gaa atg cag tgg ttc tgc ccc aag tgc gcc aac aag aag aag gat       2499
Glu Glu Met Gln Trp Phe Cys Pro Lys Cys Ala Asn Lys Lys Lys Asp
        815                 820                 825

aag aag cac aag aag cgc aag cac agg gcc cac tga tga gcggccgc          2546
Lys Lys His Lys Lys Arg Lys His Arg Ala His
    830                 835
```

<210> 4
<211> 839
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 4

```
Met Lys Glu Lys Gly Lys Glu Leu Lys Asp Pro Asp Gln Leu Tyr Thr
1               5                   10                  15


Thr Leu Lys Asn Leu Leu Ala Gln Ile Lys Ser His Pro Ser Ala Trp
            20                  25                  30


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


Val Ile Arg Phe Pro Ile Asp Leu Lys Thr Met Thr Glu Arg Leu Arg
    50                  55                  60


Ser Arg Tyr Tyr Val Thr Arg Lys Leu Phe Val Ala Asp Leu Gln Arg
65                  70                  75                  80
```

```
Val Ile Ala Asn Cys Arg Glu Tyr Asn Pro Pro Asp Ser Glu Tyr Cys
                85                  90                  95

Arg Cys Ala Ser Ala Leu Glu Lys Phe Phe Tyr Phe Lys Leu Lys Glu
            100                 105                 110

Gly Gly Leu Ile Asp Lys Lys Leu Gly Gly Gly Ala Pro Ala Val Gly
        115                 120                 125

Gly Gly Pro Lys Lys Leu Gly Gly Gly Ala Pro Ala Val Gly Gly Gly
    130                 135                 140

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

Leu Leu Gln Ser Asp Asp Glu Leu Val Gly Glu Asp Ser Asp Ser Glu
                165                 170                 175

Ile Ser Asp His Val Ser Glu Asp Asp Val Gln Ser Asp Thr Glu Glu
            180                 185                 190

Ala Phe Ile Asp Glu Val His Glu Val Gln Pro Thr Ser Ser Gly Ser
        195                 200                 205

Glu Ile Leu Asp Glu Gln Asn Val Ile Glu Gln Pro Gly Ser Ser Leu
    210                 215                 220

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

Asn Lys His Cys Trp Ser Thr Ser Lys Ser Thr Arg Arg Ser Arg Val
                245                 250                 255

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

Arg Asn Ile Tyr Asp Pro Leu Leu Cys Phe Lys Leu Phe Phe Thr Asp
        275                 280                 285

Glu Ile Ile Ser Glu Ile Val Lys Trp Thr Asn Ala Glu Ile Ser Leu
    290                 295                 300
```

```
Lys Arg Arg Glu Ser Met Thr Gly Ala Thr Phe Arg Asp Thr Asn Glu
305                 310                 315                 320

Asp Glu Ile Tyr Ala Phe Phe Gly Ile Leu Val Met Thr Ala Val Arg
                325                 330                 335

Lys Asp Asn His Met Ser Thr Asp Asp Leu Phe Asp Arg Ser Leu Ser
            340                 345                 350

Met Val Tyr Val Ser Val Met Ser Arg Asp Arg Phe Asp Phe Leu Ile
        355                 360                 365

Arg Cys Leu Arg Met Asp Asp Lys Ser Ile Arg Pro Thr Leu Arg Glu
    370                 375                 380

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

Gln Cys Ile Gln Asn Tyr Thr Pro Gly Ala His Leu Thr Ile Asp Glu
                405                 410                 415

Gln Leu Leu Gly Phe Arg Gly Arg Cys Pro Phe Arg Met Tyr Ile Pro
            420                 425                 430

Asn Lys Pro Ser Lys Tyr Gly Ile Lys Ile Leu Met Met Cys Asp Ser
        435                 440                 445

Gly Thr Lys Tyr Met Ile Asn Gly Met Pro Tyr Leu Gly Arg Gly Thr
    450                 455                 460

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

Lys Pro Val His Gly Ser Cys Arg Asn Ile Thr Cys Asp Asn Trp Phe
                485                 490                 495

Thr Ser Ile Pro Leu Ala Lys Asn Leu Leu Gln Glu Pro Tyr Lys Leu
            500                 505                 510
```

```
Thr Ile Val Gly Thr Val Arg Ser Asn Lys Arg Glu Ile Pro Glu Val
        515                 520                 525

Leu Lys Asn Ser Arg Ser Arg Pro Val Gly Thr Ser Met Phe Cys Phe
    530                 535                 540

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

Val Tyr Leu Leu Ser Ser Cys Asp Glu Asp Ala Ser Ile Asn Glu Ser
                565                 570                 575

Thr Gly Lys Pro Gln Met Val Met Tyr Tyr Asn Gln Thr Lys Gly Gly
            580                 585                 590

Val Asp Thr Leu Asp Gln Met Cys Ser Val Met Thr Cys Ser Arg Lys
        595                 600                 605

Thr Asn Arg Trp Pro Met Ala Leu Leu Tyr Gly Met Ile Asn Ile Ala
    610                 615                 620

Cys Ile Asn Ser Phe Ile Ile Tyr Ser His Asn Val Ser Ser Lys Gly
625                 630                 635                 640

Glu Lys Val Gln Ser Arg Lys Lys Phe Met Arg Asn Leu Tyr Met Ser
                645                 650                 655

Leu Thr Ser Ser Phe Met Arg Lys Arg Leu Glu Ala Pro Thr Leu Lys
            660                 665                 670

Arg Tyr Leu Arg Asp Asn Ile Ser Asn Ile Leu Pro Asn Glu Val Pro
        675                 680                 685

Gly Thr Ser Asp Asp Ser Thr Glu Glu Pro Val Met Lys Lys Arg Thr
    690                 695                 700

Tyr Cys Thr Tyr Cys Pro Ser Lys Ile Arg Arg Lys Ala Asn Ala Ser
705                 710                 715                 720

Cys Lys Lys Cys Lys Lys Val Ile Cys Arg Glu His Asn Ile Asp Met
                725                 730                 735
```

```
Cys Gln Ser Cys Phe Ala Ala Ala Lys Leu Gly Gly Gly Ala Pro Ala
            740                 745                 750

Val Gly Gly Gly Pro Lys Ala Ala Asp Lys Gly Ala Ala Val Ile Arg
        755                 760                 765

Asp Glu Trp Gly Asn Gln Ile Trp Ile Cys Pro Gly Cys Asn Lys Pro
    770                 775                 780

Asp Asp Gly Ser Pro Met Ile Gly Cys Asp Asp Cys Asp Asp Trp Tyr
785                 790                 795                 800

His Trp Pro Cys Val Gly Ile Met Thr Ala Pro Pro Glu Glu Met Gln
                805                 810                 815

Trp Phe Cys Pro Lys Cys Ala Asn Lys Lys Lys Asp Lys Lys His Lys
            820                 825                 830

Lys Arg Lys His Arg Ala His
        835
```

<210> 5
<211> 1807
<212> DNA
<213> Artificial Sequence

<220>
<223> PBw

<220>
<221> CDS
<222> (12)..(1799)

<400> 5

```
accggtccgg c atg ggc tct agc ctg gac gac gag cac att ctg tct gcc        50
              Met Gly Ser Ser Leu Asp Asp Glu His Ile Leu Ser Ala
              1               5                   10

ctg ctg cag tcc gac gat gaa ctc gtg ggc gaa gat tcc gac tcc gag         98
Leu Leu Gln Ser Asp Asp Glu Leu Val Gly Glu Asp Ser Asp Ser Glu
    15                  20                  25

atc tct gac cac gtg tcc gag gac gac gtg cag tct gat acc gag gaa        146
Ile Ser Asp His Val Ser Glu Asp Asp Val Gln Ser Asp Thr Glu Glu
```

```
30                  35                  40                  45

gcc ttc atc gac gag gtg cac gaa gtg cag cct acc tct tcc ggc tct        194
Ala Phe Ile Asp Glu Val His Glu Val Gln Pro Thr Ser Ser Gly Ser
                50                  55                  60

gag atc ctg gac gag cag aac gtg atc gag cag cct gga tcc tct ctg        242
Glu Ile Leu Asp Glu Gln Asn Val Ile Glu Gln Pro Gly Ser Ser Leu
            65                  70                  75

gcc tcc aac aga atc ctg aca ctg ccc cag aga acc atc cgg ggc aag        290
Ala Ser Asn Arg Ile Leu Thr Leu Pro Gln Arg Thr Ile Arg Gly Lys
        80                  85                  90

aac aag cac tgc tgg tcc acc tcc aag tct acc cgg cgg tct aga gtg        338
Asn Lys His Cys Trp Ser Thr Ser Lys Ser Thr Arg Arg Ser Arg Val
    95                  100                 105

tcc gct ctg aat att gtg cgg tcc cag agg ggc ccc acc aga atg tgc        386
Ser Ala Leu Asn Ile Val Arg Ser Gln Arg Gly Pro Thr Arg Met Cys
110                 115                 120                 125

cgg aac atc tac gac cct ctg ctg tgt ttc aag ctg ttc ttc acc gac        434
Arg Asn Ile Tyr Asp Pro Leu Leu Cys Phe Lys Leu Phe Phe Thr Asp
                130                 135                 140

gag atc atc agc gag atc gtg aag tgg acc aac gcc gag atc agc ctg        482
Glu Ile Ile Ser Glu Ile Val Lys Trp Thr Asn Ala Glu Ile Ser Leu
            145                 150                 155

aag cgg cgg gaa tct atg acc ggc gcc acc ttc aga gac acc aac gag        530
Lys Arg Arg Glu Ser Met Thr Gly Ala Thr Phe Arg Asp Thr Asn Glu
        160                 165                 170

gat gag atc tac gcc ttc ttc ggc atc ctg gtc atg aca gcc gtg cgg        578
Asp Glu Ile Tyr Ala Phe Phe Gly Ile Leu Val Met Thr Ala Val Arg
    175                 180                 185

aag gac aac cac atg tcc acc gac gac ctg ttc gac aga tcc ctg tcc        626
Lys Asp Asn His Met Ser Thr Asp Asp Leu Phe Asp Arg Ser Leu Ser
190                 195                 200                 205

atg gtg tac gtg tcc gtg atg agc cgg gac aga ttc gac ttc ctg atc        674
Met Val Tyr Val Ser Val Met Ser Arg Asp Arg Phe Asp Phe Leu Ile
                210                 215                 220

cgg tgc ctg cgg atg gac gac aag tcc atc aga ccc aca ctg cgc gag        722
Arg Cys Leu Arg Met Asp Asp Lys Ser Ile Arg Pro Thr Leu Arg Glu
            225                 230                 235

aac gac gtg ttc aca cct gtg cgg aag atc tgg gac ctg ttc atc cac        770
Asn Asp Val Phe Thr Pro Val Arg Lys Ile Trp Asp Leu Phe Ile His
        240                 245                 250
```

```
cag tgc atc cag aac tac acc cct ggc gct cac ctg acc atc gat gaa        818
Gln Cys Ile Gln Asn Tyr Thr Pro Gly Ala His Leu Thr Ile Asp Glu
    255                 260                 265

cag ctg ctg ggc ttc aga ggc aga tgc ccc ttc aga atg tac atc ccc        866
Gln Leu Leu Gly Phe Arg Gly Arg Cys Pro Phe Arg Met Tyr Ile Pro
270                 275                 280                 285

aac aag ccc tct aag tac ggc atc aag atc ctg atg atg tgc gac tcc        914
Asn Lys Pro Ser Lys Tyr Gly Ile Lys Ile Leu Met Met Cys Asp Ser
                290                 295                 300

ggc acc aag tac atg atc aac ggc atg ccc tac ctc ggc aga ggc acc        962
Gly Thr Lys Tyr Met Ile Asn Gly Met Pro Tyr Leu Gly Arg Gly Thr
            305                 310                 315

caa aca aat ggc gtg cca ctg ggc gag tac tat gtg aaa gaa ctg tcc       1010
Gln Thr Asn Gly Val Pro Leu Gly Glu Tyr Tyr Val Lys Glu Leu Ser
        320                 325                 330

aag cct gtg cac ggc tcc tgc aga aac atc acc tgt gac aac tgg ttc       1058
Lys Pro Val His Gly Ser Cys Arg Asn Ile Thr Cys Asp Asn Trp Phe
    335                 340                 345

acc agc att cct ctg gcc aag aac ctg ctg caa gag ccc tac aag ctg       1106
Thr Ser Ile Pro Leu Ala Lys Asn Leu Leu Gln Glu Pro Tyr Lys Leu
350                 355                 360                 365

aca atc gtg ggc acc gtg cgg tcc aac aag cgg gaa att cct gag gtg       1154
Thr Ile Val Gly Thr Val Arg Ser Asn Lys Arg Glu Ile Pro Glu Val
                370                 375                 380

ctg aag aac tct cgg tcc aga cct gtg ggc acc tcc atg ttc tgt ttc       1202
Leu Lys Asn Ser Arg Ser Arg Pro Val Gly Thr Ser Met Phe Cys Phe
            385                 390                 395

gac ggc cct ctg aca ctg gtg tcc tac aag cct aag cct gcc aag atg       1250
Asp Gly Pro Leu Thr Leu Val Ser Tyr Lys Pro Lys Pro Ala Lys Met
        400                 405                 410

gtg tac ctg ctg tcc tcc tgt gac gag gac gcc agc atc aat gag tcc       1298
Val Tyr Leu Leu Ser Ser Cys Asp Glu Asp Ala Ser Ile Asn Glu Ser
    415                 420                 425

acc ggc aag ccc cag atg gtc atg tac tac aac cag acc aaa ggc ggc       1346
Thr Gly Lys Pro Gln Met Val Met Tyr Tyr Asn Gln Thr Lys Gly Gly
430                 435                 440                 445

gtg gac acc ctg gac cag atg tgc tct gtg atg acc tgc tcc aga aag       1394
Val Asp Thr Leu Asp Gln Met Cys Ser Val Met Thr Cys Ser Arg Lys
                450                 455                 460

acc aac aga tgg ccc atg gct ctg ctg tac ggc atg atc aat atc gcc       1442
Thr Asn Arg Trp Pro Met Ala Leu Leu Tyr Gly Met Ile Asn Ile Ala
```

```
            465                 470                 475

tgc atc aac agc ttc atc atc tac tcc cac aac gtg tcc tcc aag ggc       1490
Cys Ile Asn Ser Phe Ile Ile Tyr Ser His Asn Val Ser Ser Lys Gly
        480                 485                 490

gag aag gtg cag tcc cgg aag aaa ttc atg cgg aac ctg tat atg tcc       1538
Glu Lys Val Gln Ser Arg Lys Lys Phe Met Arg Asn Leu Tyr Met Ser
    495                 500                 505

ctg acc tcc agc ttc atg aga aag cgg ctg gaa gcc cct act ctg aag       1586
Leu Thr Ser Ser Phe Met Arg Lys Arg Leu Glu Ala Pro Thr Leu Lys
510                 515                 520                 525

aga tac ctg cgg gac aac atc tcc aac atc ctg cct aac gag gtg ccc       1634
Arg Tyr Leu Arg Asp Asn Ile Ser Asn Ile Leu Pro Asn Glu Val Pro
                530                 535                 540

ggc acc agc gac gat tct aca gag gaa cct gtg atg aag aag cgg acc       1682
Gly Thr Ser Asp Asp Ser Thr Glu Glu Pro Val Met Lys Lys Arg Thr
            545                 550                 555

tac tgc acc tac tgt ccc tcc aag atc cgg cgg aag gcc aac gcc tct       1730
Tyr Cys Thr Tyr Cys Pro Ser Lys Ile Arg Arg Lys Ala Asn Ala Ser
        560                 565                 570

tgc aaa aag tgc aag aaa gtg atc tgc cgc gag cac aac atc gac atg       1778
Cys Lys Lys Cys Lys Lys Val Ile Cys Arg Glu His Asn Ile Asp Met
    575                 580                 585

tgc cag tct tgt ttc tga tga gcggccgc                                 1807
Cys Gln Ser Cys Phe
590
```

<210> 6
<211> 594
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 6

```
Met Gly Ser Ser Leu Asp Asp Glu His Ile Leu Ser Ala Leu Leu Gln
1               5                   10                  15


Ser Asp Asp Glu Leu Val Gly Glu Asp Ser Asp Ser Glu Ile Ser Asp
            20                  25                  30


His Val Ser Glu Asp Asp Val Gln Ser Asp Thr Glu Glu Ala Phe Ile
```

```
        35                  40                  45

Asp Glu Val His Glu Val Gln Pro Thr Ser Ser Gly Ser Glu Ile Leu
    50                  55                  60

Asp Glu Gln Asn Val Ile Glu Gln Pro Gly Ser Ser Leu Ala Ser Asn
65                  70                  75                  80

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

Cys Trp Ser Thr Ser Lys Ser Thr Arg Arg Ser Arg Val Ser Ala Leu
            100                 105                 110

Asn Ile Val Arg Ser Gln Arg Gly Pro Thr Arg Met Cys Arg Asn Ile
        115                 120                 125

Tyr Asp Pro Leu Leu Cys Phe Lys Leu Phe Phe Thr Asp Glu Ile Ile
    130                 135                 140

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

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

Tyr Ala Phe Phe Gly Ile Leu Val Met Thr Ala Val Arg Lys Asp Asn
            180                 185                 190

His Met Ser Thr Asp Asp Leu Phe Asp Arg Ser Leu Ser Met Val Tyr
        195                 200                 205

Val Ser Val Met Ser Arg Asp Arg Phe Asp Phe Leu Ile Arg Cys Leu
    210                 215                 220

Arg Met Asp Asp Lys Ser Ile Arg Pro Thr Leu Arg Glu Asn Asp Val
225                 230                 235                 240

Phe Thr Pro Val Arg Lys Ile Trp Asp Leu Phe Ile His Gln Cys Ile
                245                 250                 255
```

```
Gln Asn Tyr Thr Pro Gly Ala His Leu Thr Ile Asp Glu Gln Leu Leu
            260                 265                 270

Gly Phe Arg Gly Arg Cys Pro Phe Arg Met Tyr Ile Pro Asn Lys Pro
        275                 280                 285

Ser Lys Tyr Gly Ile Lys Ile Leu Met Met Cys Asp Ser Gly Thr Lys
    290                 295                 300

Tyr Met Ile Asn Gly Met Pro Tyr Leu Gly Arg Gly Thr Gln Thr Asn
305                 310                 315                 320

Gly Val Pro Leu Gly Glu Tyr Tyr Val Lys Glu Leu Ser Lys Pro Val
                325                 330                 335

His Gly Ser Cys Arg Asn Ile Thr Cys Asp Asn Trp Phe Thr Ser Ile
            340                 345                 350

Pro Leu Ala Lys Asn Leu Leu Gln Glu Pro Tyr Lys Leu Thr Ile Val
        355                 360                 365

Gly Thr Val Arg Ser Asn Lys Arg Glu Ile Pro Glu Val Leu Lys Asn
    370                 375                 380

Ser Arg Ser Arg Pro Val Gly Thr Ser Met Phe Cys Phe Asp Gly Pro
385                 390                 395                 400

Leu Thr Leu Val Ser Tyr Lys Pro Lys Pro Ala Lys Met Val Tyr Leu
                405                 410                 415

Leu Ser Ser Cys Asp Glu Asp Ala Ser Ile Asn Glu Ser Thr Gly Lys
            420                 425                 430

Pro Gln Met Val Met Tyr Tyr Asn Gln Thr Lys Gly Gly Val Asp Thr
        435                 440                 445

Leu Asp Gln Met Cys Ser Val Met Thr Cys Ser Arg Lys Thr Asn Arg
    450                 455                 460

Trp Pro Met Ala Leu Leu Tyr Gly Met Ile Asn Ile Ala Cys Ile Asn
```

```
465                 470                 475                 480

Ser Phe Ile Ile Tyr Ser His Asn Val Ser Ser Lys Gly Glu Lys Val
                485                 490                 495

Gln Ser Arg Lys Lys Phe Met Arg Asn Leu Tyr Met Ser Leu Thr Ser
            500                 505                 510

Ser Phe Met Arg Lys Arg Leu Glu Ala Pro Thr Leu Lys Arg Tyr Leu
        515                 520                 525

Arg Asp Asn Ile Ser Asn Ile Leu Pro Asn Glu Val Pro Gly Thr Ser
    530                 535                 540

Asp Asp Ser Thr Glu Glu Pro Val Met Lys Lys Arg Thr Tyr Cys Thr
545                 550                 555                 560

Tyr Cys Pro Ser Lys Ile Arg Arg Lys Ala Asn Ala Ser Cys Lys Lys
                565                 570                 575

Cys Lys Lys Val Ile Cys Arg Glu His Asn Ile Asp Met Cys Gln Ser
            580                 585                 590

Cys Phe
```

<210> 7
<211> 2123
<212> DNA
<213> Artificial Sequence

<220>
<223> Taf3-PBw

<220>
<221> CDS
<222> (16)..(2115)

<400> 7

```
accggtggat ccggc atg gtc atc aga gat gag tgg ggc aat cag atc tgg        51
                Met Val Ile Arg Asp Glu Trp Gly Asn Gln Ile Trp
                1               5                   10

atc tgt ccc ggc tgc aac aag cct gac gac ggc tct cct atg atc ggc         99
```

```
Ile Cys Pro Gly Cys Asn Lys Pro Asp Asp Gly Ser Pro Met Ile Gly
        15                  20                  25

tgc gac gac tgt gac gac tgg tat cac tgg cct tgc gtg ggc atc atg        147
Cys Asp Asp Cys Asp Asp Trp Tyr His Trp Pro Cys Val Gly Ile Met
    30                  35                  40

acc gct cca cct gaa gag atg cag tgg ttc tgc ccc aag tgc gcc aac        195
Thr Ala Pro Pro Glu Glu Met Gln Trp Phe Cys Pro Lys Cys Ala Asn
45                  50                  55                  60

aag aag aag gat aag aag cac aag aag cgg aag cac agg gcc cac aaa        243
Lys Lys Lys Asp Lys Lys His Lys Lys Arg Lys His Arg Ala His Lys
                65                  70                  75

ctt gga ggt ggt gct cct gct gtt ggc ggc gga cct aaa aaa ctt ggt        291
Leu Gly Gly Gly Ala Pro Ala Val Gly Gly Gly Pro Lys Lys Leu Gly
            80                  85                  90

ggc gga gca cca gct gtc ggc gga ggt cct aaa gcc atg ggc tct agc        339
Gly Gly Ala Pro Ala Val Gly Gly Gly Pro Lys Ala Met Gly Ser Ser
        95                  100                 105

ctg gac gac gag cac att ctg tct gcc ctg ctg cag tcc gac gat gaa        387
Leu Asp Asp Glu His Ile Leu Ser Ala Leu Leu Gln Ser Asp Asp Glu
    110                 115                 120

ctc gtg ggc gaa gat tcc gac tcc gag atc tct gac cac gtg tcc gag        435
Leu Val Gly Glu Asp Ser Asp Ser Glu Ile Ser Asp His Val Ser Glu
125                 130                 135                 140

gac gac gtg cag tct gat acc gag gaa gcc ttc atc gac gag gtg cac        483
Asp Asp Val Gln Ser Asp Thr Glu Glu Ala Phe Ile Asp Glu Val His
                145                 150                 155

gaa gtg cag cct acc tct tcc ggc tct gag atc ctg gac gag cag aac        531
Glu Val Gln Pro Thr Ser Ser Gly Ser Glu Ile Leu Asp Glu Gln Asn
            160                 165                 170

gtg atc gag cag cct gga tcc tct ctg gcc tcc aac aga atc ctg aca        579
Val Ile Glu Gln Pro Gly Ser Ser Leu Ala Ser Asn Arg Ile Leu Thr
        175                 180                 185

ctg ccc cag aga acc atc cgg ggc aag aac aag cac tgc tgg tcc acc        627
Leu Pro Gln Arg Thr Ile Arg Gly Lys Asn Lys His Cys Trp Ser Thr
    190                 195                 200

tcc aag tct acc cgg cgg tct aga gtg tcc gct ctg aat att gtg cgg        675
Ser Lys Ser Thr Arg Arg Ser Arg Val Ser Ala Leu Asn Ile Val Arg
205                 210                 215                 220

tcc cag agg ggc ccc acc aga atg tgc cgg aac atc tac gac cct ctg        723
Ser Gln Arg Gly Pro Thr Arg Met Cys Arg Asn Ile Tyr Asp Pro Leu
                225                 230                 235
```

```
ctg tgt ttc aag ctg ttc ttc acc gac gag atc atc agc gag atc gtg        771
Leu Cys Phe Lys Leu Phe Phe Thr Asp Glu Ile Ile Ser Glu Ile Val
            240                 245                 250

aag tgg acc aac gcc gag atc agc ctg aag cgg cgg gaa tct atg acc        819
Lys Trp Thr Asn Ala Glu Ile Ser Leu Lys Arg Arg Glu Ser Met Thr
        255                 260                 265

ggc gcc acc ttc aga gac acc aac gag gat gag atc tac gcc ttc ttc        867
Gly Ala Thr Phe Arg Asp Thr Asn Glu Asp Glu Ile Tyr Ala Phe Phe
    270                 275                 280

ggc atc ctg gtc atg aca gcc gtg cgg aag gac aac cac atg tcc acc        915
Gly Ile Leu Val Met Thr Ala Val Arg Lys Asp Asn His Met Ser Thr
285                 290                 295                 300

gac gac ctg ttc gac aga tcc ctg tcc atg gtg tac gtg tcc gtg atg        963
Asp Asp Leu Phe Asp Arg Ser Leu Ser Met Val Tyr Val Ser Val Met
                305                 310                 315

agc cgg gac aga ttc gac ttc ctg atc cgg tgc ctg cgg atg gac gac       1011
Ser Arg Asp Arg Phe Asp Phe Leu Ile Arg Cys Leu Arg Met Asp Asp
            320                 325                 330

aag tcc atc aga ccc aca ctg cgc gag aac gac gtg ttc aca cct gtg       1059
Lys Ser Ile Arg Pro Thr Leu Arg Glu Asn Asp Val Phe Thr Pro Val
        335                 340                 345

cgg aag atc tgg gac ctg ttc atc cac cag tgc atc cag aac tac acc       1107
Arg Lys Ile Trp Asp Leu Phe Ile His Gln Cys Ile Gln Asn Tyr Thr
    350                 355                 360

cct ggc gct cac ctg acc atc gat gaa cag ctg ctg ggc ttc aga ggc       1155
Pro Gly Ala His Leu Thr Ile Asp Glu Gln Leu Leu Gly Phe Arg Gly
365                 370                 375                 380

aga tgc ccc ttc aga atg tac atc ccc aac aag ccc tct aag tac ggc       1203
Arg Cys Pro Phe Arg Met Tyr Ile Pro Asn Lys Pro Ser Lys Tyr Gly
                385                 390                 395

atc aag atc ctg atg atg tgc gac tcc ggc acc aag tac atg atc aac       1251
Ile Lys Ile Leu Met Met Cys Asp Ser Gly Thr Lys Tyr Met Ile Asn
            400                 405                 410

ggc atg ccc tac ctc ggc aga ggc acc caa aca aat ggc gtg cca ctg       1299
Gly Met Pro Tyr Leu Gly Arg Gly Thr Gln Thr Asn Gly Val Pro Leu
        415                 420                 425

ggc gag tac tat gtg aaa gaa ctg tcc aag cct gtg cac ggc tcc tgc       1347
Gly Glu Tyr Tyr Val Lys Glu Leu Ser Lys Pro Val His Gly Ser Cys
    430                 435                 440

aga aac atc acc tgt gac aac tgg ttc acc agc att cct ctg gcc aag       1395
```

```
Arg Asn Ile Thr Cys Asp Asn Trp Phe Thr Ser Ile Pro Leu Ala Lys
445                 450                 455                 460

aac ctg ctg caa gag ccc tac aag ctg aca atc gtg ggc acc gtg cgg       1443
Asn Leu Leu Gln Glu Pro Tyr Lys Leu Thr Ile Val Gly Thr Val Arg
                465                 470                 475

tcc aac aag cgg gaa att cct gag gtg ctg aag aac tct cgg tcc aga       1491
Ser Asn Lys Arg Glu Ile Pro Glu Val Leu Lys Asn Ser Arg Ser Arg
            480                 485                 490

cct gtg ggc acc tcc atg ttc tgt ttc gac ggc cct ctg aca ctg gtg       1539
Pro Val Gly Thr Ser Met Phe Cys Phe Asp Gly Pro Leu Thr Leu Val
        495                 500                 505

tcc tac aag cct aag cct gcc aag atg gtg tac ctg ctg tcc tcc tgt       1587
Ser Tyr Lys Pro Lys Pro Ala Lys Met Val Tyr Leu Leu Ser Ser Cys
    510                 515                 520

gac gag gac gcc agc atc aat gag tcc acc ggc aag ccc cag atg gtc       1635
Asp Glu Asp Ala Ser Ile Asn Glu Ser Thr Gly Lys Pro Gln Met Val
525                 530                 535                 540

atg tac tac aac cag acc aaa ggc ggc gtg gac acc ctg gac cag atg       1683
Met Tyr Tyr Asn Gln Thr Lys Gly Gly Val Asp Thr Leu Asp Gln Met
                545                 550                 555

tgc tct gtg atg acc tgc tcc aga aag acc aac aga tgg ccc atg gct       1731
Cys Ser Val Met Thr Cys Ser Arg Lys Thr Asn Arg Trp Pro Met Ala
            560                 565                 570

ctg ctg tac ggc atg atc aat atc gcc tgc atc aac agc ttc atc atc       1779
Leu Leu Tyr Gly Met Ile Asn Ile Ala Cys Ile Asn Ser Phe Ile Ile
        575                 580                 585

tac tcc cac aac gtg tcc tcc aag ggc gag aag gtg cag tcc cgg aag       1827
Tyr Ser His Asn Val Ser Ser Lys Gly Glu Lys Val Gln Ser Arg Lys
    590                 595                 600

aaa ttc atg cgg aac ctg tat atg tcc ctg acc tcc agc ttc atg aga       1875
Lys Phe Met Arg Asn Leu Tyr Met Ser Leu Thr Ser Ser Phe Met Arg
605                 610                 615                 620

aag cgg ctg gaa gcc cct act ctg aag aga tac ctg cgg gac aac atc       1923
Lys Arg Leu Glu Ala Pro Thr Leu Lys Arg Tyr Leu Arg Asp Asn Ile
                625                 630                 635

tcc aac atc ctg cct aac gag gtg ccc ggc acc agc gac gat tct aca       1971
Ser Asn Ile Leu Pro Asn Glu Val Pro Gly Thr Ser Asp Asp Ser Thr
            640                 645                 650

gag gaa cct gtg atg aag aag cgg acc tac tgc acc tac tgt ccc tcc       2019
Glu Glu Pro Val Met Lys Lys Arg Thr Tyr Cys Thr Tyr Cys Pro Ser
        655                 660                 665
```

```
aag atc cgg cgg aag gcc aac gcc tct tgc aaa aag tgc aag aaa gtg       2067
Lys Ile Arg Arg Lys Ala Asn Ala Ser Cys Lys Lys Cys Lys Lys Val
    670                 675                 680

atc tgc cgc gag cac aac atc gac atg tgc cag tct tgt ttc tga tga       2115
Ile Cys Arg Glu His Asn Ile Asp Met Cys Gln Ser Cys Phe
685                 690                 695

gcggccgc                                                              2123
```

<210> 8
<211> 698
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 8

```
Met Val Ile Arg Asp Glu Trp Gly Asn Gln Ile Trp Ile Cys Pro Gly
1               5                   10                  15


Cys Asn Lys Pro Asp Asp Gly Ser Pro Met Ile Gly Cys Asp Asp Cys
            20                  25                  30


Asp Asp Trp Tyr His Trp Pro Cys Val Gly Ile Met Thr Ala Pro Pro
        35                  40                  45


Glu Glu Met Gln Trp Phe Cys Pro Lys Cys Ala Asn Lys Lys Lys Asp
    50                  55                  60


Lys Lys His Lys Lys Arg Lys His Arg Ala His Lys Leu Gly Gly Gly
65                  70                  75                  80


Ala Pro Ala Val Gly Gly Gly Pro Lys Lys Leu Gly Gly Gly Ala Pro
                85                  90                  95


Ala Val Gly Gly Gly Pro Lys Ala Met Gly Ser Ser Leu Asp Asp Glu
            100                 105                 110


His Ile Leu Ser Ala Leu Leu Gln Ser Asp Asp Glu Leu Val Gly Glu
        115                 120                 125
```

```
Asp Ser Asp Ser Glu Ile Ser Asp His Val Ser Glu Asp Asp Val Gln
    130                 135                 140

Ser Asp Thr Glu Glu Ala Phe Ile Asp Glu Val His Glu Val Gln Pro
145                 150                 155                 160

Thr Ser Ser Gly Ser Glu Ile Leu Asp Glu Gln Asn Val Ile Glu Gln
                165                 170                 175

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

Thr Ile Arg Gly Lys Asn Lys His Cys Trp Ser Thr Ser Lys Ser Thr
        195                 200                 205

Arg Arg Ser Arg Val Ser Ala Leu Asn Ile Val Arg Ser Gln Arg Gly
    210                 215                 220

Pro Thr Arg Met Cys Arg Asn Ile Tyr Asp Pro Leu Leu Cys Phe Lys
225                 230                 235                 240

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

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

Arg Asp Thr Asn Glu Asp Glu Ile Tyr Ala Phe Phe Gly Ile Leu Val
        275                 280                 285

Met Thr Ala Val Arg Lys Asp Asn His Met Ser Thr Asp Asp Leu Phe
    290                 295                 300

Asp Arg Ser Leu Ser Met Val Tyr Val Ser Val Met Ser Arg Asp Arg
305                 310                 315                 320

Phe Asp Phe Leu Ile Arg Cys Leu Arg Met Asp Asp Lys Ser Ile Arg
                325                 330                 335

Pro Thr Leu Arg Glu Asn Asp Val Phe Thr Pro Val Arg Lys Ile Trp
            340                 345                 350
```

```
Asp Leu Phe Ile His Gln Cys Ile Gln Asn Tyr Thr Pro Gly Ala His
        355                 360                 365

Leu Thr Ile Asp Glu Gln Leu Leu Gly Phe Arg Gly Arg Cys Pro Phe
    370                 375                 380

Arg Met Tyr Ile Pro Asn Lys Pro Ser Lys Tyr Gly Ile Lys Ile Leu
385                 390                 395                 400

Met Met Cys Asp Ser Gly Thr Lys Tyr Met Ile Asn Gly Met Pro Tyr
                405                 410                 415

Leu Gly Arg Gly Thr Gln Thr Asn Gly Val Pro Leu Gly Glu Tyr Tyr
            420                 425                 430

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

Cys Asp Asn Trp Phe Thr Ser Ile Pro Leu Ala Lys Asn Leu Leu Gln
    450                 455                 460

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

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

Ser Met Phe Cys Phe Asp Gly Pro Leu Thr Leu Val Ser Tyr Lys Pro
            500                 505                 510

Lys Pro Ala Lys Met Val Tyr Leu Leu Ser Ser Cys Asp Glu Asp Ala
        515                 520                 525

Ser Ile Asn Glu Ser Thr Gly Lys Pro Gln Met Val Met Tyr Tyr Asn
    530                 535                 540

Gln Thr Lys Gly Gly Val Asp Thr Leu Asp Gln Met Cys Ser Val Met
545                 550                 555                 560
```

```
Thr Cys Ser Arg Lys Thr Asn Arg Trp Pro Met Ala Leu Leu Tyr Gly
                565                 570                 575


Met Ile Asn Ile Ala Cys Ile Asn Ser Phe Ile Ile Tyr Ser His Asn
            580                 585                 590


Val Ser Ser Lys Gly Glu Lys Val Gln Ser Arg Lys Lys Phe Met Arg
        595                 600                 605


Asn Leu Tyr Met Ser Leu Thr Ser Ser Phe Met Arg Lys Arg Leu Glu
    610                 615                 620


Ala Pro Thr Leu Lys Arg Tyr Leu Arg Asp Asn Ile Ser Asn Ile Leu
625                 630                 635                 640


Pro Asn Glu Val Pro Gly Thr Ser Asp Asp Ser Thr Glu Glu Pro Val
                645                 650                 655


Met Lys Lys Arg Thr Tyr Cys Thr Tyr Cys Pro Ser Lys Ile Arg Arg
            660                 665                 670


Lys Ala Asn Ala Ser Cys Lys Lys Cys Lys Lys Val Ile Cys Arg Glu
        675                 680                 685


His Asn Ile Asp Met Cys Gln Ser Cys Phe
    690                 695


<210>  9
<211>  2104
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  PBw-Taf3


<220>
<221>  CDS
<222>  (12)..(2093)

<400>  9
accggtccgg c atg ggc tct agc ctg gac gac gag cac att ctg tct gcc        50
             Met Gly Ser Ser Leu Asp Asp Glu His Ile Leu Ser Ala
             1               5                   10
```

```
ctg ctg cag tcc gac gat gaa ctc gtg ggc gaa gat tcc gac tcc gag         98
Leu Leu Gln Ser Asp Asp Glu Leu Val Gly Glu Asp Ser Asp Ser Glu
    15                  20                  25

atc tct gac cac gtg tcc gag gac gac gtg cag tct gat acc gag gaa        146
Ile Ser Asp His Val Ser Glu Asp Asp Val Gln Ser Asp Thr Glu Glu
30                  35                  40                  45

gcc ttc atc gac gag gtg cac gaa gtg cag cct acc tct tcc ggc tct        194
Ala Phe Ile Asp Glu Val His Glu Val Gln Pro Thr Ser Ser Gly Ser
                50                  55                  60

gag atc ctg gac gag cag aac gtg atc gag cag cct gga tcc tct ctg        242
Glu Ile Leu Asp Glu Gln Asn Val Ile Glu Gln Pro Gly Ser Ser Leu
            65                  70                  75

gcc tcc aac aga atc ctg aca ctg ccc cag aga acc atc cgg ggc aag        290
Ala Ser Asn Arg Ile Leu Thr Leu Pro Gln Arg Thr Ile Arg Gly Lys
        80                  85                  90

aac aag cac tgc tgg tcc acc tcc aag tct acc cgg cgg tct aga gtg        338
Asn Lys His Cys Trp Ser Thr Ser Lys Ser Thr Arg Arg Ser Arg Val
    95                  100                 105

tcc gct ctg aat att gtg cgg tcc cag agg ggc ccc acc aga atg tgc        386
Ser Ala Leu Asn Ile Val Arg Ser Gln Arg Gly Pro Thr Arg Met Cys
110                 115                 120                 125

cgg aac atc tac gac cct ctg ctg tgt ttc aag ctg ttc ttc acc gac        434
Arg Asn Ile Tyr Asp Pro Leu Leu Cys Phe Lys Leu Phe Phe Thr Asp
                130                 135                 140

gag atc atc agc gag atc gtg aag tgg acc aac gcc gag atc agc ctg        482
Glu Ile Ile Ser Glu Ile Val Lys Trp Thr Asn Ala Glu Ile Ser Leu
            145                 150                 155

aag cgg cgg gaa tct atg acc ggc gcc acc ttc aga gac acc aac gag        530
Lys Arg Arg Glu Ser Met Thr Gly Ala Thr Phe Arg Asp Thr Asn Glu
        160                 165                 170

gat gag atc tac gcc ttc ttc ggc atc ctg gtc atg aca gcc gtg cgg        578
Asp Glu Ile Tyr Ala Phe Phe Gly Ile Leu Val Met Thr Ala Val Arg
    175                 180                 185

aag gac aac cac atg tcc acc gac gac ctg ttc gac aga tcc ctg tcc        626
Lys Asp Asn His Met Ser Thr Asp Asp Leu Phe Asp Arg Ser Leu Ser
190                 195                 200                 205

atg gtg tac gtg tcc gtg atg agc cgg gac aga ttc gac ttc ctg atc        674
Met Val Tyr Val Ser Val Met Ser Arg Asp Arg Phe Asp Phe Leu Ile
                210                 215                 220

cgg tgc ctg cgg atg gac gac aag tcc atc aga ccc aca ctg cgc gag        722
Arg Cys Leu Arg Met Asp Asp Lys Ser Ile Arg Pro Thr Leu Arg Glu
```

```
            225                 230                 235

aac gac gtg ttc aca cct gtg cgg aag atc tgg gac ctg ttc atc cac        770
Asn Asp Val Phe Thr Pro Val Arg Lys Ile Trp Asp Leu Phe Ile His
        240                 245                 250

cag tgc atc cag aac tac acc cct ggc gct cac ctg acc atc gat gaa        818
Gln Cys Ile Gln Asn Tyr Thr Pro Gly Ala His Leu Thr Ile Asp Glu
    255                 260                 265

cag ctg ctg ggc ttc aga ggc aga tgc ccc ttc aga atg tac atc ccc        866
Gln Leu Leu Gly Phe Arg Gly Arg Cys Pro Phe Arg Met Tyr Ile Pro
270                 275                 280                 285

aac aag ccc tct aag tac ggc atc aag atc ctg atg atg tgc gac tcc        914
Asn Lys Pro Ser Lys Tyr Gly Ile Lys Ile Leu Met Met Cys Asp Ser
                290                 295                 300

ggc acc aag tac atg atc aac ggc atg ccc tac ctc ggc aga ggc acc        962
Gly Thr Lys Tyr Met Ile Asn Gly Met Pro Tyr Leu Gly Arg Gly Thr
            305                 310                 315

caa aca aat ggc gtg cca ctg ggc gag tac tat gtg aaa gaa ctg tcc       1010
Gln Thr Asn Gly Val Pro Leu Gly Glu Tyr Tyr Val Lys Glu Leu Ser
        320                 325                 330

aag cct gtg cac ggc tcc tgc aga aac atc acc tgt gac aac tgg ttc       1058
Lys Pro Val His Gly Ser Cys Arg Asn Ile Thr Cys Asp Asn Trp Phe
    335                 340                 345

acc agc att cct ctg gcc aag aac ctg ctg caa gag ccc tac aag ctg       1106
Thr Ser Ile Pro Leu Ala Lys Asn Leu Leu Gln Glu Pro Tyr Lys Leu
350                 355                 360                 365

aca atc gtg ggc acc gtg cgg tcc aac aag cgg gaa att cct gag gtg       1154
Thr Ile Val Gly Thr Val Arg Ser Asn Lys Arg Glu Ile Pro Glu Val
                370                 375                 380

ctg aag aac tct cgg tcc aga cct gtg ggc acc tcc atg ttc tgt ttc       1202
Leu Lys Asn Ser Arg Ser Arg Pro Val Gly Thr Ser Met Phe Cys Phe
            385                 390                 395

gac ggc cct ctg aca ctg gtg tcc tac aag cct aag cct gcc aag atg       1250
Asp Gly Pro Leu Thr Leu Val Ser Tyr Lys Pro Lys Pro Ala Lys Met
        400                 405                 410

gtg tac ctg ctg tcc tcc tgt gac gag gac gcc agc atc aat gag tcc       1298
Val Tyr Leu Leu Ser Ser Cys Asp Glu Asp Ala Ser Ile Asn Glu Ser
    415                 420                 425

acc ggc aag ccc cag atg gtc atg tac tac aac cag acc aaa ggc ggc       1346
Thr Gly Lys Pro Gln Met Val Met Tyr Tyr Asn Gln Thr Lys Gly Gly
430                 435                 440                 445
```

```
gtg gac acc ctg gac cag atg tgc tct gtg atg acc tgc tcc aga aag       1394
Val Asp Thr Leu Asp Gln Met Cys Ser Val Met Thr Cys Ser Arg Lys
               450                 455                 460

acc aac aga tgg ccc atg gct ctg ctg tac ggc atg atc aat atc gcc       1442
Thr Asn Arg Trp Pro Met Ala Leu Leu Tyr Gly Met Ile Asn Ile Ala
            465                 470                 475

tgc atc aac agc ttc atc atc tac tcc cac aac gtg tcc tcc aag ggc       1490
Cys Ile Asn Ser Phe Ile Ile Tyr Ser His Asn Val Ser Ser Lys Gly
        480                 485                 490

gag aag gtg cag tcc cgg aag aaa ttc atg cgg aac ctg tat atg tcc       1538
Glu Lys Val Gln Ser Arg Lys Lys Phe Met Arg Asn Leu Tyr Met Ser
    495                 500                 505

ctg acc tcc agc ttc atg aga aag cgg ctg gaa gcc cct act ctg aag       1586
Leu Thr Ser Ser Phe Met Arg Lys Arg Leu Glu Ala Pro Thr Leu Lys
510                 515                 520                 525

aga tac ctg cgg gac aac atc tcc aac atc ctg cct aac gag gtg ccc       1634
Arg Tyr Leu Arg Asp Asn Ile Ser Asn Ile Leu Pro Asn Glu Val Pro
               530                 535                 540

ggc acc agc gac gat tct aca gag gaa cct gtg atg aag aag cgg acc       1682
Gly Thr Ser Asp Asp Ser Thr Glu Glu Pro Val Met Lys Lys Arg Thr
            545                 550                 555

tac tgc acc tac tgt ccc tcc aag atc cgg cgg aag gcc aac gcc tct       1730
Tyr Cys Thr Tyr Cys Pro Ser Lys Ile Arg Arg Lys Ala Asn Ala Ser
        560                 565                 570

tgc aaa aag tgc aag aaa gtg atc tgc cgc gag cac aac atc gac atg       1778
Cys Lys Lys Cys Lys Lys Val Ile Cys Arg Glu His Asn Ile Asp Met
    575                 580                 585

tgc cag tct tgt ttc gcc gct gct aaa ctt ggt ggt ggc gcg ccg gca       1826
Cys Gln Ser Cys Phe Ala Ala Ala Lys Leu Gly Gly Gly Ala Pro Ala
590                 595                 600                 605

gtc ggc gga ggt cca aaa gct gct gat aag ggc gct gcc gtg atc aga       1874
Val Gly Gly Gly Pro Lys Ala Ala Asp Lys Gly Ala Ala Val Ile Arg
               610                 615                 620

gat gag tgg ggc aat cag atc tgg atc tgt cct ggc tgc aac aag cct       1922
Asp Glu Trp Gly Asn Gln Ile Trp Ile Cys Pro Gly Cys Asn Lys Pro
            625                 630                 635

gac gac ggc tct cct atg atc ggc tgc gac gac tgt gac gat tgg tat       1970
Asp Asp Gly Ser Pro Met Ile Gly Cys Asp Asp Cys Asp Asp Trp Tyr
        640                 645                 650

cac tgg ccc tgc gtg ggc atc atg acc gct cca cct gaa gaa atg cag       2018
His Trp Pro Cys Val Gly Ile Met Thr Ala Pro Pro Glu Glu Met Gln
```

```
    655                 660                 665

tgg ttc tgc ccc aag tgc gcc aac aag aag aag gat aag aag cac aag       2066
Trp Phe Cys Pro Lys Cys Ala Asn Lys Lys Lys Asp Lys Lys His Lys
670                 675                 680                 685

aag cgc aag cac agg gcc cac tga tga gcggccgcga c                      2104
Lys Arg Lys His Arg Ala His
                690
```

<210> 10
<211> 692
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 10

```
Met Gly Ser Ser Leu Asp Asp Glu His Ile Leu Ser Ala Leu Leu Gln
1               5                   10                  15


Ser Asp Asp Glu Leu Val Gly Glu Asp Ser Asp Ser Glu Ile Ser Asp
            20                  25                  30


His Val Ser Glu Asp Asp Val Gln Ser Asp Thr Glu Glu Ala Phe Ile
        35                  40                  45


Asp Glu Val His Glu Val Gln Pro Thr Ser Ser Gly Ser Glu Ile Leu
    50                  55                  60


Asp Glu Gln Asn Val Ile Glu Gln Pro Gly Ser Ser Leu Ala Ser Asn
65                  70                  75                  80


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


Cys Trp Ser Thr Ser Lys Ser Thr Arg Arg Ser Arg Val Ser Ala Leu
            100                 105                 110


Asn Ile Val Arg Ser Gln Arg Gly Pro Thr Arg Met Cys Arg Asn Ile
        115                 120                 125


Tyr Asp Pro Leu Leu Cys Phe Lys Leu Phe Phe Thr Asp Glu Ile Ile
```

```
    130                 135                 140

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

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

Tyr Ala Phe Phe Gly Ile Leu Val Met Thr Ala Val Arg Lys Asp Asn
            180                 185                 190

His Met Ser Thr Asp Asp Leu Phe Asp Arg Ser Leu Ser Met Val Tyr
        195                 200                 205

Val Ser Val Met Ser Arg Asp Arg Phe Asp Phe Leu Ile Arg Cys Leu
    210                 215                 220

Arg Met Asp Asp Lys Ser Ile Arg Pro Thr Leu Arg Glu Asn Asp Val
225                 230                 235                 240

Phe Thr Pro Val Arg Lys Ile Trp Asp Leu Phe Ile His Gln Cys Ile
                245                 250                 255

Gln Asn Tyr Thr Pro Gly Ala His Leu Thr Ile Asp Glu Gln Leu Leu
            260                 265                 270

Gly Phe Arg Gly Arg Cys Pro Phe Arg Met Tyr Ile Pro Asn Lys Pro
        275                 280                 285

Ser Lys Tyr Gly Ile Lys Ile Leu Met Met Cys Asp Ser Gly Thr Lys
    290                 295                 300

Tyr Met Ile Asn Gly Met Pro Tyr Leu Gly Arg Gly Thr Gln Thr Asn
305                 310                 315                 320

Gly Val Pro Leu Gly Glu Tyr Tyr Val Lys Glu Leu Ser Lys Pro Val
                325                 330                 335

His Gly Ser Cys Arg Asn Ile Thr Cys Asp Asn Trp Phe Thr Ser Ile
            340                 345                 350
```

```
Pro Leu Ala Lys Asn Leu Leu Gln Glu Pro Tyr Lys Leu Thr Ile Val
        355                 360                 365

Gly Thr Val Arg Ser Asn Lys Arg Glu Ile Pro Glu Val Leu Lys Asn
    370                 375                 380

Ser Arg Ser Arg Pro Val Gly Thr Ser Met Phe Cys Phe Asp Gly Pro
385                 390                 395                 400

Leu Thr Leu Val Ser Tyr Lys Pro Lys Pro Ala Lys Met Val Tyr Leu
                405                 410                 415

Leu Ser Ser Cys Asp Glu Asp Ala Ser Ile Asn Glu Ser Thr Gly Lys
            420                 425                 430

Pro Gln Met Val Met Tyr Tyr Asn Gln Thr Lys Gly Gly Val Asp Thr
        435                 440                 445

Leu Asp Gln Met Cys Ser Val Met Thr Cys Ser Arg Lys Thr Asn Arg
    450                 455                 460

Trp Pro Met Ala Leu Leu Tyr Gly Met Ile Asn Ile Ala Cys Ile Asn
465                 470                 475                 480

Ser Phe Ile Ile Tyr Ser His Asn Val Ser Ser Lys Gly Glu Lys Val
                485                 490                 495

Gln Ser Arg Lys Lys Phe Met Arg Asn Leu Tyr Met Ser Leu Thr Ser
            500                 505                 510

Ser Phe Met Arg Lys Arg Leu Glu Ala Pro Thr Leu Lys Arg Tyr Leu
        515                 520                 525

Arg Asp Asn Ile Ser Asn Ile Leu Pro Asn Glu Val Pro Gly Thr Ser
    530                 535                 540

Asp Asp Ser Thr Glu Glu Pro Val Met Lys Lys Arg Thr Tyr Cys Thr
545                 550                 555                 560

Tyr Cys Pro Ser Lys Ile Arg Arg Lys Ala Asn Ala Ser Cys Lys Lys
```

```
               565                 570                 575

Cys Lys Lys Val Ile Cys Arg Glu His Asn Ile Asp Met Cys Gln Ser
            580                 585                 590

Cys Phe Ala Ala Ala Lys Leu Gly Gly Gly Ala Pro Ala Val Gly Gly
        595                 600                 605

Gly Pro Lys Ala Ala Asp Lys Gly Ala Ala Val Ile Arg Asp Glu Trp
    610                 615                 620

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

Ser Pro Met Ile Gly Cys Asp Asp Cys Asp Asp Trp Tyr His Trp Pro
                645                 650                 655

Cys Val Gly Ile Met Thr Ala Pro Pro Glu Glu Met Gln Trp Phe Cys
            660                 665                 670

Pro Lys Cys Ala Asn Lys Lys Lys Asp Lys Lys His Lys Lys Arg Lys
        675                 680                 685

His Arg Ala His
    690
```

<210> 11
<211> 2252
<212> DNA
<213> Artificial Sequence

<220>
<223> KAT2A-PBw

<220>
<221> CDS
<222> (16)..(2244)

<400> 11

```
accggtggat ccggc atg aag gaa aag ggc aaa gag ctg aag gac ccc gac        51
                Met Lys Glu Lys Gly Lys Glu Leu Lys Asp Pro Asp
                1               5                   10

cag ctg tac acc aca ctg aag aat ctg ctg gcc cag atc aag tct cac         99
```

```
Gln Leu Tyr Thr Thr Leu Lys Asn Leu Leu Ala Gln Ile Lys Ser His
        15                  20                  25

ccc tcc gcc tgg cct ttc atg gaa ccc gtg aag aag tct gag gcc cct        147
Pro Ser Ala Trp Pro Phe Met Glu Pro Val Lys Lys Ser Glu Ala Pro
    30                  35                  40

gac tac tac gaa gtg atc aga ttc ccc atc gac ctc aag acc atg acc        195
Asp Tyr Tyr Glu Val Ile Arg Phe Pro Ile Asp Leu Lys Thr Met Thr
45                  50                  55                  60

gag cgg ctg aga tcc cgg tac tac gtg acc aga aag ctg ttc gtg gcc        243
Glu Arg Leu Arg Ser Arg Tyr Tyr Val Thr Arg Lys Leu Phe Val Ala
                65                  70                  75

gac ctg cag aga gtg atc gcc aac tgt aga gag tac aac cct cct gac        291
Asp Leu Gln Arg Val Ile Ala Asn Cys Arg Glu Tyr Asn Pro Pro Asp
            80                  85                  90

tcc gag tac tgc aga tgc gcc tcc gct ctg gaa aag ttc ttc tac ttc        339
Ser Glu Tyr Cys Arg Cys Ala Ser Ala Leu Glu Lys Phe Phe Tyr Phe
        95                  100                 105

aag ctg aaa gaa ggc ggc ctg atc gac aag aag ctt gga ggc gga gca        387
Lys Leu Lys Glu Gly Gly Leu Ile Asp Lys Lys Leu Gly Gly Gly Ala
    110                 115                 120

cca gct gtt ggc gga gga cct aaa aaa ctc gga ggt ggc gct cct gct        435
Pro Ala Val Gly Gly Gly Pro Lys Lys Leu Gly Gly Gly Ala Pro Ala
125                 130                 135                 140

gtc gga ggc gga cct aaa gct atg ggc agc tct ctg gac gac gag cac        483
Val Gly Gly Gly Pro Lys Ala Met Gly Ser Ser Leu Asp Asp Glu His
                145                 150                 155

atc ctg tct gcc ctg ctg cag tcc gac gat gaa cta gtg ggc gaa gat        531
Ile Leu Ser Ala Leu Leu Gln Ser Asp Asp Glu Leu Val Gly Glu Asp
            160                 165                 170

tcc gac tcc gag atc tcc gat cac gtg tcc gag gac gac gtg cag tct        579
Ser Asp Ser Glu Ile Ser Asp His Val Ser Glu Asp Asp Val Gln Ser
        175                 180                 185

gat acc gag gaa gcc ttc atc gac gag gtg cac gaa gtg cag cct acc        627
Asp Thr Glu Glu Ala Phe Ile Asp Glu Val His Glu Val Gln Pro Thr
    190                 195                 200

tct tcc ggc tct gag atc ctg gac gag cag aac gtg atc gag cag cct        675
Ser Ser Gly Ser Glu Ile Leu Asp Glu Gln Asn Val Ile Glu Gln Pro
205                 210                 215                 220

gga tcc tct ctg gcc tcc aac aga atc ctg aca ctg ccc cag aga acc        723
Gly Ser Ser Leu Ala Ser Asn Arg Ile Leu Thr Leu Pro Gln Arg Thr
                225                 230                 235
```

```
atc cgg ggc aag aac aag cac tgc tgg tcc acc tcc aag tct acc cgg        771
Ile Arg Gly Lys Asn Lys His Cys Trp Ser Thr Ser Lys Ser Thr Arg
            240                 245                 250

cgg tct aga gtg tcc gct ctg aat att gtg cgg tcc cag agg ggc ccc        819
Arg Ser Arg Val Ser Ala Leu Asn Ile Val Arg Ser Gln Arg Gly Pro
        255                 260                 265

acc aga atg tgc cgg aac atc tac gac cct ctg ctg tgt ttc aag ctg        867
Thr Arg Met Cys Arg Asn Ile Tyr Asp Pro Leu Leu Cys Phe Lys Leu
    270                 275                 280

ttc ttc acc gac gag atc atc agc gag atc gtg aag tgg acc aac gcc        915
Phe Phe Thr Asp Glu Ile Ile Ser Glu Ile Val Lys Trp Thr Asn Ala
285                 290                 295                 300

gag atc agc ctg aag cgg cgg gaa tct atg acc ggc gcc acc ttc aga        963
Glu Ile Ser Leu Lys Arg Arg Glu Ser Met Thr Gly Ala Thr Phe Arg
                305                 310                 315

gac acc aac gag gat gag atc tac gcc ttc ttc ggc atc ctg gtc atg       1011
Asp Thr Asn Glu Asp Glu Ile Tyr Ala Phe Phe Gly Ile Leu Val Met
            320                 325                 330

aca gcc gtg cgg aag gac aac cac atg tcc acc gac gac ctg ttc gac       1059
Thr Ala Val Arg Lys Asp Asn His Met Ser Thr Asp Asp Leu Phe Asp
        335                 340                 345

aga tcc ctg tcc atg gtg tac gtg tcc gtg atg agc cgg gac aga ttc       1107
Arg Ser Leu Ser Met Val Tyr Val Ser Val Met Ser Arg Asp Arg Phe
    350                 355                 360

gac ttc ctg atc cgg tgc ctg cgg atg gac gac aag tcc atc aga ccc       1155
Asp Phe Leu Ile Arg Cys Leu Arg Met Asp Asp Lys Ser Ile Arg Pro
365                 370                 375                 380

aca ctg cgc gag aac gac gtg ttc aca cct gtg cgg aag atc tgg gac       1203
Thr Leu Arg Glu Asn Asp Val Phe Thr Pro Val Arg Lys Ile Trp Asp
                385                 390                 395

ctg ttc atc cac cag tgc atc cag aac tac acc cct ggc gct cac ctg       1251
Leu Phe Ile His Gln Cys Ile Gln Asn Tyr Thr Pro Gly Ala His Leu
            400                 405                 410

acc atc gat gaa cag ctg ctg ggc ttc aga ggc aga tgc ccc ttc aga       1299
Thr Ile Asp Glu Gln Leu Leu Gly Phe Arg Gly Arg Cys Pro Phe Arg
        415                 420                 425

atg tac atc ccc aac aag ccc tct aag tac ggc atc aag atc ctg atg       1347
Met Tyr Ile Pro Asn Lys Pro Ser Lys Tyr Gly Ile Lys Ile Leu Met
    430                 435                 440

atg tgc gac tcc ggc acc aag tac atg atc aac ggc atg ccc tac ctc       1395
```

```
Met Cys Asp Ser Gly Thr Lys Tyr Met Ile Asn Gly Met Pro Tyr Leu
445                 450                 455                 460

ggc aga ggc acc caa aca aat ggc gtg cca ctg ggc gag tac tat gtg       1443
Gly Arg Gly Thr Gln Thr Asn Gly Val Pro Leu Gly Glu Tyr Tyr Val
                465                 470                 475

aaa gaa ctg tcc aag cct gtg cac ggc tcc tgc aga aac atc acc tgt       1491
Lys Glu Leu Ser Lys Pro Val His Gly Ser Cys Arg Asn Ile Thr Cys
            480                 485                 490

gac aac tgg ttc acc agc att cct ctg gcc aag aac ctg ctg caa gag       1539
Asp Asn Trp Phe Thr Ser Ile Pro Leu Ala Lys Asn Leu Leu Gln Glu
        495                 500                 505

ccc tac aag ctg aca atc gtg ggc acc gtg cgg tcc aac aag cgg gaa       1587
Pro Tyr Lys Leu Thr Ile Val Gly Thr Val Arg Ser Asn Lys Arg Glu
    510                 515                 520

att cct gag gtg ctg aag aac tct cgg tcc aga cct gtg ggc acc tcc       1635
Ile Pro Glu Val Leu Lys Asn Ser Arg Ser Arg Pro Val Gly Thr Ser
525                 530                 535                 540

atg ttc tgt ttc gac ggc cct ctg aca ctg gtg tcc tac aag cct aag       1683
Met Phe Cys Phe Asp Gly Pro Leu Thr Leu Val Ser Tyr Lys Pro Lys
                545                 550                 555

cct gcc aag atg gtg tac ctg ctg tcc tcc tgt gac gag gac gcc agc       1731
Pro Ala Lys Met Val Tyr Leu Leu Ser Ser Cys Asp Glu Asp Ala Ser
            560                 565                 570

atc aat gag tcc acc ggc aag ccc cag atg gtc atg tac tac aac cag       1779
Ile Asn Glu Ser Thr Gly Lys Pro Gln Met Val Met Tyr Tyr Asn Gln
        575                 580                 585

acc aaa ggc ggc gtg gac acc ctg gac cag atg tgc tct gtg atg acc       1827
Thr Lys Gly Gly Val Asp Thr Leu Asp Gln Met Cys Ser Val Met Thr
    590                 595                 600

tgc tcc aga aag acc aac aga tgg ccc atg gct ctg ctg tac ggc atg       1875
Cys Ser Arg Lys Thr Asn Arg Trp Pro Met Ala Leu Leu Tyr Gly Met
605                 610                 615                 620

atc aat atc gcc tgc atc aac agc ttc atc atc tac tcc cac aac gtg       1923
Ile Asn Ile Ala Cys Ile Asn Ser Phe Ile Ile Tyr Ser His Asn Val
                625                 630                 635

tcc tcc aag ggc gag aag gtg cag tcc cgg aag aaa ttc atg cgg aac       1971
Ser Ser Lys Gly Glu Lys Val Gln Ser Arg Lys Lys Phe Met Arg Asn
            640                 645                 650

ctg tat atg tcc ctg acc tcc agc ttc atg aga aag cgg ctg gaa gcc       2019
Leu Tyr Met Ser Leu Thr Ser Ser Phe Met Arg Lys Arg Leu Glu Ala
        655                 660                 665
```

```
cct act ctg aag aga tac ctg cgg gac aac atc tcc aac atc ctg cct       2067
Pro Thr Leu Lys Arg Tyr Leu Arg Asp Asn Ile Ser Asn Ile Leu Pro
    670                 675                 680

aac gag gtg ccc ggc acc agc gac gat tct aca gag gaa cct gtg atg       2115
Asn Glu Val Pro Gly Thr Ser Asp Asp Ser Thr Glu Glu Pro Val Met
685                 690                 695                 700

aag aag cgg acc tac tgc acc tac tgt ccc tcc aag atc cgg cgg aag       2163
Lys Lys Arg Thr Tyr Cys Thr Tyr Cys Pro Ser Lys Ile Arg Arg Lys
                705                 710                 715

gcc aac gcc tct tgc aaa aag tgc aag aaa gtg atc tgc cgc gag cac       2211
Ala Asn Ala Ser Cys Lys Lys Cys Lys Lys Val Ile Cys Arg Glu His
            720                 725                 730

aac atc gac atg tgc cag tct tgt ttc tga tga gcggccgc                 2252
Asn Ile Asp Met Cys Gln Ser Cys Phe
        735                 740
```

<210> 12
<211> 741
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 12

```
Met Lys Glu Lys Gly Lys Glu Leu Lys Asp Pro Asp Gln Leu Tyr Thr
1               5                   10                  15


Thr Leu Lys Asn Leu Leu Ala Gln Ile Lys Ser His Pro Ser Ala Trp
            20                  25                  30


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


Val Ile Arg Phe Pro Ile Asp Leu Lys Thr Met Thr Glu Arg Leu Arg
    50                  55                  60


Ser Arg Tyr Tyr Val Thr Arg Lys Leu Phe Val Ala Asp Leu Gln Arg
65                  70                  75                  80


Val Ile Ala Asn Cys Arg Glu Tyr Asn Pro Pro Asp Ser Glu Tyr Cys
                85                  90                  95
```

```
Arg Cys Ala Ser Ala Leu Glu Lys Phe Phe Tyr Phe Lys Leu Lys Glu
            100                 105                 110

Gly Gly Leu Ile Asp Lys Lys Leu Gly Gly Gly Ala Pro Ala Val Gly
        115                 120                 125

Gly Gly Pro Lys Lys Leu Gly Gly Gly Ala Pro Ala Val Gly Gly Gly
    130                 135                 140

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

Leu Leu Gln Ser Asp Asp Glu Leu Val Gly Glu Asp Ser Asp Ser Glu
                165                 170                 175

Ile Ser Asp His Val Ser Glu Asp Asp Val Gln Ser Asp Thr Glu Glu
            180                 185                 190

Ala Phe Ile Asp Glu Val His Glu Val Gln Pro Thr Ser Ser Gly Ser
        195                 200                 205

Glu Ile Leu Asp Glu Gln Asn Val Ile Glu Gln Pro Gly Ser Ser Leu
    210                 215                 220

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

Asn Lys His Cys Trp Ser Thr Ser Lys Ser Thr Arg Arg Ser Arg Val
                245                 250                 255

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

Arg Asn Ile Tyr Asp Pro Leu Leu Cys Phe Lys Leu Phe Phe Thr Asp
        275                 280                 285

Glu Ile Ile Ser Glu Ile Val Lys Trp Thr Asn Ala Glu Ile Ser Leu
    290                 295                 300
```

```
Lys Arg Arg Glu Ser Met Thr Gly Ala Thr Phe Arg Asp Thr Asn Glu
305                 310                 315                 320

Asp Glu Ile Tyr Ala Phe Phe Gly Ile Leu Val Met Thr Ala Val Arg
                325                 330                 335

Lys Asp Asn His Met Ser Thr Asp Asp Leu Phe Asp Arg Ser Leu Ser
            340                 345                 350

Met Val Tyr Val Ser Val Met Ser Arg Asp Arg Phe Asp Phe Leu Ile
        355                 360                 365

Arg Cys Leu Arg Met Asp Asp Lys Ser Ile Arg Pro Thr Leu Arg Glu
    370                 375                 380

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

Gln Cys Ile Gln Asn Tyr Thr Pro Gly Ala His Leu Thr Ile Asp Glu
                405                 410                 415

Gln Leu Leu Gly Phe Arg Gly Arg Cys Pro Phe Arg Met Tyr Ile Pro
            420                 425                 430

Asn Lys Pro Ser Lys Tyr Gly Ile Lys Ile Leu Met Met Cys Asp Ser
        435                 440                 445

Gly Thr Lys Tyr Met Ile Asn Gly Met Pro Tyr Leu Gly Arg Gly Thr
    450                 455                 460

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

Lys Pro Val His Gly Ser Cys Arg Asn Ile Thr Cys Asp Asn Trp Phe
                485                 490                 495

Thr Ser Ile Pro Leu Ala Lys Asn Leu Leu Gln Glu Pro Tyr Lys Leu
            500                 505                 510

Thr Ile Val Gly Thr Val Arg Ser Asn Lys Arg Glu Ile Pro Glu Val
        515                 520                 525
```

```
Leu Lys Asn Ser Arg Ser Arg Pro Val Gly Thr Ser Met Phe Cys Phe
    530                 535                 540

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

Val Tyr Leu Leu Ser Ser Cys Asp Glu Asp Ala Ser Ile Asn Glu Ser
                565                 570                 575

Thr Gly Lys Pro Gln Met Val Met Tyr Tyr Asn Gln Thr Lys Gly Gly
            580                 585                 590

Val Asp Thr Leu Asp Gln Met Cys Ser Val Met Thr Cys Ser Arg Lys
        595                 600                 605

Thr Asn Arg Trp Pro Met Ala Leu Leu Tyr Gly Met Ile Asn Ile Ala
    610                 615                 620

Cys Ile Asn Ser Phe Ile Ile Tyr Ser His Asn Val Ser Ser Lys Gly
625                 630                 635                 640

Glu Lys Val Gln Ser Arg Lys Lys Phe Met Arg Asn Leu Tyr Met Ser
                645                 650                 655

Leu Thr Ser Ser Phe Met Arg Lys Arg Leu Glu Ala Pro Thr Leu Lys
            660                 665                 670

Arg Tyr Leu Arg Asp Asn Ile Ser Asn Ile Leu Pro Asn Glu Val Pro
        675                 680                 685

Gly Thr Ser Asp Asp Ser Thr Glu Glu Pro Val Met Lys Lys Arg Thr
    690                 695                 700

Tyr Cys Thr Tyr Cys Pro Ser Lys Ile Arg Arg Lys Ala Asn Ala Ser
705                 710                 715                 720

Cys Lys Lys Cys Lys Lys Val Ile Cys Arg Glu His Asn Ile Asp Met
                725                 730                 735
```

```
Cys Gln Ser Cys Phe
            740


<210>  13
<211>  1804
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  haPB


<220>
<221>  CDS
<222>  (12)..(1796)

<400>  13
accggtccgg c atg gga tct tct ctg gac gac gag cac atc ctg tct gcc        50
             Met Gly Ser Ser Leu Asp Asp Glu His Ile Leu Ser Ala
             1               5                   10

ctg ctg cag tct gac gat gaa ctc gtg ggc gaa gat tcc gac tcc gag         98
Leu Leu Gln Ser Asp Asp Glu Leu Val Gly Glu Asp Ser Asp Ser Glu
    15                  20                  25

gtg tcc gac cat gtg tct gag gac gac gtg cag tcc gat acc gag gaa        146
Val Ser Asp His Val Ser Glu Asp Asp Val Gln Ser Asp Thr Glu Glu
30                  35                  40                  45

gcc ttc atc gac gag gtg cac gaa gtg cag cct acc tct tcc ggc tct        194
Ala Phe Ile Asp Glu Val His Glu Val Gln Pro Thr Ser Ser Gly Ser
                50                  55                  60

gag atc ctg gac gag cag aac gtg atc gag cag cct gga tct tcc ctg        242
Glu Ile Leu Asp Glu Gln Asn Val Ile Glu Gln Pro Gly Ser Ser Leu
            65                  70                  75

gcc tcc aac aga atc ctg aca ctg cct cag cgg acc atc cgg ggc aag        290
Ala Ser Asn Arg Ile Leu Thr Leu Pro Gln Arg Thr Ile Arg Gly Lys
        80                  85                  90

aac aag cac tgc tgg tcc acc tct aag agc acc cgg cgg tct aga gtg        338
Asn Lys His Cys Trp Ser Thr Ser Lys Ser Thr Arg Arg Ser Arg Val
    95                  100                 105

tcc gct ctg aat att gtg cgg tcc cag agg ggc ccc acc aga atg tgc        386
Ser Ala Leu Asn Ile Val Arg Ser Gln Arg Gly Pro Thr Arg Met Cys
110                 115                 120                 125

cgg aac atc tac gac cct ctg ctg tgc ttc aag ctg ttc ttc acc gac        434
Arg Asn Ile Tyr Asp Pro Leu Leu Cys Phe Lys Leu Phe Phe Thr Asp
                130                 135                 140
```

```
gag atc atc tcc gag atc gtg aag tgg acc aac gcc gag atc tct ctg        482
Glu Ile Ile Ser Glu Ile Val Lys Trp Thr Asn Ala Glu Ile Ser Leu
            145                 150                 155

aag cgg cgc gag tct atg acc tct gcc acc ttc cgg gac acc aac gag        530
Lys Arg Arg Glu Ser Met Thr Ser Ala Thr Phe Arg Asp Thr Asn Glu
        160                 165                 170

gat gag atc tac gcc ttc ttc ggc atc ctg gtc atg aca gcc gtg cgg        578
Asp Glu Ile Tyr Ala Phe Phe Gly Ile Leu Val Met Thr Ala Val Arg
    175                 180                 185

aag gac aac cac atg tcc acc gac gac ctg ttc gac aga tcc ctg tcc        626
Lys Asp Asn His Met Ser Thr Asp Asp Leu Phe Asp Arg Ser Leu Ser
190                 195                 200                 205

atg gtg tac gtg tcc gtg atg tcc agg gac aga ttc gac ttc ctg atc        674
Met Val Tyr Val Ser Val Met Ser Arg Asp Arg Phe Asp Phe Leu Ile
                210                 215                 220

cgg tgc ctg cgg atg gac gac aag tct atc aga ccc aca ctg cgc gag        722
Arg Cys Leu Arg Met Asp Asp Lys Ser Ile Arg Pro Thr Leu Arg Glu
            225                 230                 235

aac gac gtg ttc aca cct gtg cgg aag atc tgg gac ctg ttc atc cac        770
Asn Asp Val Phe Thr Pro Val Arg Lys Ile Trp Asp Leu Phe Ile His
        240                 245                 250

cag tgc atc cag aac tac acc cct ggc gct cac ctg acc atc gac gaa        818
Gln Cys Ile Gln Asn Tyr Thr Pro Gly Ala His Leu Thr Ile Asp Glu
    255                 260                 265

cag ctg ctg ggc ttc aga ggc aga tgc cct ttc cgg gtg tac atc ccc        866
Gln Leu Leu Gly Phe Arg Gly Arg Cys Pro Phe Arg Val Tyr Ile Pro
270                 275                 280                 285

aac aag ccc tct aag tac ggc atc aag atc ctg atg atg tgc gac tcc        914
Asn Lys Pro Ser Lys Tyr Gly Ile Lys Ile Leu Met Met Cys Asp Ser
                290                 295                 300

ggc acc aag tac atg atc aac ggc atg ccc tac ctc ggc aga ggc acc        962
Gly Thr Lys Tyr Met Ile Asn Gly Met Pro Tyr Leu Gly Arg Gly Thr
            305                 310                 315

caa aca aat ggc gtg cca ctg ggc gag tac tac gtg aaa gaa ctg tcc       1010
Gln Thr Asn Gly Val Pro Leu Gly Glu Tyr Tyr Val Lys Glu Leu Ser
        320                 325                 330

aag cct gtg cac ggc tcc tgc aga aac atc acc tgt gat aac tgg ttc       1058
Lys Pro Val His Gly Ser Cys Arg Asn Ile Thr Cys Asp Asn Trp Phe
    335                 340                 345

acc tcc att cct ctg gcc aag aac ctg ctg caa gag cct tac aag ctg       1106
Thr Ser Ile Pro Leu Ala Lys Asn Leu Leu Gln Glu Pro Tyr Lys Leu
```

```
350                 355                 360                 365

aca atc gtg ggc acc gtg cgg tcc aac aag cgg gaa att cct gag gtg       1154
Thr Ile Val Gly Thr Val Arg Ser Asn Lys Arg Glu Ile Pro Glu Val
                370                 375                 380

ctg aag aac tct cgg tcc aga cct gtg ggc acc tcc atg ttc tgt ttc       1202
Leu Lys Asn Ser Arg Ser Arg Pro Val Gly Thr Ser Met Phe Cys Phe
            385                 390                 395

gac ggc cct ctg aca ctg gtg tcc tac aag cct aag cct gcc aag atg       1250
Asp Gly Pro Leu Thr Leu Val Ser Tyr Lys Pro Lys Pro Ala Lys Met
        400                 405                 410

gtg tac ctg ctg tcc tcc tgt gac gag gac gcc agc atc aat gag tcc       1298
Val Tyr Leu Leu Ser Ser Cys Asp Glu Asp Ala Ser Ile Asn Glu Ser
    415                 420                 425

acc ggc aag ccc cag atg gtc atg tac tac aac cag acc aaa ggc ggc       1346
Thr Gly Lys Pro Gln Met Val Met Tyr Tyr Asn Gln Thr Lys Gly Gly
430                 435                 440                 445

gtg gac acc ctg gac cag atg tgc tct gtg atg acc tgc tcc aga aag       1394
Val Asp Thr Leu Asp Gln Met Cys Ser Val Met Thr Cys Ser Arg Lys
                450                 455                 460

acc aac aga tgg ccc atg gct ctg ctg tac ggc atg atc aat atc gcc       1442
Thr Asn Arg Trp Pro Met Ala Leu Leu Tyr Gly Met Ile Asn Ile Ala
            465                 470                 475

tgc atc aac agc ttc atc atc tac tcc cac aac gtg tcc tcc aag ggc       1490
Cys Ile Asn Ser Phe Ile Ile Tyr Ser His Asn Val Ser Ser Lys Gly
        480                 485                 490

gag aag gtg cag tcc cgg aaa aag ttc atg cgg aac ctg tat atg tcc       1538
Glu Lys Val Gln Ser Arg Lys Lys Phe Met Arg Asn Leu Tyr Met Ser
    495                 500                 505

ctg acc tcc agc ttc atg aga aag cgg ctg gaa gcc cct aca ctg aag       1586
Leu Thr Ser Ser Phe Met Arg Lys Arg Leu Glu Ala Pro Thr Leu Lys
510                 515                 520                 525

cgc tac ctg cgg gac aac atc tcc aac atc ctg cct aaa gag gtg ccc       1634
Arg Tyr Leu Arg Asp Asn Ile Ser Asn Ile Leu Pro Lys Glu Val Pro
                530                 535                 540

ggc acc agc gac gac tct aca gag gaa ccc gtg atg aag aag agg acc       1682
Gly Thr Ser Asp Asp Ser Thr Glu Glu Pro Val Met Lys Lys Arg Thr
            545                 550                 555

tac tgc acc tac tgt ccc tcc aag atc cgg cgg aag gcc aac gcc tct       1730
Tyr Cys Thr Tyr Cys Pro Ser Lys Ile Arg Arg Lys Ala Asn Ala Ser
        560                 565                 570
```

```
tgc aaa aag tgc aag aaa gtg atc tgc cgc gag cac aac atc gat atg       1778
Cys Lys Lys Cys Lys Lys Val Ile Cys Arg Glu His Asn Ile Asp Met
    575                 580                 585

tgc cag tcc tgc ttc tga gcggccgc                                    1804
Cys Gln Ser Cys Phe
590
```

<210> 14
<211> 594
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 14

```
Met Gly Ser Ser Leu Asp Asp Glu His Ile Leu Ser Ala Leu Leu Gln
1               5                   10                  15


Ser Asp Asp Glu Leu Val Gly Glu Asp Ser Asp Ser Glu Val Ser Asp
            20                  25                  30


His Val Ser Glu Asp Asp Val Gln Ser Asp Thr Glu Glu Ala Phe Ile
        35                  40                  45


Asp Glu Val His Glu Val Gln Pro Thr Ser Ser Gly Ser Glu Ile Leu
    50                  55                  60


Asp Glu Gln Asn Val Ile Glu Gln Pro Gly Ser Ser Leu Ala Ser Asn
65                  70                  75                  80


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


Cys Trp Ser Thr Ser Lys Ser Thr Arg Arg Ser Arg Val Ser Ala Leu
            100                 105                 110


Asn Ile Val Arg Ser Gln Arg Gly Pro Thr Arg Met Cys Arg Asn Ile
        115                 120                 125


Tyr Asp Pro Leu Leu Cys Phe Lys Leu Phe Phe Thr Asp Glu Ile Ile
    130                 135                 140
```

```
Ser Glu Ile Val Lys Trp Thr Asn Ala Glu Ile Ser Leu Lys Arg Arg
145                 150                 155                 160

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

Tyr Ala Phe Phe Gly Ile Leu Val Met Thr Ala Val Arg Lys Asp Asn
            180                 185                 190

His Met Ser Thr Asp Asp Leu Phe Asp Arg Ser Leu Ser Met Val Tyr
        195                 200                 205

Val Ser Val Met Ser Arg Asp Arg Phe Asp Phe Leu Ile Arg Cys Leu
    210                 215                 220

Arg Met Asp Asp Lys Ser Ile Arg Pro Thr Leu Arg Glu Asn Asp Val
225                 230                 235                 240

Phe Thr Pro Val Arg Lys Ile Trp Asp Leu Phe Ile His Gln Cys Ile
                245                 250                 255

Gln Asn Tyr Thr Pro Gly Ala His Leu Thr Ile Asp Glu Gln Leu Leu
            260                 265                 270

Gly Phe Arg Gly Arg Cys Pro Phe Arg Val Tyr Ile Pro Asn Lys Pro
        275                 280                 285

Ser Lys Tyr Gly Ile Lys Ile Leu Met Met Cys Asp Ser Gly Thr Lys
    290                 295                 300

Tyr Met Ile Asn Gly Met Pro Tyr Leu Gly Arg Gly Thr Gln Thr Asn
305                 310                 315                 320

Gly Val Pro Leu Gly Glu Tyr Tyr Val Lys Glu Leu Ser Lys Pro Val
                325                 330                 335

His Gly Ser Cys Arg Asn Ile Thr Cys Asp Asn Trp Phe Thr Ser Ile
            340                 345                 350

Pro Leu Ala Lys Asn Leu Leu Gln Glu Pro Tyr Lys Leu Thr Ile Val
```

```
        355                 360                 365

Gly Thr Val Arg Ser Asn Lys Arg Glu Ile Pro Glu Val Leu Lys Asn
    370                 375                 380

Ser Arg Ser Arg Pro Val Gly Thr Ser Met Phe Cys Phe Asp Gly Pro
385                 390                 395                 400

Leu Thr Leu Val Ser Tyr Lys Pro Lys Pro Ala Lys Met Val Tyr Leu
                405                 410                 415

Leu Ser Ser Cys Asp Glu Asp Ala Ser Ile Asn Glu Ser Thr Gly Lys
            420                 425                 430

Pro Gln Met Val Met Tyr Tyr Asn Gln Thr Lys Gly Gly Val Asp Thr
        435                 440                 445

Leu Asp Gln Met Cys Ser Val Met Thr Cys Ser Arg Lys Thr Asn Arg
    450                 455                 460

Trp Pro Met Ala Leu Leu Tyr Gly Met Ile Asn Ile Ala Cys Ile Asn
465                 470                 475                 480

Ser Phe Ile Ile Tyr Ser His Asn Val Ser Ser Lys Gly Glu Lys Val
                485                 490                 495

Gln Ser Arg Lys Lys Phe Met Arg Asn Leu Tyr Met Ser Leu Thr Ser
            500                 505                 510

Ser Phe Met Arg Lys Arg Leu Glu Ala Pro Thr Leu Lys Arg Tyr Leu
        515                 520                 525

Arg Asp Asn Ile Ser Asn Ile Leu Pro Lys Glu Val Pro Gly Thr Ser
    530                 535                 540

Asp Asp Ser Thr Glu Glu Pro Val Met Lys Lys Arg Thr Tyr Cys Thr
545                 550                 555                 560

Tyr Cys Pro Ser Lys Ile Arg Arg Lys Ala Asn Ala Ser Cys Lys Lys
                565                 570                 575
```

```
Cys Lys Lys Val Ile Cys Arg Glu His Asn Ile Asp Met Cys Gln Ser
            580                 585                 590


Cys Phe



<210>  15
<211>  2545
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  KAT2A-haPB-Taf3


<220>
<221>  CDS
<222>  (15)..(2537)

<400>  15
ccggtggatc cggc atg aag gaa aag ggc aaa gag ctg aag gac ccc gac         50
               Met Lys Glu Lys Gly Lys Glu Leu Lys Asp Pro Asp
               1               5                   10

cag ctg tac acc aca ctg aag aat ctg ctg gcc cag atc aag tct cac         98
Gln Leu Tyr Thr Thr Leu Lys Asn Leu Leu Ala Gln Ile Lys Ser His
        15                  20                  25

ccc tcc gcc tgg cct ttc atg gaa ccc gtg aag aag tct gag gcc cct        146
Pro Ser Ala Trp Pro Phe Met Glu Pro Val Lys Lys Ser Glu Ala Pro
    30                  35                  40

gac tac tac gaa gtg atc aga ttc ccc atc gac ctc aag acc atg acc        194
Asp Tyr Tyr Glu Val Ile Arg Phe Pro Ile Asp Leu Lys Thr Met Thr
45                  50                  55                  60

gag cgg ctg aga tcc cgg tac tac gtg acc aga aag ctg ttc gtg gcc        242
Glu Arg Leu Arg Ser Arg Tyr Tyr Val Thr Arg Lys Leu Phe Val Ala
                65                  70                  75

gac ctg cag aga gtg atc gcc aac tgt aga gag tac aac cct cct gac        290
Asp Leu Gln Arg Val Ile Ala Asn Cys Arg Glu Tyr Asn Pro Pro Asp
            80                  85                  90

tcc gag tac tgc aga tgc gcc tcc gct ctg gaa aag ttc ttc tac ttc        338
Ser Glu Tyr Cys Arg Cys Ala Ser Ala Leu Glu Lys Phe Phe Tyr Phe
        95                  100                 105

aag ctg aaa gaa ggc ggc ctg atc gac aag aag ctt gga ggc gga gca        386
Lys Leu Lys Glu Gly Gly Leu Ile Asp Lys Lys Leu Gly Gly Gly Ala
    110                 115                 120
```

```
cca gct gtt ggc gga gga cct aaa aaa ctc gga ggt ggc gct cct gct        434
Pro Ala Val Gly Gly Gly Pro Lys Lys Leu Gly Gly Gly Ala Pro Ala
125                 130                 135                 140

gtc gga ggc gga cct aaa gct atg ggc agc tct ctg gac gac gag cac        482
Val Gly Gly Gly Pro Lys Ala Met Gly Ser Ser Leu Asp Asp Glu His
                145                 150                 155

atc ctg tct gcc ctg ctg cag tcc gac gat gaa cta gtg ggc gaa gat        530
Ile Leu Ser Ala Leu Leu Gln Ser Asp Asp Glu Leu Val Gly Glu Asp
            160                 165                 170

tcc gac tcc gag gtg tcc gac cat gtg tct gag gac gac gtg cag tcc        578
Ser Asp Ser Glu Val Ser Asp His Val Ser Glu Asp Asp Val Gln Ser
        175                 180                 185

gat acc gag gaa gcc ttc atc gac gag gtg cac gaa gtg cag cct acc        626
Asp Thr Glu Glu Ala Phe Ile Asp Glu Val His Glu Val Gln Pro Thr
    190                 195                 200

tct tcc ggc tct gag atc ctg gac gag cag aac gtg atc gag cag cct        674
Ser Ser Gly Ser Glu Ile Leu Asp Glu Gln Asn Val Ile Glu Gln Pro
205                 210                 215                 220

gga tct tcc ctg gcc tcc aac aga atc ctg aca ctg cct cag cgg acc        722
Gly Ser Ser Leu Ala Ser Asn Arg Ile Leu Thr Leu Pro Gln Arg Thr
                225                 230                 235

atc cgg ggc aag aac aag cac tgc tgg tcc acc tct aag agc acc cgg        770
Ile Arg Gly Lys Asn Lys His Cys Trp Ser Thr Ser Lys Ser Thr Arg
            240                 245                 250

cgg tct aga gtg tcc gct ctg aat att gtg cgg tcc cag agg ggc ccc        818
Arg Ser Arg Val Ser Ala Leu Asn Ile Val Arg Ser Gln Arg Gly Pro
        255                 260                 265

acc aga atg tgc cgg aac atc tac gac cct ctg ctg tgc ttc aag ctg        866
Thr Arg Met Cys Arg Asn Ile Tyr Asp Pro Leu Leu Cys Phe Lys Leu
    270                 275                 280

ttc ttc acc gac gag atc atc tcc gag atc gtg aag tgg acc aac gcc        914
Phe Phe Thr Asp Glu Ile Ile Ser Glu Ile Val Lys Trp Thr Asn Ala
285                 290                 295                 300

gag atc tct ctg aag cgg cgc gag tct atg acc tct gcc acc ttc cgg        962
Glu Ile Ser Leu Lys Arg Arg Glu Ser Met Thr Ser Ala Thr Phe Arg
                305                 310                 315

gac acc aac gag gat gag atc tac gcc ttc ttc ggc atc ctg gtc atg       1010
Asp Thr Asn Glu Asp Glu Ile Tyr Ala Phe Phe Gly Ile Leu Val Met
            320                 325                 330

aca gcc gtg cgg aag gac aac cac atg tcc acc gac gac ctg ttc gac       1058
```

```
Thr Ala Val Arg Lys Asp Asn His Met Ser Thr Asp Asp Leu Phe Asp
        335                 340                 345

aga tcc ctg tcc atg gtg tac gtg tcc gtg atg tcc agg gac aga ttc       1106
Arg Ser Leu Ser Met Val Tyr Val Ser Val Met Ser Arg Asp Arg Phe
    350                 355                 360

gac ttc ctg atc cgg tgc ctg cgg atg gac gac aag tct atc aga ccc       1154
Asp Phe Leu Ile Arg Cys Leu Arg Met Asp Asp Lys Ser Ile Arg Pro
365                 370                 375                 380

aca ctg cgc gag aac gac gtg ttc aca cct gtg cgg aag atc tgg gac       1202
Thr Leu Arg Glu Asn Asp Val Phe Thr Pro Val Arg Lys Ile Trp Asp
                385                 390                 395

ctg ttc atc cac cag tgc atc cag aac tac acc cct ggc gct cac ctg       1250
Leu Phe Ile His Gln Cys Ile Gln Asn Tyr Thr Pro Gly Ala His Leu
            400                 405                 410

acc atc gac gaa cag ctg ctg ggc ttc aga ggc aga tgc cct ttc cgg       1298
Thr Ile Asp Glu Gln Leu Leu Gly Phe Arg Gly Arg Cys Pro Phe Arg
        415                 420                 425

gtg tac atc ccc aac aag ccc tct aag tac ggc atc aag atc ctg atg       1346
Val Tyr Ile Pro Asn Lys Pro Ser Lys Tyr Gly Ile Lys Ile Leu Met
    430                 435                 440

atg tgc gac tcc ggc acc aag tac atg atc aac ggc atg ccc tac ctc       1394
Met Cys Asp Ser Gly Thr Lys Tyr Met Ile Asn Gly Met Pro Tyr Leu
445                 450                 455                 460

ggc aga ggc acc caa aca aat ggc gtg cca ctg ggc gag tac tac gtg       1442
Gly Arg Gly Thr Gln Thr Asn Gly Val Pro Leu Gly Glu Tyr Tyr Val
                465                 470                 475

aaa gaa ctg tcc aag cct gtg cac ggc tcc tgc aga aac atc acc tgt       1490
Lys Glu Leu Ser Lys Pro Val His Gly Ser Cys Arg Asn Ile Thr Cys
            480                 485                 490

gat aac tgg ttc acc tcc att cct ctg gcc aag aac ctg ctg caa gag       1538
Asp Asn Trp Phe Thr Ser Ile Pro Leu Ala Lys Asn Leu Leu Gln Glu
        495                 500                 505

cct tac aag ctg aca atc gtg ggc acc gtg cgg tcc aac aag cgg gaa       1586
Pro Tyr Lys Leu Thr Ile Val Gly Thr Val Arg Ser Asn Lys Arg Glu
    510                 515                 520

att cct gag gtg ctg aag aac tct cgg tcc aga cct gtg ggc acc tcc       1634
Ile Pro Glu Val Leu Lys Asn Ser Arg Ser Arg Pro Val Gly Thr Ser
525                 530                 535                 540

atg ttc tgt ttc gac ggc cct ctg aca ctg gtg tcc tac aag cct aag       1682
Met Phe Cys Phe Asp Gly Pro Leu Thr Leu Val Ser Tyr Lys Pro Lys
                545                 550                 555
```

```
cct gcc aag atg gtg tac ctg ctg tcc tcc tgt gac gag gac gcc agc       1730
Pro Ala Lys Met Val Tyr Leu Leu Ser Ser Cys Asp Glu Asp Ala Ser
            560                 565                 570

atc aat gag tcc acc ggc aag ccc cag atg gtc atg tac tac aac cag       1778
Ile Asn Glu Ser Thr Gly Lys Pro Gln Met Val Met Tyr Tyr Asn Gln
        575                 580                 585

acc aaa ggc ggc gtg gac acc ctg gac cag atg tgc tct gtg atg acc       1826
Thr Lys Gly Gly Val Asp Thr Leu Asp Gln Met Cys Ser Val Met Thr
    590                 595                 600

tgc tcc aga aag acc aac aga tgg ccc atg gct ctg ctg tac ggc atg       1874
Cys Ser Arg Lys Thr Asn Arg Trp Pro Met Ala Leu Leu Tyr Gly Met
605                 610                 615                 620

atc aat atc gcc tgc atc aac agc ttc atc atc tac tcc cac aac gtg       1922
Ile Asn Ile Ala Cys Ile Asn Ser Phe Ile Ile Tyr Ser His Asn Val
                625                 630                 635

tcc tcc aag ggc gag aag gtg cag tcc cgg aaa aag ttc atg cgg aac       1970
Ser Ser Lys Gly Glu Lys Val Gln Ser Arg Lys Lys Phe Met Arg Asn
            640                 645                 650

ctg tat atg tcc ctg acc tcc agc ttc atg aga aag cgg ctg gaa gcc       2018
Leu Tyr Met Ser Leu Thr Ser Ser Phe Met Arg Lys Arg Leu Glu Ala
        655                 660                 665

cct aca ctg aag cgc tac ctg cgg gac aac atc tcc aac atc ctg cct       2066
Pro Thr Leu Lys Arg Tyr Leu Arg Asp Asn Ile Ser Asn Ile Leu Pro
    670                 675                 680

aaa gag gtg ccc ggc acc agc gac gac tct aca gag gaa ccc gtg atg       2114
Lys Glu Val Pro Gly Thr Ser Asp Asp Ser Thr Glu Glu Pro Val Met
685                 690                 695                 700

aag aag agg acc tac tgc acc tac tgt ccc tcc aag atc cgg cgg aag       2162
Lys Lys Arg Thr Tyr Cys Thr Tyr Cys Pro Ser Lys Ile Arg Arg Lys
                705                 710                 715

gcc aac gcc tct tgc aaa aag tgc aag aaa gtg atc tgc cgc gag cac       2210
Ala Asn Ala Ser Cys Lys Lys Cys Lys Lys Val Ile Cys Arg Glu His
            720                 725                 730

aac atc gat atg tgc cag tcc tgc ttc gcc gct gct aaa ctt ggt ggt       2258
Asn Ile Asp Met Cys Gln Ser Cys Phe Ala Ala Ala Lys Leu Gly Gly
        735                 740                 745

ggc gcg ccg gca gtc ggc gga ggt cca aaa gct gct gat aag ggc gct       2306
Gly Ala Pro Ala Val Gly Gly Gly Pro Lys Ala Ala Asp Lys Gly Ala
    750                 755                 760

gcc gtg atc aga gat gag tgg ggc aat cag atc tgg atc tgt cct ggc       2354
```

```
Ala Val Ile Arg Asp Glu Trp Gly Asn Gln Ile Trp Ile Cys Pro Gly
765                 770                 775                 780

tgc aac aag cct gac gac ggc tct cct atg atc ggc tgc gac gac tgt       2402
Cys Asn Lys Pro Asp Asp Gly Ser Pro Met Ile Gly Cys Asp Asp Cys
                785                 790                 795

gac gat tgg tat cac tgg ccc tgc gtg ggc atc atg acc gct cca cct       2450
Asp Asp Trp Tyr His Trp Pro Cys Val Gly Ile Met Thr Ala Pro Pro
            800                 805                 810

gaa gaa atg cag tgg ttc tgc ccc aag tgc gcc aac aag aag aag gat       2498
Glu Glu Met Gln Trp Phe Cys Pro Lys Cys Ala Asn Lys Lys Lys Asp
        815                 820                 825

aag aag cac aag aag cgc aag cac agg gcc cac tga tga gcggccgc          2545
Lys Lys His Lys Lys Arg Lys His Arg Ala His
    830                 835
```

<210> 16
<211> 839
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 16

```
Met Lys Glu Lys Gly Lys Glu Leu Lys Asp Pro Asp Gln Leu Tyr Thr
1               5                   10                  15


Thr Leu Lys Asn Leu Leu Ala Gln Ile Lys Ser His Pro Ser Ala Trp
            20                  25                  30


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


Val Ile Arg Phe Pro Ile Asp Leu Lys Thr Met Thr Glu Arg Leu Arg
    50                  55                  60


Ser Arg Tyr Tyr Val Thr Arg Lys Leu Phe Val Ala Asp Leu Gln Arg
65                  70                  75                  80


Val Ile Ala Asn Cys Arg Glu Tyr Asn Pro Pro Asp Ser Glu Tyr Cys
                85                  90                  95
```

```
Arg Cys Ala Ser Ala Leu Glu Lys Phe Phe Tyr Phe Lys Leu Lys Glu
            100                 105                 110

Gly Gly Leu Ile Asp Lys Lys Leu Gly Gly Gly Ala Pro Ala Val Gly
        115                 120                 125

Gly Gly Pro Lys Lys Leu Gly Gly Gly Ala Pro Ala Val Gly Gly Gly
    130                 135                 140

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

Leu Leu Gln Ser Asp Asp Glu Leu Val Gly Glu Asp Ser Asp Ser Glu
                165                 170                 175

Val Ser Asp His Val Ser Glu Asp Asp Val Gln Ser Asp Thr Glu Glu
            180                 185                 190

Ala Phe Ile Asp Glu Val His Glu Val Gln Pro Thr Ser Ser Gly Ser
        195                 200                 205

Glu Ile Leu Asp Glu Gln Asn Val Ile Glu Gln Pro Gly Ser Ser Leu
    210                 215                 220

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

Asn Lys His Cys Trp Ser Thr Ser Lys Ser Thr Arg Arg Ser Arg Val
                245                 250                 255

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

Arg Asn Ile Tyr Asp Pro Leu Leu Cys Phe Lys Leu Phe Phe Thr Asp
        275                 280                 285

Glu Ile Ile Ser Glu Ile Val Lys Trp Thr Asn Ala Glu Ile Ser Leu
    290                 295                 300

Lys Arg Arg Glu Ser Met Thr Ser Ala Thr Phe Arg Asp Thr Asn Glu
305                 310                 315                 320
```

```
Asp Glu Ile Tyr Ala Phe Phe Gly Ile Leu Val Met Thr Ala Val Arg
                325                 330                 335

Lys Asp Asn His Met Ser Thr Asp Asp Leu Phe Asp Arg Ser Leu Ser
            340                 345                 350

Met Val Tyr Val Ser Val Met Ser Arg Asp Arg Phe Asp Phe Leu Ile
        355                 360                 365

Arg Cys Leu Arg Met Asp Asp Lys Ser Ile Arg Pro Thr Leu Arg Glu
    370                 375                 380

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

Gln Cys Ile Gln Asn Tyr Thr Pro Gly Ala His Leu Thr Ile Asp Glu
                405                 410                 415

Gln Leu Leu Gly Phe Arg Gly Arg Cys Pro Phe Arg Val Tyr Ile Pro
            420                 425                 430

Asn Lys Pro Ser Lys Tyr Gly Ile Lys Ile Leu Met Met Cys Asp Ser
        435                 440                 445

Gly Thr Lys Tyr Met Ile Asn Gly Met Pro Tyr Leu Gly Arg Gly Thr
    450                 455                 460

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

Lys Pro Val His Gly Ser Cys Arg Asn Ile Thr Cys Asp Asn Trp Phe
                485                 490                 495

Thr Ser Ile Pro Leu Ala Lys Asn Leu Leu Gln Glu Pro Tyr Lys Leu
            500                 505                 510

Thr Ile Val Gly Thr Val Arg Ser Asn Lys Arg Glu Ile Pro Glu Val
        515                 520                 525
```

```
Leu Lys Asn Ser Arg Ser Arg Pro Val Gly Thr Ser Met Phe Cys Phe
    530                 535                 540

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

Val Tyr Leu Leu Ser Ser Cys Asp Glu Asp Ala Ser Ile Asn Glu Ser
                565                 570                 575

Thr Gly Lys Pro Gln Met Val Met Tyr Tyr Asn Gln Thr Lys Gly Gly
            580                 585                 590

Val Asp Thr Leu Asp Gln Met Cys Ser Val Met Thr Cys Ser Arg Lys
        595                 600                 605

Thr Asn Arg Trp Pro Met Ala Leu Leu Tyr Gly Met Ile Asn Ile Ala
    610                 615                 620

Cys Ile Asn Ser Phe Ile Ile Tyr Ser His Asn Val Ser Ser Lys Gly
625                 630                 635                 640

Glu Lys Val Gln Ser Arg Lys Lys Phe Met Arg Asn Leu Tyr Met Ser
                645                 650                 655

Leu Thr Ser Ser Phe Met Arg Lys Arg Leu Glu Ala Pro Thr Leu Lys
            660                 665                 670

Arg Tyr Leu Arg Asp Asn Ile Ser Asn Ile Leu Pro Lys Glu Val Pro
        675                 680                 685

Gly Thr Ser Asp Asp Ser Thr Glu Glu Pro Val Met Lys Lys Arg Thr
    690                 695                 700

Tyr Cys Thr Tyr Cys Pro Ser Lys Ile Arg Arg Lys Ala Asn Ala Ser
705                 710                 715                 720

Cys Lys Lys Cys Lys Lys Val Ile Cys Arg Glu His Asn Ile Asp Met
                725                 730                 735

Cys Gln Ser Cys Phe Ala Ala Ala Lys Leu Gly Gly Gly Ala Pro Ala
            740                 745                 750
```

Val Gly Gly Gly Pro Lys Ala Ala Asp Lys Gly Ala Ala Val Ile Arg
        755   760   765

Asp Glu Trp Gly Asn Gln Ile Trp Ile Cys Pro Gly Cys Asn Lys Pro
    770   775   780

Asp Asp Gly Ser Pro Met Ile Gly Cys Asp Asp Cys Asp Asp Trp Tyr
785   790   795   800

His Trp Pro Cys Val Gly Ile Met Thr Ala Pro Pro Glu Glu Met Gln
                805   810   815

Trp Phe Cys Pro Lys Cys Ala Asn Lys Lys Lys Asp Lys Lys His Lys
            820   825   830

Lys Arg Lys His Arg Ala His
        835

<210> 17
<211> 101
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<220>
<221> primer
<222> (1)..(101)

<400> 17
tagtagctag cttaacccta gaaagataat catattgtga cgtacgttaa agataatcat   60

gcgtaaaatt gacgcatgtc gacgagcgtc acagcacaac c   101

<210> 18
<211> 72
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<220>
<221> primer
<222> (1)..(72)

<400> 18
tagtacatat gttaacccta gaaagatagt ctgcgtaaaa ttgacgcatg gtgcactctc 60

agtacaatct gc 72

<210> 19
<211> 43
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<220>
<221> primer
<222> (1)..(43)

<400> 19
atcgtggcct cggtggcctg aattccctag aaagatagtc tgc 43

<210> 20
<211> 136
<212> PRT
<213> Homo sapiens

<400> 20

Val Ile Arg Asp Glu Trp Gly Asn Gln Ile Trp Ile Cys Pro Gly Cys
1 5 10 15

Asn Lys Pro Asp Asp Gly Ser Pro Met Ile Gly Cys Asp Asp Cys Asp
20 25 30

Asp Trp Tyr His Trp Pro Cys Val Gly Ile Met Thr Ala Pro Pro Glu
35 40 45

Glu Met Gln Trp Phe Cys Pro Lys Cys Ala Asn Lys Lys Lys Asp Lys
50 55 60

Lys His Lys Lys Arg Lys His Arg Ala His Lys Leu Gly Gly Gly Ala
65 70 75 80

```
Pro Ala Val Gly Gly Gly Pro Lys Lys Leu Gly Gly Gly Ala Pro Ala
                85                  90                  95

Val Gly Gly Gly Pro Lys Ala Met Gly Ser Ser Leu Asp Asp Glu His
            100                 105                 110

Ile Leu Ser Ala Leu Leu Gln Ser Asp Asp Glu Leu Val Gly Glu Asp
        115                 120                 125

Ser Asp Ser Glu Ile Ser Asp His
    130                 135
```

<210> 21
<211> 117
<212> PRT
<213> Homo sapiens

<400> 21

```
Lys Glu Lys Gly Lys Glu Leu Lys Asp Pro Asp Gln Leu Tyr Thr Thr
1               5                   10                  15

Leu Lys Asn Leu Leu Ala Gln Ile Lys Ser His Pro Ser Ala Trp Pro
            20                  25                  30

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

Ile Arg Phe Pro Ile Asp Leu Lys Thr Met Thr Glu Arg Leu Arg Ser
    50                  55                  60

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

Ile Ala Asn Cys Arg Glu Tyr Asn Pro Pro Asp Ser Glu Tyr Cys Arg
                85                  90                  95

Cys Ala Ser Ala Leu Glu Lys Phe Phe Tyr Phe Lys Leu Lys Glu Gly
            100                 105                 110

Gly Leu Ile Asp Lys
        115
```

<210> 22
<211> 28
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide

<400> 22

Lys Leu Gly Gly Gly Ala Pro Ala Val Gly Gly Gly Pro Lys Lys Leu
1 5 10 15

Gly Gly Gly Ala Pro Ala Val Gly Gly Gly Pro Lys
20 25

<210> 23
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide

<400> 23

Ala Ala Ala Lys Leu Gly Gly Gly Ala Pro Ala Val Gly Gly Gly Pro
1 5 10 15

Lys Ala Ala Asp Lys Gly Ala Ala
20

<210> 24
<211> 67
<212> DNA
<213> Trichoplusia ni

<400> 24
ttaaccctag aaagataatc atattgtgac gtacgttaaa gataatcatg cgtaaaattg 60

acgcatg 67

<210> 25
<211> 39
<212> DNA
<213> Trichoplusia ni

<400> 25

catgcgtcaa ttttacgcag actatctttc tagggttaa 39

<210> 26
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 26
tattggtagc ccacaagctg 20

<210> 27
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 27
tttctttcag tgctatgtta tggtg 25

<210> 28
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 28
ggttgtgctg tgacgct 17

<210> 29
<211> 2249
<212> DNA
<213> Artificial Sequence

<220>
<223> Kat2a-haPB

<220>
<221> CDS
<222> (19)..(2241)

<400> 29
accggtggat ccggcatg aag gaa aag ggc aaa gag ctg aag gac ccc gac 51

```
                    Lys Glu Lys Gly Lys Glu Leu Lys Asp Pro Asp
                    1               5                   10

cag ctg tac acc aca ctg aag aat ctg ctg gcc cag atc aag tct cac         99
Gln Leu Tyr Thr Thr Leu Lys Asn Leu Leu Ala Gln Ile Lys Ser His
            15                  20                  25

ccc tcc gcc tgg cct ttc atg gaa ccc gtg aag aag tct gag gcc cct        147
Pro Ser Ala Trp Pro Phe Met Glu Pro Val Lys Lys Ser Glu Ala Pro
        30                  35                  40

gac tac tac gaa gtg atc aga ttc ccc atc gac ctc aag acc atg acc        195
Asp Tyr Tyr Glu Val Ile Arg Phe Pro Ile Asp Leu Lys Thr Met Thr
    45                  50                  55

gag cgg ctg aga tcc cgg tac tac gtg acc aga aag ctg ttc gtg gcc        243
Glu Arg Leu Arg Ser Arg Tyr Tyr Val Thr Arg Lys Leu Phe Val Ala
60                  65                  70                  75

gac ctg cag aga gtg atc gcc aac tgt aga gag tac aac cct cct gac        291
Asp Leu Gln Arg Val Ile Ala Asn Cys Arg Glu Tyr Asn Pro Pro Asp
                80                  85                  90

tcc gag tac tgc aga tgc gcc tcc gct ctg gaa aag ttc ttc tac ttc        339
Ser Glu Tyr Cys Arg Cys Ala Ser Ala Leu Glu Lys Phe Phe Tyr Phe
            95                  100                 105

aag ctg aaa gaa ggc ggc ctg atc gac aag aag ctt gga ggc gga gca        387
Lys Leu Lys Glu Gly Gly Leu Ile Asp Lys Lys Leu Gly Gly Gly Ala
        110                 115                 120

cca gct gtt ggc gga gga cct aaa aaa ctc gga ggt ggc gct cct gct        435
Pro Ala Val Gly Gly Gly Pro Lys Lys Leu Gly Gly Gly Ala Pro Ala
    125                 130                 135

gtc gga ggc gga cct aaa gct atg ggc agc tct ctg gac gac gag cac        483
Val Gly Gly Gly Pro Lys Ala Met Gly Ser Ser Leu Asp Asp Glu His
140                 145                 150                 155

atc ctg tct gcc ctg ctg cag tcc gac gat gaa cta gtg ggc gaa gat        531
Ile Leu Ser Ala Leu Leu Gln Ser Asp Asp Glu Leu Val Gly Glu Asp
                160                 165                 170

tcc gac tcc gag gtg tcc gac cat gtg tct gag gac gac gtg cag tcc        579
Ser Asp Ser Glu Val Ser Asp His Val Ser Glu Asp Asp Val Gln Ser
            175                 180                 185

gat acc gag gaa gcc ttc atc gac gag gtg cac gaa gtg cag cct acc        627
Asp Thr Glu Glu Ala Phe Ile Asp Glu Val His Glu Val Gln Pro Thr
        190                 195                 200

tct tcc ggc tct gag atc ctg gac gag cag aac gtg atc gag cag cct        675
Ser Ser Gly Ser Glu Ile Leu Asp Glu Gln Asn Val Ile Glu Gln Pro
    205                 210                 215
```

```
gga tct tcc ctg gcc tcc aac aga atc ctg aca ctg cct cag cgg acc        723
Gly Ser Ser Leu Ala Ser Asn Arg Ile Leu Thr Leu Pro Gln Arg Thr
220                 225                 230                 235

atc cgg ggc aag aac aag cac tgc tgg tcc acc tct aag agc acc cgg        771
Ile Arg Gly Lys Asn Lys His Cys Trp Ser Thr Ser Lys Ser Thr Arg
                240                 245                 250

cgg tct aga gtg tcc gct ctg aat att gtg cgg tcc cag agg ggc ccc        819
Arg Ser Arg Val Ser Ala Leu Asn Ile Val Arg Ser Gln Arg Gly Pro
            255                 260                 265

acc aga atg tgc cgg aac atc tac gac cct ctg ctg tgc ttc aag ctg        867
Thr Arg Met Cys Arg Asn Ile Tyr Asp Pro Leu Leu Cys Phe Lys Leu
        270                 275                 280

ttc ttc acc gac gag atc atc tcc gag atc gtg aag tgg acc aac gcc        915
Phe Phe Thr Asp Glu Ile Ile Ser Glu Ile Val Lys Trp Thr Asn Ala
    285                 290                 295

gag atc tct ctg aag cgg cgc gag tct atg acc tct gcc acc ttc cgg        963
Glu Ile Ser Leu Lys Arg Arg Glu Ser Met Thr Ser Ala Thr Phe Arg
300                 305                 310                 315

gac acc aac gag gat gag atc tac gcc ttc ttc ggc atc ctg gtc atg       1011
Asp Thr Asn Glu Asp Glu Ile Tyr Ala Phe Phe Gly Ile Leu Val Met
                320                 325                 330

aca gcc gtg cgg aag gac aac cac atg tcc acc gac gac ctg ttc gac       1059
Thr Ala Val Arg Lys Asp Asn His Met Ser Thr Asp Asp Leu Phe Asp
            335                 340                 345

aga tcc ctg tcc atg gtg tac gtg tcc gtg atg tcc agg gac aga ttc       1107
Arg Ser Leu Ser Met Val Tyr Val Ser Val Met Ser Arg Asp Arg Phe
        350                 355                 360

gac ttc ctg atc cgg tgc ctg cgg atg gac gac aag tct atc aga ccc       1155
Asp Phe Leu Ile Arg Cys Leu Arg Met Asp Asp Lys Ser Ile Arg Pro
    365                 370                 375

aca ctg cgc gag aac gac gtg ttc aca cct gtg cgg aag atc tgg gac       1203
Thr Leu Arg Glu Asn Asp Val Phe Thr Pro Val Arg Lys Ile Trp Asp
380                 385                 390                 395

ctg ttc atc cac cag tgc atc cag aac tac acc cct ggc gct cac ctg       1251
Leu Phe Ile His Gln Cys Ile Gln Asn Tyr Thr Pro Gly Ala His Leu
                400                 405                 410

acc atc gac gaa cag ctg ctg ggc ttc aga ggc aga tgc cct ttc cgg       1299
Thr Ile Asp Glu Gln Leu Leu Gly Phe Arg Gly Arg Cys Pro Phe Arg
            415                 420                 425

gtg tac atc ccc aac aag ccc tct aag tac ggc atc aag atc ctg atg       1347
```

```
Val Tyr Ile Pro Asn Lys Pro Ser Lys Tyr Gly Ile Lys Ile Leu Met
        430                 435                 440

atg tgc gac tcc ggc acc aag tac atg atc aac ggc atg ccc tac ctc       1395
Met Cys Asp Ser Gly Thr Lys Tyr Met Ile Asn Gly Met Pro Tyr Leu
    445                 450                 455

ggc aga ggc acc caa aca aat ggc gtg cca ctg ggc gag tac tac gtg       1443
Gly Arg Gly Thr Gln Thr Asn Gly Val Pro Leu Gly Glu Tyr Tyr Val
460                 465                 470                 475

aaa gaa ctg tcc aag cct gtg cac ggc tcc tgc aga aac atc acc tgt       1491
Lys Glu Leu Ser Lys Pro Val His Gly Ser Cys Arg Asn Ile Thr Cys
                480                 485                 490

gat aac tgg ttc acc tcc att cct ctg gcc aag aac ctg ctg caa gag       1539
Asp Asn Trp Phe Thr Ser Ile Pro Leu Ala Lys Asn Leu Leu Gln Glu
            495                 500                 505

cct tac aag ctg aca atc gtg ggc acc gtg cgg tcc aac aag cgg gaa       1587
Pro Tyr Lys Leu Thr Ile Val Gly Thr Val Arg Ser Asn Lys Arg Glu
        510                 515                 520

att cct gag gtg ctg aag aac tct cgg tcc aga cct gtg ggc acc tcc       1635
Ile Pro Glu Val Leu Lys Asn Ser Arg Ser Arg Pro Val Gly Thr Ser
    525                 530                 535

atg ttc tgt ttc gac ggc cct ctg aca ctg gtg tcc tac aag cct aag       1683
Met Phe Cys Phe Asp Gly Pro Leu Thr Leu Val Ser Tyr Lys Pro Lys
540                 545                 550                 555

cct gcc aag atg gtg tac ctg ctg tcc tcc tgt gac gag gac gcc agc       1731
Pro Ala Lys Met Val Tyr Leu Leu Ser Ser Cys Asp Glu Asp Ala Ser
                560                 565                 570

atc aat gag tcc acc ggc aag ccc cag atg gtc atg tac tac aac cag       1779
Ile Asn Glu Ser Thr Gly Lys Pro Gln Met Val Met Tyr Tyr Asn Gln
            575                 580                 585

acc aaa ggc ggc gtg gac acc ctg gac cag atg tgc tct gtg atg acc       1827
Thr Lys Gly Gly Val Asp Thr Leu Asp Gln Met Cys Ser Val Met Thr
        590                 595                 600

tgc tcc aga aag acc aac aga tgg ccc atg gct ctg ctg tac ggc atg       1875
Cys Ser Arg Lys Thr Asn Arg Trp Pro Met Ala Leu Leu Tyr Gly Met
    605                 610                 615

atc aat atc gcc tgc atc aac agc ttc atc atc tac tcc cac aac gtg       1923
Ile Asn Ile Ala Cys Ile Asn Ser Phe Ile Ile Tyr Ser His Asn Val
620                 625                 630                 635

tcc tcc aag ggc gag aag gtg cag tcc cgg aaa aag ttc atg cgg aac       1971
Ser Ser Lys Gly Glu Lys Val Gln Ser Arg Lys Lys Phe Met Arg Asn
                640                 645                 650
```

```
ctg tat atg tcc ctg acc tcc agc ttc atg aga aag cgg ctg gaa gcc       2019
Leu Tyr Met Ser Leu Thr Ser Ser Phe Met Arg Lys Arg Leu Glu Ala
            655                 660                 665

cct aca ctg aag cgc tac ctg cgg gac aac atc tcc aac atc ctg cct       2067
Pro Thr Leu Lys Arg Tyr Leu Arg Asp Asn Ile Ser Asn Ile Leu Pro
        670                 675                 680

aaa gag gtg ccc ggc acc agc gac gac tct aca gag gaa ccc gtg atg       2115
Lys Glu Val Pro Gly Thr Ser Asp Asp Ser Thr Glu Glu Pro Val Met
    685                 690                 695

aag aag agg acc tac tgc acc tac tgt ccc tcc aag atc cgg cgg aag       2163
Lys Lys Arg Thr Tyr Cys Thr Tyr Cys Pro Ser Lys Ile Arg Arg Lys
700                 705                 710                 715

gcc aac gcc tct tgc aaa aag tgc aag aaa gtg atc tgc cgc gag cac       2211
Ala Asn Ala Ser Cys Lys Lys Cys Lys Lys Val Ile Cys Arg Glu His
                720                 725                 730

aac atc gat atg tgc cag tcc tgc ttc tga gcggccgc                     2249
Asn Ile Asp Met Cys Gln Ser Cys Phe
            735                 740
```

<210> 30
<211> 740
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 30

```
Lys Glu Lys Gly Lys Glu Leu Lys Asp Pro Asp Gln Leu Tyr Thr Thr
1               5                   10                  15


Leu Lys Asn Leu Leu Ala Gln Ile Lys Ser His Pro Ser Ala Trp Pro
            20                  25                  30


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


Ile Arg Phe Pro Ile Asp Leu Lys Thr Met Thr Glu Arg Leu Arg Ser
    50                  55                  60


Arg Tyr Tyr Val Thr Arg Lys Leu Phe Val Ala Asp Leu Gln Arg Val
65                  70                  75                  80
```

```
Ile Ala Asn Cys Arg Glu Tyr Asn Pro Pro Asp Ser Glu Tyr Cys Arg
                85                  90                  95

Cys Ala Ser Ala Leu Glu Lys Phe Phe Tyr Phe Lys Leu Lys Glu Gly
            100                 105                 110

Gly Leu Ile Asp Lys Lys Leu Gly Gly Gly Ala Pro Ala Val Gly Gly
        115                 120                 125

Gly Pro Lys Lys Leu Gly Gly Gly Ala Pro Ala Val Gly Gly Gly Pro
    130                 135                 140

Lys Ala Met Gly Ser Ser Leu Asp Asp Glu His Ile Leu Ser Ala Leu
145                 150                 155                 160

Leu Gln Ser Asp Asp Glu Leu Val Gly Glu Asp Ser Asp Ser Glu Val
                165                 170                 175

Ser Asp His Val Ser Glu Asp Asp Val Gln Ser Asp Thr Glu Glu Ala
            180                 185                 190

Phe Ile Asp Glu Val His Glu Val Gln Pro Thr Ser Ser Gly Ser Glu
        195                 200                 205

Ile Leu Asp Glu Gln Asn Val Ile Glu Gln Pro Gly Ser Ser Leu Ala
    210                 215                 220

Ser Asn Arg Ile Leu Thr Leu Pro Gln Arg Thr Ile Arg Gly Lys Asn
225                 230                 235                 240

Lys His Cys Trp Ser Thr Ser Lys Ser Thr Arg Arg Ser Arg Val Ser
                245                 250                 255

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

Asn Ile Tyr Asp Pro Leu Leu Cys Phe Lys Leu Phe Phe Thr Asp Glu
        275                 280                 285
```

```
Ile Ile Ser Glu Ile Val Lys Trp Thr Asn Ala Glu Ile Ser Leu Lys
    290                 295                 300

Arg Arg Glu Ser Met Thr Ser Ala Thr Phe Arg Asp Thr Asn Glu Asp
305                 310                 315                 320

Glu Ile Tyr Ala Phe Phe Gly Ile Leu Val Met Thr Ala Val Arg Lys
                325                 330                 335

Asp Asn His Met Ser Thr Asp Asp Leu Phe Asp Arg Ser Leu Ser Met
            340                 345                 350

Val Tyr Val Ser Val Met Ser Arg Asp Arg Phe Asp Phe Leu Ile Arg
        355                 360                 365

Cys Leu Arg Met Asp Asp Lys Ser Ile Arg Pro Thr Leu Arg Glu Asn
    370                 375                 380

Asp Val Phe Thr Pro Val Arg Lys Ile Trp Asp Leu Phe Ile His Gln
385                 390                 395                 400

Cys Ile Gln Asn Tyr Thr Pro Gly Ala His Leu Thr Ile Asp Glu Gln
                405                 410                 415

Leu Leu Gly Phe Arg Gly Arg Cys Pro Phe Arg Val Tyr Ile Pro Asn
            420                 425                 430

Lys Pro Ser Lys Tyr Gly Ile Lys Ile Leu Met Met Cys Asp Ser Gly
        435                 440                 445

Thr Lys Tyr Met Ile Asn Gly Met Pro Tyr Leu Gly Arg Gly Thr Gln
    450                 455                 460

Thr Asn Gly Val Pro Leu Gly Glu Tyr Tyr Val Lys Glu Leu Ser Lys
465                 470                 475                 480

Pro Val His Gly Ser Cys Arg Asn Ile Thr Cys Asp Asn Trp Phe Thr
                485                 490                 495

Ser Ile Pro Leu Ala Lys Asn Leu Leu Gln Glu Pro Tyr Lys Leu Thr
            500                 505                 510
```

```
Ile Val Gly Thr Val Arg Ser Asn Lys Arg Glu Ile Pro Glu Val Leu
        515                 520                 525

Lys Asn Ser Arg Ser Arg Pro Val Gly Thr Ser Met Phe Cys Phe Asp
    530                 535                 540

Gly Pro Leu Thr Leu Val Ser Tyr Lys Pro Lys Pro Ala Lys Met Val
545                 550                 555                 560

Tyr Leu Leu Ser Ser Cys Asp Glu Asp Ala Ser Ile Asn Glu Ser Thr
                565                 570                 575

Gly Lys Pro Gln Met Val Met Tyr Tyr Asn Gln Thr Lys Gly Gly Val
            580                 585                 590

Asp Thr Leu Asp Gln Met Cys Ser Val Met Thr Cys Ser Arg Lys Thr
        595                 600                 605

Asn Arg Trp Pro Met Ala Leu Leu Tyr Gly Met Ile Asn Ile Ala Cys
    610                 615                 620

Ile Asn Ser Phe Ile Ile Tyr Ser His Asn Val Ser Ser Lys Gly Glu
625                 630                 635                 640

Lys Val Gln Ser Arg Lys Lys Phe Met Arg Asn Leu Tyr Met Ser Leu
                645                 650                 655

Thr Ser Ser Phe Met Arg Lys Arg Leu Glu Ala Pro Thr Leu Lys Arg
            660                 665                 670

Tyr Leu Arg Asp Asn Ile Ser Asn Ile Leu Pro Lys Glu Val Pro Gly
        675                 680                 685

Thr Ser Asp Asp Ser Thr Glu Glu Pro Val Met Lys Lys Arg Thr Tyr
    690                 695                 700

Cys Thr Tyr Cys Pro Ser Lys Ile Arg Arg Lys Ala Asn Ala Ser Cys
705                 710                 715                 720
```

```
Lys Lys Cys Lys Lys Val Ile Cys Arg Glu His Asn Ile Asp Met Cys
                725                 730                 735


Gln Ser Cys Phe
            740
```

<210> 31
<211> 2101
<212> DNA
<213> Artificial Sequence

<220>
<223> haPB-Taf3

<220>
<221> CDS
<222> (12)..(2090)

<400> 31

```
accggtccgg c atg gga tct tct ctg gac gac gag cac atc ctg tct gcc        50
             Met Gly Ser Ser Leu Asp Asp Glu His Ile Leu Ser Ala
             1               5                   10

ctg ctg cag tct gac gat gaa ctc gtg ggc gaa gat tcc gac tcc gag         98
Leu Leu Gln Ser Asp Asp Glu Leu Val Gly Glu Asp Ser Asp Ser Glu
    15                  20                  25

gtg tcc gac cat gtg tct gag gac gac gtg cag tcc gat acc gag gaa        146
Val Ser Asp His Val Ser Glu Asp Asp Val Gln Ser Asp Thr Glu Glu
30                  35                  40                  45

gcc ttc atc gac gag gtg cac gaa gtg cag cct acc tct tcc ggc tct        194
Ala Phe Ile Asp Glu Val His Glu Val Gln Pro Thr Ser Ser Gly Ser
                50                  55                  60

gag atc ctg gac gag cag aac gtg atc gag cag cct gga tct tcc ctg        242
Glu Ile Leu Asp Glu Gln Asn Val Ile Glu Gln Pro Gly Ser Ser Leu
            65                  70                  75

gcc tcc aac aga atc ctg aca ctg cct cag cgg acc atc cgg ggc aag        290
Ala Ser Asn Arg Ile Leu Thr Leu Pro Gln Arg Thr Ile Arg Gly Lys
        80                  85                  90

aac aag cac tgc tgg tcc acc tct aag agc acc cgg cgg tct aga gtg        338
Asn Lys His Cys Trp Ser Thr Ser Lys Ser Thr Arg Arg Ser Arg Val
    95                  100                 105

tcc gct ctg aat att gtg cgg tcc cag agg ggc ccc acc aga atg tgc        386
Ser Ala Leu Asn Ile Val Arg Ser Gln Arg Gly Pro Thr Arg Met Cys
110                 115                 120                 125
```

```
cgg aac atc tac gac cct ctg ctg tgc ttc aag ctg ttc ttc acc gac        434
Arg Asn Ile Tyr Asp Pro Leu Leu Cys Phe Lys Leu Phe Phe Thr Asp
                130                 135                 140

gag atc atc tcc gag atc gtg aag tgg acc aac gcc gag atc tct ctg        482
Glu Ile Ile Ser Glu Ile Val Lys Trp Thr Asn Ala Glu Ile Ser Leu
            145                 150                 155

aag cgg cgc gag tct atg acc tct gcc acc ttc cgg gac acc aac gag        530
Lys Arg Arg Glu Ser Met Thr Ser Ala Thr Phe Arg Asp Thr Asn Glu
        160                 165                 170

gat gag atc tac gcc ttc ttc ggc atc ctg gtc atg aca gcc gtg cgg        578
Asp Glu Ile Tyr Ala Phe Phe Gly Ile Leu Val Met Thr Ala Val Arg
    175                 180                 185

aag gac aac cac atg tcc acc gac gac ctg ttc gac aga tcc ctg tcc        626
Lys Asp Asn His Met Ser Thr Asp Asp Leu Phe Asp Arg Ser Leu Ser
190                 195                 200                 205

atg gtg tac gtg tcc gtg atg tcc agg gac aga ttc gac ttc ctg atc        674
Met Val Tyr Val Ser Val Met Ser Arg Asp Arg Phe Asp Phe Leu Ile
                210                 215                 220

cgg tgc ctg cgg atg gac gac aag tct atc aga ccc aca ctg cgc gag        722
Arg Cys Leu Arg Met Asp Asp Lys Ser Ile Arg Pro Thr Leu Arg Glu
            225                 230                 235

aac gac gtg ttc aca cct gtg cgg aag atc tgg gac ctg ttc atc cac        770
Asn Asp Val Phe Thr Pro Val Arg Lys Ile Trp Asp Leu Phe Ile His
        240                 245                 250

cag tgc atc cag aac tac acc cct ggc gct cac ctg acc atc gac gaa        818
Gln Cys Ile Gln Asn Tyr Thr Pro Gly Ala His Leu Thr Ile Asp Glu
    255                 260                 265

cag ctg ctg ggc ttc aga ggc aga tgc cct ttc cgg gtg tac atc ccc        866
Gln Leu Leu Gly Phe Arg Gly Arg Cys Pro Phe Arg Val Tyr Ile Pro
270                 275                 280                 285

aac aag ccc tct aag tac ggc atc aag atc ctg atg atg tgc gac tcc        914
Asn Lys Pro Ser Lys Tyr Gly Ile Lys Ile Leu Met Met Cys Asp Ser
                290                 295                 300

ggc acc aag tac atg atc aac ggc atg ccc tac ctc ggc aga ggc acc        962
Gly Thr Lys Tyr Met Ile Asn Gly Met Pro Tyr Leu Gly Arg Gly Thr
            305                 310                 315

caa aca aat ggc gtg cca ctg ggc gag tac tac gtg aaa gaa ctg tcc       1010
Gln Thr Asn Gly Val Pro Leu Gly Glu Tyr Tyr Val Lys Glu Leu Ser
        320                 325                 330

aag cct gtg cac ggc tcc tgc aga aac atc acc tgt gat aac tgg ttc       1058
Lys Pro Val His Gly Ser Cys Arg Asn Ile Thr Cys Asp Asn Trp Phe
```

```
    335                 340                 345

acc tcc att cct ctg gcc aag aac ctg ctg caa gag cct tac aag ctg       1106
Thr Ser Ile Pro Leu Ala Lys Asn Leu Leu Gln Glu Pro Tyr Lys Leu
350                 355                 360                 365

aca atc gtg ggc acc gtg cgg tcc aac aag cgg gaa att cct gag gtg       1154
Thr Ile Val Gly Thr Val Arg Ser Asn Lys Arg Glu Ile Pro Glu Val
                370                 375                 380

ctg aag aac tct cgg tcc aga cct gtg ggc acc tcc atg ttc tgt ttc       1202
Leu Lys Asn Ser Arg Ser Arg Pro Val Gly Thr Ser Met Phe Cys Phe
            385                 390                 395

gac ggc cct ctg aca ctg gtg tcc tac aag cct aag cct gcc aag atg       1250
Asp Gly Pro Leu Thr Leu Val Ser Tyr Lys Pro Lys Pro Ala Lys Met
        400                 405                 410

gtg tac ctg ctg tcc tcc tgt gac gag gac gcc agc atc aat gag tcc       1298
Val Tyr Leu Leu Ser Ser Cys Asp Glu Asp Ala Ser Ile Asn Glu Ser
    415                 420                 425

acc ggc aag ccc cag atg gtc atg tac tac aac cag acc aaa ggc ggc       1346
Thr Gly Lys Pro Gln Met Val Met Tyr Tyr Asn Gln Thr Lys Gly Gly
430                 435                 440                 445

gtg gac acc ctg gac cag atg tgc tct gtg atg acc tgc tcc aga aag       1394
Val Asp Thr Leu Asp Gln Met Cys Ser Val Met Thr Cys Ser Arg Lys
                450                 455                 460

acc aac aga tgg ccc atg gct ctg ctg tac ggc atg atc aat atc gcc       1442
Thr Asn Arg Trp Pro Met Ala Leu Leu Tyr Gly Met Ile Asn Ile Ala
            465                 470                 475

tgc atc aac agc ttc atc atc tac tcc cac aac gtg tcc tcc aag ggc       1490
Cys Ile Asn Ser Phe Ile Ile Tyr Ser His Asn Val Ser Ser Lys Gly
        480                 485                 490

gag aag gtg cag tcc cgg aaa aag ttc atg cgg aac ctg tat atg tcc       1538
Glu Lys Val Gln Ser Arg Lys Lys Phe Met Arg Asn Leu Tyr Met Ser
    495                 500                 505

ctg acc tcc agc ttc atg aga aag cgg ctg gaa gcc cct aca ctg aag       1586
Leu Thr Ser Ser Phe Met Arg Lys Arg Leu Glu Ala Pro Thr Leu Lys
510                 515                 520                 525

cgc tac ctg cgg gac aac atc tcc aac atc ctg cct aaa gag gtg ccc       1634
Arg Tyr Leu Arg Asp Asn Ile Ser Asn Ile Leu Pro Lys Glu Val Pro
                530                 535                 540

ggc acc agc gac gac tct aca gag gaa ccc gtg atg aag aag agg acc       1682
Gly Thr Ser Asp Asp Ser Thr Glu Glu Pro Val Met Lys Lys Arg Thr
            545                 550                 555
```

```
tac tgc acc tac tgt ccc tcc aag atc cgg cgg aag gcc aac gcc tct       1730
Tyr Cys Thr Tyr Cys Pro Ser Lys Ile Arg Arg Lys Ala Asn Ala Ser
        560                 565                 570

tgc aaa aag tgc aag aaa gtg atc tgc cgc gag cac aac atc gat atg       1778
Cys Lys Lys Cys Lys Lys Val Ile Cys Arg Glu His Asn Ile Asp Met
    575                 580                 585

tgc cag tcc tgc ttc gcc gct gct aaa ctt ggt ggt ggc gcg ccg gca       1826
Cys Gln Ser Cys Phe Ala Ala Ala Lys Leu Gly Gly Gly Ala Pro Ala
590                 595                 600                 605

gtc ggc gga ggt cca aaa gct gct gat aag ggc gct gcc gtg atc aga       1874
Val Gly Gly Gly Pro Lys Ala Ala Asp Lys Gly Ala Ala Val Ile Arg
                610                 615                 620

gat gag tgg ggc aat cag atc tgg atc tgt cct ggc tgc aac aag cct       1922
Asp Glu Trp Gly Asn Gln Ile Trp Ile Cys Pro Gly Cys Asn Lys Pro
            625                 630                 635

gac gac ggc tct cct atg atc ggc tgc gac gac tgt gac gat tgg tat       1970
Asp Asp Gly Ser Pro Met Ile Gly Cys Asp Asp Cys Asp Asp Trp Tyr
        640                 645                 650

cac tgg ccc tgc gtg ggc atc atg acc gct cca cct gaa gaa atg cag       2018
His Trp Pro Cys Val Gly Ile Met Thr Ala Pro Pro Glu Glu Met Gln
    655                 660                 665

tgg ttc tgc ccc aag tgc gcc aac aag aag aag gat aag aag cac aag       2066
Trp Phe Cys Pro Lys Cys Ala Asn Lys Lys Lys Asp Lys Lys His Lys
670                 675                 680                 685

aag cgc aag cac agg gcc cac tga tgagcggccg c                         2101
Lys Arg Lys His Arg Ala His
                690
```

<210> 32
<211> 692
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 32

```
Met Gly Ser Ser Leu Asp Asp Glu His Ile Leu Ser Ala Leu Leu Gln
1               5                   10                  15


Ser Asp Asp Glu Leu Val Gly Glu Asp Ser Asp Ser Glu Val Ser Asp
            20                  25                  30
```

```
His Val Ser Glu Asp Asp Val Gln Ser Asp Thr Glu Glu Ala Phe Ile
        35                  40                  45

Asp Glu Val His Glu Val Gln Pro Thr Ser Ser Gly Ser Glu Ile Leu
    50                  55                  60

Asp Glu Gln Asn Val Ile Glu Gln Pro Gly Ser Ser Leu Ala Ser Asn
65                  70                  75                  80

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

Cys Trp Ser Thr Ser Lys Ser Thr Arg Arg Ser Arg Val Ser Ala Leu
            100                 105                 110

Asn Ile Val Arg Ser Gln Arg Gly Pro Thr Arg Met Cys Arg Asn Ile
        115                 120                 125

Tyr Asp Pro Leu Leu Cys Phe Lys Leu Phe Phe Thr Asp Glu Ile Ile
    130                 135                 140

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

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

Tyr Ala Phe Phe Gly Ile Leu Val Met Thr Ala Val Arg Lys Asp Asn
            180                 185                 190

His Met Ser Thr Asp Asp Leu Phe Asp Arg Ser Leu Ser Met Val Tyr
        195                 200                 205

Val Ser Val Met Ser Arg Asp Arg Phe Asp Phe Leu Ile Arg Cys Leu
    210                 215                 220

Arg Met Asp Asp Lys Ser Ile Arg Pro Thr Leu Arg Glu Asn Asp Val
225                 230                 235                 240

Phe Thr Pro Val Arg Lys Ile Trp Asp Leu Phe Ile His Gln Cys Ile
```

```
                245                 250                 255

Gln Asn Tyr Thr Pro Gly Ala His Leu Thr Ile Asp Glu Gln Leu Leu
            260                 265                 270

Gly Phe Arg Gly Arg Cys Pro Phe Arg Val Tyr Ile Pro Asn Lys Pro
        275                 280                 285

Ser Lys Tyr Gly Ile Lys Ile Leu Met Met Cys Asp Ser Gly Thr Lys
    290                 295                 300

Tyr Met Ile Asn Gly Met Pro Tyr Leu Gly Arg Gly Thr Gln Thr Asn
305                 310                 315                 320

Gly Val Pro Leu Gly Glu Tyr Tyr Val Lys Glu Leu Ser Lys Pro Val
                325                 330                 335

His Gly Ser Cys Arg Asn Ile Thr Cys Asp Asn Trp Phe Thr Ser Ile
            340                 345                 350

Pro Leu Ala Lys Asn Leu Leu Gln Glu Pro Tyr Lys Leu Thr Ile Val
        355                 360                 365

Gly Thr Val Arg Ser Asn Lys Arg Glu Ile Pro Glu Val Leu Lys Asn
    370                 375                 380

Ser Arg Ser Arg Pro Val Gly Thr Ser Met Phe Cys Phe Asp Gly Pro
385                 390                 395                 400

Leu Thr Leu Val Ser Tyr Lys Pro Lys Pro Ala Lys Met Val Tyr Leu
                405                 410                 415

Leu Ser Ser Cys Asp Glu Asp Ala Ser Ile Asn Glu Ser Thr Gly Lys
            420                 425                 430

Pro Gln Met Val Met Tyr Tyr Asn Gln Thr Lys Gly Gly Val Asp Thr
        435                 440                 445

Leu Asp Gln Met Cys Ser Val Met Thr Cys Ser Arg Lys Thr Asn Arg
    450                 455                 460
```

```
Trp Pro Met Ala Leu Leu Tyr Gly Met Ile Asn Ile Ala Cys Ile Asn
465                 470                 475                 480

Ser Phe Ile Ile Tyr Ser His Asn Val Ser Ser Lys Gly Glu Lys Val
                485                 490                 495

Gln Ser Arg Lys Lys Phe Met Arg Asn Leu Tyr Met Ser Leu Thr Ser
            500                 505                 510

Ser Phe Met Arg Lys Arg Leu Glu Ala Pro Thr Leu Lys Arg Tyr Leu
        515                 520                 525

Arg Asp Asn Ile Ser Asn Ile Leu Pro Lys Glu Val Pro Gly Thr Ser
    530                 535                 540

Asp Asp Ser Thr Glu Glu Pro Val Met Lys Lys Arg Thr Tyr Cys Thr
545                 550                 555                 560

Tyr Cys Pro Ser Lys Ile Arg Arg Lys Ala Asn Ala Ser Cys Lys Lys
                565                 570                 575

Cys Lys Lys Val Ile Cys Arg Glu His Asn Ile Asp Met Cys Gln Ser
            580                 585                 590

Cys Phe Ala Ala Ala Lys Leu Gly Gly Gly Ala Pro Ala Val Gly Gly
        595                 600                 605

Gly Pro Lys Ala Ala Asp Lys Gly Ala Ala Val Ile Arg Asp Glu Trp
    610                 615                 620

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

Ser Pro Met Ile Gly Cys Asp Asp Cys Asp Asp Trp Tyr His Trp Pro
                645                 650                 655

Cys Val Gly Ile Met Thr Ala Pro Pro Glu Glu Met Gln Trp Phe Cys
            660                 665                 670

Pro Lys Cys Ala Asn Lys Lys Lys Asp Lys Lys His Lys Lys Arg Lys
```

675 680 685

His Arg Ala His
690

<210> 33
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 33
taagagcacc aactgctctt cca 23

<210> 34
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 34
accagaagag ggcaccagat ct 22