SEQUENCE LISTING

<110> DNA SCRIPT

<120> Efficient product cleavage in template-free enzymatic synthesis of polynucleotides

<130> B2960PC00

<160> 15

<170> PatentIn version 3.5

<210> 1
<211> 510
<212> PRT
<213> ARTIFICIAL SEQUENCE

<220>
<223> TdT

<400> 1

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Met Asp Pro Leu Gln Ala Val His Leu Gly Pro Arg Lys Lys Arg Pro
1               5                  10                  15


Arg Gln Leu Gly Thr Pro Val Ala Ser Thr Pro Tyr Asp Ile Arg Phe
            20                  25                  30


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


Arg Ala Phe Leu Met Glu Leu Ala Arg Arg Lys Gly Phe Arg Val Glu
    50                  55                  60


Asn Glu Leu Ser Asp Ser Val Thr His Ile Val Ala Glu Asn Asn Ser
65                  70                  75                  80


Gly Ser Asp Val Leu Glu Trp Leu Gln Leu Gln Asn Ile Lys Ala Ser
                85                  90                  95


Ser Glu Leu Glu Leu Leu Asp Ile Ser Trp Leu Ile Glu Cys Met Gly
            100                 105                 110


Ala Gly Lys Pro Val Glu Met Met Gly Arg His Gln Leu Val Val Asn
        115                 120                 125
```

```
Arg Asn Ser Ser Pro Ser Pro Val Pro Gly Ser Gln Asn Val Pro Ala
    130                 135                 140

Pro Ala Val Lys Lys Ile Ser Gln Tyr Ala Cys Gln Arg Arg Thr Thr
145                 150                 155                 160

Leu Asn Asn Tyr Asn Gln Leu Phe Thr Asp Ala Leu Asp Ile Leu Ala
                165                 170                 175

Glu Asn Asp Glu Leu Arg Glu Asn Glu Gly Ser Cys Leu Ala Phe Met
            180                 185                 190

Arg Ala Ser Ser Val Leu Lys Ser Leu Pro Phe Pro Ile Thr Ser Met
        195                 200                 205

Lys Asp Thr Glu Gly Ile Pro Cys Leu Gly Asp Lys Val Lys Ser Ile
    210                 215                 220

Ile Glu Gly Ile Ile Glu Asp Gly Glu Ser Ser Glu Ala Lys Ala Val
225                 230                 235                 240

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

Gly Val Gly Leu Lys Thr Ala Glu Lys Trp Phe Arg Met Gly Phe Arg
            260                 265                 270

Thr Leu Ser Lys Ile Gln Ser Asp Lys Ser Leu Arg Phe Thr Gln Met
        275                 280                 285

Gln Lys Ala Gly Phe Leu Tyr Tyr Glu Asp Leu Val Ser Cys Val Asn
    290                 295                 300

Arg Pro Glu Ala Glu Ala Val Ser Met Leu Val Lys Glu Ala Val Val
305                 310                 315                 320

Thr Phe Leu Pro Asp Ala Leu Val Thr Met Thr Gly Gly Phe Arg Arg
                325                 330                 335

Gly Lys Met Thr Gly His Asp Val Asp Phe Leu Ile Thr Ser Pro Glu
```

340 345 350

Ala Thr Glu Asp Glu Glu Gln Gln Leu Leu His Lys Val Thr Asp Phe
355 360 365

Trp Lys Gln Gln Gly Leu Leu Leu Tyr Cys Asp Ile Leu Glu Ser Thr
370 375 380

Phe Glu Lys Phe Lys Gln Pro Ser Arg Lys Val Asp Ala Leu Asp His
385 390 395 400

Phe Gln Lys Cys Phe Leu Ile Leu Lys Leu Asp His Gly Arg Val His
405 410 415

Ser Glu Lys Ser Gly Gln Gln Glu Gly Lys Gly Trp Lys Ala Ile Arg
420 425 430

Val Asp Leu Val Met Cys Pro Tyr Asp Arg Arg Ala Phe Ala Leu Leu
435 440 445

Gly Trp Thr Gly Ser Arg Gln Phe Glu Arg Asp Leu Arg Arg Tyr Ala
450 455 460

Thr His Glu Arg Lys Met Met Leu Asp Asn His Ala Leu Tyr Asp Arg
465 470 475 480

Thr Lys Arg Val Phe Leu Glu Ala Glu Ser Glu Glu Glu Ile Phe Ala
485 490 495

His Leu Gly Leu Asp Tyr Ile Glu Pro Trp Glu Arg Asn Ala
500 505 510

<210> 2
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<220>
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Asn Ser Ser Pro Ser Pro Val Pro Gly Ser Gln Asn Val Pro Ala Pro

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1               5                   10                  15

Ala Val Lys Lys Ile Ser Gln Tyr Ala Cys Gln Arg Arg Thr Thr Leu
            20                  25                  30

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

Asn Asp Glu Leu Arg Glu Asn Glu Gly Ser Cys Leu Ala Phe Met Arg
    50                  55                  60

Ala Ser Ser Val Leu Lys Ser Leu Pro Phe Pro Ile Thr Ser Met Lys
65                  70                  75                  80

Asp Thr Glu Gly Ile Pro Cys Leu Gly Asp Lys Val Lys Ser Ile Ile
                85                  90                  95

Glu Gly Ile Ile Glu Asp Gly Glu Ser Ser Glu Ala Lys Ala Val Leu
            100                 105                 110

Asn Asp Glu Arg Tyr Lys Ser Phe Lys Leu Phe Thr Ser Val Phe Gly
        115                 120                 125

Val Gly Leu Lys Thr Ala Glu Lys Trp Phe Arg Met Gly Phe Arg Thr
    130                 135                 140

Leu Ser Lys Ile Gln Ser Asp Lys Ser Leu Arg Phe Thr Gln Met Gln
145                 150                 155                 160

Lys Ala Gly Phe Leu Tyr Tyr Glu Asp Leu Val Ser Cys Val Asn Arg
                165                 170                 175

Pro Glu Ala Glu Ala Val Ser Met Leu Val Lys Glu Ala Val Val Thr
            180                 185                 190

Phe Leu Pro Asp Ala Leu Val Thr Met Thr Gly Gly Phe Arg Arg Gly
        195                 200                 205

Lys Met Thr Gly His Asp Val Asp Phe Leu Ile Thr Ser Pro Glu Ala
    210                 215                 220
```

```
Thr Glu Asp Glu Glu Gln Gln Leu Leu His Lys Val Thr Asp Phe Trp
225                 230                 235                 240


Lys Gln Gln Gly Leu Leu Leu Tyr Cys Asp Ile Leu Glu Ser Thr Phe
                245                 250                 255


Glu Lys Phe Lys Gln Pro Ser Arg Lys Val Asp Ala Leu Asp His Phe
            260                 265                 270


Gln Lys Cys Phe Leu Ile Leu Lys Leu Asp His Gly Arg Val His Ser
        275                 280                 285


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


Asp Leu Val Met Cys Pro Tyr Asp Arg Arg Ala Phe Ala Leu Leu Gly
305                 310                 315                 320


Trp Thr Gly Ser Arg Gln Phe Glu Arg Asp Leu Arg Arg Tyr Ala Thr
                325                 330                 335


His Glu Arg Lys Met Met Leu Asp Asn His Ala Leu Tyr Asp Arg Thr
            340                 345                 350


Lys Arg Val Phe Leu Glu Ala Glu Ser Glu Glu Glu Ile Phe Ala His
        355                 360                 365


Leu Gly Leu Asp Tyr Ile Glu Pro Trp Glu Arg Asn Ala
    370                 375                 380


<210>  3
<211>  380
<212>  PRT
<213>  BOVINE

<400>  3

Asp Tyr Ser Ala Thr Pro Asn Pro Gly Phe Gln Lys Thr Pro Pro Leu
1               5                   10                  15


Ala Val Lys Lys Ile Ser Gln Tyr Ala Cys Gln Arg Lys Thr Thr Leu
            20                  25                  30
```

```
Asn Asn Tyr Asn His Ile Phe Thr Asp Ala Phe Glu Ile Leu Ala Glu
        35                  40                  45

Asn Ser Glu Phe Lys Glu Asn Glu Val Ser Tyr Val Thr Phe Met Arg
    50                  55                  60

Ala Ala Ser Val Leu Lys Ser Leu Pro Phe Thr Ile Ile Ser Met Lys
65                  70                  75                  80

Asp Thr Glu Gly Ile Pro Cys Leu Gly Asp Lys Val Lys Cys Ile Ile
                85                  90                  95

Glu Glu Ile Ile Glu Asp Gly Glu Ser Ser Glu Val Lys Ala Val Leu
            100                 105                 110

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

Val Gly Leu Lys Thr Ser Glu Lys Trp Phe Arg Met Gly Phe Arg Ser
    130                 135                 140

Leu Ser Lys Ile Met Ser Asp Lys Thr Leu Lys Phe Thr Lys Met Gln
145                 150                 155                 160

Lys Ala Gly Phe Leu Tyr Tyr Glu Asp Leu Val Ser Cys Val Thr Arg
                165                 170                 175

Ala Glu Ala Glu Ala Val Gly Val Leu Val Lys Glu Ala Val Trp Ala
            180                 185                 190

Phe Leu Pro Asp Ala Phe Val Thr Met Thr Gly Gly Phe Arg Arg Gly
        195                 200                 205

Lys Lys Ile Gly His Asp Val Asp Phe Leu Ile Thr Ser Pro Gly Ser
    210                 215                 220

Ala Glu Asp Glu Glu Gln Leu Leu Pro Lys Val Ile Asn Leu Trp Glu
225                 230                 235                 240
```

```
Lys Lys Gly Leu Leu Leu Tyr Tyr Asp Leu Val Glu Ser Thr Phe Glu
                245                 250                 255

Lys Phe Lys Leu Pro Ser Arg Gln Val Asp Thr Leu Asp His Phe Gln
            260                 265                 270

Lys Cys Phe Leu Ile Leu Lys Leu His His Gln Arg Val Asp Ser Ser
        275                 280                 285

Lys Ser Asn Gln Gln Glu Gly Lys Thr Trp Lys Ala Ile Arg Val Asp
    290                 295                 300

Leu Val Met Cys Pro Tyr Glu Asn Arg Ala Phe Ala Leu Leu Gly Trp
305                 310                 315                 320

Thr Gly Ser Arg Gln Phe Glu Arg Asp Ile Arg Arg Tyr Ala Thr His
                325                 330                 335

Glu Arg Lys Met Met Leu Asp Asn His Ala Leu Tyr Asp Lys Thr Lys
            340                 345                 350

Arg Val Phe Leu Lys Ala Glu Ser Glu Glu Glu Ile Phe Ala His Leu
        355                 360                 365

Gly Leu Asp Tyr Ile Glu Pro Trp Glu Arg Asn Ala
    370                 375                 380
```

<210> 4
<211> 380
<212> PRT
<213> HUMAN

<400> 4

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Asp Tyr Ser Asp Ser Thr Asn Pro Gly Pro Pro Lys Thr Pro Pro Ile
1               5                   10                  15

Ala Val Gln Lys Ile Ser Gln Tyr Ala Cys Gln Arg Arg Thr Thr Leu
            20                  25                  30

Asn Asn Cys Asn Gln Ile Phe Thr Asp Ala Phe Asp Ile Leu Ala Glu
        35                  40                  45
```

```
Asn Cys Glu Phe Arg Glu Asn Glu Asp Ser Cys Val Thr Phe Met Arg
    50                  55                  60

Ala Ala Ser Val Leu Lys Ser Leu Pro Phe Thr Ile Ile Ser Met Lys
65                  70                  75                  80

Asp Thr Glu Gly Ile Pro Cys Leu Gly Ser Lys Val Lys Gly Ile Ile
                85                  90                  95

Glu Glu Ile Ile Glu Asp Gly Glu Ser Ser Glu Val Lys Ala Val Leu
            100                 105                 110

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

Val Gly Leu Lys Thr Ser Glu Lys Trp Phe Arg Met Gly Phe Arg Thr
    130                 135                 140

Leu Ser Lys Val Arg Ser Asp Lys Ser Leu Lys Phe Thr Arg Met Gln
145                 150                 155                 160

Lys Ala Gly Phe Leu Tyr Tyr Glu Asp Leu Val Ser Cys Val Thr Arg
                165                 170                 175

Ala Glu Ala Glu Ala Val Ser Val Leu Val Lys Glu Ala Val Trp Ala
            180                 185                 190

Phe Leu Pro Asp Ala Phe Val Thr Met Thr Gly Gly Phe Arg Arg Gly
        195                 200                 205

Lys Lys Met Gly His Asp Val Asp Phe Leu Ile Thr Ser Pro Gly Ser
    210                 215                 220

Thr Glu Asp Glu Glu Gln Leu Leu Gln Lys Val Met Asn Leu Trp Glu
225                 230                 235                 240

Lys Lys Gly Leu Leu Leu Tyr Tyr Asp Leu Val Glu Ser Thr Phe Glu
                245                 250                 255

Lys Leu Arg Leu Pro Ser Arg Lys Val Asp Ala Leu Asp His Phe Gln
```

```
            260                 265                 270

Lys Cys Phe Leu Ile Phe Lys Leu Pro Arg Gln Arg Val Asp Ser Asp
        275                 280                 285

Gln Ser Ser Trp Gln Glu Gly Lys Thr Trp Lys Ala Ile Arg Val Asp
    290                 295                 300

Leu Val Leu Cys Pro Tyr Glu Arg Arg Ala Phe Ala Leu Leu Gly Trp
305                 310                 315                 320

Thr Gly Ser Arg Gln Phe Glu Arg Asp Leu Arg Arg Tyr Ala Thr His
                325                 330                 335

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

Arg Ile Phe Leu Lys Ala Glu Ser Glu Glu Glu Ile Phe Ala His Leu
        355                 360                 365

Gly Leu Asp Tyr Ile Glu Pro Trp Glu Arg Asn Ala
    370                 375                 380


<210>  5
<211>  376
<212>  PRT
<213>  CHICKEN

<400>  5

Gln Tyr Pro Thr Leu Lys Thr Pro Glu Ser Glu Val Ser Ser Phe Thr
1               5                   10                  15

Ala Ser Lys Val Ser Gln Tyr Ser Cys Gln Arg Lys Thr Thr Leu Asn
            20                  25                  30

Asn Cys Asn Lys Lys Phe Thr Asp Ala Phe Glu Ile Met Ala Glu Asn
        35                  40                  45

Tyr Glu Phe Lys Glu Asn Glu Ile Phe Cys Leu Glu Phe Leu Arg Ala
    50                  55                  60
```

```
Ala Ser Val Leu Lys Ser Leu Pro Phe Pro Val Thr Arg Met Lys Asp
65                  70                  75                  80

Ile Gln Gly Leu Pro Cys Met Gly Asp Arg Val Arg Asp Val Ile Glu
                85                  90                  95

Glu Ile Ile Glu Glu Gly Glu Ser Ser Arg Ala Lys Asp Val Leu Asn
            100                 105                 110

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

Gly Val Lys Thr Ser Glu Lys Trp Phe Arg Met Gly Leu Arg Thr Val
    130                 135                 140

Glu Glu Val Lys Ala Asp Lys Thr Leu Lys Leu Ser Lys Met Gln Arg
145                 150                 155                 160

Ala Gly Phe Leu Tyr Tyr Glu Asp Leu Val Ser Cys Val Ser Lys Ala
                165                 170                 175

Glu Ala Asp Ala Val Ser Ser Ile Val Lys Asn Thr Val Cys Thr Phe
            180                 185                 190

Leu Pro Asp Ala Leu Val Thr Ile Thr Gly Gly Phe Arg Arg Gly Lys
        195                 200                 205

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

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

Ile Glu Ser Thr Phe Val Lys Glu Gln Ile Pro Ser Arg His Val Asp
                245                 250                 255

Ala Met Asp His Phe Gln Lys Cys Phe Ala Ile Leu Lys Leu Tyr Gln
            260                 265                 270

Pro Arg Val Asp Asn Ser Ser Tyr Asn Met Ser Lys Lys Cys Asp Met
        275                 280                 285
```

```
Ala Glu Val Lys Asp Trp Lys Ala Ile Arg Val Asp Leu Val Ile Thr
    290                 295                 300

Pro Phe Glu Gln Tyr Ala Tyr Ala Leu Leu Gly Trp Thr Gly Ser Arg
305                 310                 315                 320

Gln Phe Gly Arg Asp Leu Arg Arg Tyr Ala Thr His Glu Arg Lys Met
                325                 330                 335

Met Leu Asp Asn His Ala Leu Tyr Asp Lys Arg Lys Arg Val Phe Leu
            340                 345                 350

Lys Ala Gly Ser Glu Glu Glu Ile Phe Ala His Leu Gly Leu Asp Tyr
        355                 360                 365

Val Glu Pro Trp Glu Arg Asn Ala
    370                 375
```

<210> 6
<211> 387
<212> PRT
<213> POSSUM

<400> 6

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Ser Ala Asn Pro Asp Pro Thr Ala Gly Thr Leu Asn Ile Leu Pro Pro
1               5                   10                  15

Thr Thr Lys Thr Ile Ser Gln Tyr Ala Cys Gln Arg Arg Thr Thr Ile
            20                  25                  30

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

Asn Tyr Glu Phe Lys Glu Asn Asp Asp Thr Cys Leu Thr Phe Met Arg
    50                  55                  60

Ala Ile Ser Val Leu Lys Cys Leu Pro Phe Glu Val Val Ser Leu Lys
65                  70                  75                  80

Asp Thr Glu Gly Leu Pro Trp Ile Gly Asp Glu Val Lys Gly Ile Met
```

```
                85                  90                  95

Glu Glu Ile Ile Glu Asp Gly Glu Ser Leu Glu Val Gln Ala Val Leu
            100                 105                 110

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

Val Gly Leu Lys Thr Ala Asp Lys Trp Tyr Arg Met Gly Phe Arg Thr
    130                 135                 140

Leu Asn Lys Ile Arg Ser Asp Lys Thr Leu Lys Leu Thr Lys Met Gln
145                 150                 155                 160

Lys Ala Gly Leu Cys Tyr Tyr Glu Asp Leu Ile Asp Cys Val Ser Lys
                165                 170                 175

Ala Glu Ala Asp Ala Val Ser Leu Leu Val Gln Asp Ala Val Trp Thr
            180                 185                 190

Phe Leu Pro Asp Ala Leu Val Thr Ile Thr Gly Gly Phe Arg Arg Gly
        195                 200                 205

Lys Glu Phe Gly His Asp Val Asp Phe Leu Ile Thr Ser Pro Gly Ala
    210                 215                 220

Glu Lys Glu Gln Glu Asp Gln Leu Leu Gln Lys Val Thr Asn Leu Trp
225                 230                 235                 240

Lys Lys Gln Gly Leu Leu Leu Tyr Cys Asp Leu Ile Glu Ser Thr Phe
                245                 250                 255

Glu Asp Leu Lys Leu Pro Ser Arg Lys Ile Asp Ala Leu Asp His Phe
            260                 265                 270

Gln Lys Cys Phe Leu Ile Leu Lys Leu Tyr His His Lys Glu Asp Lys
        275                 280                 285

Arg Lys Trp Glu Met Pro Thr Gly Ser Asn Glu Ser Glu Ala Lys Ser
    290                 295                 300
```

```
Trp Lys Ala Ile Arg Val Asp Leu Val Val Cys Pro Tyr Asp Arg Tyr
305                 310                 315                 320


Ala Phe Ala Leu Leu Gly Trp Ser Gly Ser Arg Gln Phe Glu Arg Asp
                325                 330                 335


Leu Arg Arg Tyr Ala Thr His Glu Lys Lys Met Met Leu Asp Asn His
            340                 345                 350


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


Glu Glu Ile Phe Ala His Leu Gly Leu Glu Tyr Ile Gln Pro Ser Glu
    370                 375                 380


Arg Asn Ala
385
```

<210> 7
<211> 381
<212> PRT
<213> SHREW

<400> 7

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Asp Cys Pro Ala Ser His Asp Ser Ser Pro Gln Lys Thr Glu Ser Ala
1               5                   10                  15


Ala Val Gln Lys Ile Ser Gln Tyr Ala Cys Gln Arg Arg Thr Thr Leu
            20                  25                  30


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


Asn Cys Glu Phe Arg Glu Asn Glu Gly Ser Tyr Val Thr Tyr Met Arg
    50                  55                  60


Ala Ala Ser Val Leu Lys Ser Leu Pro Phe Ser Ile Ile Ser Met Lys
65                  70                  75                  80


Asp Thr Glu Gly Ile Pro Cys Leu Ala Asp Lys Val Lys Cys Val Ile
                85                  90                  95
```

```
Glu Glu Ile Ile Glu Asp Gly Glu Ser Ser Glu Val Lys Ala Val Leu
            100                 105                 110

Asn Asp Glu Arg Tyr Lys Ser Phe Lys Leu Phe Thr Ser Val Phe Gly
        115                 120                 125

Val Gly Leu Lys Thr Ala Glu Lys Trp Phe Arg Leu Gly Phe Arg Thr
    130                 135                 140

Leu Ser Gly Ile Met Asn Asp Lys Thr Leu Lys Leu Thr His Met Gln
145                 150                 155                 160

Lys Ala Gly Phe Leu Tyr Tyr Glu Asp Leu Val Ser Cys Val Thr Arg
                165                 170                 175

Ala Glu Ala Glu Ala Val Gly Val Leu Val Lys Glu Ala Val Trp Ala
            180                 185                 190

Phe Leu Pro Asp Ala Ile Val Thr Met Thr Gly Gly Phe Arg Arg Gly
        195                 200                 205

Lys Lys Val Gly His Asp Val Asp Phe Leu Ile Thr Ser Pro Glu Ala
    210                 215                 220

Thr Glu Glu Gln Glu Gln Gln Leu Leu His Lys Val Ile Thr Phe Trp
225                 230                 235                 240

Glu Lys Glu Gly Leu Leu Leu Tyr Cys Asp Leu Tyr Glu Ser Thr Phe
                245                 250                 255

Glu Lys Leu Lys Met Pro Ser Arg Lys Val Asp Ala Leu Asp His Phe
            260                 265                 270

Gln Lys Cys Phe Leu Ile Leu Lys Leu His Arg Glu Cys Val Asp Asp
        275                 280                 285

Gly Thr Ser Ser Gln Leu Gln Gly Lys Thr Trp Lys Ala Ile Arg Val
    290                 295                 300
```

```
Asp Leu Val Val Cys Pro Tyr Glu Cys Arg Ala Phe Ala Leu Leu Gly
305                 310                 315                 320


Trp Thr Gly Ser Pro Gln Phe Glu Arg Asp Leu Arg Arg Tyr Ala Thr
                325                 330                 335


His Glu Arg Lys Met Met Leu Asp Asn His Ala Leu Tyr Asp Lys Thr
            340                 345                 350


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


Leu Gly Leu Asp Tyr Ile Glu Pro Trp Glu Arg Asn Ala
    370                 375                 380


<210>  8
<211>  387
<212>  PRT
<213>  PYTHON

<400>  8

Glu Lys Tyr Gln Leu Pro Glu Asp Glu Asp Arg Ser Val Thr Ser Asp
1               5                   10                  15


Leu Asp Arg Asp Ser Ile Ser Glu Tyr Ala Cys Gln Arg Arg Thr Thr
            20                  25                  30


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


Glu Asn Tyr Glu Phe Asn Glu Asn Lys Gly Phe Cys Thr Ala Phe Arg
    50                  55                  60


Arg Ala Ala Ser Val Leu Lys Cys Leu Pro Phe Thr Ile Val Gln Val
65                  70                  75                  80


His Asp Ile Glu Gly Val Pro Trp Met Gly Lys Gln Val Lys Gly Ile
                85                  90                  95


Ile Glu Asp Ile Ile Glu Glu Gly Glu Ser Ser Lys Val Lys Ala Val
            100                 105                 110
```

```
Leu Asp Asn Glu Asn Tyr Arg Ser Val Lys Leu Phe Thr Ser Val Phe
        115                 120                 125

Gly Val Gly Leu Lys Thr Ser Asp Lys Trp Tyr Arg Met Gly Leu Arg
    130                 135                 140

Thr Leu Glu Glu Val Lys Arg Asp Lys Asn Leu Lys Leu Thr Arg Met
145                 150                 155                 160

Gln Lys Ala Gly Phe Leu His Tyr Asp Asp Leu Thr Ser Cys Val Ser
                165                 170                 175

Lys Ala Glu Ala Asp Ala Ala Ser Leu Ile Val Gln Asp Val Val Trp
            180                 185                 190

Lys Ile Val Pro Asn Ala Ile Val Thr Ile Ala Gly Gly Phe Arg Arg
        195                 200                 205

Gly Lys Gln Thr Gly His Asp Val Asp Phe Leu Ile Thr Val Pro Gly
    210                 215                 220

Ser Lys Gln Glu Glu Glu Glu Leu Leu His Thr Val Ile Asp Ile Trp
225                 230                 235                 240

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

Glu Asp Thr Lys Leu Pro Ser Arg Lys Val Asp Ala Leu Asp His Phe
            260                 265                 270

Gln Lys Cys Phe Ala Ile Leu Lys Val His Lys Glu Arg Glu Asp Lys
        275                 280                 285

Gly Asn Ser Ile Arg Ser Lys Ala Phe Ser Glu Glu Glu Ile Lys Asp
    290                 295                 300

Trp Lys Ala Ile Arg Val Asp Leu Val Val Val Pro Phe Glu Gln Tyr
305                 310                 315                 320

Ala Phe Ala Leu Leu Gly Trp Thr Gly Ser Thr Gln Phe Glu Arg Asp
```

```
                325                 330                 335

Leu Arg Arg Tyr Ala Thr His Glu Lys Lys Met Met Leu Asp Asn His
            340                 345                 350

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

Glu Glu Ile Phe Ala His Leu Gly Leu Asp Tyr Leu Glu Pro Trp Glu
    370                 375                 380

Arg Asn Ala
385
```

<210> 9
<211> 381
<212> PRT
<213> DOG

<400> 9

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Asp Tyr Thr Ala Ser Pro Asn Pro Glu Leu Gln Lys Thr Leu Pro Val
1               5                   10                  15

Ala Val Lys Lys Ile Ser Gln Tyr Ala Cys Gln Arg Arg Thr Thr Leu
            20                  25                  30

Asn Asn Tyr Asn Asn Val Phe Thr Asp Ala Phe Glu Val Leu Ala Glu
        35                  40                  45

Asn Tyr Glu Phe Arg Glu Asn Glu Val Phe Ser Leu Thr Phe Met Arg
    50                  55                  60

Ala Ala Ser Val Leu Lys Ser Leu Pro Phe Thr Ile Ile Ser Met Lys
65                  70                  75                  80

Asp Thr Glu Gly Ile Pro Cys Leu Gly Asp Gln Val Lys Cys Ile Ile
                85                  90                  95

Glu Glu Ile Ile Glu Asp Gly Glu Ser Ser Glu Val Lys Ala Val Leu
            100                 105                 110
```

```
Asn Asp Glu Arg Tyr Gln Ser Phe Lys Leu Phe Thr Ser Val Phe Gly
        115                 120                 125

Val Gly Leu Lys Thr Ser Glu Lys Trp Phe Arg Met Gly Phe Arg Thr
    130                 135                 140

Leu Ser Lys Ile Lys Ser Asp Lys Ser Leu Lys Phe Thr Pro Met Gln
145                 150                 155                 160

Lys Ala Gly Phe Leu Tyr Tyr Glu Asp Leu Val Ser Cys Val Thr Arg
                165                 170                 175

Ala Glu Ala Glu Ala Val Gly Val Leu Val Lys Glu Ala Val Gly Ala
            180                 185                 190

Phe Leu Pro Asp Ala Phe Val Thr Met Thr Gly Gly Phe Arg Arg Gly
        195                 200                 205

Lys Lys Met Gly His Asp Val Asp Phe Leu Ile Thr Ser Pro Gly Ser
    210                 215                 220

Thr Asp Glu Asp Glu Glu Gln Leu Leu Pro Lys Val Ile Asn Leu Trp
225                 230                 235                 240

Glu Arg Lys Gly Leu Leu Leu Tyr Cys Asp Leu Val Glu Ser Thr Phe
                245                 250                 255

Glu Lys Leu Lys Leu Pro Ser Arg Lys Val Asp Ala Leu Asp His Phe
            260                 265                 270

Gln Lys Cys Phe Leu Ile Leu Lys Leu His His Gln Arg Val Asp Gly
        275                 280                 285

Gly Lys Cys Ser Gln Gln Glu Gly Lys Thr Trp Lys Ala Ile Arg Val
    290                 295                 300

Asp Leu Val Met Cys Pro Tyr Glu Arg Arg Ala Phe Ala Leu Leu Gly
305                 310                 315                 320

Trp Thr Gly Ser Arg Gln Phe Glu Arg Asp Leu Arg Arg Tyr Ala Ser
                325                 330                 335
```

```
His Glu Arg Lys Met Ile Leu Asp Asn His Ala Leu Tyr Asp Lys Thr
            340                 345                 350


Lys Lys Ile Phe Leu Lys Ala Glu Ser Glu Glu Glu Ile Phe Ala His
        355                 360                 365


Leu Gly Leu Asp Tyr Ile Glu Pro Trp Glu Arg Asn Ala
    370                 375                 380


<210>  10
<211>  382
<212>  PRT
<213>  TRUNC MOLE

<400>  10

Gly Asp Cys Pro Ala Ser His Asp Ser Ser Pro Gln Lys Thr Glu Ser
1               5                   10                  15


Ala Ala Val Gln Lys Ile Ser Gln Tyr Ala Cys Gln Arg Arg Thr Thr
            20                  25                  30


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


Glu Asn Cys Glu Phe Arg Glu Asn Glu Gly Ser Tyr Val Thr Tyr Met
    50                  55                  60


Arg Ala Ala Ser Val Leu Lys Ser Leu Pro Phe Ser Ile Ile Ser Met
65                  70                  75                  80


Lys Asp Thr Glu Gly Ile Pro Cys Leu Ala Asp Lys Val Lys Cys Val
                85                  90                  95


Ile Glu Glu Ile Ile Glu Asp Gly Glu Ser Ser Glu Val Lys Ala Val
            100                 105                 110


Leu Asn Asp Glu Arg Tyr Lys Ser Phe Lys Leu Phe Thr Ser Val Phe
        115                 120                 125


Gly Val Gly Leu Lys Thr Ala Glu Lys Trp Phe Arg Leu Gly Phe Arg
```

```
    130                 135                 140

Thr Leu Ser Gly Ile Met Asn Asp Lys Thr Leu Lys Leu Thr His Met
145                 150                 155                 160

Gln Lys Ala Gly Phe Leu Tyr Tyr Glu Asp Leu Val Ser Cys Val Thr
                165                 170                 175

Arg Ala Glu Ala Glu Ala Val Gly Val Leu Val Lys Glu Ala Val Trp
            180                 185                 190

Ala Phe Leu Pro Asp Ala Ile Val Thr Met Thr Gly Gly Phe Arg Arg
        195                 200                 205

Gly Lys Lys Val Gly His Asp Val Asp Phe Leu Ile Thr Ser Pro Glu
    210                 215                 220

Ala Thr Glu Glu Gln Glu Gln Gln Leu Leu His Lys Val Ile Thr Phe
225                 230                 235                 240

Trp Glu Lys Glu Gly Leu Leu Leu Tyr Cys Asp Leu Tyr Glu Ser Thr
                245                 250                 255

Phe Glu Lys Leu Lys Met Pro Ser Arg Lys Val Asp Ala Leu Asp His
            260                 265                 270

Phe Gln Lys Cys Phe Leu Ile Leu Lys Leu His Arg Glu Cys Val Asp
        275                 280                 285

Asp Gly Thr Ser Ser Gln Leu Gln Gly Lys Thr Trp Lys Ala Ile Arg
    290                 295                 300

Val Asp Leu Val Val Cys Pro Tyr Glu Cys Arg Ala Phe Ala Leu Leu
305                 310                 315                 320

Gly Trp Thr Gly Ser Pro Gln Phe Glu Arg Asp Leu Arg Arg Tyr Ala
                325                 330                 335

Thr His Glu Arg Lys Met Met Leu Asp Asn His Ala Leu Tyr Asp Lys
            340                 345                 350
```

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

His Leu Gly Leu Asp Tyr Ile Glu Pro Trp Glu Arg Asn Ala
370 375 380

<210> 11
<211> 379
<212> PRT
<213> PIKA TRUNK

<400> 11

Glu Tyr Ser Ala Asn Pro Ser Pro Gly Pro Gln Ala Thr Pro Ala Val
1 5 10 15

Tyr Lys Ile Ser Gln Tyr Ala Cys Gln Arg Arg Thr Thr Leu Asn Asn
20 25 30

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

Glu Phe Lys Glu Asn Glu Gly Cys Tyr Val Thr Tyr Met Arg Ala Ala
50 55 60

Ser Val Leu Lys Ser Leu Pro Phe Thr Ile Val Ser Met Lys Asp Thr
65 70 75 80

Glu Gly Ile Pro Cys Leu Glu Asp Lys Val Lys Ser Ile Met Glu Glu
85 90 95

Ile Ile Glu Glu Gly Glu Ser Ser Glu Val Lys Ala Val Leu Ser Asp
100 105 110

Glu Arg Tyr Gln Cys Phe Lys Leu Phe Thr Ser Val Phe Gly Val Gly
115 120 125

Leu Lys Thr Ser Glu Lys Trp Phe Arg Met Gly Phe Arg Ser Leu Ser
130 135 140

Asn Ile Arg Leu Asp Lys Ser Leu Lys Phe Thr Gln Met Gln Lys Ala
145 150 155 160

```
Gly Phe Arg Tyr Tyr Glu Asp Ile Val Ser Cys Val Thr Arg Ala Glu
                165                 170                 175

Ala Glu Ala Val Asp Val Leu Val Asn Glu Ala Val Arg Ala Phe Leu
            180                 185                 190

Pro Asp Ala Phe Ile Thr Met Thr Gly Gly Phe Arg Arg Gly Lys Lys
        195                 200                 205

Ile Gly His Asp Val Asp Phe Leu Ile Thr Ser Pro Glu Leu Thr Glu
    210                 215                 220

Glu Asp Glu Gln Gln Leu Leu His Lys Val Met Asn Leu Trp Glu Lys
225                 230                 235                 240

Lys Gly Leu Leu Leu Tyr His Asp Leu Val Glu Ser Thr Phe Glu Lys
                245                 250                 255

Leu Lys Gln Pro Ser Arg Lys Val Asp Ala Leu Asp His Phe Gln Lys
            260                 265                 270

Cys Phe Leu Ile Phe Lys Leu Tyr His Glu Arg Val Gly Gly Asp Arg
        275                 280                 285

Cys Arg Gln Pro Glu Gly Lys Asp Trp Lys Ala Ile Arg Val Asp Leu
    290                 295                 300

Val Met Cys Pro Tyr Glu Cys His Ala Phe Ala Leu Leu Gly Trp Thr
305                 310                 315                 320

Gly Ser Arg Gln Phe Glu Arg Asp Leu Arg Arg Tyr Ala Ser His Glu
                325                 330                 335

Arg Lys Met Ile Leu Asp Asn His Ala Leu Tyr Asp Lys Thr Lys Arg
            340                 345                 350

Val Phe Leu Gln Ala Glu Asn Glu Glu Glu Ile Phe Ala His Leu Gly
        355                 360                 365
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Leu Asp Tyr Ile Glu Pro Trp Glu Arg Asn Ala
    370                 375


<210>  12
<211>  384
<212>  PRT
<213>  TRUNC HEDGEHOG

<400>  12

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


Ala Ile Lys Lys Ile Ser Gln Tyr Ala Cys Gln Arg Arg Thr Ser Leu
            20                  25                  30


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


Asn His Glu Phe Arg Glu Asn Glu Val Ser Cys Val Ala Phe Met Arg
    50                  55                  60


Ala Ala Ser Val Leu Lys Ser Leu Pro Phe Thr Ile Ile Ser Met Lys
65                  70                  75                  80


Asp Thr Lys Gly Ile Pro Cys Leu Gly Asp Lys Ala Lys Cys Val Ile
                85                  90                  95


Glu Glu Ile Ile Glu Asp Gly Glu Ser Ser Glu Val Lys Ala Ile Leu
            100                 105                 110


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


Val Gly Leu Lys Thr Ser Glu Lys Trp Phe Arg Met Gly Phe Arg Thr
    130                 135                 140


Leu Asn Lys Ile Met Ser Asp Lys Thr Leu Lys Leu Thr Arg Met Gln
145                 150                 155                 160


Lys Ala Gly Phe Leu Tyr Tyr Glu Asp Leu Val Ser Cys Val Ala Lys
                165                 170                 175
```

```
Ala Glu Ala Asp Ala Val Ser Val Leu Val Gln Glu Ala Val Trp Ala
            180                 185                 190

Phe Leu Pro Asp Ala Met Val Thr Met Thr Gly Gly Phe Arg Arg Gly
        195                 200                 205

Lys Lys Leu Gly His Asp Val Asp Phe Leu Ile Thr Ser Pro Gly Ala
    210                 215                 220

Thr Glu Glu Glu Glu Gln Gln Leu Leu Pro Lys Val Ile Asn Phe Trp
225                 230                 235                 240

Glu Arg Lys Gly Leu Leu Leu Tyr His Asp Leu Val Glu Ser Thr Phe
                245                 250                 255

Glu Lys Leu Lys Leu Pro Ser Arg Lys Val Asp Ala Leu Asp His Phe
            260                 265                 270

Gln Lys Cys Phe Leu Ile Leu Lys Leu His Leu Gln His Val Asn Gly
        275                 280                 285

Val Gly Asn Ser Lys Thr Gly Gln Gln Glu Gly Lys Asn Trp Lys Ala
    290                 295                 300

Ile Arg Val Asp Leu Val Met Cys Pro Tyr Glu Arg Arg Ala Phe Ala
305                 310                 315                 320

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

Phe Ala Thr His Glu Arg Lys Met Met Leu Asp Asn His Ala Leu Tyr
            340                 345                 350

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

Phe Ala His Leu Gly Leu Asp Tyr Ile Asp Pro Trp Glu Arg Asn Ala
    370                 375                 380
```

<210> 13

<211> 381
<212> PRT
<213> TREE SHREW

<400> 13

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Asp His Ser Thr Ser Pro Ser Pro Gly Pro Gln Lys Thr Pro Ala Leu
1               5                   10                  15


Ala Val Gln Lys Ile Ser Gln Tyr Ala Cys Gln Arg Arg Thr Thr Leu
            20                  25                  30


Asn Asn Cys Asn Arg Val Phe Thr Asp Ala Phe Glu Thr Leu Ala Glu
        35                  40                  45


Asn Tyr Glu Phe Arg Glu Asn Glu Asp Ser Ser Val Ile Phe Leu Arg
    50                  55                  60


Ala Ala Ser Val Leu Arg Ser Leu Pro Phe Thr Ile Thr Ser Met Arg
65                  70                  75                  80


Asp Thr Glu Gly Leu Pro Cys Leu Gly Asp Lys Val Lys Cys Val Ile
                85                  90                  95


Glu Glu Ile Ile Glu Asp Gly Glu Ser Ser Glu Val Asn Ala Val Leu
            100                 105                 110


Asn Asp Glu Arg Tyr Lys Ser Phe Lys Leu Phe Thr Ser Val Phe Gly
        115                 120                 125


Val Gly Leu Lys Thr Ser Glu Lys Trp Phe Arg Met Gly Phe Arg Thr
    130                 135                 140


Leu Ser Arg Val Arg Ser Asp Lys Ser Leu His Leu Thr Arg Met Gln
145                 150                 155                 160


Gln Ala Gly Phe Leu Tyr Tyr Glu Asp Leu Ala Ser Cys Val Thr Arg
                165                 170                 175


Ala Glu Ala Glu Ala Val Gly Val Leu Val Lys Glu Ala Val Gly Ala
            180                 185                 190
```

```
Phe Leu Pro Asp Ala Leu Val Thr Ile Thr Gly Gly Phe Arg Arg Gly
        195                 200                 205

Lys Lys Thr Gly His Asp Val Asp Phe Leu Ile Thr Ser Pro Gly Ser
    210                 215                 220

Thr Glu Glu Lys Glu Glu Glu Leu Leu Gln Lys Val Leu Asn Leu Trp
225                 230                 235                 240

Glu Lys Lys Gly Leu Leu Leu Tyr Tyr Asp Leu Val Glu Ser Thr Phe
                245                 250                 255

Glu Lys Leu Lys Thr Pro Ser Arg Lys Val Asp Ala Leu Asp His Phe
            260                 265                 270

Pro Lys Cys Phe Leu Ile Leu Lys Leu His His Gln Arg Val Asp Gly
        275                 280                 285

Asp Lys Pro Ser Gln Gln Glu Gly Lys Ser Trp Lys Ala Ile Arg Val
    290                 295                 300

Asp Leu Val Met Cys Pro Tyr Glu Arg His Ala Phe Ala Leu Leu Gly
305                 310                 315                 320

Trp Thr Gly Ser Arg Gln Phe Glu Arg Asp Leu Arg Arg Tyr Ala Thr
                325                 330                 335

His Glu Arg Lys Met Met Leu Asp Asn His Ala Leu Tyr Asp Lys Thr
            340                 345                 350

Lys Arg Val Phe Leu Lys Ala Glu Ser Glu Glu Asp Ile Phe Ala His
        355                 360                 365

Leu Gly Leu Asp Tyr Ile Glu Pro Trp Glu Arg Asn Ala
    370                 375                 380
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<210> 14
<211> 394
<212> PRT
<213> PLATYPUS

<400> 14

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Leu Thr Asn Ser Ala Pro Ile Asn Cys Met Thr Glu Thr Pro Ser Leu
1               5                  10                  15

Ala Thr Lys Gln Val Ser Gln Tyr Ala Cys Glu Arg Arg Thr Thr Leu
            20                  25                  30

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

Asp Phe Glu Phe Arg Glu Asn Glu Gly Ile Cys Leu Ala Phe Met Arg
    50                  55                  60

Ala Ile Ser Val Leu Lys Cys Leu Pro Phe Thr Ile Val Arg Met Lys
65                  70                  75                  80

Asp Ile Glu Gly Val Pro Trp Leu Gly Asp Gln Val Lys Ser Ile Ile
                85                  90                  95

Glu Glu Ile Ile Glu Asp Gly Glu Ser Ser Ser Val Lys Ala Val Leu
            100                 105                 110

Asn Asp Glu Arg Tyr Arg Ser Phe Gln Leu Phe Asn Ser Val Phe Glu
        115                 120                 125

Val Gly Leu Thr Asp Asn Gly Glu Asn Gly Ile Ala Arg Gly Phe Gln
    130                 135                 140

Thr Leu Asn Glu Val Ile Thr Asp Glu Asn Ile Ser Leu Thr Lys Thr
145                 150                 155                 160

Thr Leu Ser Thr Ser Leu Trp Asn Tyr Leu Pro Gly Phe Leu Tyr Tyr
                165                 170                 175

Glu Asp Leu Val Ser Cys Val Ala Lys Glu Glu Ala Asp Ala Val Tyr
            180                 185                 190

Leu Ile Val Lys Glu Ala Val Arg Ala Phe Leu Pro Glu Ala Leu Val
        195                 200                 205

Thr Leu Thr Gly Gly Phe Arg Arg Gly Lys Lys Ile Gly His Asp Val
```

```
    210                 215                 220

Asp Phe Leu Ile Ser Asp Pro Glu Ser Gly Gln Asp Glu Gln Leu Leu
225                 230                 235                 240

Pro Asn Ile Ile Lys Leu Trp Glu Lys Gln Glu Leu Leu Leu Tyr Tyr
                245                 250                 255

Asp Leu Val Glu Ser Thr Phe Glu Lys Thr Lys Ile Pro Ser Arg Lys
            260                 265                 270

Val Asp Ala Met Asp His Phe Gln Lys Cys Phe Leu Ile Leu Lys Leu
        275                 280                 285

His His Gln Lys Val Asp Ser Gly Arg Tyr Lys Pro Pro Pro Glu Ser
    290                 295                 300

Lys Asn His Glu Ala Lys Asn Trp Lys Ala Ile Arg Val Asp Leu Val
305                 310                 315                 320

Met Cys Pro Phe Glu Gln Tyr Ala Tyr Ala Leu Leu Gly Trp Thr Gly
                325                 330                 335

Ser Arg Gln Phe Glu Arg Asp Leu Arg Arg Tyr Ala Thr His Glu Lys
            340                 345                 350

Lys Met Met Leu Asp Asn His Ala Leu Tyr Asp Lys Thr Lys Lys Ile
        355                 360                 365

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

Asp Tyr Ile Glu Pro Trp Glu Arg Asn Ala
385                 390
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<210> 15
<211> 384
<212> PRT
<213> JERBOA

<400> 15

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Ser Ser Glu Leu Glu Leu Leu Asp Val Ser Trp Leu Ile Glu Cys Met
1               5                  10                  15

Gly Ala Gly Lys Pro Val Glu Met Thr Gly Arg His Gln Leu Val Lys
            20                  25                  30

Gln Thr Phe Cys Leu Pro Gly Phe Ile Leu Gln Asp Ala Phe Asp Ile
        35                  40                  45

Leu Ala Glu Asn Cys Glu Phe Arg Glu Asn Glu Ala Ser Cys Val Glu
    50                  55                  60

Phe Met Arg Ala Ala Ser Val Leu Lys Ser Leu Pro Phe Pro Ile Ile
65                  70                  75                  80

Ser Val Lys Asp Thr Glu Gly Ile Pro Trp Leu Gly Gly Lys Val Lys
                85                  90                  95

Cys Val Ile Glu Glu Ile Ile Glu Asp Gly Glu Ser Ser Glu Val Lys
            100                 105                 110

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

Val Phe Gly Val Gly Leu Lys Thr Ala Glu Arg Trp Phe Arg Met Gly
    130                 135                 140

Phe Arg Thr Leu Ser Thr Val Lys Leu Asp Lys Ser Leu Thr Phe Thr
145                 150                 155                 160

Arg Met Gln Lys Ala Gly Phe Leu His Tyr Glu Asp Leu Val Ser Cys
                165                 170                 175

Val Thr Arg Ala Glu Ala Glu Ala Val Ser Val Leu Val Gln Gln Ala
            180                 185                 190

Val Val Ala Phe Leu Pro Asp Ala Leu Val Ser Met Thr Gly Gly Phe
        195                 200                 205

Arg Arg Gly Lys Lys Ile Gly His Asp Val Asp Phe Leu Ile Thr Ser
    210                 215                 220
```

```
Pro Glu Ala Thr Glu Glu Glu Glu Gln Gln Leu Leu His Lys Val Thr
225                 230                 235                 240

Asn Phe Trp Glu Gln Lys Gly Leu Leu Leu Tyr Cys Asp His Val Glu
                245                 250                 255

Ser Thr Phe Glu Lys Cys Lys Leu Pro Ser Arg Lys Val Asp Ala Leu
            260                 265                 270

Asp His Phe Gln Lys Cys Phe Leu Ile Leu Lys Leu Tyr Arg Glu Arg
        275                 280                 285

Val Asp Ser Val Lys Ser Ser Gln Gln Glu Gly Lys Gly Trp Lys Ala
    290                 295                 300

Ile Arg Val Asp Leu Val Met Cys Pro Tyr Glu Cys Arg Ala Phe Ala
305                 310                 315                 320

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

Tyr Ala Thr His Glu Arg Lys Met Arg Leu Asp Asn His Ala Leu Tyr
            340                 345                 350

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

Phe Ala His Leu Gly Leu Glu Tyr Ile Glu Pro Leu Glu Arg Asn Ala
    370                 375                 380
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