eolf-seql

SEQUENCE LISTING

<110> Novartis Pharmaceuticals Corporation

<120> Production of glycoproteins with mammalian-like N-glycans in filamentous fungi

<130> NOVA 0008 EP seq

<160> 820

<170> PatentIn version 3.5

<210> 1
<211> 407
<212> PRT
<213> Trichoderma reesei

<400> 1

Met Gln Thr Phe Gly Ala Phe Leu Val Ser Phe Leu Ala Ala Ser Gly
1 5 10 15

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

Val Gln Tyr Asn Lys Asn Tyr Val Pro His Gly Pro Thr Ala Leu Phe
35 40 45

Lys Ala Lys Arg Lys Tyr Gly Ala Pro Ile Ser Asp Asn Leu Lys Ser
50 55 60

Leu Val Ala Ala Arg Gln Ala Lys Gln Ala Leu Ala Lys Arg Gln Thr
65 70 75 80

Gly Ser Ala Pro Asn His Pro Ser Asp Ser Ala Asp Ser Glu Tyr Ile
85 90 95

Thr Ser Val Ser Ile Gly Thr Pro Ala Gln Val Leu Pro Leu Asp Phe
100 105 110

```
Asp Thr Gly Ser Ser Asp Leu Trp Val Phe Ser Ser Glu Thr Pro Lys
        115                 120                 125

Ser Ser Ala Thr Gly His Ala Ile Tyr Thr Pro Ser Lys Ser Ser Thr
    130                 135                 140

Ser Lys Lys Val Ser Gly Ala Ser Trp Ser Ile Ser Tyr Gly Asp Gly
145                 150                 155                 160

Ser Ser Ser Ser Gly Asp Val Tyr Thr Asp Lys Val Thr Ile Gly Gly
                165                 170                 175

Phe Ser Val Asn Thr Gln Gly Val Glu Ser Ala Thr Arg Val Ser Thr
            180                 185                 190

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

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

Asn Ala Ala Ser Ser Leu Ala Glu Pro Leu Phe Thr Ala Asp Leu Arg
225                 230                 235                 240

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

Ala Lys Gly Pro Val Ala Tyr Thr Pro Val Asp Asn Ser Gln Gly Phe
            260                 265                 270

Trp Glu Phe Thr Ala Ser Gly Tyr Ser Val Gly Gly Gly Lys Leu Asn
        275                 280                 285

Arg Asn Ser Ile Asp Gly Ile Ala Asp Thr Gly Thr Thr Leu Leu Leu
    290                 295                 300
```

```
Leu Asp Asp Asn Val Val Asp Ala Tyr Tyr Ala Asn Val Gln Ser Ala
305                 310                 315                 320


Gln Tyr Asp Asn Gln Gln Glu Gly Val Val Phe Asp Cys Asp Glu Asp
                325                 330                 335


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


Gly Asp Leu Leu Asn Leu Thr Pro Leu Glu Glu Gly Ser Ser Thr Cys
        355                 360                 365


Phe Gly Gly Leu Gln Ser Ser Ser Gly Ile Gly Ile Asn Ile Phe Gly
    370                 375                 380


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


Arg Leu Gly Trp Ala Gln Lys
                405
```

<210> 2
<211> 399
<212> PRT
<213> Trichoderma reesei

<400> 2

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Met Gln Pro Ser Phe Gly Ser Phe Leu Val Thr Val Leu Ser Ala Ser
1               5                   10                  15


Met Ala Ala Gly Ser Val Ile Pro Ser Thr Asn Ala Asn Pro Gly Ser
            20                  25                  30


Phe Glu Ile Lys Arg Ser Ala Asn Lys Ala Phe Thr Gly Arg Asn Gly
        35                  40                  45


Pro Leu Ala Leu Ala Arg Thr Tyr Ala Lys Tyr Gly Val Glu Val Pro
```

```
    50                  55                  60

Lys Thr Leu Val Asp Ala Ile Gln Leu Val Lys Ser Ile Gln Leu Ala
65                  70                  75                  80

Lys Arg Asp Ser Ala Thr Val Thr Ala Thr Pro Asp His Asp Asp Ile
                85                  90                  95

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

Leu Asp Phe Asp Thr Gly Ser Ser Asp Leu Trp Val Phe Ser Ser Asp
        115                 120                 125

Val Asp Pro Thr Ser Ser Gln Gly His Asp Ile Tyr Thr Pro Ser Lys
    130                 135                 140

Ser Thr Ser Ser Lys Lys Leu Glu Gly Ala Ser Trp Asn Ile Thr Tyr
145                 150                 155                 160

Gly Asp Arg Ser Ser Ser Ser Gly Asp Val Tyr His Asp Ile Val Ser
                165                 170                 175

Val Gly Asn Leu Thr Val Lys Ser Gln Ala Val Glu Ser Ala Arg Asn
            180                 185                 190

Val Ser Ala Gln Phe Thr Gln Gly Asn Asn Asp Gly Leu Val Gly Leu
        195                 200                 205

Ala Phe Ser Ser Ile Asn Thr Val Lys Pro Thr Pro Gln Lys Thr Trp
    210                 215                 220

Tyr Asp Asn Ile Val Gly Ser Leu Asp Ser Pro Val Phe Val Ala Asp
225                 230                 235                 240

Leu Arg His Asp Thr Pro Gly Ser Tyr His Phe Gly Ser Ile Pro Ser
```

245 250 255

Glu Ala Ser Lys Ala Phe Tyr Ala Pro Ile Asp Asn Ser Lys Gly Phe
260 265 270

Trp Gln Phe Ser Thr Ser Ser Asn Ile Ser Gly Gln Phe Asn Ala Val
275 280 285

Ala Asp Thr Gly Thr Thr Leu Leu Leu Ala Ser Asp Asp Leu Val Lys
290 295 300

Ala Tyr Tyr Ala Lys Val Gln Gly Ala Arg Val Asn Val Phe Leu Gly
305 310 315 320

Gly Tyr Val Phe Asn Cys Thr Thr Gln Leu Pro Asp Phe Thr Phe Thr
325 330 335

Val Gly Glu Gly Asn Ile Thr Val Pro Gly Thr Leu Ile Asn Tyr Ser
340 345 350

Glu Ala Gly Asn Gly Gln Cys Phe Gly Gly Ile Gln Pro Ser Gly Gly
355 360 365

Leu Pro Phe Ala Ile Phe Gly Asp Ile Ala Leu Lys Ala Ala Tyr Val
370 375 380

Ile Phe Asp Ser Gly Asn Lys Gln Val Gly Trp Ala Gln Lys Lys
385 390 395

<210> 3
<211> 452
<212> PRT
<213> Trichoderma reesei

<400> 3

Met Glu Ala Ile Leu Gln Ala Gln Ala Lys Phe Arg Leu Asp Arg Gly
1 5 10 15

```
Leu Gln Lys Ile Thr Ala Val Arg Asn Lys Asn Tyr Lys Arg His Gly
            20                  25                  30

Pro Lys Ser Tyr Val Tyr Leu Leu Asn Arg Phe Gly Phe Glu Pro Thr
        35                  40                  45

Lys Pro Gly Pro Tyr Phe Gln Gln His Arg Ile His Gln Arg Gly Leu
    50                  55                  60

Ala His Pro Asp Phe Lys Ala Ala Val Gly Gly Arg Val Thr Arg Gln
65                  70                  75                  80

Lys Val Leu Ala Lys Lys Val Lys Glu Asp Gly Thr Val Asp Ala Gly
                85                  90                  95

Gly Ser Lys Thr Gly Glu Val Asp Ala Glu Asp Gln Gln Asn Asp Ser
            100                 105                 110

Glu Tyr Leu Cys Glu Val Thr Ile Gly Thr Pro Gly Gln Lys Leu Met
        115                 120                 125

Leu Asp Phe Asp Thr Gly Ser Ser Asp Leu Trp Val Phe Ser Thr Glu
    130                 135                 140

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

Ser Ser Thr Phe Lys Pro Leu Lys Asp Gln Thr Trp Gln Ile Ser Tyr
                165                 170                 175

Gly Asp Gly Ser Ser Ala Ser Gly Thr Cys Gly Ser Asp Thr Val Thr
            180                 185                 190

Leu Gly Gly Leu Ser Ile Lys Asn Gln Thr Ile Glu Leu Ala Ser Lys
        195                 200                 205
```

```
Leu Ala Pro Gln Phe Ala Gln Gly Thr Gly Asp Gly Leu Leu Gly Leu
    210                 215                 220

Ala Trp Pro Gln Ile Asn Thr Val Gln Thr Asp Gly Arg Pro Thr Pro
225                 230                 235                 240

Ala Asn Thr Pro Val Ala Asn Met Ile Gln Gln Asp Asp Ile Pro Ser
                245                 250                 255

Asp Ala Gln Leu Phe Thr Ala Ala Phe Tyr Ser Glu Arg Asp Glu Asn
            260                 265                 270

Ala Glu Ser Phe Tyr Thr Phe Gly Tyr Ile Asp Gln Asp Leu Val Ser
        275                 280                 285

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

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

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

Leu Val Ser Asp Glu Val Cys Glu Ala Leu Tyr Lys Ala Ile Pro Gly
            340                 345                 350

Ala Lys Tyr Asp Asp Asn Gln Gln Gly Tyr Val Phe Pro Ile Asn Thr
        355                 360                 365

Asp Ala Ser Ser Leu Pro Glu Leu Lys Val Ser Val Gly Asn Thr Gln
    370                 375                 380

Phe Val Ile Gln Pro Glu Asp Leu Ala Phe Ala Pro Ala Asp Asp Ser
385                 390                 395                 400
```

```
Asn Trp Tyr Gly Gly Val Gln Ser Arg Gly Ser Asn Pro Phe Asp Ile
                405                 410                 415


Leu Gly Asp Val Phe Leu Lys Ser Val Tyr Ala Ile Phe Asp Gln Gly
            420                 425                 430


Asn Gln Arg Phe Gly Ala Val Pro Lys Ile Gln Ala Lys Gln Asn Leu
        435                 440                 445


Gln Pro Pro Gln
    450
```

<210> 4
<211> 395
<212> PRT
<213> Trichoderma reesei

<400> 4

```
Met Lys Ser Ala Leu Leu Ala Ala Ala Ala Leu Val Gly Ser Ala Gln
1               5                   10                  15


Ala Gly Ile His Lys Met Lys Leu Gln Lys Val Ser Leu Glu Gln Gln
            20                  25                  30


Leu Glu Gly Ser Ser Ile Glu Ala His Val Gln Gln Leu Gly Gln Lys
        35                  40                  45


Tyr Met Gly Val Arg Pro Thr Ser Arg Ala Glu Val Met Phe Asn Asp
    50                  55                  60


Lys Pro Pro Lys Val Gln Gly Gly His Pro Val Pro Val Thr Asn Phe
65                  70                  75                  80


Met Asn Ala Gln Tyr Phe Ser Glu Ile Thr Ile Gly Thr Pro Pro Gln
                85                  90                  95
```

```
Ser Phe Lys Val Val Leu Asp Thr Gly Ser Ser Asn Leu Trp Val Pro
            100                 105                 110

Ser Gln Ser Cys Asn Ser Ile Ala Cys Phe Leu His Ser Thr Tyr Asp
        115                 120                 125

Ser Ser Ser Ser Ser Thr Tyr Lys Pro Asn Gly Ser Asp Phe Glu Ile
    130                 135                 140

His Tyr Gly Ser Gly Ser Leu Thr Gly Phe Ile Ser Asn Asp Val Val
145                 150                 155                 160

Thr Ile Gly Asp Leu Lys Ile Lys Gly Gln Asp Phe Ala Glu Ala Thr
                165                 170                 175

Ser Glu Pro Gly Leu Ala Phe Ala Phe Gly Arg Phe Asp Gly Ile Leu
            180                 185                 190

Gly Leu Gly Tyr Asp Thr Ile Ser Val Asn Gly Ile Val Pro Pro Phe
        195                 200                 205

Tyr Gln Met Val Asn Gln Lys Leu Ile Asp Glu Pro Val Phe Ala Phe
    210                 215                 220

Tyr Leu Gly Ser Ser Asp Glu Gly Ser Glu Ala Val Phe Gly Gly Val
225                 230                 235                 240

Asp Asp Ala His Tyr Glu Gly Lys Ile Glu Tyr Ile Pro Leu Arg Arg
                245                 250                 255

Lys Ala Tyr Trp Glu Val Asp Leu Asp Ser Ile Ala Phe Gly Asp Glu
            260                 265                 270

Val Ala Glu Leu Glu Asn Thr Gly Ala Ile Leu Asp Thr Gly Thr Ser
        275                 280                 285
```

```
Leu Asn Val Leu Pro Ser Gly Leu Ala Glu Leu Leu Asn Ala Glu Ile
    290                 295                 300

Gly Ala Lys Lys Gly Phe Gly Gly Gln Tyr Thr Val Asp Cys Ser Lys
305                 310                 315                 320

Arg Asp Ser Leu Pro Asp Ile Thr Phe Ser Leu Ala Gly Ser Lys Tyr
                325                 330                 335

Ser Leu Pro Ala Ser Asp Tyr Ile Ile Glu Met Ser Gly Asn Cys Ile
            340                 345                 350

Ser Ser Phe Gln Gly Met Asp Phe Pro Glu Pro Val Gly Pro Leu Val
        355                 360                 365

Ile Leu Gly Asp Ala Phe Leu Arg Arg Tyr Tyr Ser Val Tyr Asp Leu
    370                 375                 380

Gly Arg Asp Ala Val Gly Leu Ala Lys Ala Lys
385                 390                 395
```

<210> 5
<211> 426
<212> PRT
<213> Trichoderma reesei

<400> 5

```
Met Lys Phe His Ala Ala Ala Leu Thr Leu Ala Cys Leu Ala Ser Ser
1               5                   10                  15

Ala Ser Ala Gly Val Ala Gln Pro Arg Ala Asp Glu Val Glu Ser Ala
            20                  25                  30

Glu Gln Gly Lys Thr Phe Ser Leu Glu Gln Ile Pro Asn Glu Arg Tyr
        35                  40                  45
```

```
Lys Gly Asn Ile Pro Ala Ala Tyr Ile Ser Ala Leu Ala Lys Tyr Ser
    50                  55                  60

Pro Thr Ile Pro Asp Lys Ile Lys His Ala Ile Glu Ile Asn Pro Asp
65                  70                  75                  80

Leu His Arg Lys Phe Ser Lys Leu Ile Asn Ala Gly Asn Met Thr Gly
                85                  90                  95

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

Pro Val Lys Ile Gly Thr Pro Pro Gln Thr Leu Pro Leu Asn Leu Asp
        115                 120                 125

Thr Gly Ser Ser Asp Leu Trp Val Ile Ser Thr Asp Thr Tyr Pro Pro
    130                 135                 140

Gln Val Gln Gly Gln Thr Arg Tyr Asn Val Ser Ala Ser Thr Thr Ala
145                 150                 155                 160

Gln Arg Leu Ile Gly Glu Ser Trp Val Ile Arg Tyr Gly Asp Gly Ser
                165                 170                 175

Ser Ala Asn Gly Ile Val Tyr Lys Asp Arg Val Gln Ile Gly Asn Thr
            180                 185                 190

Phe Phe Asn Gln Gln Ala Val Glu Ser Ala Val Asn Ile Ser Asn Glu
        195                 200                 205

Ile Ser Asp Asp Ser Phe Ser Ser Gly Leu Leu Gly Ala Ala Ser Ser
    210                 215                 220

Ala Ala Asn Thr Val Arg Pro Asp Arg Gln Thr Thr Tyr Leu Glu Asn
225                 230                 235                 240
```

```
Ile Lys Ser Gln Leu Ala Arg Pro Val Phe Thr Ala Asn Leu Lys Lys
                245                 250                 255

Gly Lys Pro Gly Asn Tyr Asn Phe Gly Tyr Ile Asn Gly Ser Glu Tyr
            260                 265                 270

Ile Gly Pro Ile Gln Tyr Ala Ala Ile Asn Pro Ser Ser Pro Leu Trp
        275                 280                 285

Glu Val Ser Val Ser Gly Tyr Arg Val Gly Ser Asn Asp Thr Lys Tyr
    290                 295                 300

Val Pro Arg Val Trp Asn Ala Ile Ala Asp Thr Gly Thr Thr Leu Leu
305                 310                 315                 320

Leu Val Pro Asn Asp Ile Val Ser Ala Tyr Tyr Ala Gln Val Lys Gly
                325                 330                 335

Ser Thr Phe Ser Asn Asp Val Gly Met Met Leu Val Pro Cys Ala Ala
            340                 345                 350

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

Pro Gly Ser Tyr Ile Asn Tyr Gly Arg Met Asn Lys Thr Tyr Cys Tyr
    370                 375                 380

Gly Gly Ile Gln Ser Ser Glu Asp Ala Pro Phe Ala Val Leu Gly Asp
385                 390                 395                 400

Ile Ala Leu Lys Ala Gln Phe Val Val Phe Asp Met Gly Asn Lys Val
                405                 410                 415

Val Gly Phe Ala Asn Lys Asn Thr Asn Val
            420                 425
```

<210> 6
<211> 446
<212> PRT
<213> Trichoderma reesei

<400> 6

```
Met Thr Leu Pro Val Pro Leu Arg Glu His Asp Leu Pro Phe Leu Lys
1               5                  10                  15


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


Leu Pro Ile Ile His Ala Arg Arg Pro Lys Leu Ala Ser Arg Ala Ile
        35                  40                  45


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


Asn Ile Gly Thr Pro Pro Gln Thr Val Tyr Ala Gln Ile Asp Thr Gly
65                  70                  75                  80


Ser Phe Glu Leu Trp Val Asn Pro Asn Cys Ser Asn Val Gln Ser Ala
                85                  90                  95


Asp Gln Arg Phe Cys Arg Ala Ile Gly Phe Tyr Asp Pro Ser Ser Ser
            100                 105                 110


Ser Thr Ala Asp Val Thr Ser Gln Ser Ala Arg Leu Arg Tyr Gly Ile
        115                 120                 125


Gly Ser Ala Asp Val Thr Tyr Val His Asp Thr Ile Ser Leu Pro Gly
    130                 135                 140


Ser Gly Ser Gly Ser Lys Ala Met Lys Ala Val Gln Phe Gly Val Ala
145                 150                 155                 160


Asp Thr Ser Val Asp Glu Phe Ser Gly Ile Leu Gly Leu Gly Ala Gly
```

```
                165                 170                 175

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

Gln Gly Val Thr Ala Thr Lys Ala Phe Ser Leu Ala Leu Gly Ser Lys
        195                 200                 205

Ala Glu Glu Glu Gly Val Ile Ile Phe Gly Gly Val Asp Thr Ala Lys
    210                 215                 220

Phe His Gly Glu Leu Ala His Leu Pro Ile Val Pro Ala Asp Asp Ser
225                 230                 235                 240

Pro Asp Gly Val Ala Arg Tyr Trp Val Lys Met Lys Ser Ile Ser Leu
                245                 250                 255

Thr Pro Pro Pro Pro Ser Ser Ser Gly Ser Thr Asp Asp Asn Asn Asn
            260                 265                 270

Lys Pro Val Ala Phe Pro Gln Thr Ser Met Thr Val Phe Leu Asp Ser
        275                 280                 285

Gly Ser Thr Leu Thr Leu Leu Pro Pro Ala Leu Val Arg Gln Ile Ala
    290                 295                 300

Ser Ala Leu Gly Ser Thr Gln Thr Asp Glu Ser Gly Phe Phe Val Val
305                 310                 315                 320

Asp Cys Ala Leu Ala Ser Gln Asp Gly Thr Ile Asp Phe Glu Phe Asp
                325                 330                 335

Gly Val Thr Ile Arg Val Pro Tyr Ala Glu Met Ile Arg Gln Val Ser
            340                 345                 350

Thr Leu Pro Pro His Cys Tyr Leu Gly Met Met Gly Ser Thr Gln Phe
```

355 360 365

Ala Leu Leu Gly Asp Thr Phe Leu Arg Ser Ala Tyr Ala Val Phe Asp
370 375 380

Leu Thr Ser Asn Val Val His Leu Ala Pro Tyr Ala Asn Cys Gly Thr
385 390 395 400

Asn Val Lys Ser Ile Thr Ser Thr Ser Ser Leu Ser Asn Leu Val Gly
405 410 415

Thr Cys Asn Asp Pro Ser Lys Pro Ser Ser Ser Pro Ser Pro Ser Gln
420 425 430

Thr Pro Ser Ala Ser Pro Ser Ser Thr Ala Thr Gln Lys Ala
435 440 445

<210> 7
<211> 488
<212> PRT
<213> Trichoderma reesei

<400> 7

Met Arg Ala Ser Pro Leu Ala Val Ala Gly Val Ala Leu Ala Ser Ala
1 5 10 15

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

Arg Leu Ser Arg Arg Asp Gly Thr Ile Asp Gly Thr Leu Ser Asn Gln
35 40 45

Arg Val Gln Gly Gly Tyr Phe Ile Asn Val Gln Val Gly Ser Pro Gly
50 55 60

Gln Asn Ile Thr Leu Gln Leu Asp Thr Gly Ser Ser Asp Val Trp Val
65 70 75 80

```
Pro Ser Ser Thr Ala Ala Ile Cys Thr Gln Val Ser Glu Arg Asn Pro
                85                  90                  95

Gly Cys Gln Phe Gly Ser Phe Asn Pro Asp Asp Ser Asp Thr Phe Asp
            100                 105                 110

Glu Val Gly Gln Gly Leu Phe Asp Ile Thr Tyr Val Asp Gly Ser Ser
        115                 120                 125

Ser Lys Gly Asp Tyr Phe Gln Asp Asn Phe Gln Ile Asn Gly Val Thr
    130                 135                 140

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

Gly Leu Ile Gly Val Gly Tyr Met Asn Asp Glu Ala Ser Val Ser Thr
                165                 170                 175

Thr Arg Ser Thr Tyr Pro Asn Leu Pro Ile Val Leu Gln Gln Gln Lys
            180                 185                 190

Leu Ile Asn Ser Val Ala Phe Ser Leu Trp Leu Asn Asp Leu Asp Ala
        195                 200                 205

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

Gly Asp Leu Thr Ser Ile Asp Ile Ile Ser Pro Asn Gly Gly Lys Thr
225                 230                 235                 240

Phe Thr Glu Phe Ala Val Asn Leu Tyr Ser Val Gln Ala Thr Ser Pro
                245                 250                 255

Ser Gly Thr Asp Thr Leu Ser Thr Ser Glu Asp Thr Leu Ile Ala Val
            260                 265                 270
```

```
Leu Asp Ser Gly Thr Thr Leu Thr Tyr Leu Pro Gln Asp Met Ala Glu
        275                 280                 285

Glu Ala Trp Asn Glu Val Gly Ala Glu Tyr Ser Asn Glu Leu Gly Leu
    290                 295                 300

Ala Val Val Pro Cys Ser Val Gly Asn Thr Asn Gly Phe Phe Ser Phe
305                 310                 315                 320

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

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

Gly Pro Asn Lys Gly Gln Ser Ile Cys Glu Phe Gly Ile Gln Asn Gly
        355                 360                 365

Thr Gly Ser Pro Phe Leu Leu Gly Asp Thr Phe Leu Arg Ser Ala Phe
    370                 375                 380

Val Val Tyr Asp Leu Val Asn Asn Gln Ile Ala Ile Ala Pro Thr Asn
385                 390                 395                 400

Phe Asn Ser Thr Arg Thr Asn Val Val Ala Phe Ala Ser Ser Gly Ala
                405                 410                 415

Pro Ile Pro Ser Ala Thr Ala Ala Pro Asn Gln Ser Arg Thr Gly His
            420                 425                 430

Ser Ser Ser Thr His Ser Gly Leu Ser Ala Ala Ser Gly Phe His Asp
        435                 440                 445

Gly Asp Asp Glu Asn Ala Gly Ser Leu Thr Ser Val Phe Ser Gly Pro
    450                 455                 460
```

```
Gly Met Ala Val Val Gly Met Thr Ile Cys Tyr Thr Leu Leu Gly Ser
465                 470                 475                 480


Ala Ile Phe Gly Ile Gly Trp Leu
                485
```

<210> 8
<211> 526
<212> PRT
<213> Trichoderma reesei

<400> 8

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Met Arg Pro Asn Ser Val Leu Leu Ala Pro Leu Ala Leu Tyr Ala Ser
1               5                   10                  15


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


Glu Glu His Asn Ala Gly Glu Ala Lys Arg Ser Ala Asp Asn Gly Leu
        35                  40                  45


Thr Phe Asp Ile Lys Arg Arg Ala Ser Arg Arg Ala Pro Ala Ser Gln
    50                  55                  60


Glu Glu Lys Ala Ala Trp Gln Ala Ala Leu Leu Ser His Lys Tyr Ser
65                  70                  75                  80


Glu Ser Val Thr Pro Ser Pro Ser Pro Asp Thr Thr Leu Ser Lys Arg
                85                  90                  95


Asp Asn Gln Phe Ser Ile Leu Lys Ala Val Asp Pro Asp Ala Pro Asn
            100                 105                 110


Thr Ala Gly Leu Ala Gln Asp Gly Thr Asp Tyr Ser Tyr Phe Val Gln
        115                 120                 125
```

```
Ala Ser Leu Gly Ser Lys Lys Thr Lys Leu Tyr Met Leu Leu Asp Thr
    130                 135                 140

Gly Ala Gly Ser Ser Trp Val Met Gly Thr Asp Cys Val Ser Glu Ala
145                 150                 155                 160

Cys Ser Leu His Asp Ser Phe Gly Pro Glu Asp Ser Asp Thr Leu Lys
                165                 170                 175

Thr Ser Thr Lys Asp Phe Ser Ile Ala Tyr Gly Ser Gly Ala Val Ser
            180                 185                 190

Gly Ser Leu Val Asn Asp Thr Ile Glu Val Ala Gly Met Ser Leu Thr
        195                 200                 205

Tyr Gln Phe Gly Leu Ala His Asn Thr Ser Ser Asp Phe Val His Phe
    210                 215                 220

Ala Phe Asp Gly Ile Leu Gly Met Ser Met Asn Ser Gly Ala Asn Glu
225                 230                 235                 240

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

Phe Ser Val Ala Leu Ala Arg Ala Ser Asp Gly His Asn Asp Gly Glu
            260                 265                 270

Val Thr Phe Gly Ala Thr Asn Pro Ser Arg Tyr Thr Gly Asp Ile Thr
        275                 280                 285

Tyr Thr Pro Ile Pro Ser Gly Thr Asp Trp Ser Ile Pro Leu Asp Asp
    290                 295                 300

Met Ser Tyr Asn Gly Lys Lys Gly Asn Val Gly Gly Ile Asn Ala Tyr
305                 310                 315                 320
```

```
Ile Asp Thr Gly Thr Ser Tyr Met Phe Gly Pro Ser Lys Asn Val Lys
                325                 330                 335

Ala Leu His Ala Val Ile Asp Gly Ala Lys Ser Ser Asp Gly Ile Thr
            340                 345                 350

Trp Thr Val Pro Cys Asp Thr Thr Thr Pro Leu Val Val Thr Phe Ser
        355                 360                 365

Gly Val Asp Phe Ala Ile Ser Pro Lys Asp Trp Ile Ser Pro Lys Asp
    370                 375                 380

Ser Ser Gly Lys Cys Thr Ser Asn Val Tyr Gly Tyr Glu Val Val Ser
385                 390                 395                 400

Gly Ser Trp Leu Phe Gly Asp Thr Phe Leu Lys Asn Val Tyr Ala Val
                405                 410                 415

Phe Asp Lys Glu Gln Met Arg Ile Gly Lys Thr Ser Pro Arg Ala Thr
            420                 425                 430

Ser Pro Ser Ser Pro Ala Pro Thr Arg Thr Pro Ser Pro Ala Thr Thr
        435                 440                 445

Ser Pro Ser Ser Ala Ser Thr Pro Gly Ser Thr Pro Thr Thr Ser Ser
    450                 455                 460

Thr Arg Thr Ala Arg Pro Ser Thr Ser Ala Pro Ser Gly Thr Ser Ser
465                 470                 475                 480

Thr Gly Ala Pro Ser Pro Ser Ala Ser Ala Asn Arg Asp Val Leu Arg
                485                 490                 495

Ala Lys Arg Ile Asn Met Leu Lys Ser Ile Ser Ser Phe Trp His Asp
            500                 505                 510
```

```
Pro Cys Cys Cys Leu Phe Leu His Val Ser Ile Ser Ser Thr
        515                 520                 525


<210>  9
<211>  761
<212>  PRT
<213>  Trichoderma reesei

<400>  9

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


Ala Leu Glu Phe Ile Asp Asp Thr Val Ala Gln Gln Asn Gly Ile Met
            20                  25                  30


Arg Tyr Thr Leu Thr Thr Thr Lys Gly Ala Thr Ser Lys His Leu His
        35                  40                  45


Arg Arg Gln Asp Ser Ala Asp Leu Met Ser Gln Gln Thr Gly Tyr Phe
    50                  55                  60


Tyr Ser Ile Gln Leu Glu Ile Gly Thr Pro Pro Gln Ala Val Ser Val
65                  70                  75                  80


Asn Phe Asp Thr Gly Ser Ser Glu Leu Trp Val Asn Pro Val Cys Ser
                85                  90                  95


Lys Ala Thr Asp Pro Ala Phe Cys Lys Thr Phe Gly Gln Tyr Asn His
            100                 105                 110


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


Thr Gly Phe Val Asp Phe Asn Tyr Gly Tyr Asp Tyr Val Gln Leu Gly
    130                 135                 140
```

```
Ser Leu Arg Ile Asn Gln Gln Val Phe Gly Val Ala Thr Asp Ser Glu
145                 150                 155                 160


Phe Ala Ser Val Gly Ile Leu Gly Ala Gly Pro Asp Leu Ser Gly Trp
                165                 170                 175


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


Ile Lys Ser Arg Ala Phe Ser Leu Asp Ile Arg Gly Leu Asp Ser Asp
        195                 200                 205


Arg Gly Ser Val Thr Tyr Gly Gly Ile Asp Ile Lys Lys Phe Ser Gly
    210                 215                 220


Pro Leu Ala Lys Lys Pro Ile Ile Pro Ala Ala Gln Ser Pro Asp Gly
225                 230                 235                 240


Tyr Thr Arg Tyr Trp Val His Met Asp Gly Met Ser Ile Thr Lys Glu
                245                 250                 255


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


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


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


Gly Asp Tyr Ile Val Asp Cys Asp Ile Ile Asp Thr Pro Gly Arg Val
305                 310                 315                 320


Asn Phe Lys Phe Gly Asn Val Val Val Asp Val Glu Tyr Lys Asp Phe
                325                 330                 335
```

```
Ile Trp Gln Gln Pro Asp Leu Gly Ile Cys Lys Leu Gly Val Ser Gln
            340                 345                 350

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

Val Val Phe Asp Trp Asp Asn Gln Glu Val His Ile Ala Ala Asn Glu
    370                 375                 380

Asp Cys Gly Asp Glu Leu Ile Pro Ile Gly Ser Gly Pro Asp Ala Ile
385                 390                 395                 400

Pro Ala Ser Ala Ile Gly Lys Cys Ser Pro Ser Val Lys Thr Asp Thr
                405                 410                 415

Thr Thr Ser Val Ala Glu Thr Thr Ala Thr Ser Ala Ala Ala Ser Thr
            420                 425                 430

Ser Glu Leu Ala Ala Thr Thr Ser Glu Ala Ala Thr Thr Ser Ser Glu
        435                 440                 445

Ala Ala Thr Thr Ser Ala Ala Ala Glu Thr Thr Ser Val Pro Leu Asn
    450                 455                 460

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

Ser Asn Gly Thr Ala Pro Tyr Pro Ile Pro Ser Leu Ser Ser Val Ala
                485                 490                 495

Ala Ala Ala Gly Ser Ser Thr Val Pro Ser Glu Ser Ser Thr Gly Ala
            500                 505                 510

Ala Ala Ala Gly Thr Thr Ser Ala Ala Thr Gly Ser Gly Ser Gly Ser
        515                 520                 525
```

```
Gly Ser Gly Asp Ala Thr Thr Ala Ser Ala Thr Tyr Thr Ser Thr Phe
    530                 535                 540

Thr Thr Thr Asn Val Tyr Thr Val Thr Ser Cys Pro Pro Ser Val Thr
545                 550                 555                 560

Asn Cys Pro Val Gly His Val Thr Thr Glu Val Val Val Ala Tyr Thr
                565                 570                 575

Thr Trp Cys Pro Val Glu Asn Gly Pro His Pro Thr Ala Pro Pro Lys
            580                 585                 590

Pro Ala Ala Pro Glu Ile Thr Ala Thr Phe Thr Leu Pro Asn Thr Tyr
        595                 600                 605

Thr Cys Ser Gln Gly Lys Asn Thr Cys Ser Asn Pro Lys Thr Ala Pro
    610                 615                 620

Asn Val Ile Val Val Thr Pro Ile Val Thr Gln Thr Ala Pro Val Val
625                 630                 635                 640

Ile Pro Gly Ile Ala Ala Pro Thr Pro Thr Pro Ser Val Ala Ala Ser
                645                 650                 655

Ser Pro Ala Ser Pro Ser Val Val Pro Ser Pro Thr Ala Pro Val Ala
            660                 665                 670

Thr Ser Pro Ala Gln Ser Ala Tyr Tyr Pro Pro Pro Pro Pro Pro Glu
        675                 680                 685

His Ala Val Ser Thr Pro Val Ala Asn Pro Pro Ala Val Thr Pro Ala
    690                 695                 700

Pro Ala Pro Phe Pro Ser Gly Gly Leu Thr Thr Val Ile Ala Pro Gly
705                 710                 715                 720
```

Ser Thr Gly Val Pro Ser Gln Pro Ala Gln Ser Gly Leu Pro Pro Val
725 730 735

Pro Ala Gly Ala Ala Gly Phe Arg Ala Pro Ala Ala Val Ala Leu Leu
740 745 750

Ala Gly Ala Val Ala Ala Ala Leu Leu
755 760

<210> 10
<211> 477
<212> PRT
<213> Trichoderma reesei

<400> 10

Met Arg Phe Val Gln Tyr Val Ser Leu Ala Gly Leu Phe Ala Ala Ala
1 5 10 15

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

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

Leu Asp Ala Ile Asn Asn Leu Thr Gly Gly Gly Tyr Tyr Ala Gln Phe
50 55 60

Ser Val Gly Thr Pro Pro Gln Lys Leu Ser Phe Leu Leu Asp Thr Gly
65 70 75 80

Ser Ser Asp Thr Trp Val Asn Ser Val Thr Ala Asp Leu Cys Thr Asp
85 90 95

Glu Phe Thr Gln Gln Thr Val Gly Glu Tyr Cys Phe Arg Gln Phe Asn
100 105 110

Pro Arg Arg Ser Ser Ser Tyr Lys Ala Ser Thr Glu Val Phe Asp Ile

```
        115                 120                 125

Thr Tyr Leu Asp Gly Arg Arg Ile Arg Gly Asn Tyr Phe Thr Asp Thr
    130                 135                 140

Val Thr Ile Asn Gln Ala Asn Ile Thr Gly Gln Lys Ile Gly Leu Ala
145                 150                 155                 160

Leu Gln Ser Val Arg Gly Thr Gly Ile Leu Gly Leu Gly Phe Arg Glu
                165                 170                 175

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

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

Leu Gln Thr Ser Gln Gly Ile Leu Leu Phe Gly Gly Val Asp Thr Asp
    210                 215                 220

Lys Phe His Gly Gly Leu Ala Thr Leu Pro Leu Gln Ser Leu Pro Pro
225                 230                 235                 240

Ser Ile Ala Glu Thr Gln Asp Ile Val Met Tyr Ser Val Asn Leu Asp
                245                 250                 255

Gly Phe Ser Ala Ser Asp Val Asp Thr Pro Asp Val Ser Ala Lys Ala
            260                 265                 270

Val Leu Asp Ser Gly Ser Thr Ile Thr Leu Leu Pro Asp Ala Val Val
        275                 280                 285

Gln Glu Leu Phe Asp Glu Tyr Asp Val Leu Asn Ile Gln Gly Leu Pro
    290                 295                 300

Val Pro Phe Ile Asp Cys Ala Lys Ala Asn Ile Lys Asp Ala Thr Phe
```

305 310 315 320

Asn Phe Lys Phe Asp Gly Lys Thr Ile Lys Val Pro Ile Asp Glu Met
325 330 335

Val Leu Asn Asn Leu Ala Ala Ala Ser Asp Glu Ile Met Ser Asp Pro
340 345 350

Ser Leu Ser Lys Phe Phe Lys Gly Trp Ser Gly Val Cys Thr Phe Gly
355 360 365

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

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

Asn Lys Gln Ile Gly Ile Ala Gln Ala Thr Leu Asn Ser Thr Ser Ser
405 410 415

Thr Ile Val Glu Phe Lys Ala Gly Ser Lys Thr Ile Pro Gly Pro Ala
420 425 430

Ser Thr Gly Asp Asp Ser Asp Asp Ser Ser Asp Asp Ser Asp Glu Asp
435 440 445

Ser Ala Gly Ala Ala Leu His Pro Thr Phe Ser Ile Ala Leu Ala Gly
450 455 460

Thr Leu Phe Thr Ala Val Ser Met Met Met Ser Val Leu
465 470 475

<210> 11
<211> 259
<212> PRT
<213> Trichoderma reesei

<400> 11

```
Met Ala Pro Ala Ser Gln Val Val Ser Ala Leu Met Leu Pro Ala Leu
1               5                   10                  15

Ala Leu Gly Ala Ala Ile Gln Pro Arg Gly Ala Asp Ile Val Gly Gly
            20                  25                  30

Thr Ala Ala Ser Leu Gly Glu Phe Pro Tyr Ile Val Ser Leu Gln Asn
        35                  40                  45

Pro Asn Gln Gly Gly His Phe Cys Gly Gly Val Leu Val Asn Ala Asn
    50                  55                  60

Thr Val Val Thr Ala Ala His Cys Ser Val Val Tyr Pro Ala Ser Gln
65                  70                  75                  80

Ile Arg Val Arg Ala Gly Thr Leu Thr Trp Asn Ser Gly Gly Thr Leu
                85                  90                  95

Val Gly Val Ser Gln Ile Ile Val Asn Pro Ser Tyr Asn Asp Arg Thr
            100                 105                 110

Thr Asp Phe Asp Val Ala Val Trp His Leu Ser Ser Pro Ile Arg Glu
        115                 120                 125

Ser Ser Thr Ile Gly Tyr Ala Thr Leu Pro Ala Gln Gly Ser Asp Pro
    130                 135                 140

Val Ala Gly Ser Thr Val Thr Thr Ala Gly Trp Gly Thr Thr Ser Glu
145                 150                 155                 160

Asn Ser Asn Ser Ile Pro Ser Arg Leu Asn Lys Val Ser Val Pro Val
                165                 170                 175

Val Ala Arg Ser Thr Cys Gln Ala Asp Tyr Arg Ser Gln Gly Leu Ser
            180                 185                 190
```

```
Val Thr Asn Asn Met Phe Cys Ala Gly Leu Thr Gln Gly Gly Lys Asp
        195                 200                 205

Ser Cys Ser Gly Asp Ser Gly Gly Pro Ile Val Asp Ala Asn Gly Val
    210                 215                 220

Leu Gln Gly Val Val Ser Trp Gly Ile Gly Cys Ala Glu Ala Gly Phe
225                 230                 235                 240

Pro Gly Val Tyr Thr Arg Ile Gly Asn Phe Val Asn Tyr Ile Asn Gln
                245                 250                 255

Asn Leu Ala
```

<210> 12
<211> 882
<212> PRT
<213> Trichoderma reesei

<400> 12

```
Met Val Arg Ser Ala Leu Phe Val Ser Leu Leu Ala Thr Phe Ser Gly
1               5                   10                  15

Val Ile Ala Arg Val Ser Gly His Gly Ser Lys Ile Val Pro Gly Ala
            20                  25                  30

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

Lys Leu Asn Gly Glu Gly Ser Thr Arg Leu Lys Phe Asp Tyr Lys Leu
    50                  55                  60

Phe Lys Gly Val Ser Val Gln Leu Lys Asp Leu Asp Asn His Glu Ala
65                  70                  75                  80
```

```
Lys Ala Gln Gln Met Ala Gln Leu Pro Ala Val Lys Asn Val Trp Pro
                85                  90                  95

Val Thr Leu Ile Asp Ala Pro Asn Pro Lys Val Glu Trp Val Ala Gly
            100                 105                 110

Ser Thr Ala Pro Thr Leu Glu Ser Arg Ala Ile Lys Lys Pro Pro Ile
        115                 120                 125

Pro Asn Asp Ser Ser Asp Phe Pro Thr His Gln Met Thr Gln Ile Asp
    130                 135                 140

Lys Leu Arg Ala Lys Gly Tyr Thr Gly Lys Gly Val Arg Val Ala Val
145                 150                 155                 160

Ile Asp Thr Gly Ile Asp Tyr Thr His Pro Ala Leu Gly Gly Cys Phe
                165                 170                 175

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

Tyr Thr Gly Phe Asn Thr Pro Val Pro Asp Asp Asp Pro Val Asp Cys
        195                 200                 205

Ala Gly His Gly Ser His Val Ala Gly Ile Ile Ala Ala Gln Glu Asn
    210                 215                 220

Pro Tyr Gly Phe Thr Gly Gly Ala Pro Asp Val Thr Leu Gly Ala Tyr
225                 230                 235                 240

Arg Val Phe Gly Cys Asp Gly Gln Ala Gly Asn Asp Val Leu Ile Ser
                245                 250                 255

Ala Tyr Asn Gln Ala Phe Glu Asp Gly Ala Gln Ile Ile Thr Ala Ser
            260                 265                 270
```

```
Ile Gly Gly Pro Ser Gly Trp Ala Glu Glu Pro Trp Ala Val Ala Val
        275                 280                 285


Thr Arg Ile Val Glu Ala Gly Val Pro Cys Thr Val Ser Ala Gly Asn
    290                 295                 300


Glu Gly Asp Ser Gly Leu Phe Phe Ala Ser Thr Ala Ala Asn Gly Lys
305                 310                 315                 320


Lys Val Ile Ala Val Ala Ser Val Asp Asn Glu Asn Ile Pro Ser Val
                325                 330                 335


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


Gly Tyr Val Ser Ser Ser Lys Ala Trp Asp Gly Val Ser Lys Pro Leu
        355                 360                 365


Tyr Ala Val Ser Phe Asp Thr Thr Ile Pro Asp Asp Gly Cys Ser Pro
    370                 375                 380


Leu Pro Asp Ser Thr Pro Asp Leu Ser Asp Tyr Ile Val Leu Val Arg
385                 390                 395                 400


Arg Gly Thr Cys Thr Phe Val Gln Lys Ala Gln Asn Val Ala Ala Lys
                405                 410                 415


Gly Ala Lys Tyr Leu Leu Tyr Tyr Asn Asn Ile Pro Gly Ala Leu Ala
            420                 425                 430


Val Asp Val Ser Ala Val Pro Glu Ile Glu Ala Val Gly Met Val Asp
        435                 440                 445


Asp Lys Thr Gly Ala Thr Trp Ile Ala Ala Leu Lys Asp Gly Lys Thr
    450                 455                 460
```

```
Val Thr Leu Thr Leu Thr Asp Pro Ile Glu Ser Glu Lys Gln Ile Gln
465                 470                 475                 480


Phe Ser Asp Asn Pro Thr Thr Gly Gly Ala Leu Ser Gly Tyr Thr Thr
                485                 490                 495


Trp Gly Pro Thr Trp Glu Leu Asp Val Lys Pro Gln Ile Ser Ser Pro
            500                 505                 510


Gly Gly Asn Ile Leu Ser Thr Tyr Pro Val Ala Leu Gly Gly Tyr Ala
        515                 520                 525


Thr Leu Ser Gly Thr Ser Met Ala Cys Pro Leu Thr Ala Ala Ala Val
    530                 535                 540


Ala Leu Ile Gly Gln Ala Arg Gly Thr Phe Asp Pro Ala Leu Ile Asp
545                 550                 555                 560


Asn Leu Leu Ala Thr Thr Ala Asn Pro Gln Leu Phe Asn Asp Gly Glu
                565                 570                 575


Lys Phe Tyr Asp Phe Leu Ala Pro Val Pro Gln Gln Gly Gly Gly Leu
            580                 585                 590


Ile Gln Ala Tyr Asp Ala Ala Phe Ala Thr Thr Leu Leu Ser Pro Ser
        595                 600                 605


Ser Leu Ser Phe Asn Asp Thr Asp His Phe Ile Lys Lys Lys Gln Ile
    610                 615                 620


Thr Leu Lys Asn Thr Ser Lys Gln Arg Val Thr Tyr Lys Leu Asn His
625                 630                 635                 640


Val Pro Thr Asn Thr Phe Tyr Thr Leu Ala Pro Gly Asn Gly Tyr Pro
                645                 650                 655
```

```
Ala Pro Phe Pro Asn Asp Ala Val Ala Ala His Ala Asn Leu Lys Phe
            660                 665                 670

Asn Leu Gln Gln Val Thr Leu Pro Ala Gly Arg Ser Ile Thr Val Asp
        675                 680                 685

Val Phe Pro Thr Pro Pro Arg Asp Val Asp Ala Lys Arg Leu Ala Leu
    690                 695                 700

Trp Ser Gly Tyr Ile Thr Val Asn Gly Thr Asp Gly Thr Ser Leu Ser
705                 710                 715                 720

Val Pro Tyr Gln Gly Leu Thr Gly Ser Leu His Lys Gln Lys Val Leu
                725                 730                 735

Tyr Pro Glu Asp Ser Trp Ile Ala Asp Ser Thr Asp Glu Ser Leu Ala
            740                 745                 750

Pro Val Glu Asn Gly Thr Val Phe Thr Ile Pro Ala Pro Gly Asn Ala
        755                 760                 765

Gly Pro Asp Asp Lys Leu Pro Ser Leu Val Val Ser Pro Ala Leu Gly
    770                 775                 780

Ser Arg Tyr Val Arg Val Asp Leu Val Leu Leu Ser Ala Pro Pro His
785                 790                 795                 800

Gly Thr Lys Leu Lys Thr Val Lys Phe Leu Asp Thr Thr Ser Ile Gly
                805                 810                 815

Gln Pro Ala Gly Ser Pro Leu Leu Trp Ile Ser Arg Gly Ala Asn Pro
            820                 825                 830

Ile Ala Trp Thr Gly Glu Leu Ser Asp Asn Lys Phe Ala Pro Pro Gly
        835                 840                 845
```

```
Thr Tyr Lys Ala Val Phe His Ala Leu Arg Ile Phe Gly Asn Glu Lys
    850                 855                 860


Lys Lys Glu Asp Trp Asp Val Ser Glu Ser Pro Ala Phe Thr Ile Lys
865                 870                 875                 880


Tyr Ala
```

<210> 13
<211> 541
<212> PRT
<213> Trichoderma reesei

<400> 13

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


Thr Phe Gln Ile Gly Thr Ile His Glu Lys Ser Ala Pro Val Leu Ser
            20                  25                  30


Asn Val Glu Ala Asn Ala Ile Pro Asp Ala Tyr Ile Ile Lys Phe Lys
        35                  40                  45


Asp His Val Gly Glu Asp Asp Ala Ser Lys His His Asp Trp Ile Gln
    50                  55                  60


Ser Ile His Thr Asn Val Glu Gln Glu Arg Leu Glu Leu Arg Lys Arg
65                  70                  75                  80


Ser Asn Val Phe Gly Ala Asp Asp Val Phe Asp Gly Leu Lys His Thr
                85                  90                  95


Phe Lys Ile Gly Asp Gly Phe Lys Gly Tyr Ala Gly His Phe His Glu
            100                 105                 110
```

```
Ser Val Ile Glu Gln Val Arg Asn His Pro Asp Val Glu Tyr Ile Glu
        115                 120                 125


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


Ile Ile Val Glu Asp Ser Cys Asn Gly Glu Thr Glu Lys Gln Ala Pro
145                 150                 155                 160


Trp Gly Leu Ala Arg Ile Ser His Arg Glu Thr Leu Asn Phe Gly Ser
                165                 170                 175


Phe Asn Lys Tyr Leu Tyr Thr Ala Asp Gly Gly Glu Gly Val Asp Ala
            180                 185                 190


Tyr Val Ile Asp Thr Gly Thr Asn Ile Glu His Val Asp Phe Glu Gly
        195                 200                 205


Arg Ala Lys Trp Gly Lys Thr Ile Pro Ala Gly Asp Glu Asp Glu Asp
    210                 215                 220


Gly Asn Gly His Gly Thr His Cys Ser Gly Thr Val Ala Gly Lys Lys
225                 230                 235                 240


Tyr Gly Val Ala Lys Lys Ala His Val Tyr Ala Val Lys Val Leu Arg
                245                 250                 255


Ser Asn Gly Ser Gly Thr Met Ser Asp Val Val Lys Gly Val Glu Tyr
            260                 265                 270


Ala Ala Leu Ser His Ile Glu Gln Val Lys Lys Ala Lys Lys Gly Lys
        275                 280                 285


Arg Lys Gly Phe Lys Gly Ser Val Ala Asn Met Ser Leu Gly Gly Gly
    290                 295                 300
```

```
Lys Thr Gln Ala Leu Asp Ala Ala Val Asn Ala Ala Val Arg Ala Gly
305                 310                 315                 320


Val His Phe Ala Val Ala Ala Gly Asn Asp Asn Ala Asp Ala Cys Asn
                325                 330                 335


Tyr Ser Pro Ala Ala Ala Thr Glu Pro Leu Thr Val Gly Ala Ser Ala
            340                 345                 350


Leu Asp Asp Ser Arg Ala Tyr Phe Ser Asn Tyr Gly Lys Cys Thr Asp
        355                 360                 365


Ile Phe Ala Pro Gly Leu Ser Ile Gln Ser Thr Trp Ile Gly Ser Lys
    370                 375                 380


Tyr Ala Val Asn Thr Ile Ser Gly Thr Ser Met Ala Ser Pro His Ile
385                 390                 395                 400


Cys Gly Leu Leu Ala Tyr Tyr Leu Ser Leu Gln Pro Ala Gly Asp Ser
                405                 410                 415


Glu Phe Ala Val Ala Pro Ile Thr Pro Lys Lys Leu Lys Glu Ser Val
            420                 425                 430


Ile Ser Val Ala Thr Lys Asn Ala Leu Ser Asp Leu Pro Asp Ser Asp
        435                 440                 445


Thr Pro Asn Leu Leu Ala Trp Asn Gly Gly Gly Cys Ser Asn Phe Ser
    450                 455                 460


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


Gln Ala Lys Leu Pro Ser Thr Ile Glu Glu Leu Glu Glu Ala Ile Glu
                485                 490                 495
```

```
Gly Asp Phe Glu Val Val Ser Gly Glu Ile Val Lys Gly Ala Lys Ser
            500                 505                 510


Phe Gly Ser Lys Ala Glu Lys Phe Ala Lys Lys Ile His Asp Leu Val
        515                 520                 525


Glu Glu Glu Ile Glu Glu Phe Ile Ser Glu Leu Ser Glu
    530                 535                 540


<210>  14
<211>  391
<212>  PRT
<213>  Trichoderma reesei

<400>  14

Met Arg Leu Ser Val Leu Leu Ser Val Leu Pro Leu Val Leu Ala Ala
1               5                   10                  15


Pro Ala Ile Glu Lys Arg Ala Glu Pro Ala Pro Leu Leu Val Pro Thr
            20                  25                  30


Thr Lys His Gly Leu Val Ala Asp Lys Tyr Ile Val Lys Phe Lys Asp
        35                  40                  45


Gly Ser Ser Leu Gln Ala Val Asp Glu Ala Ile Ser Gly Leu Val Ser
    50                  55                  60


Asn Ala Asp His Val Tyr Gln His Val Phe Arg Gly Phe Ala Ala Thr
65                  70                  75                  80


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


Tyr Ile Glu Gln Asp Ala Val Val Lys Ile Asn Ala Tyr Val Ser Gln
            100                 105                 110


Thr Gly Ala Pro Trp Gly Leu Gly Arg Ile Ser His Lys Ala Arg Gly
```

```
        115                 120                 125

Ser Thr Thr Tyr Val Tyr Asp Asp Ser Ala Gly Ala Gly Thr Cys Ser
    130                 135                 140

Tyr Val Ile Asp Thr Gly Val Asp Ala Thr His Pro Asp Phe Glu Gly
145                 150                 155                 160

Arg Ala Thr Leu Leu Arg Ser Phe Val Ser Gly Gln Asn Thr Asp Gly
                165                 170                 175

Asn Gly His Gly Thr His Val Ser Gly Thr Ile Gly Ser Arg Thr Tyr
            180                 185                 190

Gly Val Ala Lys Lys Thr Gln Ile Tyr Gly Val Lys Val Leu Asp Asn
        195                 200                 205

Ser Gly Ser Gly Ser Phe Ser Thr Val Ile Ala Gly Met Asp Tyr Val
    210                 215                 220

Ala Ser Asp Ser Gln Thr Arg Asn Cys Pro Asn Gly Ser Val Ala Asn
225                 230                 235                 240

Met Ser Leu Gly Gly Gly Tyr Thr Ala Ser Val Asn Gln Ala Ala Ala
                245                 250                 255

Arg Leu Ile Gln Ala Gly Val Phe Leu Ala Val Ala Ala Gly Asn Asp
            260                 265                 270

Gly Val Asp Ala Arg Asn Thr Ser Pro Ala Ser Glu Pro Thr Val Cys
        275                 280                 285

Thr Val Gly Ala Ser Thr Ser Ser Asp Ala Arg Ala Ser Phe Ser Asn
    290                 295                 300

Tyr Gly Ser Val Val Asp Ile Phe Ala Pro Gly Gln Asp Ile Leu Ser
```

305 310 315 320

Thr Trp Pro Asn Arg Gln Thr Asn Thr Ile Ser Gly Thr Ser Met Ala
325 330 335

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

Phe Ser Asp Pro Gln Ala Leu Cys Ala Arg Ile Gln Ser Leu Ala Asn
355 360 365

Arg Asn Leu Leu Ser Gly Ile Pro Ser Gly Thr Ile Asn Ala Ile Ala
370 375 380

Phe Asn Gly Asn Pro Ser Gly
385 390

<210> 15
<211> 387
<212> PRT
<213> Trichoderma reesei

<400> 15

Met Gly Leu Val Thr Asn Pro Phe Ala Lys Asn Ile Ile Pro Asn Arg
1 5 10 15

Tyr Ile Val Val Tyr Asn Asn Ser Phe Gly Glu Glu Ala Ile Ser Ala
20 25 30

Lys Gln Ala Gln Phe Ala Ala Lys Ile Ala Lys Arg Asn Leu Gly Lys
35 40 45

Arg Gly Leu Phe Gly Asn Glu Leu Ser Thr Ala Ile His Ser Phe Ser
50 55 60

Met His Thr Trp Arg Ala Met Ala Leu Asp Ala Asp Asp Ile Met Ile
65 70 75 80

```
Lys Asp Ile Phe Asp Ala Glu Glu Val Ala Tyr Ile Glu Ala Asp Thr
                85                  90                  95

Lys Val Gln His Ala Ala Leu Val Ala Gln Thr Asn Ala Ala Pro Gly
            100                 105                 110

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

Asp Asn Ser Ala Gly Ser Asn Ile Thr Ala Tyr Val Val Asp Thr Gly
    130                 135                 140

Ile Arg Ile Thr His Ser Glu Phe Glu Gly Arg Ala Thr Phe Gly Ala
145                 150                 155                 160

Asn Phe Val Asn Asp Asp Thr Asp Glu Asn Gly His Gly Ser His Val
                165                 170                 175

Ala Gly Thr Ile Gly Gly Ala Thr Phe Gly Val Ala Lys Asn Val Glu
            180                 185                 190

Leu Val Ala Val Lys Val Leu Asp Ala Asp Gly Ser Gly Ser Asn Ser
        195                 200                 205

Gly Val Leu Asn Gly Met Gln Phe Val Val Asn Asp Val Gln Ala Lys
    210                 215                 220

Lys Arg Ser Gly Lys Ala Val Met Asn Met Ser Leu Gly Gly Ser Phe
225                 230                 235                 240

Ser Thr Ala Val Asn Asn Ala Ile Thr Ala Leu Thr Asn Ala Gly Ile
                245                 250                 255

Val Pro Val Val Ala Ala Gly Asn Glu Asn Gln Asp Thr Ala Asn Thr
            260                 265                 270
```

```
Ser Pro Gly Ser Ala Pro Gln Ala Ile Thr Val Gly Ala Ile Asp Ala
        275                 280                 285

Thr Thr Asp Ile Arg Ala Gly Phe Ser Asn Phe Gly Thr Gly Val Asp
    290                 295                 300

Ile Tyr Ala Pro Gly Val Asp Val Leu Ser Val Gly Ile Lys Ser Asp
305                 310                 315                 320

Ile Asp Thr Ala Val Leu Ser Gly Thr Ser Met Ala Ser Pro His Val
                325                 330                 335

Ala Gly Leu Ala Ala Tyr Leu Met Ala Leu Glu Gly Val Ser Asn Val
            340                 345                 350

Asp Asp Val Ser Asn Leu Ile Lys Asn Leu Ala Ala Lys Thr Gly Ala
        355                 360                 365

Ala Val Lys Gln Asn Ile Ala Gly Thr Thr Ser Leu Ile Ala Asn Asn
    370                 375                 380

Gly Asn Phe
385
```

<210> 16
<211> 409
<212> PRT
<213> Trichoderma reesei

<400> 16

```
Met Ala Ser Leu Arg Arg Leu Ala Leu Tyr Leu Gly Ala Leu Leu Pro
1               5                   10                  15

Ala Val Leu Ala Ala Pro Ala Val Asn Tyr Lys Leu Pro Glu Ala Val
            20                  25                  30
```

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

Asp Ser His Leu Thr Trp Val Lys Asp Leu His Arg Arg Ser Leu Gly
    50                  55                  60

Lys Arg Ser Thr Ala Gly Val Glu Lys Thr Tyr Asn Ile Asp Ser Trp
65                  70                  75                  80

Asn Ala Tyr Ala Gly Glu Phe Asp Glu Glu Thr Val Lys Gln Ile Lys
                85                  90                  95

Ala Asn Pro Asp Val Ala Ser Val Glu Pro Asp Tyr Ile Met Trp Leu
            100                 105                 110

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

Pro Trp Gly Leu Gly Thr Val Ser His Arg Thr Pro Gly Ser Thr Ser
    130                 135                 140

Tyr Ile Tyr Asp Thr Ser Ala Gly Ser Gly Thr Phe Ala Tyr Val Val
145                 150                 155                 160

Asp Ser Gly Ile Asn Ile Ala His Gln Gln Phe Gly Gly Arg Ala Ser
                165                 170                 175

Leu Gly Tyr Asn Ala Ala Gly Gly Asp His Val Asp Thr Leu Gly His
            180                 185                 190

Gly Thr His Val Ser Gly Thr Ile Gly Gly Ser Thr Tyr Gly Val Ala
        195                 200                 205

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

```
Ser Thr Ser Val Ile Leu Asp Gly Tyr Asn Trp Ala Val Asn Asp Ile
225                 230                 235                 240


Val Ser Arg Asn Arg Ala Ser Lys Ser Ala Ile Asn Met Ser Leu Gly
                245                 250                 255


Gly Pro Ala Ser Ser Thr Trp Ala Thr Ala Ile Asn Ala Ala Phe Asn
            260                 265                 270


Lys Gly Val Leu Thr Ile Val Ala Ala Gly Asn Gly Asp Ala Leu Gly
        275                 280                 285


Asn Pro Gln Pro Val Ser Ser Thr Ser Pro Ala Asn Val Pro Asn Ala
    290                 295                 300


Ile Thr Val Ala Ala Leu Asp Ile Asn Trp Arg Thr Ala Ser Phe Thr
305                 310                 315                 320


Asn Tyr Gly Ala Gly Val Asp Val Phe Ala Pro Gly Val Asn Ile Leu
                325                 330                 335


Ser Ser Trp Ile Gly Ser Asn Thr Ala Thr Asn Thr Ile Ser Gly Thr
            340                 345                 350


Ser Met Ala Thr Pro His Val Val Gly Leu Ala Leu Tyr Leu Gln Ala
        355                 360                 365


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


Leu Ala Thr Thr Gly Arg Val Thr Gly Ser Leu Asn Gly Ser Pro Asn
385                 390                 395                 400


Thr Leu Ile Phe Asn Gly Asn Ser Ala
                405
```

<210> 17
<211> 555
<212> PRT
<213> Trichoderma reesei

<400> 17

```
Met Arg Ala Cys Leu Leu Phe Leu Gly Ile Thr Ala Leu Ala Thr Ala
1               5                   10                  15


Ile Pro Ala Leu Lys Pro Pro His Gly Ser Pro Asp Arg Ala His Thr
            20                  25                  30


Thr Gln Leu Ala Lys Val Ser Ile Ala Leu Gln Pro Glu Cys Arg Glu
        35                  40                  45


Leu Leu Glu Gln Ala Leu His His Leu Ser Asp Pro Ser Ser Pro Arg
    50                  55                  60


Tyr Gly Arg Tyr Leu Gly Arg Glu Glu Ala Lys Ala Leu Leu Arg Pro
65                  70                  75                  80


Arg Arg Glu Ala Thr Ala Ala Val Lys Arg Trp Leu Ala Arg Ala Gly
                85                  90                  95


Val Pro Ala His Asp Val Leu Thr Asp Gly Gln Phe Ile His Val Arg
            100                 105                 110


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


Thr Leu Gly Ser Gln Thr Ile Ala Ile Ser Thr Leu Pro Gly Lys Ile
    130                 135                 140


Arg Lys His Val Met Thr Val Gln Tyr Val Pro Leu Trp Thr Glu Ala
145                 150                 155                 160
```

```
Asp Trp Glu Glu Cys Lys Thr Ile Ile Thr Pro Ser Cys Leu Lys Arg
                165                 170                 175

Leu Tyr His Val Asp Ser Tyr Arg Ala Lys Tyr Glu Ser Ser Ser Leu
            180                 185                 190

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

Asp Lys Phe Leu His Asp Phe Ala Pro Tyr Ser Thr Asn Ala Asn Phe
    210                 215                 220

Ser Ile Glu Ser Val Asn Gly Gly Gln Ser Pro Gln Gly Met Asn Glu
225                 230                 235                 240

Pro Ala Ser Glu Ala Asn Gly Asp Val Gln Tyr Ala Val Ala Met Gly
                245                 250                 255

Tyr His Val Pro Val Arg Tyr Tyr Ala Val Gly Gly Glu Asn His Asp
            260                 265                 270

Ile Ile Pro Asp Leu Asp Leu Val Asp Thr Thr Glu Glu Tyr Leu Glu
        275                 280                 285

Pro Phe Leu Glu Phe Ala Ser His Leu Leu Asp Leu Asp Asp Asp Glu
    290                 295                 300

Leu Pro Arg Val Val Ser Ile Ser Tyr Gly Ala Asn Glu Gln Leu Phe
305                 310                 315                 320

Pro Arg Ser Tyr Ala His Gln Val Cys Asp Met Phe Gly Gln Leu Gly
                325                 330                 335

Ala Arg Gly Val Ser Ile Val Val Ala Ala Gly Asp Leu Gly Pro Gly
            340                 345                 350
```

```
Val Ser Cys Gln Ser Asn Asp Gly Ser Ala Arg Pro Lys Phe Ile Pro
        355                 360                 365

Ser Phe Pro Ala Thr Cys Pro Tyr Val Thr Ser Val Gly Ser Thr Arg
    370                 375                 380

Gly Ile Met Pro Glu Val Ala Ala Ser Phe Ser Ser Gly Gly Phe Ser
385                 390                 395                 400

Asp Tyr Phe Ala Arg Pro Ala Trp Gln Asp Arg Ala Val Gly Ala Tyr
                405                 410                 415

Leu Gly Ala His Gly Glu Glu Trp Glu Gly Phe Tyr Asn Pro Ala Gly
            420                 425                 430

Arg Gly Phe Pro Asp Val Ala Ala Gln Gly Val Asn Phe Arg Phe Arg
        435                 440                 445

Ala His Gly Asn Glu Ser Leu Ser Ser Gly Thr Ser Leu Ser Ser Pro
    450                 455                 460

Val Phe Ala Ala Leu Ile Ala Leu Leu Asn Asp His Arg Ser Lys Ser
465                 470                 475                 480

Gly Met Pro Pro Met Gly Phe Leu Asn Pro Trp Ile Tyr Thr Val Gly
                485                 490                 495

Ser His Ala Phe Thr Asp Ile Ile Glu Ala Arg Ser Glu Gly Cys Pro
            500                 505                 510

Gly Gln Ser Val Glu Tyr Leu Ala Ser Pro Tyr Ile Pro Asn Ala Gly
        515                 520                 525

Trp Ser Ala Val Pro Gly Trp Asp Pro Val Thr Gly Trp Gly Thr Pro
    530                 535                 540
```

Leu Phe Asp Arg Met Leu Asn Leu Ser Leu Val
545 550 555

<210> 18
<211> 388
<212> PRT
<213> Trichoderma reesei

<400> 18

Met Ala Trp Leu Lys Lys Leu Ala Leu Val Leu Leu Ala Ile Val Pro
1 5 10 15

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

Ser Leu Glu Asp Leu Glu Ser Glu Asp Lys Tyr Val Ile Gly Leu Lys
35 40 45

Gln Gly Leu Ser Pro Thr Asp Leu Lys Lys His Leu Leu Arg Val Ser
50 55 60

Ala Val Gln Tyr Arg Asn Lys Asn Ser Thr Phe Glu Gly Gly Thr Gly
65 70 75 80

Val Lys Arg Thr Tyr Ala Ile Gly Asp Tyr Arg Ala Tyr Thr Ala Val
85 90 95

Leu Asp Arg Asp Thr Val Arg Glu Ile Trp Asn Asp Thr Leu Glu Lys
100 105 110

Pro Pro Trp Gly Leu Ala Thr Leu Ser Asn Lys Lys Pro His Gly Phe
115 120 125

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

Leu Asp Thr Gly Ile Asn Ser Lys His Val Asp Phe Glu Gly Arg Ala

```
145                 150                 155                 160

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

His Gly Thr His Val Ala Gly Ile Ile Gly Gly Lys Thr Phe Gly Val
            180                 185                 190

Ala Lys Lys Thr Gln Leu Ile Gly Val Lys Val Phe Leu Asp Asp Glu
        195                 200                 205

Ala Thr Thr Ser Thr Leu Met Glu Gly Leu Glu Trp Ala Val Asn Asp
    210                 215                 220

Ile Thr Thr Lys Gly Arg Gln Gly Arg Ser Val Ile Asn Met Ser Leu
225                 230                 235                 240

Gly Gly Pro Tyr Ser Gln Ala Leu Asn Asp Ala Ile Asp His Ile Ala
                245                 250                 255

Asp Met Gly Ile Leu Pro Val Ala Ala Ala Gly Asn Lys Gly Ile Pro
            260                 265                 270

Ala Thr Phe Ile Ser Pro Ala Ser Ala Asp Lys Ala Met Thr Val Gly
        275                 280                 285

Ala Ile Asn Ser Asp Trp Gln Glu Thr Asn Phe Ser Asn Phe Gly Pro
    290                 295                 300

Gln Val Asn Ile Leu Ala Pro Gly Glu Asp Val Leu Ser Ala Tyr Val
305                 310                 315                 320

Ser Thr Asn Thr Ala Thr Arg Val Leu Ser Gly Thr Ser Met Ala Ala
                325                 330                 335

Pro His Val Ala Gly Leu Ala Leu Tyr Leu Met Ala Leu Glu Glu Phe
```

340 345 350

Asp Ser Thr Gln Lys Leu Thr Asp Arg Ile Leu Gln Leu Gly Met Lys
355 360 365

Asn Lys Val Val Asn Leu Met Thr Asp Ser Pro Asn Leu Ile Ile His
370 375 380

Asn Asn Val Lys
385

<210> 19
<211> 256
<212> PRT
<213> Trichoderma reesei

<400> 19

Met Phe Ile Ala Gly Val Ala Leu Ser Ala Leu Leu Cys Ala Asp Thr
1 5 10 15

Val Leu Ala Gly Val Ala Gln Asp Arg Gly Leu Ala Ala Arg Leu Ala
20 25 30

Arg Arg Ala Gly Arg Arg Ser Ala Pro Phe Arg Asn Asp Thr Ser His
35 40 45

Ala Thr Val Gln Ser Asn Trp Gly Gly Ala Ile Leu Glu Gly Ser Gly
50 55 60

Phe Thr Ala Ala Ser Ala Thr Val Asn Val Pro Arg Gly Gly Gly Gly
65 70 75 80

Ser Asn Ala Ala Gly Ser Ala Trp Val Gly Ile Asp Gly Ala Ser Cys
85 90 95

Gln Thr Ala Ile Leu Gln Thr Gly Phe Asp Trp Tyr Gly Asp Gly Thr
100 105 110

```
Tyr Asp Ala Trp Tyr Glu Trp Tyr Pro Glu Phe Ala Ala Asp Phe Ser
        115                 120                 125


Gly Ile Asp Ile Arg Gln Gly Asp Gln Ile Ala Met Ser Val Val Ala
    130                 135                 140


Thr Ser Leu Thr Gly Gly Ser Ala Thr Leu Glu Asn Leu Ser Thr Gly
145                 150                 155                 160


Gln Lys Val Thr Gln Asn Phe Asn Arg Val Thr Ala Gly Ser Leu Cys
                165                 170                 175


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


Asn Gly Ser Asn Cys Gln Pro Val Pro Phe Ala Ser Phe Ser Pro Ala
        195                 200                 205


Ile Thr Phe Ser Ser Ala Thr Ala Thr Arg Ser Gly Arg Ser Val Ser
    210                 215                 220


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


Thr Arg Cys Ser Val Ser Gly Ser Ser Thr Leu Thr Cys Ser Tyr Val
                245                 250                 255


<210>  20
<211>  236
<212>  PRT
<213>  Trichoderma reesei

<400>  20

Met Asp Ala Ile Arg Ala Arg Ser Ala Ala Arg Arg Ser Asn Arg Phe
1               5                   10                  15
```

```
Gln Ala Gly Ser Ser Lys Asn Val Asn Gly Thr Ala Asp Val Glu Ser
            20                  25                  30

Thr Asn Trp Ala Gly Ala Ala Ile Thr Thr Ser Gly Val Thr Glu Val
        35                  40                  45

Ser Gly Thr Phe Thr Val Pro Arg Pro Ser Val Pro Ala Gly Gly Ser
    50                  55                  60

Ser Arg Glu Glu Tyr Cys Gly Ala Ala Trp Val Gly Ile Asp Gly Tyr
65                  70                  75                  80

Ser Asp Ala Asp Leu Ile Gln Thr Gly Val Leu Trp Cys Val Glu Asp
                85                  90                  95

Gly Glu Tyr Leu Tyr Glu Ala Trp Tyr Glu Tyr Leu Pro Ala Ala Leu
            100                 105                 110

Val Glu Tyr Ser Gly Ile Ser Val Thr Ala Gly Ser Val Val Thr Val
        115                 120                 125

Thr Ala Thr Lys Thr Gly Thr Asn Ser Gly Val Thr Thr Leu Thr Ser
    130                 135                 140

Gly Gly Lys Thr Val Ser His Thr Phe Ser Arg Gln Asn Ser Pro Leu
145                 150                 155                 160

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

Ser Leu Val Pro Phe Ala Asp Phe Gly Ser Val Thr Phe Thr Gly Ala
            180                 185                 190

Thr Ala Val Val Asn Gly Ala Thr Val Thr Ala Gly Gly Asp Ser Pro
        195                 200                 205
```

```
Val Ile Ile Asp Leu Glu Asp Ser Arg Gly Asp Ile Leu Thr Ser Thr
    210                 215                 220


Thr Val Ser Gly Ser Thr Val Thr Val Glu Tyr Glu
225                 230                 235


<210>  21
<211>  513
<212>  PRT
<213>  Trichoderma reesei

<400>  21

Met Ala Val Leu Ser Arg Leu Ala Leu Thr Ala Ser Phe Ala Leu Cys
1               5                   10                  15


Gly Val Ser Ala Ala Gly Ile Gln Gln Pro Leu Thr Ala Pro Glu Ser
            20                  25                  30


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


Ile Asp Ser Glu Ala Leu Gln Ser Ala Ile Ser Ile Asp Thr Leu Val
    50                  55                  60


Lys Arg Ala Glu Ser Phe Tyr Lys Phe Ala Lys Ala Ser Glu Glu Glu
65                  70                  75                  80


Tyr Gly His Pro Thr Arg Val Ile Gly Ser Ala Gly His Glu Gln Thr
                85                  90                  95


Leu Asn Tyr Ile Thr Asn Thr Leu Leu Asp His Gly Asp Tyr Tyr Asn
            100                 105                 110


Val Ser Val Gln Glu Phe Pro Val Thr Leu Ser Asn Val Phe Gln Phe
        115                 120                 125
```

```
Arg Leu Val Leu Ala Asp Glu Val Ser Lys Ser Ala Ile Pro Met Gly
    130                 135                 140

Leu Thr Pro Pro Thr Lys Asp Lys Glu Pro Val His Gly Asp Leu Val
145                 150                 155                 160

Leu Val Gln Asn Ser Gly Cys Asp Ala Ser Asp Tyr Pro Gln Asn Val
                165                 170                 175

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

Lys Ser Ile Gly Ala Gly Lys Ala Gly Ala Lys Ala Ala Val Ile Tyr
        195                 200                 205

Asn Thr Asp Pro Glu Glu Leu His Gly Thr Leu Gly Leu Pro Val Glu
    210                 215                 220

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

Leu Ala Lys Leu Ser Asn Gly Glu Ser Val Asp Ala Ile Ala Tyr Ile
                245                 250                 255

Asp Ala Glu Val Lys Gln Ile Gln Thr Val Asn Val Leu Ala Gln Thr
            260                 265                 270

Glu Glu Gly Asp Pro Asp Asn Cys Val Met Leu Gly Gly His Ser Asp
        275                 280                 285

Gly Val Ala Glu Gly Pro Gly Ile Asn Asp Asp Gly Ser Gly Ser Ile
    290                 295                 300

Ser Val Leu Glu Val Ala Val Gln Leu Thr Lys Phe Lys Val Asn Asn
305                 310                 315                 320
```

```
Cys Val Arg Phe Ala Trp Trp Ala Ala Glu Glu Glu Gly Leu Leu Gly
                325                 330                 335

Ser Asp Phe Tyr Ala Ala Ser Leu Ser Asp Glu Glu Asn Gln Lys Ile
            340                 345                 350

Arg Leu Phe Met Asp Tyr Asp Met Met Ala Ser Pro Asn Phe Ala Tyr
        355                 360                 365

Gln Ile Tyr Asn Ala Thr Asn Ala Glu Ser Pro Ala Gly Ser Glu Glu
    370                 375                 380

Leu Arg Asn Leu Tyr Val Asp Trp Tyr Lys Ser Gln Gly Leu Asn Tyr
385                 390                 395                 400

Thr Phe Ile Pro Phe Asp Gly Arg Ser Asp Tyr Asp Gly Phe Ile Arg
                405                 410                 415

Ala Gly Ile Pro Ala Gly Gly Ile Ala Thr Gly Ala Glu Ala Val Lys
            420                 425                 430

Thr Lys Glu Glu Ala Glu Met Phe Gly Gly Arg Ala Gly Glu Trp Leu
        435                 440                 445

Asp Pro Cys Tyr His Gln Leu Cys Asp Asp Leu Gly Asn Leu Asn His
    450                 455                 460

Thr Ala Trp Glu Val Asn Thr Lys Leu Ile Ala His Ser Val Ala Thr
465                 470                 475                 480

Tyr Ala Leu Ser Phe Asp Gly Phe Pro Lys Arg Lys Leu Glu Thr Glu
                485                 490                 495

Met Ser Ala Tyr Ser Gln Thr Thr Lys His His Gly Pro Lys Leu Ile
            500                 505                 510
```

Leu

<210> 22
<211> 515
<212> PRT
<213> Trichoderma virens

<400> 22

```
Met Ala Val Leu Ser Lys Leu Ala Leu Ala Ala Ser Phe Ala Leu Cys
1               5                   10                  15


Gly Val Ser Ala Ala Gly Ile Gln Gln Gln Pro Leu Thr Ala Pro Ser
            20                  25                  30


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


Leu Ile Asp Ser Glu Ala Leu Gln Asn Ala Ile Ser Ile Asp Ala Leu
    50                  55                  60


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


Glu Tyr Gly His Pro Thr Arg Val Ile Gly Ser Ser Gly His Glu Glu
                85                  90                  95


Thr Leu Asn Tyr Ile Ala Asn Thr Leu Leu Asp Leu Gly Asp Tyr Tyr
            100                 105                 110


Asn Val Ser Val Gln Glu Phe Pro Val Thr Leu Ser Asn Val Phe Gln
        115                 120                 125


Phe Arg Leu Val Leu Ala Asp Glu Val Ser Lys Ser Ala Ile Pro Met
    130                 135                 140


Gly Leu Thr Pro Pro Thr Lys Asp Lys Glu Pro Val His Gly Asp Leu
```

```
145                 150                 155                 160

Val Leu Val Lys Asn Ser Gly Cys Asn Ala Ser Asp Tyr Pro Lys Asn
                165                 170                 175

Val Lys Gly Asn Ile Ala Phe Ile Arg Arg Gly Glu Cys Ala Phe Gly
            180                 185                 190

Asp Lys Ser Ile Gly Ala Gly Lys Ala Gly Ala Lys Ala Ala Val Ile
        195                 200                 205

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

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

Ile Ala Asp Lys Leu Ala Asp Gly Glu Ser Leu Asp Ala Ile Ala Tyr
                245                 250                 255

Ile Asp Ala Glu Val Lys Gln Ile Gln Thr Val Asn Val Leu Ala Gln
            260                 265                 270

Thr Glu Gln Gly Asp Pro Asp Asn Cys Val Met Leu Gly Gly His Ser
        275                 280                 285

Asp Gly Val Ala Glu Gly Pro Gly Ile Asn Asp Asp Gly Ser Gly Ser
    290                 295                 300

Met Ser Val Leu Glu Val Ala Val Gln Leu Thr Lys Phe Lys Val Asn
305                 310                 315                 320

Asn Cys Val Arg Phe Ala Trp Trp Ala Ala Glu Glu Glu Gly Leu Leu
                325                 330                 335

Gly Ser Asp Phe Tyr Ala Glu Asn Leu Ser Glu Glu Glu Asn Gln Lys
```

```
            340                 345                 350

Ile Arg Leu Phe Met Asp Tyr Asp Met Met Ala Ser Pro Asn Phe Ala
        355                 360                 365

Tyr Gln Ile Tyr Asn Ala Thr Asn Ala Glu Ser Pro Ala Gly Ser Glu
    370                 375                 380

Glu Leu Arg Asn Leu Tyr Val Asp Trp Tyr Lys Ser Gln Gly Leu Asn
385                 390                 395                 400

Tyr Thr Phe Ile Pro Phe Asp Gly Arg Ser Asp Tyr Asp Gly Phe Ile
                405                 410                 415

Arg Ala Gly Ile Pro Ala Gly Gly Ile Ala Thr Gly Ala Glu Ala Val
            420                 425                 430

Lys Thr Lys Glu Glu Glu Glu Met Phe Gly Gly His Ala Gly Gln Trp
        435                 440                 445

Leu Asp Pro Cys Tyr His Gln Leu Cys Asp Asp Leu Gly Asn Leu Asn
    450                 455                 460

His Thr Ala Trp Glu Val Asn Thr Lys Leu Ile Ala His Ser Val Ala
465                 470                 475                 480

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

Glu Thr Ile Ser Ala Tyr Gly Gln Thr Met Lys His His Gly Pro Lys
            500                 505                 510

Leu Ile Leu
        515
```

<210> 23

<211> 511
<212> PRT
<213> Trichoderma atroviride

<400> 23

```
Met Ala Val Leu Ser Arg Leu Ala Leu Thr Ala Ser Phe Ala Leu Ser
1               5                   10                  15


Ala Ser Ala Ala Gly Leu Gly Gly Ser Trp Gln Gln Ser Pro Leu Thr
            20                  25                  30


Ser Pro Ser Ser Leu Ser Ser Ser Gln Gly Ser Lys Pro Leu Ile Ser
        35                  40                  45


Thr Glu Ala Leu Gln Glu Ala Ile Ser Ile Asp Ala Leu Val Glu Arg
    50                  55                  60


Ala Gln Lys Phe Tyr Lys Phe Ala Gln Thr Ser Glu Glu Asp Tyr Gly
65                  70                  75                  80


His Pro Thr Arg Val Ile Gly Ser Thr Gly His Glu Arg Thr Leu Asn
                85                  90                  95


Tyr Ile Val Asn Thr Leu Leu Asp Gln Gly Asp Tyr Tyr Thr Ile Ser
            100                 105                 110


Thr Gln Glu Phe Pro Val Thr Leu Ser Asn Val Phe Glu Ser Gln Leu
        115                 120                 125


Val Leu Gly Ser Ser Val Ser Lys Ser Ala Val Pro Met Gly Leu Thr
    130                 135                 140


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


Asn Asn Asp Gly Cys His Asp Ser Asp Tyr Pro Lys Asn Val Lys Gly
                165                 170                 175
```

```
Asn Ile Ala Phe Ile Arg Arg Gly Ala Cys Ala Phe Gly Asp Lys Ser
            180                 185                 190

Ile Gly Ala Gly Lys Ala Gly Ala Lys Ala Ala Val Ile Tyr Asn Thr
        195                 200                 205

Asp Pro Glu Glu Leu His Gly Thr Leu Gly Glu Pro Thr Lys Tyr His
    210                 215                 220

Val Ala Thr Phe Gly Ile Asp Gly Thr Glu Gly Asn Ala Val Ala Glu
225                 230                 235                 240

Lys Leu Ala Lys Gly Glu Ser Val Ser Ala Ile Ala Tyr Ile Asp Ala
                245                 250                 255

Glu Val Lys Gln Ile Gln Thr Val Asn Val Leu Ala Gln Thr Asp Glu
            260                 265                 270

Gly Asp Pro Asp Asn Cys Val Met Leu Gly Gly His Ser Asp Gly Val
        275                 280                 285

Ala Glu Gly Pro Gly Ile Asn Asp Asp Gly Ser Gly Ser Met Ser Val
    290                 295                 300

Leu Glu Val Ala Val Gln Leu Ala Lys Phe Lys Val Asn Asn Cys Val
305                 310                 315                 320

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

Phe Tyr Ala Ala Ser Leu Ser Glu Glu Glu Asn Gln Lys Ile Arg Leu
            340                 345                 350

Phe Met Asp Tyr Asp Met Met Ala Ser Pro Asn Phe Ala Tyr Gln Ile
        355                 360                 365
```

```
Tyr Asn Ala Thr Asn Ala Tyr Asn Pro Ala Gly Ser Glu Glu Leu Arg
    370                 375                 380

Asp Leu Tyr Val Asp Trp Tyr Lys Ser Gln Gly Leu Asn Tyr Thr Phe
385                 390                 395                 400

Ile Pro Phe Asp Gly Arg Ser Asp Tyr Asp Gly Phe Ile Arg Ala Gly
                405                 410                 415

Ile Pro Ala Gly Gly Ile Ala Thr Gly Ala Glu Ala Val Lys Thr Lys
            420                 425                 430

Glu Glu Glu Glu Met Phe Gly Gly His Ala Gly Gln Trp Leu Asp Pro
        435                 440                 445

Cys Tyr His Gln Ile Cys Asp Asp Leu Gly Asn Leu Asn His Thr Ala
    450                 455                 460

Trp Glu Val Asn Thr Lys Leu Ile Ala His Ser Val Ala Thr Tyr Ala
465                 470                 475                 480

Leu Ser Phe Asp Gly Phe Pro Lys Arg Glu Gln Glu Thr Lys Ile Ser
                485                 490                 495

Ser Tyr Ser Glu Thr Ile Lys Gln His Gly Pro Lys Leu Ile Met
            500                 505                 510
```

<210> 24
<211> 510
<212> PRT
<213> Fusarium graminicola

<400> 24

```
Met Thr Thr Lys Ser Phe Cys Leu Val Ala Ala Thr Ala Ala Leu Ser
1               5                   10                  15
```

```
Gly Val Ser Ala Leu Gln Ile Pro Leu Asn Leu Gln Val Pro Lys Leu
            20                  25                  30

Ser Trp Ser Pro Phe Ser Asp Asp Leu Pro Leu Val Asp Thr Lys Glu
        35                  40                  45

Leu Gln Lys Ser Ile Lys Pro Glu Asn Leu Glu Ala Arg Ala Lys Asp
    50                  55                  60

Leu Tyr Glu Ile Ala Lys Asn Gly Glu Glu Glu Tyr Gly His Pro Thr
65                  70                  75                  80

Arg Val Ile Gly Ser Glu Gly His Leu Gly Thr Leu Ser Tyr Ile His
                85                  90                  95

Ala Glu Leu Ala Lys Leu Gly Gly Tyr Tyr Thr Val Ser Asn Gln Gln
            100                 105                 110

Phe Pro Ala Val Ser Gly Asn Val Phe Glu Ser Arg Leu Val Leu Gly
        115                 120                 125

Asn Asp Val Pro Lys Glu Ala Ala Pro Met Gly Leu Thr Pro Pro Thr
    130                 135                 140

Lys Asn Lys Glu Pro Val Tyr Gly Lys Leu Val Leu Val Asp Asn Glu
145                 150                 155                 160

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

Leu Val Leu Arg Gly Thr Cys Pro Phe Gly Thr Lys Ser Gly Asn Ala
            180                 185                 190

Gly Lys Ala Gly Ala Val Ala Ala Val Val Tyr Asn Tyr Glu Lys Gly
        195                 200                 205
```

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

Phe Gly Leu Gly Gly Asp Glu Gly Lys Ala Val Val Lys Lys Ile Lys
225                 230                 235                 240

Asp Gly Glu Glu Val Asp Ala Ile Ala Tyr Ile Asp Ala Glu Val Lys
                245                 250                 255

Thr Ile Ser Thr Thr Asn Ile Ile Ala Gln Thr Arg Gly Gly Asp Pro
            260                 265                 270

Asp Asn Cys Val Met Leu Gly Gly His Ser Asp Ser Val Ala Glu Gly
        275                 280                 285

Pro Gly Ile Asn Asp Asp Gly Ser Gly Ser Ile Ser Val Leu Glu Val
    290                 295                 300

Ala Val Gln Leu Thr Lys Tyr Arg Val Asn Asn Cys Val Arg Phe Ala
305                 310                 315                 320

Trp Trp Ala Ala Glu Glu Glu Gly Leu Leu Gly Ser Asp His Tyr Val
                325                 330                 335

Ser Val Leu Ser Asp Glu Glu Asn Gln Lys Ile Arg Leu Phe Met Asp
            340                 345                 350

Tyr Asp Met Met Ala Ser Pro Asn Phe Ala Tyr Gln Ile Tyr Asn Ala
        355                 360                 365

Thr Asn Ala Ala Asn Pro Lys Gly Ser Glu Glu Leu Arg Asn Leu Tyr
    370                 375                 380

Val Asp Trp Tyr Glu Glu Gln Gly Leu Asn Tyr Thr Phe Ile Pro Phe
385                 390                 395                 400
```

```
Asp Gly Arg Ser Asp Tyr Asp Gly Phe Ile Arg Gly Gly Ile Pro Ala
                405                 410                 415


Gly Gly Ile Ala Thr Gly Ala Glu Gly Val Lys Thr Glu Glu Glu Val
            420                 425                 430


Ala Met Phe Gly Gly Glu Ala Gly Val Trp Tyr Asp Lys Asn Tyr His
        435                 440                 445


Gln Ile Gly Asp Asp Leu Thr Asn Val Asn Tyr Thr Ala Trp Glu Val
    450                 455                 460


Asn Thr Lys Leu Ile Ala His Ser Val Ala Thr Tyr Ala Lys Ser Phe
465                 470                 475                 480


Lys Gly Phe Pro Glu Arg Ser Ser Glu Ala Val Val Gln Ser Glu Thr
                485                 490                 495


Tyr Ser Asp Lys Thr Lys Tyr His Gly Ser Lys Leu Phe Leu
            500                 505                 510


<210>  25
<211>  502
<212>  PRT
<213>  Aspergillus nidulans

<400>  25

Met Arg Pro Ala Ala Val Ser Leu Gly Leu Ile Gly Gly Ile Ser Ala
1               5                   10                  15


Leu Gly Ile Pro Leu Pro Glu Thr Leu Glu Gln Leu Pro Leu Ser Asp
            20                  25                  30


Ala Gln Lys Pro Leu Val Ser Ser Glu Gly Leu Gln Ala Gln Ile His
        35                  40                  45
```

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

Arg Gly Ile Asp Glu Tyr Asn His Pro Thr Arg Val Ile Gly Ser Lys
65                  70                  75                  80

Gly His Trp Gly Thr Leu Asp Tyr Ile Tyr Ser Thr Ile Met Glu Leu
                85                  90                  95

Gly Asp Tyr Tyr Asp Val Thr Asn Gln Ser Phe Pro Ala Val Ser Gly
            100                 105                 110

Asn Val Phe Glu Ser Arg Leu Val Leu Gly His Glu Val Pro Ala Ser
        115                 120                 125

Ala Arg Pro Met Gly Leu Thr Pro Pro Thr Lys Asn Arg Glu Pro Val
    130                 135                 140

Tyr Gly Ser Leu Ile Leu Val Ser Asn Glu Gly Cys Asp Lys Ala Asp
145                 150                 155                 160

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

Cys Pro Phe Gly Thr Lys Ser Glu Leu Ala Gly Lys Ala Gly Ala Val
            180                 185                 190

Ala Ala Val Val Tyr Asn Asn Glu His Gly Glu Val Ser Gly Thr Leu
        195                 200                 205

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

Asp Ala Ala Pro Tyr Val Gln Gln Leu Lys Glu Gly Lys Lys Val Asp
225                 230                 235                 240
```

```
Ser Ile Ala Tyr Ile Asp Ala Thr Val Asp Thr Ile Tyr Thr Thr Asn
               245                 250                 255

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

Gly Gly His Ser Asp Ser Val Ala Glu Gly Pro Gly Ile Asn Asp Asp
        275                 280                 285

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

Tyr Asp Val Asn Asn Cys Val Arg Phe Ala Trp Trp Ala Ala Glu Glu
305                 310                 315                 320

Glu Gly Leu Leu Gly Ser Asp Tyr Tyr Val Ser Val Leu Ser Glu Glu
               325                 330                 335

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

Pro Asn Phe Ala Tyr Gln Val Tyr Asn Ala Thr Asn Glu Val Asn Pro
        355                 360                 365

Val Gly Ser Glu Glu Leu Arg Asp Leu Tyr Thr Glu Phe Tyr Thr Ser
    370                 375                 380

His Gly Leu Asn Phe Thr Tyr Ile Pro Phe Asp Gly Arg Ser Asp Tyr
385                 390                 395                 400

Asp Gly Phe Ile Arg Asn Gly Ile Pro Gly Gly Gly Ile Ala Thr Gly
               405                 410                 415

Ala Glu Gly Val Lys Thr Asp Glu Glu Gln Glu Met Phe Gly Gly Ile
            420                 425                 430
```

```
Ala Gly Asn Trp Tyr Asp Pro Cys Tyr His Gln Leu Cys Asp Asp Leu
        435                 440                 445


Gly Asn Val Asn Ala Thr Ala Trp Glu Val Asn Ser Lys Leu Val Ala
    450                 455                 460


His Thr Val Ala Thr Tyr Ala Val Ser Phe Glu Gly Phe Pro Lys Arg
465                 470                 475                 480


Thr Thr Thr Asn Val Lys Ser Val Asp Leu Glu Lys Arg Lys Tyr His
                485                 490                 495


Gly Pro Lys Leu Leu Met
            500
```

<210> 26
<211> 508
<212> PRT
<213> Aspergillus niger

<400> 26

```
Met Arg Ile Asp Ser Ala Ala Leu His Leu Val Pro Val Leu Leu Gly
1               5                   10                  15


Gln Val Gly Ala Leu Gln Leu Pro Leu Val Gln Asp Ser Asn Ser Gln
            20                  25                  30


Trp Gln Lys Pro Asn Ala Gly Asp Lys Pro Leu Ile Ser Ser Pro Leu
        35                  40                  45


Leu Gln Glu Gln Val Lys Ala Glu Asn Leu Leu Asp Arg Ala Arg Gln
    50                  55                  60


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


Arg Val Ile Gly Ser Lys Gly His Leu Gly Thr Leu Asp Tyr Ile Tyr
```

```
                85                  90                  95

Ser Thr Leu Thr Asp Leu Gly Asp Tyr Tyr Thr Val Val Asn Gln Ser
            100                 105                 110

Phe Pro Ala Val Ser Gly Asn Val Phe Glu Ser Arg Leu Val Leu Gly
        115                 120                 125

His Asp Val Pro Lys Ser Ala Thr Pro Met Gly Leu Thr Pro Pro Thr
    130                 135                 140

Arg Asn Lys Glu Pro Val Tyr Gly Ser Leu Val Ala Val Ser Asn Leu
145                 150                 155                 160

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

Phe Ile Ser Arg Gly Ser Cys Pro Phe Gly Thr Lys Ser Gln Leu Ala
            180                 185                 190

Gly Lys Ala Gly Ala Val Ala Ala Val Ile Tyr Asn Asn Glu Arg Gly
        195                 200                 205

Asp Leu Ser Gly Thr Leu Gly Asn Pro Thr Pro Asp His Val Ala Thr
    210                 215                 220

Phe Gly Ile Ser Asp Glu Asp Ala Ala Pro Val Leu Glu Lys Leu Asn
225                 230                 235                 240

Lys Gly Glu Lys Val Asp Ala Ile Ala Tyr Val Asp Ala Ile Val Glu
                245                 250                 255

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

Asn Asn Cys Val Met Leu Gly Gly His Ser Asp Ser Val Ala Glu Gly
```

```
        275                 280                 285

Pro Gly Ile Asn Asp Asp Gly Ser Gly Thr Leu Thr Leu Leu Glu Leu
    290                 295                 300

Ala Thr Leu Leu Thr Gln Phe Arg Val Asn Asn Cys Val Arg Phe Ala
305                 310                 315                 320

Trp Trp Ala Ala Glu Glu Glu Gly Leu Leu Gly Ser Asp Tyr Tyr Val
                325                 330                 335

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

Tyr Asp Met Leu Gly Ser Pro Asn Phe Ala Tyr Gln Val Tyr Asn Ala
        355                 360                 365

Thr Asn Ala Val Asn Pro Glu Gly Ser Glu Glu Leu Arg Asp Leu Tyr
    370                 375                 380

Thr Asp Phe Tyr Glu Asp His Gly Phe Asn Tyr Thr Tyr Ile Pro Phe
385                 390                 395                 400

Asp Gly Arg Ser Asp Tyr Asp Ala Phe Ile Arg His Gly Ile Pro Gly
                405                 410                 415

Gly Gly Ile Ala Thr Gly Ala Glu Gly Ile Lys Thr Val Glu Glu Ala
            420                 425                 430

Asp Met Phe Gly Gly Val Ala Gly Gln Trp Tyr Asp Pro Cys Tyr His
        435                 440                 445

Gln Ile Cys Asp Thr Val Ala Asn Val Asn Leu Thr Ala Trp Glu Trp
    450                 455                 460

Asn Thr Lys Leu Val Ala His Ser Ile Ala Thr Tyr Ala Lys Ser Phe
```

465 470 475 480

Asp Gly Phe Pro Glu Arg Ser Asp Glu Pro Ile Ser Pro Ala Ala Phe
485 490 495

Glu Glu Pro Lys Tyr His Gly His Ala Leu Gln Leu
500 505

<210> 27
<211> 503
<212> PRT
<213> Aspergillus oryzae

<400> 27

Met Arg Leu Gln Leu Pro Glu Val Ala Ile Ala Thr Leu Leu Leu Gly
1 5 10 15

Glu Val Gly Ala Val Gln Leu Pro Leu Leu Gln Ser Gln Val Pro Ile
20 25 30

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

Lys Ala Glu Asn Leu Leu Lys Arg Ala Lys Glu Leu Ser Lys Ile Ala
50 55 60

Asp Leu Gly Glu Glu Glu Tyr Asn His Pro Thr Arg Val Ile Gly Ser
65 70 75 80

Lys Gly His Leu Gly Thr Ile Asp Tyr Ile Tyr Ser Thr Leu Ala Lys
85 90 95

Leu Gly Asp Tyr Tyr Thr Ile Thr Asn Gln Ser Phe Pro Ala Val Thr
100 105 110

Gly Asn Val Phe Glu Ser Arg Leu Val Leu Gly Asp Ala Val Pro Glu
115 120 125

```
Ser Ala Ala Pro Met Gly Leu Thr Pro Pro Thr Lys Asn Lys Gln Pro
    130                 135                 140

Val His Ala Pro Leu Val Ala Val Ser Asn Phe Gly Cys Asp Ala Ser
145                 150                 155                 160

Asp Phe Pro Ser Asp Val Ser Gly Ala Ile Ala Leu Ile Ser Arg Gly
                165                 170                 175

Thr Cys Pro Phe Gly Thr Lys Ser Glu Leu Ala Gly Lys Ala Gly Ala
            180                 185                 190

Val Ala Ala Val Val Tyr Asn Asn Glu Lys Gly Ser Leu Ser Gly Thr
        195                 200                 205

Leu Gly Asn Pro Thr Pro Asp His Val Ala Thr Trp Gly Leu Ser Asp
    210                 215                 220

Glu Asp Ala Ala Pro Ile Leu Glu Lys Leu Glu Lys Gly Glu Glu Val
225                 230                 235                 240

Asp Gly Ile Ala Tyr Met Asp Ala Ile Val Glu Thr Ile His Thr Thr
                245                 250                 255

Asn Ile Ile Ala Gln Thr Thr Glu Gly Asp Pro Glu Asn Cys Val Met
            260                 265                 270

Leu Gly Gly His Ser Asp Ser Val Ala Glu Gly Pro Gly Ile Asn Asp
        275                 280                 285

Asp Gly Ser Gly Ser Leu Thr Leu Leu Glu Leu Ala Thr Leu Leu Thr
    290                 295                 300

Gln Tyr Arg Val Asn Asn Cys Val Arg Phe Ala Trp Trp Ala Gly Glu
305                 310                 315                 320
```

```
Glu Glu Gly Leu Leu Gly Ser Asp Tyr Tyr Val Ser Val Leu Thr Pro
                325                 330                 335

Glu Glu Asn Leu Lys Ile Arg Leu Phe Met Asp Tyr Asp Met Leu Gly
            340                 345                 350

Ser Pro Asn Phe Ala Tyr Gln Val Tyr Asn Ala Thr Asn Ser Val Asn
        355                 360                 365

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

Asp His Asp Leu Asn Tyr Thr Tyr Ile Pro Phe Asp Gly Arg Ser Asp
385                 390                 395                 400

Tyr Asp Ala Phe Ile Arg His Gly Ile Pro Gly Gly Gly Ile Ala Thr
                405                 410                 415

Gly Ala Glu Gly Ile Lys Thr Pro Glu Glu Gln Glu Met Phe Gly Gly
            420                 425                 430

Val Ala Gly Ala Trp Tyr Asp Pro Cys Tyr His Gln Ile Cys Asp Val
        435                 440                 445

Val Gly Asn Val Asn Leu Thr Ala Trp Glu Leu Asn Thr Lys Leu Val
    450                 455                 460

Ala His Ser Val Ala Thr Tyr Ala Arg Ser Phe Glu Gly Phe Pro Lys
465                 470                 475                 480

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

His Gly Pro Arg Leu Val Leu
            500
```

<210> 28
<211> 524
<212> PRT
<213> Aspergillus fumigatus

<400> 28

```
Met Val Ala Ser Thr Ile His Leu Leu Cys Thr Ala Phe Ala Leu Thr
1               5                   10                  15


Ala Glu Gly Ala Ala Leu Gln Leu Pro Leu Phe Gly Ala Ser Glu Pro
            20                  25                  30


Gln Ile Pro Val Ala Gly Lys Glu Leu Ile Ser Ser Ser Ala Leu Gln
        35                  40                  45


Ser Gln Ile Asp Val Gly Lys Leu Leu Asn Arg Ala Lys His Leu Tyr
    50                  55                  60


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


Ile Gly Ser Lys Gly His Leu Gly Thr Leu Asp Tyr Ile Tyr Ala Thr
                85                  90                  95


Leu Thr Glu Phe Asp Asp Tyr Tyr Thr Ile Ser Asn Gln Thr Phe Pro
            100                 105                 110


Ala Val Thr Gly Asn Val Met Glu Ser Arg Leu Val Leu Gly His Thr
        115                 120                 125


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


His Glu Pro Val Tyr Gly Pro Leu Val Leu Val Ser Arg Leu Gly Cys
145                 150                 155                 160
```

```
Glu Ala Ala Asp Tyr Pro Pro Glu Leu Gln Gly Ala Ile Ala Phe Ile
                165                 170                 175

Ser Arg Gly Ser Cys Pro Phe Gly Thr Lys Ser Ala Leu Ala Gly Lys
            180                 185                 190

Ala Gly Ala Val Ala Ala Val Ile Phe Asn Asn Glu Lys Gly Gly Leu
        195                 200                 205

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

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

Gln Lys Val Asp Ala Ile Ala Tyr Met Asp Ala Thr Val Glu Thr Ile
                245                 250                 255

Thr Thr Thr Asn Ile Ile Ala Gln Thr Lys Glu Gly Asp Ala Asp Asn
            260                 265                 270

Cys Val Met Ala Gly Ala His Ser Asp Ser Val Met Glu Gly Pro Gly
        275                 280                 285

Ile Asn Asp Asp Gly Ser Gly Ser Leu Thr Leu Leu Glu Ile Ala Ser
    290                 295                 300

Leu Leu Pro His Tyr Arg Val Asn Asn Cys Val Arg Leu Ala Trp Trp
305                 310                 315                 320

Ala Gly Glu Glu Glu Gly Leu Leu Gly Ser Asp Tyr Tyr Val Ser Val
                325                 330                 335

Leu Ser Glu Ala Glu Asn Leu Lys Ile Arg Leu Phe Met Asp Tyr Asp
            340                 345                 350
```

```
Met Leu Ala Ser Pro Asn Phe Ala Tyr Gln Val Tyr Asn Ala Thr Asn
        355                 360                 365

Ala Val Asn Pro Val Gly Ser Glu Gln Leu Arg Asp Leu Tyr Thr Glu
    370                 375                 380

Phe Tyr Glu Ala His Gly Leu Asn Phe Thr Tyr Ile Pro Phe Asp Gly
385                 390                 395                 400

Arg Ser Asp Tyr Asp Ala Phe Ile Arg Asn Gly Ile Pro Gly Gly Gly
                405                 410                 415

Ile Ala Thr Gly Ala Glu Val Ile Lys Thr Glu Glu Glu Gln Lys Met
            420                 425                 430

Phe Gly Gly Val Ala Gly Asp Ala Phe Asp Pro Cys Tyr His Gln Leu
        435                 440                 445

Cys Asp Asp Val Ser Asn Val Asn Leu Thr Ala Trp Glu Val Asn Thr
    450                 455                 460

Lys Val Arg Val Asp Phe Cys Val Tyr Thr Arg Arg Arg Leu Leu Ile
465                 470                 475                 480

Cys Thr Gln Leu Val Ala His Ser Ile Ala Thr Tyr Ala Arg Ser Phe
                485                 490                 495

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

Glu Gln Arg Lys Tyr His Gly His Ser Leu Leu Tyr
        515                 520
```

<210> 29
<211> 511
<212> PRT

<213> Myceliophtora thermophila

<400> 29

```
Met Arg Thr Pro Ala Ala Ser Leu Leu Ala Phe Ala Leu Pro Ala Leu
1               5                  10                  15

Ala Thr Ala Gly Gly His Gly Gly Ser Ser Gly Leu Gly Cys Asp Ser
            20                  25                  30

Gln Arg Pro Leu Val Ser Ser Glu Lys Leu Gln Ser Leu Ile Lys Lys
        35                  40                  45

Glu Asp Leu Leu Ala Gly Ser Gln Glu Leu Gln Asp Ile Ala Thr Ala
    50                  55                  60

His Gly Gly His Arg Ala Phe Gly Ser Ser Gly His Asn Ala Thr Val
65                  70                  75                  80

Asp Phe Leu Tyr Tyr Thr Leu Lys Ala Leu Asp Tyr Tyr Asn Val Thr
                85                  90                  95

Lys Gln Pro Phe Lys Glu Ile Phe Ser Ser Gly Thr Gly Ser Leu Thr
            100                 105                 110

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

Gly Ser Ala Thr Asp Lys Pro Val Val Val Val Ala Asn Val Gly Cys
    130                 135                 140

Asp Ala Ala Asp Tyr Pro Ala Glu Val Ala Gly Asn Ile Ala Leu Ile
145                 150                 155                 160

Lys Arg Gly Thr Cys Thr Phe Ser Gln Lys Ser Val Asn Ala Lys Ala
                165                 170                 175
```

```
Ala Gly Ala Val Ala Ala Ile Ile Tyr Asn Asn Ala Glu Gly Lys Leu
            180                 185                 190

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

Ile Thr Leu Glu Ala Gly Glu Ala Leu Leu Ala Lys Leu Ala Gly Gly
    210                 215                 220

Pro Val Thr Ala Thr Leu Gln Ile Asp Ala Leu Val Glu Glu Arg Val
225                 230                 235                 240

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

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

Asn Asp Asp Gly Ser Gly Thr Ile Gly Met Leu Thr Val Ala Lys Ala
        275                 280                 285

Leu Thr Lys Phe Arg Val Lys Asn Ala Val Arg Phe Ala Phe Trp Ser
    290                 295                 300

Ala Glu Glu Tyr Gly Leu Leu Gly Ser Tyr Ala Tyr Ile Lys Ser Ile
305                 310                 315                 320

Asn Ser Ser Ala Ala Glu Leu Ser Lys Ile Arg Ala Tyr Leu Asn Phe
                325                 330                 335

Asp Met Ile Ala Ser Pro Asn Tyr Ile Tyr Gly Ile Tyr Asp Gly Asp
            340                 345                 350

Gly Asn Ala Phe Asn Leu Thr Gly Pro Ala Gly Ser Asp Val Ile Glu
        355                 360                 365
```

```
Arg Asn Phe Glu Asn Phe Phe Lys Arg Lys His Thr Pro Ser Val Pro
    370                 375                 380

Thr Glu Phe Ser Gly Arg Ser Asp Tyr Ala Ala Phe Ile Glu Asn Gly
385                 390                 395                 400

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

Arg Glu Ala Glu Leu Phe Gly Gly Arg Ala Gly Val Ala Tyr Asp Val
            420                 425                 430

Asn Tyr His Gln Ala Gly Asp Thr Val Asp Asn Leu Ala Leu Asp Ala
        435                 440                 445

Phe Leu Leu Asn Thr Lys Ala Ile Ala Asp Ser Val Ala Thr Tyr Ala
    450                 455                 460

Leu Ser Phe Asp Gly Leu Pro Arg Val Asp Gly Lys Lys Arg Arg Trp
465                 470                 475                 480

Asp Ala His Arg Ala Arg Met Leu Lys Arg Ser Ala Gly Ser His Gly
                485                 490                 495

His Ala His Leu His Ser Gly Pro Cys Gly Gly Gly Ala Ser Ile
            500                 505                 510
```

<210> 30
<211> 492
<212> PRT
<213> Fusarium graminicola

<400> 30

```
Met Lys Tyr Ser Thr Ile Leu Ala Leu Ala Gly Leu Ala Ser Ala Ser
1               5                   10                  15

Thr Pro Lys Lys Pro Leu Val Asn Glu Leu Lys Leu Gln Lys Asp Ile
```

```
            20                  25                  30

Thr Leu Lys Gly Leu Met Ala Gly Ala Gln Lys Leu Gln Asp Ile Ala
        35                  40                  45

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

Thr Val Asp Tyr Leu Tyr Asn Thr Leu Lys Ser Leu Asn Tyr Tyr Asn
65                  70                  75                  80

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

Leu Lys Ala Asp Gly Glu Asp Ile Ala Ala Ala Ile Met Thr Tyr Thr
            100                 105                 110

Pro Ala Gly Glu Ala Ser Gly Pro Leu Val Val Ala Ala Asn Leu Gly
        115                 120                 125

Cys Glu Ala Ser Asp Phe Pro Ala Glu Ser Lys Gly Lys Val Val Leu
    130                 135                 140

Val Lys Arg Gly Glu Cys Ala Phe Ser Ala Lys Ser Thr Asn Gly Lys
145                 150                 155                 160

Thr Ala Gly Ala Ser Ala Val Ile Val Tyr Asn Asn Val Ala Gly Glu
                165                 170                 175

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

Gly Ile Ser Leu Glu Ser Gly Glu Ala Ile Leu Ala Lys Thr Lys Ala
        195                 200                 205

Gly Glu Val Lys Val Asp Leu Lys Val Asp Ala Thr Val Glu Asn Arg
```

```
    210                 215                 220

Val Thr Phe Asn Val Ile Ala Glu Thr Lys Glu Gly Asp His Asp Asn
225                 230                 235                 240

Val Leu Val Val Gly Gly His Ser Asp Ser Val Ala Ala Gly Pro Gly
                245                 250                 255

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

Ala Leu Thr Lys Tyr Arg Val Lys Asn Ala Val Arg Phe Gly Phe Trp
        275                 280                 285

Ser Ala Glu Glu Phe Gly Leu Leu Gly Ser Tyr Ala Tyr Met Lys Ser
    290                 295                 300

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

Phe Asp Met Ile Ala Ser Pro Asn Tyr Val Tyr Gly Ile Tyr Asp Gly
                325                 330                 335

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

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

Pro Ser Glu Phe Ser Gly Arg Ser Asp Tyr Ala Ala Phe Ile Glu Asn
    370                 375                 380

Gly Ile Pro Ser Gly Gly Leu Phe Thr Gly Ala Glu Gln Leu Lys Thr
385                 390                 395                 400

Glu Glu Glu Ala Lys Lys Phe Gly Gly Glu Ala Gly Val Ala Tyr Asp
```

405 410 415

Ile Asn Tyr His Lys Ala Gly Asp Thr Ile Asp Asn Leu Asn Lys Glu
420 425 430

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

Ala Lys Ser Phe Lys Gly Ile Pro Gln Val Asn His Leu Thr Arg Arg
450 455 460

Arg Asp Ala Asp His Ala Gln Ile Phe Lys Arg Thr Ser Ala His Thr
465 470 475 480

His Ala His Gly Gly Pro Cys Gly Ala Val Glu Val
485 490

<210> 31
<211> 493
<212> PRT
<213> Penicilium Chrysogenum

<400> 31

Met Lys Trp Ser Leu Leu Ile Thr His Leu Ser Val Ala Phe Ala Glu
1 5 10 15

Ala Gly Arg Arg Lys Pro Leu Val Ser Pro Asp Glu Phe Pro Ser Ala
20 25 30

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

Ala Tyr Ala Tyr Pro Glu Arg Asn Arg Val Phe Gly Ser Ala Ala His
50 55 60

Asn Asp Thr Val Asp Tyr Ile Tyr Arg Glu Leu Lys Lys Thr Gly Tyr
65 70 75 80

```
Tyr His Val Trp Lys Gln Pro Gln Val His Thr Trp Thr Thr Ala Lys
                85                  90                  95

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

Tyr Ser Pro Ser Ala Asp Val Thr Ala Glu Met Ala Val Val Ser Asn
        115                 120                 125

Leu Gly Cys Ser Ala Ser Asp Tyr Pro Ser Gly Val Ala Gly Gly Ile
    130                 135                 140

Ala Leu Val Gln Arg Gly Glu Cys Ser Phe Gly Glu Lys Ser Val Leu
145                 150                 155                 160

Ala Ala Ala Ala Lys Ala Ser Ala Val Ile Ile Tyr Asn Asn Glu Ala
                165                 170                 175

Gly Pro Val Ser Gly Thr Leu Gly Gly Val Thr Asn Glu Leu Gly Pro
            180                 185                 190

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

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

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

Gly Asp His Asn Asn Val Val Ser Leu Gly Gly His Thr Asp Ser Val
                245                 250                 255

Asp Ala Gly Pro Gly Ile Asn Asp Asp Gly Ser Gly Val Ile Ser Asn
            260                 265                 270
```

```
Leu Val Val Ala Lys Ala Leu Thr Arg Phe Ser Val Lys Asn Ala Val
        275                 280                 285

Arg Phe Phe Phe Trp Thr Ala Glu Glu Phe Gly Leu Leu Gly Ser Glu
    290                 295                 300

Tyr Tyr Thr Ser His Leu Asp Ala Asp Glu Leu Ala Lys Ile Arg Leu
305                 310                 315                 320

Tyr Leu Asn Phe Asp Met Ile Ala Ser Pro Asn Tyr Ala Leu Met Ile
                325                 330                 335

Tyr Asp Gly Asp Gly Asp Ala Phe Asn Gln Thr Gly Pro Ala Gly Ser
            340                 345                 350

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

Pro Tyr Ile Pro Thr Ala Phe Asp Gly Arg Ser Asp Tyr Asp Gly Phe
    370                 375                 380

Ile Ser Arg Gly Ile Pro Ala Gly Gly Ile Phe Thr Gly Ala Glu Gly
385                 390                 395                 400

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

Ala Tyr Asp Val Asn Tyr His Ala Ala Gly Asp Asp Phe Lys Asn Leu
            420                 425                 430

Asn His Glu Ala Phe Leu Ile Asn Ser Lys Ala Thr Ala Phe Ala Val
        435                 440                 445

Ala Lys Tyr Ala Asn Ser Leu Ala Ser Ile Pro Arg His Ser Ala Thr
    450                 455                 460
```

```
Pro Thr Lys Arg Val Val Lys Lys Arg Ala Pro Arg Ser His Ala His
465                 470                 475                 480


Thr Lys Asn Thr Gly Cys Phe His Ser Leu Val Glu Ile
                485                 490


<210>  32
<211>  501
<212>  PRT
<213>  Aspergillus fumigatus

<400>  32

Met Val Thr Met Lys Leu Leu Tyr Leu Thr Ser Phe Ala Ser Leu Ala
1               5                   10                  15


Val Ala Asn Gly Pro Gly Trp Asp Trp Lys Pro Arg Val His Pro Lys
            20                  25                  30


Val Leu Pro Gln Met Ile His Leu Trp Asp Leu Leu Gln Gly Ala Gln
        35                  40                  45


Gln Leu Glu Asp Phe Ala Tyr Ala Tyr Pro Glu Arg Asn Arg Val Phe
    50                  55                  60


Gly Gly Arg Ala His Glu Asp Thr Val Asn Tyr Leu Tyr Arg Glu Leu
65                  70                  75                  80


Lys Lys Thr Gly Tyr Tyr Asp Val Tyr Lys Gln Pro Gln Val His Gln
                85                  90                  95


Trp Thr Arg Ala Asp Gln Ala Leu Thr Val Asp Gly Gln Ser Tyr Asp
            100                 105                 110


Ala Thr Thr Met Thr Tyr Ser Pro Ser Val Asn Ala Thr Ala Pro Leu
        115                 120                 125
```

```
Ala Val Val Asn Asn Leu Gly Cys Val Glu Ala Asp Tyr Pro Ala Asp
    130                 135                 140

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

Thr Lys Ser Val Leu Ser Ala Lys Ala Gly Ala Ala Ala Ala Leu Val
                165                 170                 175

Tyr Asn Asn Ile Glu Gly Ser Met Ala Gly Thr Leu Gly Gly Ala Thr
            180                 185                 190

Ser Glu Leu Gly Ala Tyr Ala Pro Ile Ala Gly Ile Ser Leu Ala Asp
        195                 200                 205

Gly Gln Ala Leu Ile Gln Met Ile Gln Ala Gly Thr Val Thr Ala Asn
    210                 215                 220

Leu Trp Ile Asp Ser Gln Val Glu Asn Arg Thr Thr Tyr Asn Val Ile
225                 230                 235                 240

Ala Gln Thr Lys Gly Gly Asp Pro Asn Asn Val Val Ala Leu Gly Gly
                245                 250                 255

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

Gly Ile Ile Ser Asn Leu Val Val Ala Lys Ala Leu Thr Arg Phe Ser
        275                 280                 285

Val Lys Asn Ala Val Arg Phe Cys Phe Trp Thr Ala Glu Glu Phe Gly
    290                 295                 300

Leu Leu Gly Ser Asn Tyr Tyr Val Asn Ser Leu Asn Ala Thr Glu Gln
305                 310                 315                 320
```

```
Ala Lys Ile Arg Leu Tyr Leu Asn Phe Asp Met Ile Ala Ser Pro Asn
                325                 330                 335

Tyr Ala Leu Met Ile Tyr Asp Gly Asp Gly Ser Ala Phe Asn Leu Thr
            340                 345                 350

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

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

Asp Tyr Gln Ala Phe Ile Leu Asn Gly Ile Pro Ala Gly Gly Leu Phe
385                 390                 395                 400

Thr Gly Ala Glu Ala Ile Lys Thr Glu Glu Gln Ala Gln Leu Phe Gly
                405                 410                 415

Gly Gln Ala Gly Val Ala Leu Asp Ala Asn Tyr His Ala Lys Gly Asp
            420                 425                 430

Asn Met Thr Asn Leu Asn Arg Glu Ala Phe Leu Ile Asn Ser Arg Ala
        435                 440                 445

Thr Ala Phe Ala Val Ala Thr Tyr Ala Asn Ser Leu Asp Ser Ile Pro
    450                 455                 460

Pro Arg Asn Met Thr Thr Val Val Lys Arg Ser Gln Leu Glu Gln Ala
465                 470                 475                 480

Met Lys Arg Thr Pro His Thr His Thr Gly Gly Thr Gly Cys Tyr Lys
                485                 490                 495

Asp Arg Val Glu Gln
            500
```

<210> 33
<211> 496
<212> PRT
<213> Aspergillus oryzae

<400> 33

```
Met Arg Ser Leu Leu Trp Ala Ser Leu Leu Ser Gly Val Leu Ala Gly
1               5                  10                  15


Arg Ala Leu Val Ser Pro Asp Glu Phe Pro Glu Asp Ile Gln Leu Glu
            20                  25                  30


Asp Leu Leu Glu Gly Ser Gln Gln Leu Glu Asp Phe Ala Tyr Ala Tyr
        35                  40                  45


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


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


Lys Gln Pro Gln Val His Leu Trp Ser Asn Ala Asp Gln Thr Leu Lys
                85                  90                  95


Val Gly Asp Glu Glu Ile Glu Ala Lys Thr Met Thr Tyr Ser Pro Ser
            100                 105                 110


Val Glu Val Thr Ala Asp Val Ala Val Val Lys Asn Leu Gly Cys Ser
        115                 120                 125


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


Arg Gly Glu Cys Pro Phe Gly Asp Lys Ser Val Leu Ala Ala Lys Ala
145                 150                 155                 160
```

```
Lys Ala Ala Ala Ser Ile Val Tyr Asn Asn Val Ala Gly Ser Met Ala
                165                 170                 175

Gly Thr Leu Gly Ala Ala Gln Ser Asp Lys Gly Pro Tyr Ser Ala Ile
            180                 185                 190

Val Gly Ile Ser Leu Glu Asp Gly Gln Lys Leu Ile Lys Leu Ala Glu
        195                 200                 205

Ala Gly Ser Val Ser Val Asp Leu Trp Val Asp Ser Lys Gln Glu Asn
    210                 215                 220

Arg Thr Thr Tyr Asn Val Val Ala Gln Thr Lys Gly Gly Asp Pro Asn
225                 230                 235                 240

Asn Val Val Ala Leu Gly Gly His Thr Asp Ser Val Glu Ala Gly Pro
                245                 250                 255

Gly Ile Asn Asp Asp Gly Ser Gly Ile Ile Ser Asn Leu Val Ile Ala
            260                 265                 270

Lys Ala Leu Thr Gln Tyr Ser Val Lys Asn Ala Val Arg Phe Leu Phe
        275                 280                 285

Trp Thr Ala Glu Glu Phe Gly Leu Leu Gly Ser Asn Tyr Tyr Val Ser
    290                 295                 300

His Leu Asn Ala Thr Glu Leu Asn Lys Ile Arg Leu Tyr Leu Asn Phe
305                 310                 315                 320

Asp Met Ile Ala Ser Pro Asn Tyr Ala Leu Met Ile Tyr Asp Gly Asp
                325                 330                 335

Gly Ser Ala Phe Asn Gln Ser Gly Pro Ala Gly Ser Ala Gln Ile Glu
            340                 345                 350
```

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

Thr Gln Phe Asp Gly Arg Ser Asp Tyr Glu Ala Phe Ile Leu Asn Gly
    370   375   380

Ile Pro Ser Gly Gly Leu Phe Thr Gly Ala Glu Gly Ile Met Ser Glu
385   390   395   400

Glu Asn Ala Ser Arg Trp Gly Gly Gln Ala Gly Val Ala Tyr Asp Ala
                405   410   415

Asn Tyr His Ala Ala Gly Asp Asn Met Thr Asn Leu Asn His Glu Ala
            420   425   430

Phe Leu Ile Asn Ser Lys Ala Thr Ala Phe Ala Val Ala Thr Tyr Ala
        435   440   445

Asn Asp Leu Ser Ser Ile Pro Lys Arg Asn Thr Thr Ser Ser Leu His
    450   455   460

Arg Arg Ala Arg Thr Met Arg Pro Phe Gly Lys Arg Ala Pro Lys Thr
465   470   475   480

His Ala His Val Ser Gly Ser Gly Cys Trp His Ser Gln Val Glu Ala
                485   490   495

<210> 34
<211> 503
<212> PRT
<213> Aspergillus nidulans

<400> 34

Met Lys Ser Ile Leu Val Pro Ala Leu Ser Leu Ala Ser Leu Ala Trp
1   5   10   15

Ala Gly Lys His Lys Pro Leu Val Thr Pro Glu Ala Leu Gln Asp Leu

```
            20                  25                  30

Ile Thr Leu Asp Asp Leu Leu Ala Gly Ser Gln Gln Leu Gln Asp Phe
        35                  40                  45

Ala Tyr Ala Tyr Pro Glu Arg Asn Arg Val Phe Gly Gly Arg Ala His
    50                  55                  60

Asp Asp Thr Val Asn Trp Leu Tyr Arg Glu Leu Lys Arg Thr Gly Tyr
65                  70                  75                  80

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

Glu Ser Leu Thr Val Asn Gly Glu Ala Ile Glu Ala Thr Thr Met Thr
            100                 105                 110

Tyr Ser Pro Ser Ala Asn Ala Ser Ala Glu Leu Ala Val Ile Ser Gly
        115                 120                 125

Leu Gly Cys Ser Pro Ala Asp Phe Ala Ser Asp Val Ala Gly Lys Val
    130                 135                 140

Val Leu Val Gln Arg Gly Asn Cys Thr Phe Gly Glu Lys Ser Val Tyr
145                 150                 155                 160

Ala Ala Ala Ala Asp Ala Ala Ala Thr Ile Val Tyr Asn Asn Val Glu
                165                 170                 175

Gly Ser Leu Ser Gly Thr Leu Gly Ala Ala Gln Ser Glu Gln Gly Pro
            180                 185                 190

Tyr Ser Gly Ile Val Gly Ile Ser Leu Ala Asp Gly Glu Ala Leu Leu
        195                 200                 205

Ala Leu Ala Glu Glu Gly Pro Val His Val Asp Leu Trp Ile Asp Ser
```

```
    210                 215                 220

Val Met Glu Asn Arg Thr Thr Tyr Asn Val Ile Ala Gln Thr Lys Gly
225                 230                 235                 240

Gly Asp Pro Asp Asn Val Val Thr Leu Gly Gly His Ser Asp Ser Val
                245                 250                 255

Glu Ala Gly Pro Gly Ile Asn Asp Asp Gly Ser Gly Ile Ile Ser Asn
            260                 265                 270

Leu Val Ile Ala Arg Ala Leu Thr Lys Phe Ser Thr Lys His Ala Val
        275                 280                 285

Arg Phe Phe Phe Trp Thr Ala Glu Glu Phe Gly Leu Leu Gly Ser Asp
    290                 295                 300

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

Tyr Leu Asn Phe Asp Met Ile Ala Ser Pro Asn Tyr Gly Leu Leu Leu
                325                 330                 335

Tyr Asp Gly Asp Gly Ser Ala Phe Asn Leu Thr Gly Pro Ala Gly Ser
            340                 345                 350

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

Ala Thr Val Glu Thr Glu Phe Asp Gly Arg Ser Asp Tyr Glu Ala Phe
    370                 375                 380

Ile Leu Asn Gly Ile Pro Ala Gly Gly Val Phe Thr Gly Ala Glu Glu
385                 390                 395                 400

Ile Lys Ser Glu Glu Glu Val Ala Leu Trp Gly Gly Glu Ala Gly Val
```

405 410 415

Ala Tyr Asp Ala Asn Tyr His Gln Val Gly Asp Thr Ile Asp Asn Leu
420 425 430

Asn Thr Glu Ala Tyr Leu Leu Asn Ser Lys Ala Thr Ala Phe Ala Val
435 440 445

Ala Thr Tyr Ala Asn Asp Leu Ser Thr Ile Pro Lys Arg Glu Met Thr
450 455 460

Thr Ala Val Lys Arg Ala Asn Val Asn Gly His Met His Arg Arg Thr
465 470 475 480

Met Pro Lys Lys Arg Gln Thr Ala His Arg His Ala Ala Lys Gly Cys
485 490 495

Phe His Ser Arg Val Glu Gln
500

<210> 35
<211> 508
<212> PRT
<213> Neurospora crassa

<400> 35

Met Arg Thr Ala Ala Ala Ser Leu Ala Thr Leu Ala Leu Ala Val Pro
1 5 10 15

Ala Leu Ala Ala Thr Ile Gln Gly Gly Pro Thr Arg Lys Pro Tyr Val
20 25 30

Cys Ser Asp Ala Leu Gln Tyr Gln Ile Thr Glu Lys Asp Ile Arg Ala
35 40 45

Gly Ala Gln Lys Leu Gln Asp Ile Ala Asn Ala Asn Asn Gly Thr Arg
50 55 60

```
Val Phe Gly Ser Thr Gly His Asn Ala Thr Val Asp Phe Leu Tyr Asn
65                  70                  75                  80

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

Glu Thr Tyr Ser Ala Gly Thr Gly Ser Leu Ser Val Asn Gly Lys Ala
            100                 105                 110

Leu Asp Val Arg Ile Met Thr Tyr Thr Pro Ala Gly Ser Ala Thr Gly
        115                 120                 125

Pro Ile Val Tyr Ala Glu Gly Leu Gly Cys Ser Ala Ala Glu Tyr Pro
    130                 135                 140

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

Phe Gly Gln Lys Ala Leu Ser Ala Lys Glu Ala Gly Ala Val Gly Leu
                165                 170                 175

Val Ile Tyr Asn Asn Val Asp Gly Ser Leu Ser Gly Thr Leu Gly Glu
            180                 185                 190

Ala Phe Lys Asp Tyr Ala Pro Val Val Gly Leu Ser Lys Glu Asp Gly
        195                 200                 205

Glu Ala Leu Ile Ala Ser Ile Lys Gly Gly Glu Glu Ile Lys Ala Glu
    210                 215                 220

Phe Lys Val Asp Ala Val Thr Glu His Arg Val Ser Phe Asn Val Ile
225                 230                 235                 240

Ala Glu Thr Lys Gly Gly Asp His Asn Asn Val Leu Ile Val Gly Gly
                245                 250                 255
```

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

Gly Val Ile Gly Ile Leu Thr Val Ala Lys Ala Leu Ala Lys Phe Gln
        275                 280                 285

Val Lys Asn Ala Val Arg Phe Gly Phe Trp Ser Ala Glu Glu Phe Gly
    290                 295                 300

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

Glu Leu Ala Lys Ile Arg Ala Tyr Leu Asn Phe Asp Met Ile Ala Ser
                325                 330                 335

Pro Asn Tyr Ile Tyr Gly Ile Tyr Asp Gly Asp Gly Ser Ala Phe Asn
            340                 345                 350

Leu Thr Gly Pro Gln Gly Ser Asp Val Ile Glu Lys Asp Phe Glu Gln
        355                 360                 365

Phe Phe Ser Lys Asn Lys Val Ala Ser Val Pro Ser Glu Phe Asn Gly
    370                 375                 380

Arg Ser Asp Tyr Ala Ala Phe Ile Glu Asn Gly Ile Pro Ser Gly Gly
385                 390                 395                 400

Ile Phe Thr Gly Ala Glu Gly Ile Lys Thr Glu Ala Glu Ala Ala Ala
                405                 410                 415

Val Gly Gly Thr Ala Gly Ile Ala Tyr Asp Val Asn Tyr His Gln Ala
            420                 425                 430

Gly Asp Thr Ile Asp Asn Ile Ala Trp Asp Ala Phe Leu Leu Asn Thr
        435                 440                 445
```

```
Arg Ala Ile Ala Asn Ser Val Ala Lys Tyr Ala Arg Ser Phe Lys Ser
    450                 455                 460

Leu Pro Ala Ile Asn Leu Met Gln Arg Arg Trp Asp Gly Asp Val Ala
465                 470                 475                 480

Gln Thr Leu Lys Arg Asn Lys Lys Arg Ala Asn Gly Ala His Val His
                485                 490                 495

Ser His Ser Gly Pro Cys Gly Gly Gly Glu Glu Ile
            500                 505
```

<210> 36
<211> 493
<212> PRT
<213> Myceliophtora thermophila

<400> 36

```
Met Arg Leu Leu Arg Thr Ala Gly Ala Ala Thr Leu Phe Leu Ser Pro
1               5                   10                  15

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

Asp Ile Arg Thr Glu Glu Leu Gln Asn Val Leu Trp Asn Leu Asn His
        35                  40                  45

Ile Ala Val Thr His Gly Gly Asn Arg Ala Phe Gly Glu Pro Gly Tyr
    50                  55                  60

Lys Ala Ser Leu Asp Phe Ile Leu Glu Arg Ala Gln Thr Arg Phe His
65                  70                  75                  80

Asn Glu Phe Asp Thr Val Val Gln Pro Phe Asn His Thr Tyr Gly Lys
                85                  90                  95
```

```
Thr Asn Gln Ile Lys Val Thr Gly Pro Glu Gly Glu Asp Val Phe Val
            100                 105                 110

Ile Ser Pro Leu Tyr Asn Pro Ala Thr Pro Leu Pro Asp Gly Ile Thr
        115                 120                 125

Ala Pro Leu Val Asp Thr Pro Val Asp Asp Glu Arg Gly Ser Ala Cys
    130                 135                 140

Phe Pro Asp Gln Trp Glu Gly Val Asp Val Lys Gly Lys Leu Val Leu
145                 150                 155                 160

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

Glu Arg Gly Ala Leu Gly Val Ile Leu Tyr Asn Glu Gln Pro Gly Thr
            180                 185                 190

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

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

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

Ser Asp Thr Arg Glu Thr Trp Asn Ile Ile Ala Glu Thr Lys Gln Gly
                245                 250                 255

Asp Pro Asp Lys Val Ile Met Leu Gly Ala His Leu Asp Ser Val Gln
            260                 265                 270

Ala Gly Ala Gly Ile Asn Asp Asp Gly Ser Gly Thr Ala Ala Leu Leu
        275                 280                 285
```

```
Glu Ile Leu Thr Ala Val Arg Arg Tyr Asp Gly Phe Pro His Lys Ile
    290                 295                 300

Arg Phe Ala Trp Trp Ala Ala Glu Glu Ser Gly Leu Val Gly Ser Leu
305                 310                 315                 320

Tyr Tyr Thr Ser His Leu Thr Glu Glu Glu Ala Asp Arg Ile Lys Tyr
                325                 330                 335

Tyr Phe Asn Tyr Asp Met Ile Gly Ser Pro His Pro Asp Phe Glu Ile
            340                 345                 350

Ala Ser Asp Gly Asn Ser Gly Val Gly Pro Gln Leu Leu Glu Glu Tyr
        355                 360                 365

Leu Val Glu Gln Gly Lys Glu Ile Val His Gly Gly Phe Gly Ser Gly
    370                 375                 380

Ser Asp Phe Val Gly Phe Leu Glu Leu Gly Ile Pro Ser Thr Ala Leu
385                 390                 395                 400

His Thr Gly Ala Gly Ala Pro Phe Asp Glu Cys Tyr His Gln Ala Cys
                405                 410                 415

Asp Asp Leu Asp Asn Ile Asn Trp Glu Ala Leu Thr Val Asn Ala Lys
            420                 425                 430

Ala Ala Ala Arg Ala Ala Ala Arg Leu Ala Asn Ser Leu Glu Gly Val
        435                 440                 445

Pro Pro Arg Lys Lys Thr Ser Leu Asn Leu His Thr Arg Arg Gly Val
    450                 455                 460

Val Gln Asn Phe Arg Lys Trp Ala Ser Leu Ala Glu Glu Ala Ser His
465                 470                 475                 480
```

Gly His Thr Cys Ser His Thr Gly Lys Arg Val Val Val
485 490

<210> 37
<211> 605
<212> PRT
<213> Trichoderma reesei

<400> 37

Met Ala Ala Thr Arg Asp Pro Thr Thr Leu Ser Asn Tyr Gly Ala Trp
1 5 10 15

Arg Thr Lys His Thr Ser Ala Ser Phe Asn Ile Asp Phe Asp Asn Lys
20 25 30

Arg Leu Val Gly Ser Val Val Leu Gln Leu Glu Ser Gln Thr Asp Lys
35 40 45

Gln Ser Thr Glu Ile Val Leu Asp Ser Arg Phe Val Lys Val Ser Ser
50 55 60

Val Ala Val Asp Gly Ala Ala Ala Gln Trp Glu Leu Lys Pro His Ser
65 70 75 80

Asp Pro Phe Gly Ala Pro Leu His Ile Gln Val Pro His Gly Ala Ala
85 90 95

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

Cys Thr Ala Leu Gln Trp Leu Thr Pro Ala Gln Thr Ser Asn Lys Lys
115 120 125

His Pro Tyr Met Phe Ser Gln Cys Gln Ala Ile Asn Ala Arg Ser Ile
130 135 140

```
Phe Pro Cys Gln Asp Thr Pro Asp Val Lys Ser Thr Ile Ser Phe Lys
145                 150                 155                 160


Phe Thr Ser Thr Leu Pro Val Val Ala Ser Gly Val Ala Val Gly Asp
                165                 170                 175


His Thr Ala Thr Pro Gly Val Glu Lys Val Tyr Glu Phe Glu Gln Lys
            180                 185                 190


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


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


Leu Lys Gly Cys Gln Trp Glu Leu Glu Arg Asp Met Glu Lys Phe Leu
225                 230                 235                 240


Glu Ile Ala Glu Ser Ile Val Phe Pro Tyr Arg Trp Gly Glu Tyr Asn
                245                 250                 255


Val Leu Val Leu Pro Pro Ser Phe Pro Tyr Gly Gly Met Glu Asn Pro
            260                 265                 270


Ile Tyr Thr Phe Ala Thr Pro Thr Ile Ile Ser Gly Asp Arg Gln Asn
        275                 280                 285


Val Asp Val Ile Ala His Glu Leu Ala His Ser Trp Ser Gly Asn Leu
    290                 295                 300


Val Ser Asn Ala Ser Trp Glu His Phe Trp Leu Asn Glu Gly Trp Thr
305                 310                 315                 320


Val Tyr Leu Glu Arg Arg Ile Glu Ala Ala Val His Gly Glu Pro Gln
                325                 330                 335
```

```
Phe Asp Phe Ser Ser Ile Ile Gly Trp Lys Ala Leu Glu Asp Ala Val
            340                 345                 350

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

Asp Asn Val Asp Pro Glu Asp Val Tyr Ser Thr Val Ala Tyr Glu Lys
    370                 375                 380

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

Phe Asn Lys Phe Ile Pro His Tyr Phe Thr Lys Trp Ala Gly Lys Ser
                405                 410                 415

Leu Asp Ser Phe Glu Phe Arg Asp Thr Phe Val Asp Phe Phe Asn Asn
            420                 425                 430

Leu Gly Asp Glu Glu Val Lys Gln Lys Val Ala Thr Ile Asp Trp Glu
        435                 440                 445

Gly Arg Phe Tyr Thr Pro Gly Leu Pro Pro Lys Pro Glu Phe Asp Thr
    450                 455                 460

Thr Leu Ala Ser Gln Cys Tyr Glu Leu Ala Glu Lys Trp Lys Asp Ala
465                 470                 475                 480

Ser Tyr Glu Pro Ser Pro Lys Asp Val Glu Gly Phe Ser Ser Asn Gln
                485                 490                 495

Lys Ile Val Phe Leu Glu Lys Leu Gln Gln Phe Glu Pro Leu Ser Thr
            500                 505                 510

Asp Arg Ala Gln Leu Leu Gly Lys Val Tyr Asp Leu Leu Asn Thr Gln
        515                 520                 525
```

```
Asn Val Glu Leu Lys Phe Ala Tyr Leu Gln Leu Ala Leu Lys Ala Asn
    530                 535                 540

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

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

Arg Asn Leu Ala Leu Glu Thr Phe Ala Lys Asn Lys Asp Phe Tyr His
            580                 585                 590

Pro Ile Cys Arg Gly Met Val Glu Lys Asp Leu Gly Val
        595                 600                 605
```

<210> 38
<211> 636
<212> PRT
<213> Trichoderma virens

<400> 38

```
Met Ser Trp Phe Ser Leu Arg Val Gly Leu Leu Arg Ser Thr Asn Arg
1               5                   10                  15

Ile Ile Thr Ser Tyr Ala Arg Arg Gly Phe Ala Thr Ile Asn Thr Met
            20                  25                  30

Ala Gly Thr Arg Asp Pro Thr Thr Leu Ser Asn Tyr Gly Ala Trp Arg
        35                  40                  45

Thr Arg His Thr Thr Ala Asn Phe Asn Ile Asp Phe Glu Asn Lys Arg
    50                  55                  60

Leu Lys Gly Ser Val Val Leu Gln Leu Glu Ser Gln Thr Asp Lys Glu
65                  70                  75                  80

Ser Lys Glu Ile Ile Leu Asp Ser Arg Phe Val Asn Val Ser Ser Val
```

```
                85                  90                  95

Asn Val Asn Asp Thr Ala Ser Lys Trp Glu Leu Lys Pro His Ser Asp
            100                 105                 110

Pro Phe Gly Ala Pro Leu His Val Gln Val Pro Asp Gly Ala Ala Lys
        115                 120                 125

Gly Glu Ile Val His Leu Ala Ile Glu Leu Glu Thr Thr Ser Lys Cys
    130                 135                 140

Thr Ala Leu Gln Trp Leu Thr Pro Ala Gln Thr Ser Asn Lys Lys His
145                 150                 155                 160

Pro Tyr Met Phe Ser Gln Cys Gln Ala Ile Asn Ala Arg Ser Ile Phe
                165                 170                 175

Pro Cys Gln Asp Thr Pro Asp Val Lys Ser Thr Ile Ser Phe Lys Phe
            180                 185                 190

Thr Ser Thr Leu Pro Val Val Ala Ser Gly Val Ala Val Gly Asp His
        195                 200                 205

Thr Ala Thr Pro Gly Val Glu Lys Val Tyr Glu Phe Glu Gln Lys Val
    210                 215                 220

Pro Ile Pro Ser Tyr Leu Phe Ala Val Ala Ser Gly Asp Ile Val Ala
225                 230                 235                 240

Ala Pro Ile Gly Ser Arg Ser Lys Val Val Thr Gly Pro Asn Glu Leu
                245                 250                 255

Lys Gly Cys Gln Trp Glu Leu Glu Arg Asp Met Glu Lys Phe Leu Glu
            260                 265                 270

Ile Ala Glu Ser Ile Val Phe Pro Tyr Lys Trp Gly Glu Tyr Asn Val
```

```
        275                 280                 285

Leu Val Leu Pro Pro Ser Phe Pro Tyr Gly Gly Met Glu Asn Pro Ile
    290                 295                 300

Tyr Thr Phe Ala Thr Pro Thr Ile Ile Ser Gly Asp Arg Gln Asn Val
305                 310                 315                 320

Asp Val Ile Ala His Glu Leu Ala His Ser Trp Ser Gly Asn Leu Val
                325                 330                 335

Ser Asn Ala Ser Trp Glu His Phe Trp Leu Asn Glu Gly Trp Thr Val
            340                 345                 350

Tyr Leu Glu Arg Arg Ile Glu Ala Ala Val His Gly Glu Pro Gln Phe
        355                 360                 365

Asp Phe Ser Ser Ile Ile Gly Trp Lys Ala Leu Glu Asp Ala Val Ala
    370                 375                 380

His Phe Gly Ala Asp His Glu Tyr Thr Lys Leu Ile Ile Ser His Asp
385                 390                 395                 400

Asn Val Asp Pro Glu Asp Val Tyr Ser Thr Val Ala Tyr Glu Lys Gly
                405                 410                 415

Phe His Phe Leu Tyr Tyr Leu Asp Arg Leu Val Gly Arg Asp Asn Phe
            420                 425                 430

Asn Lys Phe Ile Pro His Tyr Phe Thr Lys Trp Ala Gly Lys Ser Leu
        435                 440                 445

Asp Ser Phe Glu Phe Arg Asp Thr Phe Val Asp Phe Phe Asn Asn Leu
    450                 455                 460

Gly Asp Glu Glu Val Lys Gln Lys Val Ala Thr Ile Asp Trp Glu Gly
```

```
465                 470                 475                 480

Arg Phe Tyr Thr Pro Gly Leu Pro Pro Lys Pro Glu Phe Asp Thr Thr
                485                 490                 495

Leu Ala Gly Gln Cys Tyr Glu Leu Ala Glu Lys Trp Lys Asp Ala Ser
            500                 505                 510

Tyr Val Pro Asn Ala Lys Asp Ile Glu Ser Phe Ser Ser Asn Gln Lys
        515                 520                 525

Ile Val Phe Leu Glu Lys Leu Gln Gln Tyr Glu Pro Leu Ser Ser Glu
    530                 535                 540

Arg Ala Gln Leu Leu Gly Ser Ala Tyr Asp Leu Leu Asn Thr Gln Asn
545                 550                 555                 560

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

Ser Thr Ser Tyr Gln Thr Thr Ala Asp Leu Leu Gly Lys Val Gly Arg
            580                 585                 590

Met Lys Phe Val Arg Pro Leu Phe Arg Ser Leu Ser Lys Val Asp Arg
        595                 600                 605

Ser Leu Ala Leu Glu Thr Phe Ala Lys Asn Lys Asp Phe Tyr His Pro
    610                 615                 620

Ile Cys Arg Gly Met Val Glu Lys Asp Leu Gly Val
625                 630                 635
```

<210> 39
<211> 604
<212> PRT
<213> Trichoderma atroviride

<400> 39

```
Met Ala Lys Arg Asp Pro Thr Thr Leu Ser Asn Tyr Asp Ala Trp Arg
1               5                  10                  15

Thr Lys His Thr Thr Ala Ser Phe Ser Ile Asp Phe Asp Asn Lys Arg
            20                  25                  30

Leu Lys Gly Ser Val Val Leu Gln Leu Glu Ser Gln Thr Asp Lys Gln
        35                  40                  45

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

Asn Val Asn Ser Ala Glu Ser Lys Trp Glu Leu Lys Pro His Ser Asp
65                  70                  75                  80

Pro Phe Gly Ala Pro Leu His Val Gln Val Pro Asp Gly Ala Ala Lys
                85                  90                  95

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

Thr Ala Leu Gln Trp Leu Thr Pro Ala Gln Thr Ser Asn Lys Lys His
        115                 120                 125

Pro Tyr Met Phe Ser Gln Cys Gln Ala Ile Asn Ala Arg Ser Ile Phe
    130                 135                 140

Pro Cys Gln Asp Thr Pro Asp Val Lys Ser Thr Ile Ser Phe Lys Phe
145                 150                 155                 160

Thr Ser Thr Leu Pro Val Val Ala Ser Gly Val Ala Val Gly Asp His
                165                 170                 175

Thr Ala Thr Pro Gly Val Glu Lys Val Tyr Glu Phe Glu Gln Lys Val
            180                 185                 190
```

```
Pro Ile Pro Ser Tyr Leu Phe Ala Val Ala Ser Gly Asp Ile Val Ser
        195                 200                 205

Ala Pro Ile Gly Ser Arg Ser Lys Val Val Thr Gly Pro Asn Glu Leu
    210                 215                 220

Glu Gly Cys Lys Trp Glu Leu Glu Arg Asp Met Glu Lys Phe Leu Glu
225                 230                 235                 240

Ile Ala Glu Ser Ile Val Phe Pro Tyr Lys Trp Gly Glu Tyr Asn Val
                245                 250                 255

Leu Val Leu Pro Pro Ser Phe Pro Tyr Gly Gly Met Glu Asn Pro Ile
            260                 265                 270

Tyr Thr Phe Ala Thr Pro Thr Ile Ile Ser Gly Asp Arg Gln Asn Val
        275                 280                 285

Asp Val Ile Ala His Glu Leu Ala His Ser Trp Ser Gly Asn Leu Val
    290                 295                 300

Ser Asn Ala Ser Trp Glu His Phe Trp Leu Asn Glu Gly Trp Thr Val
305                 310                 315                 320

Tyr Leu Glu Arg Arg Ile Glu Ala Ala Val His Gly Glu Pro Gln Phe
                325                 330                 335

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

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

Asn Val Asp Pro Glu Asp Val Tyr Ser Thr Val Ala Tyr Glu Lys Gly
    370                 375                 380
```

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

Asn Lys Phe Ile Pro His Tyr Phe Thr Lys Trp Ala Gly Lys Ser Leu
                405                 410                 415

Asp Ser Phe Glu Phe Arg Asp Thr Phe Val Asp Phe Phe Asn Gly Leu
            420                 425                 430

Gly Asp Glu Asp Ile Lys Lys Lys Val Ala Thr Ile Asp Trp Glu Gly
        435                 440                 445

Lys Leu Tyr Thr Pro Gly Leu Pro Pro Lys Pro Glu Phe Asp Met Thr
    450                 455                 460

Leu Ala Gly Gln Cys Tyr Glu Leu Ala Ala Lys Trp Glu Asn Asp Ser
465                 470                 475                 480

Tyr Glu Pro Ser Ala Lys Asp Val Glu Ser Phe Ser Ser Asn Gln Lys
                485                 490                 495

Ile Val Phe Leu Glu Lys Leu Gln Gln His Gly Ala Leu Ser Thr Glu
            500                 505                 510

Arg Ala Gln Leu Leu Gly Lys Val Tyr Ser Leu Leu Asp Thr Gln Asn
        515                 520                 525

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

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

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

```
Ser Leu Ala Leu Glu Thr Phe Ala Lys Tyr Lys Asp Phe Tyr His Pro
            580                 585                 590


Ile Cys Arg Gly Met Val Glu Lys Asp Leu Gly Val
        595                 600


<210>  40
<211>  639
<212>  PRT
<213>  Fusarium graminicola

<400>  40

Met Ser Trp Phe Ser Ser Leu Lys Lys Pro Ser Ile Leu Arg Thr Cys
1               5                   10                  15


Gln Val Thr Ile Thr His Asn Leu Arg Arg Thr Phe Ala Thr Val Asn
            20                  25                  30


Pro Asn Met Thr Ala Asn Arg Asp Pro Ser Thr Leu Ser Asn Tyr Ser
        35                  40                  45


Ala Trp Arg Thr Arg His Thr Thr Ala Asn Phe Lys Ile Asp Phe Asp
    50                  55                  60


Gln Lys Ala Leu Lys Gly Ser Val Val Leu Gln Leu Glu Ser Gln Thr
65                  70                  75                  80


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


Ser Ser Ile Ser Ile Asp Ser Lys Glu Ser Lys Trp Glu Leu Lys Ser
            100                 105                 110


Phe Asn Ala Pro Leu Gly Ala Pro Leu His Ile Ala Val Pro Asp Gly
        115                 120                 125
```

```
Val Ala Lys Gly Glu Leu Ile Asp Leu Ala Ile Asp Leu Gln Thr Thr
    130                 135                 140

Ser Lys Cys Thr Ala Leu Gln Trp Leu Thr Pro Ala Gln Thr Ser Asn
145                 150                 155                 160

Lys Lys His Pro Tyr Met Phe Ser Gln Cys Gln Ala Ile Asn Ala Arg
                165                 170                 175

Ser Ile Phe Pro Cys Gln Asp Thr Pro Asp Val Lys Ser Thr Phe Ser
            180                 185                 190

Phe Lys Leu Thr Ser Ser Leu Pro Val Val Ala Ser Gly Val Pro Val
        195                 200                 205

Gly Asp His Glu Ala Thr Pro Gly Lys Glu Lys Leu Tyr Glu Phe Glu
    210                 215                 220

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

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

Asn Glu Leu Glu Gly Cys Lys Trp Glu Leu Glu Arg Asp Met Glu Lys
            260                 265                 270

Phe Met Glu Val Ala Glu Lys Leu Val Phe Pro Tyr Lys Trp Gly Ala
        275                 280                 285

Tyr Asn Val Leu Val Leu Pro Pro Ser Phe Pro Tyr Gly Gly Met Glu
    290                 295                 300

Asn Pro Ile Tyr Thr Phe Ala Thr Pro Thr Ile Ile Ser Gly Asp Arg
305                 310                 315                 320
```

```
Gln Asn Val Asp Val Ile Ala His Glu Leu Ser His Ser Trp Ser Gly
                325                 330                 335

Asn Leu Val Ser Asn Ala Ser Trp Glu His Phe Trp Leu Asn Glu Gly
            340                 345                 350

Trp Thr Met Tyr Leu Glu Arg Arg Ile Gln Ala Ala Ile His Gly Asp
        355                 360                 365

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

Ala Val Glu Leu Phe Gly Lys Asp His Glu Tyr Thr Lys Leu Ile Ile
385                 390                 395                 400

Lys His Glu Gly Val Asp Pro Glu Asp Val Tyr Ser Thr Val Ala Tyr
                405                 410                 415

Glu Lys Gly Phe His Phe Leu Tyr Tyr Leu Glu Gly Val Val Gly Arg
            420                 425                 430

Glu Asn Phe Asp Lys Phe Ile Pro Phe Tyr Phe Thr Lys Trp Ser Glu
        435                 440                 445

Lys Ser Leu Asp Ser Phe Glu Phe Lys Gln Thr Phe Leu Asp Phe Phe
    450                 455                 460

Asn Asn Leu Gly Asn Lys Glu Val Ala Lys Lys Ile Thr Glu Ile Asn
465                 470                 475                 480

Trp Glu Glu Lys Phe Tyr Thr Pro Gly Leu Pro Pro Lys Pro Glu Phe
                485                 490                 495

Asp Thr Thr Leu Ala Asn Gln Cys Tyr Asp Leu Ala Asn Lys Trp Lys
            500                 505                 510
```

```
Asp Ala Lys Phe Glu Pro Asn Ala Asn Asp Leu Glu Glu Phe Thr Ala
        515                 520                 525


Asn Gln Lys Leu Val Phe Leu Gly Glu Val Gln Gln Ser Gly Asp Leu
    530                 535                 540


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


Ser Lys Asn Val Glu Ile Leu Ser Ala Tyr Tyr Gln Ile Ala Leu Gln
                565                 570                 575


Ala Lys Asp Ser Ala Ile Tyr Gln Ala Ala Ala Asp Leu Leu Gly Thr
            580                 585                 590


Val Gly Arg Met Lys Tyr Val Arg Pro Leu Phe Arg Ala Leu Asn Lys
        595                 600                 605


Val Asp Arg Gln Leu Ala Leu Asp Thr Phe Glu Lys Asn Lys Asp Phe
    610                 615                 620


Tyr His Pro Ile Cys Lys Gly Met Val Glu Lys Asp Leu Gly Leu
625                 630                 635


<210>  41
<211>  614
<212>  PRT
<213>  Neurospora crassa

<400>  41

Met Ala Pro Val Arg Asp Pro Asn Thr Leu Ser Asn Tyr Asp Ala Trp
1               5                   10                  15


Arg Thr Arg His Thr Thr Ala Asn Leu Lys Ile Asp Phe Thr Ala Lys
            20                  25                  30
```

```
Cys Leu Arg Gly Ser Val Ile Leu Glu Leu Glu Ser Gln Thr Asp Lys
        35                  40                  45

Ala Ser Lys Glu Ile Val Leu Asp Ser Ser Tyr Val Thr Val Asn Ser
    50                  55                  60

Ile Lys Leu Asn Ser Ala Pro Ser Leu Trp Glu Thr Lys Ala Arg Thr
65                  70                  75                  80

Glu Pro Asn Gly Ser Pro Val His Ile Ala Val Pro Glu Gly Ala Ala
                85                  90                  95

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

Cys Thr Ala Leu Gln Trp Leu Thr Pro Ala Gln Thr Ser Asp Lys Ala
        115                 120                 125

Ala Pro Phe Met Phe Ser Gln Cys Gln Ala Ile His Ala Arg Ser Leu
    130                 135                 140

Phe Pro Cys Gln Asp Thr Pro Asp Val Lys Ser Thr Tyr Asp Phe Asn
145                 150                 155                 160

Ile Thr Ser Pro Tyr Val Val Val Ala Ser Gly Val Pro Val Pro Asp
                165                 170                 175

Glu Thr Lys Asp Leu Gly Glu Glu Lys Leu Tyr Lys Phe Gln Gln Lys
            180                 185                 190

Val Pro Ile Pro Ser Tyr Leu Phe Ala Leu Ser Ser Gly Glu Ile Ala
        195                 200                 205

Ser Ala Pro Val Gly Lys Arg Ser Cys Val Cys Thr Gly Pro Asn Glu
    210                 215                 220
```

```
Leu Lys Ala Ser Gln Trp Glu Leu Glu Gly Asp Met Asp Lys Phe Leu
225                 230                 235                 240


Glu Ala Ala Glu Lys Ile Val Phe Pro Tyr Arg Trp Gly Glu Tyr Asn
                245                 250                 255


Val Leu Val Leu Pro Pro Ser Phe Pro Tyr Gly Gly Met Glu Asn Pro
            260                 265                 270


Ile Phe Thr Phe Ala Thr Pro Thr Ile Ile Ser Gly Asp Lys Gln Asn
        275                 280                 285


Ile Asp Val Ile Ala His Glu Leu Ala His Ser Trp Ser Gly Asn Leu
    290                 295                 300


Val Thr Ser Cys Ser Trp Glu His Phe Trp Leu Asn Glu Gly Trp Thr
305                 310                 315                 320


Met Tyr Leu Glu Arg Arg Ile Leu Ala Ser Ile His Gly Gly Asp Ala
                325                 330                 335


His Phe Asp Phe Ser Ala Ile Arg Gly Trp Lys Ala Leu Glu Glu Ala
            340                 345                 350


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


His Lys Gly Ile Asp Pro Asp Asp Ala Phe Ser Thr Val Pro Tyr Glu
    370                 375                 380


Lys Gly Phe His Phe Val Trp Ser Leu Asp Arg Leu Val Gly Arg Glu
385                 390                 395                 400


Asn Phe Asp Lys Phe Ile Pro Tyr Tyr Phe Gly Lys Trp Ser Asn Lys
                405                 410                 415
```

```
Ser Leu Asp Ser Tyr Glu Phe Lys Asp Thr Phe Leu Glu Phe Phe Ser
            420                 425                 430

Ala Pro Glu Tyr Ser Asp Leu Lys Asp Lys Ile Ala Ser Ile Asp Trp
        435                 440                 445

Glu Gly Arg Phe His Ser Thr Gly Leu Pro Pro Lys Pro Glu Phe Asp
    450                 455                 460

Thr Ser Leu Ala Asp Val Cys Tyr Glu Leu Ala Glu Lys Trp Lys Ser
465                 470                 475                 480

Lys Asp Phe Thr Pro Ser Pro Ser Asp Val Ala Ser Trp Thr Gly Asn
                485                 490                 495

Gln Val Leu Val Phe Leu Asn Ala Val Gln Asp Phe Glu Glu Pro Leu
            500                 505                 510

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

Ser Lys Asn Ala Glu Leu Lys Ala Ala Tyr Tyr His Ile Ala Met Arg
    530                 535                 540

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

Val Gly Arg Met Lys Phe Val Arg Pro Leu Phe Arg Gly Leu Asn Lys
                565                 570                 575

Val Asp Arg Glu Leu Ala Leu Lys Thr Phe Glu Lys Asn Arg Glu Phe
            580                 585                 590

Tyr His Pro Ile Cys Arg Gln Met Val Glu Lys Asp Leu Gly Val Ser
        595                 600                 605
```

Glu Ala Ala Asn Ser Ser
610

<210> 42
<211> 613
<212> PRT
<213> Myceliophtora thermophila

<400> 42

Met Ala Pro Val Arg Asp Pro Asn Thr Leu Ser Asn Tyr Asp Gln Trp
1 5 10 15

Arg Thr Arg His Thr Thr Ala Asn Phe Lys Val Asp Phe Ala Ala Lys
20 25 30

Cys Leu Arg Gly Ser Val Ile Leu Glu Leu Glu Ser Gln Thr Asp Lys
35 40 45

Ala Ser Arg Glu Ile Ile Leu Asp Ser Ser Tyr Val Asp Val Ser Ala
50 55 60

Ile Lys Leu Asn Ser Thr Pro Ser Gln Trp Val Ile Lys Asp Arg Thr
65 70 75 80

Gly Pro Asn Gly Ser Pro Val His Val Ala Val Pro Asn Gly Ala Ala
85 90 95

Lys Gly Glu Val Val Lys Leu Glu Ile Glu Leu Ala Thr Thr Glu Lys
100 105 110

Cys Thr Ala Leu Gln Trp Leu Thr Pro Ala Gln Thr Ser Asn Lys Lys
115 120 125

Ala Pro Phe Met Phe Ser Gln Cys Gln Ala Ile His Ala Arg Ser Ile
130 135 140

Phe Pro Cys Gln Asp Thr Pro Asp Val Lys Ser Thr Tyr Glu Phe Asn

```
145                 150                 155                 160

Ile Arg Ser Pro His Val Val Val Ala Ser Gly Val Pro Val Pro Gly
                165                 170                 175

Ala Thr Val Asp Ala Gly Glu Asp Lys Ile Tyr Lys Phe Glu Gln Lys
            180                 185                 190

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

Ser Ala Pro Ile Gly Arg Cys Ser Ser Val Ala Thr Gly Pro Asn Glu
    210                 215                 220

Leu Lys Ala Ser Gln Trp Glu Leu Gln Asp Asp Met Asp Lys Phe Leu
225                 230                 235                 240

Asp Ala Ala Glu Lys Ile Val Phe Pro Tyr Gln Trp Gly Glu Tyr Asn
                245                 250                 255

Val Leu Val Leu Pro Pro Ser Phe Pro Tyr Gly Gly Met Glu Asn Pro
            260                 265                 270

Ile Phe Thr Phe Ala Thr Pro Thr Ile Ile Ser Gly Asp Arg Gln Asn
        275                 280                 285

Ile Asp Val Ile Ala His Glu Leu Ala His Ser Trp Ser Gly Asn Leu
    290                 295                 300

Val Thr Ser Cys Ser Trp Glu His Phe Trp Leu Asn Glu Gly Trp Thr
305                 310                 315                 320

Val Tyr Leu Glu Arg Arg Ile Leu Ala Ala Ile His Lys Asn Asp Ala
                325                 330                 335

Tyr Phe Asp Phe Ser Ala Ile Ile Gly Trp Lys His Leu Glu Glu Ala
```

```
            340                 345                 350

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

His Asp Gly Ile Asp Pro Asp Asp Ala Phe Ser Thr Val Pro Tyr Glu
    370                 375                 380

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

Asn Phe Asp Lys Phe Ile Pro Tyr Tyr Phe Lys Lys Trp Gln Asn Lys
                405                 410                 415

Ser Leu Asp Ser Tyr Glu Phe Lys Asp Thr Phe Leu Glu Phe Phe Gly
            420                 425                 430

Ala Pro Glu Tyr Ala Gly Leu Lys Asp Lys Leu Ala Glu Ile Asp Trp
        435                 440                 445

Glu Gly Arg Phe Phe Asn Thr Gly Leu Pro Pro Lys Pro Glu Phe Asn
    450                 455                 460

Thr Ser Leu Val Asp Val Cys Phe Gln Leu Ala Glu Lys Trp Lys Gln
465                 470                 475                 480

Lys Asp Tyr Thr Pro Ser Pro Ser Asp Ile Ser Ser Trp Thr Gly Asn
                485                 490                 495

Gln Val Leu Val Phe Leu Asn Ala Val Gln Asp Phe Glu Glu Pro Leu
            500                 505                 510

Thr Val Gly Gln Ser Gln Asn Leu Gly Lys Ile Tyr Gly Leu Ala Asp
        515                 520                 525

Ser Lys Asn Ala Glu Leu Lys Ser Ala Tyr Tyr Gln Ile Ala Met Lys
```

530 535 540

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

Val Gly Arg Met Lys Phe Val Arg Pro Leu Phe Arg Ser Leu Asn Lys
565 570 575

Val Asp Arg Asp Leu Ala Leu Gly Thr Phe Glu Lys Asn Arg Asp Phe
580 585 590

Tyr His Pro Ile Cys Arg Gln Leu Val Glu Lys Asp Leu Gly Val Gly
595 600 605

Glu Ala Lys Ser Ser
610

<210> 43
<211> 662
<212> PRT
<213> Aspergillus oryzae

<400> 43

Met Ile Arg Ile Pro Leu Phe Gln Pro Trp Lys Pro Arg Leu Pro Arg
1 5 10 15

Gly Ser Val Val His Ser Cys Tyr Phe Ile Pro Phe Ser Glu Val Thr
20 25 30

Thr Arg Ile Pro Trp Ile Ala Gln Ala Ser Arg Arg Ser Met Ala Thr
35 40 45

Val Ile His Ser Pro Arg Asp Pro Asn Thr Leu Ser Asn Tyr Asn Asn
50 55 60

Trp Val Ser Thr His Ile Thr Ala Thr Phe Asp Ile Leu Phe Glu Gln
65 70 75 80

```
Lys Lys Leu Val Gly Asn Val Val His Lys Leu Lys Ser Ile Thr Asp
                85                  90                  95

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

Asp Val Lys Val Asp Gly Gln Ala Ser His Trp Glu Leu Leu Pro Pro
        115                 120                 125

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

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

Lys Cys Thr Ala Leu Gln Trp Leu Thr Pro Ala Gln Thr Ser Asn Arg
                165                 170                 175

Lys His Pro Tyr Met Phe Ser Gln Cys Gln Ala Ile His Ala Arg Ser
            180                 185                 190

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

Asn Ile Thr Ser Pro Leu Pro Val Val Ala Ser Gly Leu Pro Val Arg
    210                 215                 220

Gly Ile Ile Glu Lys Ala Gln Pro Gly Ser Lys Thr Leu Tyr Gln Phe
225                 230                 235                 240

His Gln Lys Leu Pro Ile Pro Ser Tyr Leu Phe Ala Leu Ala Ser Gly
                245                 250                 255

Asp Ile Ser Glu Ala Ala Ile Gly Pro Arg Ser Val Val Ala Thr Ser
            260                 265                 270
```

```
Pro Asp Lys Leu Ser Glu Cys Gln Trp Glu Leu Lys Ala Asp Thr Glu
        275                 280                 285

Asn Phe Ile His Ala Ile Glu Lys Ile Val Tyr Pro Tyr Ala Trp Gly
    290                 295                 300

Glu Tyr Asn Val Leu Ile Leu Pro Pro Ser Phe Pro Tyr Gly Gly Met
305                 310                 315                 320

Glu Asn Pro Ile Phe Thr Phe Ala Thr Pro Ser Ile Ile Ser Lys Asp
                325                 330                 335

Arg Glu Asn Val Asp Val Ile Ala His Glu Leu Ala His Ser Trp Ser
            340                 345                 350

Gly Asn Leu Val Thr Asn Ala Ser Trp Glu His Phe Trp Leu Asn Glu
        355                 360                 365

Gly Trp Thr Thr Tyr Leu Glu Arg Arg Ile Leu Ala Ala Val His Gly
    370                 375                 380

Glu Ala Tyr Arg His Phe Ser Ala Ile Ile Gly Trp Lys Ser Leu Ala
385                 390                 395                 400

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

Thr Asp Leu Lys Gly Lys Asp Pro Asp Asp Ala Phe Ser Ser Ile Pro
            420                 425                 430

Tyr Glu Lys Gly Phe Asn Phe Leu Phe His Leu Glu Asn Leu Leu Ala
        435                 440                 445

Lys Asp Lys Phe Asp Arg Phe Ile Pro His Tyr Phe Thr Lys Phe Lys
    450                 455                 460
```

```
Gly Lys Ser Leu Asp Ser Tyr Glu Phe Lys Ala Thr Met Leu Glu Phe
465                 470                 475                 480

Phe Gln His Asp Leu Glu Ala Ser Asn Leu Leu Lys Asn Val Asp Trp
                485                 490                 495

Asp Ala Trp Phe Tyr Ala Pro Gly Leu Pro Pro Lys Pro Gln Phe Asp
            500                 505                 510

Thr Ser Leu Val Asp Val Val Tyr Glu Leu Ser Ser Lys Trp Lys Ser
        515                 520                 525

Leu Pro Asp Ser Ser Phe Gln Pro Arg Thr Ser Asp Ile Glu Gly Leu
    530                 535                 540

Thr Ala Asn Gln Ile Val Val Leu Leu Glu Gln Ile Leu Leu Phe Glu
545                 550                 555                 560

Arg Pro Leu Thr Pro Glu Leu Ser Arg Val Leu Gly Glu Val Tyr Ser
                565                 570                 575

Leu Ala Lys Ser Glu Asn Ile Glu Val Ser Asn Leu Tyr Phe Gln Val
            580                 585                 590

Gly Leu Arg Ala Gly Asp Asp Thr Val Tyr Lys Pro Thr Ala Glu Leu
        595                 600                 605

Leu Gly Lys Ile Gly Arg Met Lys Phe Val Arg Pro Leu Tyr Arg Asn
    610                 615                 620

Leu Gln Lys Val Asn Arg Pro Leu Ala Ile Glu Thr Phe Glu Lys Asn
625                 630                 635                 640

Lys Asp Phe Tyr His Pro Ile Cys Arg Ala Met Val Glu Lys Asp Leu
                645                 650                 655
```

Phe Gly Lys Arg Glu Glu
            660

<210> 44
<211> 664
<212> PRT
<213> Aspergillus niger

<400> 44

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

Val Pro Cys Phe Thr Gly Leu Lys Ala Asn Val Asn Ser Ser Ile Gln
            20   25   30

Val Arg Trp Ser Leu Arg Leu Pro Gln Ile His Arg Arg Ser Met Ala
        35   40   45

Ile Ser Ile His Pro Pro Arg Asp Pro Asn Thr Leu Ser Asn Tyr Asn
    50   55   60

Asn Trp Ile Cys Thr His Ile Thr Ala Asn Phe Asp Ile Leu Phe Asp
65   70   75   80

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

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

Gly Asp Val Lys Ile Asp Gly Arg Pro Ser Glu Trp Glu Leu Leu Pro
        115   120   125

Pro Leu Glu Pro Tyr Gly Ser Ala Leu Lys Ile Lys Leu Asp Gln Gly
    130   135   140

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


Glu Lys Cys Thr Ala Leu Gln Trp Leu Thr Pro Ala Gln Thr Ser Asn
                165                 170                 175


Lys Lys His Pro Tyr Met Phe Ser Gln Cys Gln Ala Ile His Ala Arg
            180                 185                 190


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


Phe Asn Ile Ser Ser Pro Leu Pro Val Ile Ala Ser Gly Leu Pro Val
    210                 215                 220


Arg Asp Ala Leu Gly Ala Ser Lys Ser Glu Gly Lys Ser Leu Tyr Gln
225                 230                 235                 240


Phe His Gln Arg Val Pro Ile Pro Ser Tyr Leu Phe Ala Leu Ala Ser
                245                 250                 255


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


Ser Pro Asp Lys Val Gln Glu Cys Gln Trp Glu Leu Glu Ala Asp Thr
        275                 280                 285


Glu Lys Phe Ile Gly Ala Ile Glu Lys Ile Val Tyr Pro Tyr Ala Trp
    290                 295                 300


Gly Glu Tyr Asn Val Leu Ile Leu Pro Pro Ser Phe Pro Tyr Gly Gly
305                 310                 315                 320


Met Glu Asn Pro Ile Phe Thr Phe Ala Thr Pro Ser Ile Ile Ser Lys
                325                 330                 335
```

```
Asp Arg Glu Asn Ile Asp Val Ile Ala His Glu Leu Ala His Ser Trp
            340                 345                 350

Ser Gly Asn Leu Val Thr Asn Ala Ser Trp Glu His Phe Trp Leu Asn
        355                 360                 365

Glu Gly Trp Thr Thr Tyr Leu Glu Arg Arg Ile Leu Ala Ala Val His
    370                 375                 380

Gly Glu Ala Tyr Arg His Phe Ser Ala Ile Ile Gly Trp Lys Ala Leu
385                 390                 395                 400

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

Ile Thr Asp Leu Lys Gly Lys Asp Pro Asp Asp Ala Phe Ser Ser Ile
            420                 425                 430

Pro Tyr Glu Lys Gly Phe Asn Phe Leu Phe His Leu Glu Thr Leu Val
        435                 440                 445

Gly Lys Gln Lys Phe Asp Arg Phe Ile Pro His Tyr Phe Thr Val Phe
    450                 455                 460

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

Phe Phe Gly Thr Asp Ala Glu Ala Ser Lys Leu Leu Asn Asp Leu Asp
                485                 490                 495

Trp Asp Thr Trp Phe Tyr Ala Pro Gly Leu Pro Pro Lys Pro Gln Phe
            500                 505                 510

Asp Thr Ser Leu Val Asp Val Val Tyr Glu Leu Ala Gln Lys Trp Lys
        515                 520                 525
```

```
Ser Leu Ser Glu Thr Ser Ser Phe Lys Pro Gln Leu Ser Asp Ile Glu
    530                 535                 540

Ser Leu Ser Ala Asn Gln Ile Val Val Phe Leu Glu Gln Met Leu Leu
545                 550                 555                 560

Leu Glu Arg Pro Leu Thr Pro Glu Leu Ser Lys Leu Met Gly Glu Val
                565                 570                 575

Tyr Gly Leu Ser Lys Ser Glu Asn Ile Glu Val Ala Asn Leu Tyr Phe
            580                 585                 590

Gln Leu Gly Leu Lys Ala Gly Asp Glu Asn Val Val Asp Pro Ala Thr
        595                 600                 605

Glu Leu Leu Gly Arg Ile Gly Arg Met Lys Phe Val Arg Pro Leu Phe
    610                 615                 620

Arg Ser Leu Gln Arg Val Asn Arg Glu Val Ala Val Ala Thr Phe Glu
625                 630                 635                 640

Lys Tyr Lys Asp Phe Tyr His Pro Ile Cys Arg Ala Met Val Glu Lys
                645                 650                 655

Asp Leu Phe Gly Lys Arg Asp Val
            660
```

<210> 45
<211> 639
<212> PRT
<213> Aspergillus nidulans

<400> 45

```
Met Thr Thr Thr Thr Thr Thr Thr Thr Thr Thr Thr Leu Pro Phe Asn
1               5                   10                  15
```

```
Leu Tyr Gly Arg Ser Met Ala Thr Leu Met Asn Pro Val Arg Asp Pro
            20                  25                  30

Asn Thr Leu Ser Asn Tyr Asn Asn Trp Leu Cys Thr His Thr Thr Ala
        35                  40                  45

Asn Phe Glu Ile Phe Phe Glu Glu Lys Lys Leu Val Gly Asn Val Val
    50                  55                  60

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

Asp Ser His His Val Asp Ile Arg Asn Val Gln Val Ala Gly Leu Pro
                85                  90                  95

Val Lys Ala Trp Glu Leu Leu Pro Pro Leu Gly Pro Tyr Gly Thr Ala
            100                 105                 110

Leu Lys Ile Lys Leu Glu Asn Pro Val Gly Leu Asn Glu Ile Ile Asp
        115                 120                 125

Val Asp Ile Ala Val Gln Thr Thr Lys Glu Cys Thr Ala Leu Gln Trp
    130                 135                 140

Leu Thr Pro Ala Gln Thr Ser Asn Lys Lys His Pro Tyr Met Phe Ser
145                 150                 155                 160

Gln Cys Gln Ala Ile His Ala Arg Ser Ile Phe Pro Cys Gln Asp Thr
                165                 170                 175

Pro Asp Val Lys Cys Thr Phe Asp Phe Asn Ile Thr Ser Pro Leu Pro
            180                 185                 190

Val Ile Ala Ser Gly Leu Pro Val Arg Ser Thr Ser Thr Val Pro Gln
        195                 200                 205
```

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

Ser Tyr Leu Phe Ala Leu Ala Ser Gly Asp Ile Ala Glu Ala Ala Ile
225                 230                 235                 240

Gly Pro Arg Ser Val Val Ala Thr Ser Pro Asp Lys Leu Glu Glu Cys
                245                 250                 255

Lys Trp Glu Leu Glu Ala Asp Thr Glu Arg Phe Ile Lys Thr Ile Glu
            260                 265                 270

Glu Ile Ile Tyr Pro Tyr Ala Trp Gly Glu Tyr Asn Val Leu Ile Leu
        275                 280                 285

Pro Pro Ser Phe Pro Tyr Gly Gly Met Glu Asn Pro Val Phe Thr Phe
    290                 295                 300

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

Ala His Glu Leu Ala His Ser Trp Ser Gly Asn Leu Val Thr Ser Ala
                325                 330                 335

Ser Trp Glu His Phe Trp Leu Asn Glu Gly Trp Thr Val Tyr Leu Glu
            340                 345                 350

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

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

His Asp His Glu Phe Thr Lys Leu Val Pro Asn Leu Lys Gly Glu Asp
385                 390                 395                 400
```

```
Pro Asp Asp Ala Phe Ser Thr Ile Pro Tyr Glu Lys Gly Phe Asn Phe
                405                 410                 415

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

Ile Pro His Tyr Phe Thr Thr Phe Lys Gly Lys Ser Leu Asp Ser Tyr
        435                 440                 445

Asp Phe Lys Ala Thr Leu Leu Asp Phe Phe Lys Ser Asp Ala Glu Ala
    450                 455                 460

Ser Arg Leu Leu Gln Glu Leu Asp Trp Asp Ser Trp Phe Tyr Lys Pro
465                 470                 475                 480

Gly Leu Pro Pro Lys Pro Glu Phe Asp Thr Ser Leu Ala Asp Val Val
                485                 490                 495

Tyr Glu Leu Ala Gly Lys Trp Arg Ser Leu Pro Glu Ser Pro Phe Gln
            500                 505                 510

Pro Gln Pro Ser Asp Ile Gln Gly Leu Thr Ala Asn Gln Ile Val Val
        515                 520                 525

Phe Leu Glu Gln Ile Leu Leu Phe Glu Arg Pro Leu Thr Ala Glu Leu
    530                 535                 540

Ser Lys Leu Met Gly Glu Val Tyr Gly Leu Thr Gly Ser Glu Asn Ile
545                 550                 555                 560

Glu Val Ala Asn Leu Tyr Leu Gln Val Gly Leu Lys Ala Ala Asp Lys
                565                 570                 575

Ser Val Ile Gly Pro Thr Thr Asp Leu Leu Gly Arg Ile Gly Arg Met
            580                 585                 590
```

Lys Phe Val Arg Pro Leu Tyr Arg Ala Leu Gln Lys Val Asp Arg Gln
595 600 605

Val Ala Ile Asp Thr Phe Glu Lys His Lys Asp Phe Tyr His Pro Ile
610 615 620

Cys Arg Gly Met Val Glu Lys Asp Leu Phe Gly Lys Lys Asp Ala
625 630 635

<210> 46
<211> 614
<212> PRT
<213> Aspergillus fumigatus

<400> 46

Met Thr Thr Val Val Asn Leu Pro Arg Asp Pro Asn Thr Leu Ser Asn
1 5 10 15

Tyr Asn Asn Trp Val Ser Thr His Ile Thr Ala Asn Phe Asp Ile Leu
20 25 30

Phe Asp Gln Arg Lys Leu Ala Gly Asn Val Ile His Arg Phe Arg Ser
35 40 45

Thr Thr Asp Gly Glu Ser Asn His Ile Ile Leu Asp Thr Asn His Leu
50 55 60

Asp Ile Gly Ser Val Lys Val Asn Gly Gln Pro Ser Glu Trp Glu Tyr
65 70 75 80

Leu Pro Arg Leu Glu Pro Tyr Gly Thr Pro Leu Lys Ile Lys Leu Asp
85 90 95

Gln Gly Val Lys Leu Asn Glu Thr Ile Glu Val Asp Ile Ser Val Gln
100 105 110

Thr Thr Glu Lys Cys Thr Ala Leu Gln Trp Leu Thr Pro Ala Gln Thr

```
        115                 120                 125

Ser Asn Lys Lys His Pro Tyr Met Phe Ser Gln Cys Gln Ala Ile His
    130                 135                 140

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

Leu Asp Phe Asn Ile Thr Ser Pro Leu Pro Val Ile Ala Ser Gly Leu
                165                 170                 175

Pro Val Arg Gly Ser Ser Glu Ala Pro Lys Ser Asp Gly Lys Thr Leu
            180                 185                 190

Tyr Lys Phe His Gln Lys Val Pro Ile Pro Ser Tyr Leu Phe Ala Leu
        195                 200                 205

Ala Ser Gly Asp Ile Ser Glu Ala Pro Ile Gly Pro Arg Ser Val Val
    210                 215                 220

Ala Thr Ser Pro Asp Lys Leu Gly Glu Cys Gln Trp Glu Leu Glu Ala
225                 230                 235                 240

Asp Thr Glu Lys Phe Ile Asn Ala Ile Glu Lys Ile Val Tyr Pro Tyr
                245                 250                 255

Val Trp Gly Glu Tyr Asn Val Leu Ile Leu Pro Pro Ser Phe Pro Tyr
            260                 265                 270

Gly Gly Met Glu Asn Pro Ile Phe Thr Phe Ala Thr Pro Ser Ile Ile
        275                 280                 285

Ser Lys Asp Arg Glu Asn Ile Asp Val Ile Ala His Glu Leu Ala His
    290                 295                 300

Ser Trp Ser Gly Asn Leu Val Thr Asn Ala Ser Trp Glu His Phe Trp
```

```
305                 310                 315                 320

Leu Asn Glu Gly Trp Thr Thr Tyr Leu Glu Arg Arg Leu Arg His Gly
                325                 330                 335

Glu Pro Tyr Arg His Phe Ser Ala Ile Ile Gly Trp Lys Ala Leu Thr
            340                 345                 350

Asp Ser Val Glu His Phe Gly Pro Glu His Asp Phe Thr Lys Leu Ile
        355                 360                 365

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

Tyr Glu Lys Gly Phe Asn Phe Leu Phe His Leu Glu Asn Leu Val Gly
385                 390                 395                 400

Lys Ser Lys Phe Asp Arg Phe Ile Pro His Tyr Phe Asn Lys Tyr Lys
                405                 410                 415

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

Phe Lys Asp Asp Ser Asp Ala Ser Thr Ala Leu Asn Glu Leu Asp Trp
        435                 440                 445

Asp Ser Trp Phe Tyr Ala Pro Gly Leu Pro Pro Lys Pro Asp Phe Asp
    450                 455                 460

Thr Ser Leu Val Asp Val Val Tyr Asp Leu Ala Lys Lys Trp Leu Ser
465                 470                 475                 480

Leu Pro Lys Ser Ser Phe Lys Pro Gln Pro Glu Asp Ile Arg Gly Leu
                485                 490                 495

Thr Ala Asn Gln Val Val Val Phe Leu Glu Gln Ile Leu Val Ser Glu
```

500 505 510

Arg Gln Leu Thr Pro Glu Leu Ser Lys Leu Met Gly Glu Ile Tyr Gly
515 520 525

Leu Ala Ala Ser Gln Asn Ile Glu Val Ala Asn Leu Tyr Phe Gln Val
530 535 540

Gly Leu Gln Ala Gly Asp Ala Ser Val Val Glu Pro Thr Ala Asp Leu
545 550 555 560

Leu Gly Lys Ile Gly Arg Met Lys Phe Val Arg Pro Leu Tyr Arg Lys
565 570 575

Leu Ala Lys Phe Asp Arg Lys Arg Ala Leu Asp Thr Phe Glu Lys His
580 585 590

Lys Gly Phe Tyr His Pro Ile Cys Arg Ala Met Val Glu Lys Asp Leu
595 600 605

Phe Gly Lys Lys Asp Glu
610

<210> 47
<211> 666
<212> PRT
<213> Penicilium Chrysogenum

<400> 47

Met Gly Asn Glu Lys Trp Gln Met Ala Asn Gly Leu Met Gly Glu Lys
1 5 10 15

Phe Leu Ser Ser Met Asn Pro Thr Leu Gly Arg Ser Leu Thr Arg Asn
20 25 30

Leu Asn Phe Asn Leu Val Arg Thr Ser Phe Lys Leu Gln Phe Thr Ser
35 40 45

```
Ile Arg Thr Met Ala Thr Ile Asn Pro Pro Arg Asp Pro Asn Thr Val
    50                  55                  60

Ser Asn Tyr Asn Asn Trp Arg Ser Thr His Ile Thr Ala Asn Phe Asp
65                  70                  75                  80

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

Lys Ser Ile Thr Asp Gly Glu Ser Gln Glu Ile Ile Leu Asp Thr Ser
            100                 105                 110

His Leu Asp Ile Gly Val Val Lys Val Asp Gly Gln Pro Ser Lys Trp
        115                 120                 125

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

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

Val Lys Thr Thr Asp Lys Cys Thr Ala Leu Gln Trp Leu Thr Pro Ala
                165                 170                 175

Gln Thr Ser Asn Lys Lys His Pro Tyr Met Phe Ser Gln Cys Gln Ala
            180                 185                 190

Ile His Ala Arg Ser Ile Phe Pro Cys Gln Asp Thr Pro Asp Val Lys
        195                 200                 205

Ala Thr Phe Asp Phe Asn Ile Thr Ser Pro Leu Pro Val Met Thr Ser
    210                 215                 220

Gly Leu Pro Ile Arg Lys Ser Ser Met Glu Ser Lys Ala Asp His Gln
225                 230                 235                 240
```

```
Leu Tyr Arg Phe His Gln Ser Val Pro Ile Pro Ser Tyr Leu Phe Ala
                245                 250                 255

Ile Ala Ser Gly Asp Val Ala Glu Ala Pro Ile Gly Pro Arg Ser Val
            260                 265                 270

Val Ala Thr Ser Pro Asp Lys Leu Glu Glu Cys Lys Trp Glu Leu Glu
        275                 280                 285

Ala Asp Thr Glu Asn Phe Ile Thr Thr Ile Glu Lys Ile Val Tyr Ser
    290                 295                 300

Tyr Ala Trp Gly Glu Tyr Asn Val Leu Ile Leu Pro Pro Ser Phe Pro
305                 310                 315                 320

Tyr Gly Gly Met Glu Asn Pro Ile Phe Thr Phe Ala Thr Pro Ser Ile
                325                 330                 335

Ile Ser Lys Asp Arg Glu Asn Ile Asp Val Ile Ala His Glu Leu Ala
            340                 345                 350

His Ser Trp Ser Gly Asn Leu Val Thr Asn Ala Ser Trp Glu His Phe
        355                 360                 365

Trp Leu Asn Glu Gly Trp Thr Val Tyr Leu Glu Arg Arg Ile Leu Ala
    370                 375                 380

Ala Ile His Gly Glu Ala Tyr Arg His Phe Ser Ala Ile Ile Gly Trp
385                 390                 395                 400

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

Thr Lys Leu Ile Val Asp Leu Lys Gly Lys Asp Pro Asp Asp Ala Phe
            420                 425                 430
```

```
Ser Ser Val Pro Tyr Glu Lys Gly Phe Asn Phe Leu Phe Tyr Leu Glu
        435                 440                 445

Asn Leu Val Gly Lys Ser Lys Phe Asp Lys Phe Ile Pro His Tyr Phe
    450                 455                 460

Thr Thr Phe Lys Cys Lys Ser Leu Asp Ser Tyr Glu Phe Lys Ala Leu
465                 470                 475                 480

Ile Leu Asp Phe Phe Gln Ser Asp Ala Glu Ala Ser Lys Leu Leu Asp
                485                 490                 495

Glu Leu Asp Trp Asp Lys Trp Phe Tyr Ala Pro Gly Leu Pro Pro Lys
            500                 505                 510

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

Lys Trp Gln Ser Leu Pro Asp Ser Ser Phe Lys Pro Gln Ile Ser Asp
    530                 535                 540

Ile Gln Gly Leu Thr Ala Asn Gln Leu Val Val Phe Leu Glu Gln Met
545                 550                 555                 560

Leu Leu Leu Glu Lys Pro Leu Ser Pro Glu Thr Ser Lys Leu Met Gly
                565                 570                 575

Asp Val Tyr Gly Phe Thr Lys Ser Glu Asn Ile Glu Val Ser Asn Leu
            580                 585                 590

Tyr Cys Gln Val Gly Met Lys Ala Gly Asp Asp Ser Val Ile Glu Pro
        595                 600                 605

Thr Thr Glu Leu Leu Gly Arg Ile Gly Arg Met Lys Phe Val Arg Pro
    610                 615                 620
```

```
Leu Phe Arg Asn Leu Gln Lys Ile Asn Arg Pro Val Ala Leu Ala Thr
625                 630                 635                 640


Phe Glu Lys Tyr Lys Asp Phe Tyr His Pro Ile Cys Arg Gly Met Val
                645                 650                 655


Glu Lys Asp Leu Phe Gly Lys Lys Asp Asn
            660                 665


<210>  48
<211>  533
<212>  PRT
<213>  Trichoderma reesei

<400>  48

Met Trp Ser Leu Ala Val Ala Ala Glu Leu Leu Leu Leu Ala Gly Thr
1               5                   10                  15


Ala Ser Ala Leu Leu Phe Gln Asp Leu Arg Pro Pro Lys Pro Asp Val
            20                  25                  30


Asp Leu Asp Asn Asn Phe Arg Ile Ala Ala Ala Ala Ser Thr Pro Thr
        35                  40                  45


Tyr Gly Thr Phe Gln Gln Leu Ile Asp His Asp His Pro Glu Leu Gly
    50                  55                  60


Thr Phe Ser Gln Arg Tyr Val Trp Asn Asp Glu Phe Tyr Ala Gly Pro
65                  70                  75                  80


Gly Ser Pro Ile Ile Leu Met Gly Pro Asn Glu Ser Ala Leu Asp Gly
                85                  90                  95


Tyr Glu Arg Tyr Thr Thr Asn Leu Thr Leu Pro Gly Val Met Ala Gln
            100                 105                 110
```

```
Glu Leu Gly Ala Gly Ala Leu Ile Ile Glu His Arg Tyr Trp Gly Gln
        115                 120                 125

Ser Ser Pro Phe Asp Ser Leu Thr Thr Glu Asn Met Arg Tyr Leu Thr
    130                 135                 140

Leu Glu Gln Ser Val Gln Asp Leu Val Tyr Phe Ala Gln Asn Val Val
145                 150                 155                 160

Leu Pro Phe Asp Gln Asn Arg Thr Ser Thr Pro Asp Lys Ala Pro Trp
                165                 170                 175

Val Leu Val Gly Cys Ser Tyr Ser Gly Ala Leu Ala Ala Trp Val Gln
            180                 185                 190

Asp Leu Ala Pro Gly Thr Phe Trp Ala Tyr Gln Cys Ser Ser Pro Val
        195                 200                 205

Val Glu Ala Ile Gly Pro Leu Trp Lys Tyr Phe Glu Gln Val Lys Leu
    210                 215                 220

Ala Met Pro Gln Asn Cys Thr Ala Asp Tyr Ala Arg Ile Val Gln Tyr
225                 230                 235                 240

Ile Asp Gly Val Leu Leu Gly His Asn Gln Lys Ala Lys Asp Glu Leu
                245                 250                 255

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

Ala Ala Leu Val Ser Gly Leu Tyr Thr Trp Gln Ser Val Leu Phe Ser
        275                 280                 285

Asp Gly Tyr Ser Ala Thr Asn Arg Met Cys Asp Tyr Val Glu Asn Gln
    290                 295                 300
```

```
Trp Pro Gly Ser Thr Ala Pro Ala Pro Gly Lys Asn Gly Val Gly Leu
305                 310                 315                 320

Thr Lys Ala Leu Ala Gly Tyr Ala Lys Trp Phe Thr Thr Leu Ser Leu
                325                 330                 335

Pro Gly Ser Cys Ala Ser Tyr Gly Tyr Trp Thr Asn Pro Asn Asp Thr
            340                 345                 350

Ser Cys Tyr Asp Thr Tyr Asn Ala Ser Ser Pro Leu Phe Thr Asp Leu
        355                 360                 365

Ser Pro Glu Asn Thr Gly Asn Arg Gln Trp Trp Trp Phe Leu Cys Asn
    370                 375                 380

Glu Pro Phe Lys Trp Trp Gln Val Arg Gly Leu Gly Asn Leu Val Ser
385                 390                 395                 400

Arg Leu Val Asn Gln Pro Tyr Phe Glu Arg Gln Cys Gly Leu Ile Phe
                405                 410                 415

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

Ala Arg Val Asn Arg Val Thr Gly Gly Trp Tyr Asn Val Asn Thr His
        435                 440                 445

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

Val Met Ala Val Asp Arg Pro Gly Gly Pro Leu Arg Ser Thr Lys Gln
465                 470                 475                 480

His Pro Val Trp Val Val Pro Gly Ala Ala His Cys Gly Asp Met Leu
                485                 490                 495
```

```
Val Arg Asn Arg Asn Ala Asn Glu Gly Val Arg Asn Val Phe Asp Ser
            500                 505                 510


Glu Val Ala Asn Ile Lys Gln Trp Val Gln Glu Phe Tyr Glu Glu Lys
        515                 520                 525


Gly Lys Lys Gly Asn
    530
```

<210> 49
<211> 507
<212> PRT
<213> Trichoderma virens

<400> 49

```
Met Arg Pro Arg Arg Pro Glu Leu Glu Pro Val Arg Leu Ala Ala Asn
1               5                   10                  15


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


His Pro Glu Lys Gly Thr Phe Gln Gln Arg Tyr Ala Trp Asn Gly Glu
        35                  40                  45


Phe Tyr Lys Gly Pro Gly Ser Pro Ile Ile Leu Met Gly Pro Asn Glu
    50                  55                  60


Ser Ala Leu Asp Gly Phe Glu Gly Tyr Thr Thr Asn Lys Thr Leu Pro
65                  70                  75                  80


Gly Val Ile Ala Gln Glu Leu Gly Ala Gly Ala Leu Ile Ile Glu His
                85                  90                  95


Arg Tyr Trp Gly Gln Ser Ser Pro Phe Asp Thr Leu Asn Thr Glu Asn
            100                 105                 110
```

```
Met Gln Tyr Leu Thr Leu Glu Gln Ser Val Lys Asp Leu Val Tyr Phe
        115                 120                 125

Ala Gln Asn Val Val Leu Pro Phe Asp Gln Asn Arg Thr Ser Thr Pro
    130                 135                 140

Asp Lys Ala Pro Trp Val Leu Ala Gly Cys Ser Tyr Ser Gly Ala Leu
145                 150                 155                 160

Thr Gly Trp Val Gln Asp Leu Ala Pro Gly Thr Phe Trp Ala Tyr Ser
                165                 170                 175

Cys Ser Ser Pro Val Val Glu Ala Val Asp Glu Leu Trp Arg Tyr Phe
            180                 185                 190

Glu Gln Val Lys Leu Ala Met Pro Lys Asn Cys Ser Ser Asp Tyr Ala
        195                 200                 205

Gln Val Ile Gln His Val Asp Gln Val Leu Leu Gly Arg Asn Gln Lys
    210                 215                 220

Ala Lys Asp Asp Leu Lys Ala Leu Phe Gly Leu Ala Asp Leu Glu His
225                 230                 235                 240

Asp Asp Asp Phe Ala Ala Ala Leu Asn Asn Gly Leu Tyr Thr Trp Gln
                245                 250                 255

Ser Val Leu Phe Ser Asp Ala Ser Asn Pro Leu Leu Val Met Cys Asp
            260                 265                 270

Tyr Val Glu Asn Val Trp Pro Gly Ser Thr Ser Pro Val Pro Gly Ala
        275                 280                 285

Lys Gly Val Gly Leu Thr Lys Ala Leu Ala Gly Tyr Ala Lys Trp Phe
    290                 295                 300
```

```
Thr Ser Val Ser Leu Pro Gly Ser Cys Ser Gly Tyr Gly Tyr Trp Ser
305                 310                 315                 320


Asn Pro Asn Asp Thr Ser Cys Tyr Asp Thr Tyr Asn Ala Thr Ser Pro
                325                 330                 335


Leu Phe Thr Asp Leu Thr Val Glu Asn Thr Ala Asn Arg Gln Trp Phe
            340                 345                 350


Trp Tyr Leu Cys Asn Glu Pro Phe Lys Trp Trp Gln Val Arg Gly Gln
        355                 360                 365


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


Cys Asn Leu Phe Phe Pro Arg Glu Gly Lys Tyr Thr Tyr Gly Ile Ala
385                 390                 395                 400


Lys Gly Val Thr Thr His His Val Asn Gln Val Thr Gly Gly Trp Arg
                405                 410                 415


Asn Val Asn Thr His Arg Leu Gln Trp Thr Ala Gly Glu Phe Asp Pro
            420                 425                 430


Trp Arg Pro Ala Thr Val Met Ala Glu Asn Arg Pro Gly Gly Pro Leu
        435                 440                 445


Gln Ser Thr Pro Glu His Pro Val Phe Val Val Pro Gly Ala Ala His
    450                 455                 460


Cys Gly Asp Met Leu Val Arg Asn Ala Asn Ala Asn Ala Gly Val Lys
465                 470                 475                 480


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

Phe Tyr Glu Glu Lys Gly Gly Lys Pro His Tyr
500 505

<210> 50
<211> 533
<212> PRT
<213> Trichoderma atroviride

<400> 50

Met Arg Ser Ser Asn Pro Ile Ala Val Ala Ala Glu Leu Leu Leu Leu
1 5 10 15

Ala Gly Ala Val Ser Ala Gly Thr Pro Gln Asp Thr Ser Pro Pro Lys
20 25 30

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

Arg Thr Phe Gln Gln Leu Ile Asp His Asp His Pro Glu Leu Gly Thr
50 55 60

Phe Ser Gln Arg Tyr Val Tyr Asn Gly Asp Tyr Tyr Lys Gly Pro Gly
65 70 75 80

Ser Pro Ile Ile Leu Val Gly Pro Asn Glu Ser Ala Leu Asp Gly Tyr
85 90 95

Glu Gly Tyr Thr Thr Asn Ala Thr Leu Pro Gly Thr Tyr Ala Gln Ala
100 105 110

Val Gly Gly Gly Ala Ile Ile Ile Glu His Arg Tyr Trp Gly Gln Ser
115 120 125

Ser Pro Tyr Gln Ser Leu Asp Thr Glu Asn Met Thr Tyr Leu Thr Leu
130 135 140

Asp Gln Ser Ile Lys Asp Leu Thr Tyr Phe Ala Lys Asn Val Val Leu

```
145                 150                 155                 160

Pro Phe Asp Gln Asn Arg Thr Ser Thr Pro Asp Lys Ala Pro Trp Val
                165                 170                 175

Leu Ser Gly Cys Ser Tyr Ser Gly Ala Leu Thr Ala Trp Val Gln Asp
            180                 185                 190

Ile Ala Pro Gly Thr Phe Trp Ala Tyr Ser Ala Ser Ser Pro Val Val
        195                 200                 205

Glu Ala Ile Gly Pro Leu Trp Gln Tyr Phe Glu Gln Val Lys Leu Ala
    210                 215                 220

Met Pro Gln Asn Cys Thr Ser Asp Tyr Val Lys Ile Ile Asp His Val
225                 230                 235                 240

Asp Ser Ile Leu Leu Gly Asn Asp Lys Lys Ala Lys Ala Asp Leu Arg
                245                 250                 255

Ser Leu Phe Lys Leu Glu Gly Val Glu Tyr Asp Asp Asp Phe Ala Ala
            260                 265                 270

Ala Leu Val Asn Gly Leu Tyr Thr Trp Gln Asn Val Leu Phe Ala Asp
        275                 280                 285

Gly Phe Ser Ala Thr Asn Gln Met Cys Asp Tyr Val Glu Asn Lys Trp
    290                 295                 300

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

Lys Ala Leu Ala Gly Tyr Ala Lys Trp Phe Thr Glu Leu Ser Leu Pro
                325                 330                 335

Asn Thr Cys Ser Ser Tyr Gly Tyr Trp Lys Gly Glu Phe Asp Val Asp
```

```
            340                 345                 350

Cys Tyr Asn Thr His Asn Ala Ser Ser Pro Leu Phe Thr Asp Leu Thr
        355                 360                 365

Pro Thr Asn Ser Ala Asn Arg Gln Trp Asn Trp Phe Leu Cys Asn Glu
    370                 375                 380

Pro Phe Lys Trp Trp Gln Val Arg Gly Glu Gly Asn Leu Val Ser Arg
385                 390                 395                 400

Leu Val Thr Gln Ala Tyr Phe Glu Arg Gln Cys Gly Leu Phe Phe Pro
                405                 410                 415

Lys Glu Gly Asp Tyr Thr Tyr Gly Ile Ala Glu Gly Lys Thr Thr Ala
            420                 425                 430

Asp Val Asn Lys Val Thr Gly Gly Trp Tyr Asn Val Asn Thr His Arg
        435                 440                 445

Leu Gln Trp Ala Ala Gly Glu Phe Asp Pro Trp Arg Pro Ala Thr Val
    450                 455                 460

Met Ala Thr Thr Arg Pro Gly Gly Gln Leu Gln Ser Thr Ala Ala His
465                 470                 475                 480

Pro Val Arg Val Ile Pro Gly Gly Ala His Cys Gly Asp Gln Leu Thr
                485                 490                 495

Phe Asn Ala Gln Ala Asn Ala Ala Leu Gly Thr Ile Phe Ala Ala Glu
            500                 505                 510

Val Ala Ser Ile Lys Gln Trp Val Gln Glu Phe Tyr Ala Glu Lys Gly
        515                 520                 525

Gly Lys Asn His Tyr
```

530

<210> 51
<211> 526
<212> PRT
<213> Aspergillus niger

<400> 51

Met Arg Ser Phe Ser Val Val Ala Ala Ala Ser Leu Ala Leu Ser Trp
1 5 10 15

Ala Ser Leu Ala Gln Ala Ala Arg Pro Arg Leu Val Pro Lys Pro Ile
20 25 30

Ser Arg Pro Ala Ser Ser Lys Ser Ala Ala Thr Thr Gly Glu Ala Tyr
35 40 45

Phe Glu Gln Leu Leu Asp His His Asn Pro Glu Lys Gly Thr Phe Ser
50 55 60

Gln Arg Tyr Trp Trp Ser Thr Glu Tyr Trp Gly Gly Pro Gly Ser Pro
65 70 75 80

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

Tyr Leu Thr Asn Asp Thr Leu Thr Gly Val Tyr Ala Gln Glu Ile Gln
100 105 110

Gly Ala Val Ile Leu Ile Glu His Arg Tyr Trp Gly Asp Ser Ser Pro
115 120 125

Tyr Glu Val Leu Asn Ala Glu Thr Leu Gln Tyr Leu Thr Leu Asp Gln
130 135 140

Ser Ile Leu Asp Met Thr Tyr Phe Ala Glu Thr Val Lys Leu Gln Phe
145 150 155 160

```
Asp Asn Ser Ser Arg Ser Asn Ala Gln Asn Ala Pro Trp Val Met Val
                165                 170                 175

Gly Gly Ser Tyr Ser Gly Ala Leu Thr Ala Trp Thr Glu Ser Ile Ala
            180                 185                 190

Pro Gly Thr Phe Trp Ala Tyr His Ala Thr Ser Ala Pro Val Glu Ala
        195                 200                 205

Ile Tyr Asp Phe Trp Gln Tyr Phe Tyr Pro Ile Gln Gln Gly Met Ala
    210                 215                 220

Gln Asn Cys Ser Lys Asp Val Ser Leu Val Ala Glu Tyr Val Asp Lys
225                 230                 235                 240

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

Phe Gly Leu Gly Ala Val Glu His Tyr Asp Asp Phe Ala Ala Val Leu
            260                 265                 270

Pro Asn Gly Pro Tyr Leu Trp Gln Asp Asn Asp Phe Val Thr Gly Tyr
        275                 280                 285

Ser Ser Phe Phe Gln Phe Cys Asp Ala Val Glu Gly Val Glu Ala Gly
    290                 295                 300

Ala Ala Val Thr Pro Gly Pro Glu Gly Val Gly Leu Glu Lys Ala Leu
305                 310                 315                 320

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

Ala Ser Tyr Gly Tyr Trp Thr Asp Glu Trp Ser Val Ala Cys Phe Asp
            340                 345                 350
```

```
Ser Tyr Asn Ala Ser Ser Pro Ile Phe Thr Asp Thr Ser Val Gly Asn
        355                 360                 365

Pro Val Asp Arg Gln Trp Glu Trp Phe Leu Cys Asn Glu Pro Phe Phe
    370                 375                 380

Trp Trp Gln Asp Gly Ala Pro Glu Gly Thr Ser Thr Ile Val Pro Arg
385                 390                 395                 400

Leu Val Ser Ala Ser Tyr Trp Gln Arg Gln Cys Pro Leu Tyr Phe Pro
                405                 410                 415

Glu Val Asn Gly Tyr Thr Tyr Gly Ser Ala Lys Gly Lys Asn Ser Ala
            420                 425                 430

Thr Val Asn Ser Trp Thr Gly Gly Trp Asp Met Thr Arg Asn Thr Thr
        435                 440                 445

Arg Leu Ile Trp Thr Asn Gly Gln Tyr Asp Pro Trp Arg Asp Ser Gly
    450                 455                 460

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

Glu Pro Val Gln Ile Ile Pro Gly Gly Phe His Cys Ser Asp Leu Tyr
                485                 490                 495

Met Glu Asp Tyr Tyr Ala Asn Glu Gly Val Arg Lys Val Val Asp Asn
            500                 505                 510

Glu Val Lys Gln Ile Lys Glu Trp Val Glu Glu Tyr Tyr Ala
        515                 520                 525
```

<210> 52
<211> 525

<212> PRT
<213> Aspergillus fumigatus

<400> 52

```
Met Arg Thr Ala Ala Ala Ser Leu Thr Leu Ala Ala Thr Cys Leu Phe
1               5                  10                  15


Glu Leu Ala Ser Ala Leu Met Pro Arg Ala Pro Leu Ile Pro Ala Met
            20                  25                  30


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


Ile Asp His Asn Asn Pro Gly Leu Gly Thr Phe Pro Gln Arg Tyr Trp
    50                  55                  60


Tyr Asn Pro Glu Phe Trp Ala Gly Pro Gly Ser Pro Val Leu Leu Phe
65                  70                  75                  80


Thr Pro Gly Glu Ser Asp Ala Ala Asp Tyr Asp Gly Phe Leu Thr Asn
                85                  90                  95


Lys Thr Ile Val Gly Arg Phe Ala Glu Glu Ile Gly Gly Ala Val Ile
            100                 105                 110


Leu Leu Glu His Arg Tyr Trp Gly Ala Ser Ser Pro Tyr Pro Glu Leu
        115                 120                 125


Thr Thr Glu Thr Leu Gln Tyr Leu Thr Leu Glu Gln Ser Ile Ala Asp
    130                 135                 140


Leu Val His Phe Ala Lys Thr Val Asn Leu Pro Phe Asp Glu Asn His
145                 150                 155                 160


Ser Ser Asn Ala Asp Asn Ala Pro Trp Val Met Thr Gly Gly Ser Tyr
                165                 170                 175
```

```
Ser Gly Ala Leu Ala Ala Trp Thr Ala Ser Ile Ala Pro Gly Thr Phe
            180                 185                 190

Trp Ala Tyr His Ala Ser Ser Ala Pro Val Gln Ala Ile Tyr Asp Phe
        195                 200                 205

Trp Gln Tyr Phe Val Pro Val Val Glu Gly Met Pro Lys Asn Cys Ser
    210                 215                 220

Lys Asp Leu Asn Arg Val Val Glu Tyr Ile Asp His Val Tyr Glu Ser
225                 230                 235                 240

Gly Asp Ile Glu Arg Gln Gln Glu Ile Lys Glu Met Phe Gly Leu Gly
                245                 250                 255

Ala Leu Lys His Phe Asp Asp Phe Ala Ala Ala Ile Thr Asn Gly Pro
            260                 265                 270

Trp Leu Trp Gln Asp Met Asn Phe Val Ser Gly Tyr Ser Arg Phe Tyr
        275                 280                 285

Lys Phe Cys Asp Ala Val Glu Asn Val Thr Pro Gly Ala Lys Ser Val
    290                 295                 300

Pro Gly Pro Glu Gly Val Gly Leu Glu Lys Ala Leu Gln Gly Tyr Ala
305                 310                 315                 320

Ser Trp Phe Asn Ser Thr Tyr Leu Pro Gly Ser Cys Ala Glu Tyr Lys
                325                 330                 335

Tyr Trp Thr Asp Lys Asp Ala Val Asp Cys Tyr Asp Ser Tyr Glu Thr
            340                 345                 350

Asn Ser Pro Ile Tyr Thr Asp Lys Ala Val Asn Asn Thr Ser Asn Lys
        355                 360                 365
```

```
Gln Trp Thr Trp Phe Leu Cys Asn Glu Pro Leu Phe Tyr Trp Gln Asp
    370                 375                 380

Gly Ala Pro Lys Asp Glu Ser Thr Ile Val Ser Arg Ile Val Ser Ala
385                 390                 395                 400

Glu Tyr Trp Gln Arg Gln Cys His Ala Tyr Phe Pro Glu Val Asn Gly
                405                 410                 415

Tyr Thr Phe Gly Ser Ala Asn Gly Lys Thr Ala Glu Asp Val Asn Lys
            420                 425                 430

Trp Thr Lys Gly Trp Asp Leu Thr Asn Thr Thr Arg Leu Ile Trp Ala
        435                 440                 445

Asn Gly Gln Phe Asp Pro Trp Arg Asp Ala Ser Val Ser Ser Lys Thr
    450                 455                 460

Arg Pro Gly Gly Pro Leu Gln Ser Thr Glu Gln Ala Pro Val His Val
465                 470                 475                 480

Ile Pro Gly Gly Phe His Cys Ser Asp Gln Trp Leu Val Tyr Gly Glu
                485                 490                 495

Ala Asn Ala Gly Val Gln Lys Val Ile Asp Glu Glu Val Ala Gln Ile
            500                 505                 510

Lys Ala Trp Val Ala Glu Tyr Pro Lys Tyr Arg Lys Pro
        515                 520                 525
```

<210> 53
<211> 547
<212> PRT
<213> Neurospora crassa

<400> 53

```
Met Arg Phe Phe Ser Ala Ala Thr Ala Leu Leu Ala Ala Ala Ser Thr
1               5                  10                  15


Ala His Ala Ala Phe Phe Lys Thr Leu Gly Met Glu Ile Gly Pro Ile
            20                  25                  30


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


Ser Gly Tyr Gly Thr Phe Asp Gln Leu Ile Asp His Asn Thr Pro Glu
    50                  55                  60


Leu Gly Thr Phe Lys Gln Arg Phe Trp Tyr Gly Phe Gln Tyr Trp Lys
65                  70                  75                  80


Gly Pro Gly Ser Pro Ile Ile Leu Val Asn Pro Gly Glu Gln Ala Ala
                85                  90                  95


Asp Gly Phe Asn Lys Ser Tyr Leu Ser Asp Gln Arg Leu Ala Gly Trp
            100                 105                 110


Met Ala Lys Asp Met Gly Ala Ala Val Val Ile Met Glu His Arg Tyr
        115                 120                 125


Trp Gly Asn Ser Ser Pro Phe Asp Glu Leu Thr Val Lys Asn Leu Gln
    130                 135                 140


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


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


Ala Pro Trp Ile Phe Ser Gly Gly Ser Tyr Ser Gly Ala Leu Ala Gly
            180                 185                 190
```

```
Trp Leu Glu Ala Leu Tyr Pro Gly Thr Phe Trp Ala Tyr His Gly Thr
        195                 200                 205

Ser Gly Val Val Glu Thr Leu Gly His Phe Trp Thr Tyr Phe Val Pro
    210                 215                 220

Val Leu Glu Ala Thr Pro Gln Asn Cys Thr Lys Asp Leu Thr Ala Val
225                 230                 235                 240

Ile Asp Tyr Val Asp Ser Val Leu Leu His Gly Thr Pro Lys Ala Lys
                245                 250                 255

Arg Glu Leu Lys Ser Lys Phe Lys Leu Gln Asn Leu Thr Asp Ala Asp
            260                 265                 270

Phe Ala Ser Ala Ile Glu Ser Gly Pro Trp Ser Trp Gln Ser Thr Gln
        275                 280                 285

Phe Tyr Ser Glu Lys Ile Thr Gly Tyr Asn Pro Tyr Tyr Arg Phe Cys
    290                 295                 300

Asp Tyr Val Glu Asn Val Trp Pro Asn Ser Thr Asn Lys Val Pro Gly
305                 310                 315                 320

Pro Leu Gly Val Gly Ile Lys Lys Ala Leu Asp Gly Tyr Ala Lys Trp
                325                 330                 335

Phe Val Glu Glu Ser Leu Pro Gly Thr Cys Glu Ser Ser Gly Tyr Asp
            340                 345                 350

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

Ser Asn Pro Ile Phe His Asp Leu Ser Val Asp Asn Ala Tyr Asn Arg
    370                 375                 380
```

```
Gln Trp Asn Trp Phe Leu Cys Asn Glu Pro Phe Glu Trp Trp Gln Asp
385                 390                 395                 400


Gly Ala Pro Leu Gly Arg Pro Ser Ile Val Ser Arg Leu Val Asp Ala
                405                 410                 415


Asp Tyr Trp Arg Lys Gln Cys Pro Leu Trp Phe Pro Ala Glu Lys Gly
            420                 425                 430


Ser Asn Ala Thr Tyr Gly Ile Lys Gln Gly Lys Arg Ala Glu Asp Val
        435                 440                 445


Asn Lys Trp Thr Gly Gly Trp Lys His Thr Asn Gly Thr Arg Ile Met
    450                 455                 460


Gln Ala Asn Gly Ser Leu Asp Pro Trp Arg Asp Val Thr Leu Ser Ser
465                 470                 475                 480


Lys Phe Arg Pro Gly Gly Pro Phe Lys Gly Asn Lys Asn His Gln Val
                485                 490                 495


Arg Val Ile Glu Gly Gly Thr His Cys Ser Asp Phe Tyr Gly Pro Asn
            500                 505                 510


Trp Ser Ala Asn Glu Gly Ile Lys Lys Val Ala Glu Glu Glu Val Ala
        515                 520                 525


Gln Met Gly Gln Trp Val Ala Asp Phe Tyr Lys Lys Arg Gly Ile Thr
    530                 535                 540


Arg Thr Arg
545
```

<210> 54
<211> 544
<212> PRT
<213> Myceliophtora thermophila

<400> 54

```
Met Arg Leu Ser Ile Thr Ala Leu Ala Ala Gly Leu Ala Phe Ala Pro
1               5                  10                  15


Leu Ala Ala Ala Phe Gly Arg Gly Leu Ile Met Asp Ile Gly Pro Asp
            20                  25                  30


Asp Asp Thr Val Ser Glu Thr Glu Leu Gln Lys Arg Ala Glu Thr Val
        35                  40                  45


Asn Gly Trp Gly Thr Phe Asp Gln Leu Ile Asp His Ala Asn Pro Ser
    50                  55                  60


Leu Gly Thr Phe Lys Gln Arg Tyr Trp Tyr Gly Thr Glu Tyr Trp Lys
65                  70                  75                  80


Gly Pro Gly Ser Pro Ile Tyr Leu Val Ser Pro Gly Glu Gln Ser Gly
                85                  90                  95


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


Met Ala Asn Gln Thr Gly Gly Ala Val Ile Val Leu Glu His Arg Tyr
        115                 120                 125


Trp Gly Gln Ser Ser Pro Tyr Asp Glu Leu Thr Val Glu Asn Leu Arg
    130                 135                 140


Tyr Leu Thr Leu Asp Asn Ser Leu Lys Asp Leu Val Tyr Phe Ala Lys
145                 150                 155                 160


Asn Phe Ala Pro Pro Phe Asp Pro Ser Gly Ser Ser Ser Ala Asp Lys
                165                 170                 175


Ala Pro Trp Ile Phe Ala Gly Gly Ser Tyr Ser Gly Ala Leu Ala Gly
```

```
            180                 185                 190

Trp Leu Ala Ala Arg Glu Pro Gly Thr Phe Trp Ala Tyr Tyr Ser Ser
        195                 200                 205

Ser Gly Val Val Glu Ala Ile Gly Asp Phe Trp Gln Tyr Phe Val Pro
    210                 215                 220

Val Gln Glu Ala Thr Pro Lys Asn Cys Ser Ala Asp Val Gly Ala Val
225                 230                 235                 240

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

Gln Ala Leu Lys Asp Lys Phe Gly Leu Gly Glu Leu Glu Asp Ala Asp
            260                 265                 270

Phe Ala Ala Ala Leu Glu Trp Gly Pro Trp Glu Trp Gln Ser Gly Gln
        275                 280                 285

Phe Tyr Ser Phe Asn Thr Thr Gly Tyr Asn Pro Phe Tyr Arg Phe Cys
    290                 295                 300

Asp Tyr Val Glu Asn Val Trp Pro Asn Ser Thr Asn Lys Val Pro Gly
305                 310                 315                 320

Pro Arg Gly Val Gly Leu Thr Lys Ala Leu Glu Gly Tyr Ala Lys Tyr
                325                 330                 335

Val Lys Glu Gln Val Ile Pro Gly Phe Cys Glu Ser Ala Gly Tyr Pro
            340                 345                 350

Glu Trp Glu Gly Glu Asn Asn Ile Ala Cys Phe Lys Asn Leu Asp Pro
        355                 360                 365

Asn Asn Ala Ala Tyr Lys Asp Leu Ser Leu Asp Asn Trp Ile Asn Arg
```

```
    370                 375                 380

Gln Trp Asn Trp Met Leu Cys Asn Glu Pro Phe Glu Trp Trp Gln Asp
385                 390                 395                 400

Gly Ala Pro Leu Thr Arg Pro Thr Leu Val Ser Arg Leu Val Asn Ala
                405                 410                 415

Asp Tyr Trp Arg Lys Gln Cys Pro Leu His Phe Pro Glu Gly Gly Tyr
            420                 425                 430

Gly Ile Ala Ala Gly Lys Arg Ala Lys Asp Val Asn Arg Trp Thr Gly
        435                 440                 445

Gly Trp Ser Val Thr Asn Thr Thr Arg Ala Met His Thr Asn Gly Gln
    450                 455                 460

Tyr Asp Pro Trp Arg Asp Ala Thr Leu Ser Ser Lys Phe Arg Pro Gly
465                 470                 475                 480

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

Gly Thr His Cys Ser Asp Leu Tyr Gly Gln Asn Trp Ala Val Asn Glu
            500                 505                 510

Asp Val Lys Lys Leu Ala Gln Asp Ala Ala Asp Glu Met Thr Gly Trp
        515                 520                 525

Val Gly Glu Trp Tyr Glu Glu Lys Gly Leu Pro Lys Pro Trp Ala Ala
    530                 535                 540
```

<210> 55
<211> 538
<212> PRT
<213> Myceliophtora graminicola

<400> 55

```
Met His Leu Leu Asn Ser Leu Ala Ala Ile Ala Val Phe Leu Gln His
1               5                  10                  15

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

Lys Ala Gln Leu His Ala Arg Gln Ala Asp Ser Thr Ala Gly Val Val
        35                  40                  45

Asp Gly Val Phe His Gln Leu Val Asp His Asp Asn Pro Ser Leu Gly
    50                  55                  60

Thr Phe Glu Gln Arg Tyr Trp Tyr Ser Leu Asn Tyr Ala Asn Gly Ser
65                  70                  75                  80

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

Val Lys Phe Trp Leu His Asp Asp Tyr Val Ile Gly Gly Met Ile Ala
            100                 105                 110

Arg Arg Ile Gly Ala Val Met Ile Met Leu Glu Asp Arg Tyr Phe Gly
        115                 120                 125

Lys Ser Ser Pro Tyr Asp Gln Leu Thr Thr Glu Asn Met Lys Tyr Tyr
    130                 135                 140

Thr Glu Asp Gln Met Val Arg Asp Lys Ile His Phe Ala Lys Thr Ala
145                 150                 155                 160

Glu Leu Pro Phe Ala Lys Asn Gly Gly Ser Arg Pro Asp Gln Val Pro
                165                 170                 175

Trp Val His Thr Gly Cys Ser Ala Gln Gly Asn Arg Val Met Phe Ser
            180                 185                 190
```

```
Gln Lys Glu Ser Pro Asp Thr Phe Trp Ala Ser Trp Ala Ser Ser Ala
        195                 200                 205

Pro Pro Gln Ala Ile Pro Asn Tyr Trp Arg Tyr Phe Asp Ala Ala Lys
    210                 215                 220

Ala Tyr Leu Pro Lys Asn Cys Thr Ala Asp Val Glu Lys Val Ile Glu
225                 230                 235                 240

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

Ile Lys Thr Asp Phe Gly Ala Pro Asp Leu Lys His Asn Asp Asp Phe
            260                 265                 270

Met Asn Leu Leu Asn Tyr Gly Pro Gln Thr Phe Gln Gly Ala Ser Leu
        275                 280                 285

Arg Ile Gly Asp Thr Trp Gln Phe Cys Asp Tyr Val Glu Asn Ala Val
    290                 295                 300

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

Asp Lys Ala Leu Lys Gly Tyr Ala Arg Trp Thr Lys Glu Val Trp Ile
                325                 330                 335

Pro Gly Arg Cys Glu Gln Gln Gly Pro Trp Lys Gly Glu Asn Asn Thr
            340                 345                 350

Gly Cys Phe Asn Phe Gly Asp Ala Asp Ser Leu Val Tyr Ala Thr Lys
        355                 360                 365

Gly Leu Asp Ala Pro Ser Ile Val Asp Thr Leu Gln Ala Gln Trp Leu
    370                 375                 380
```

```
Phe Cys Asn Glu Pro Asp Glu Asn Trp Gln Thr Gly Ser Pro Lys Gly
385                 390                 395                 400

Thr Pro Thr Leu Val Ser Arg Leu Val Asn Thr Asp Tyr Phe Arg Lys
                405                 410                 415

Thr Cys Ala Arg Tyr Phe Pro Thr Gly Pro Asn Gly Glu Thr Phe Gly
            420                 425                 430

Leu Ala Lys Gly Lys Thr Ala Asp Ile Trp Asn Thr Arg Tyr Gly Gly
        435                 440                 445

Trp Ser Asp Pro Ile Gly Tyr Leu Asn Arg Thr Val Leu Val Asn Gly
    450                 455                 460

Lys Phe Asp Pro Trp Arg Ala Ala Ser Phe Ala Ser Asp Gln Arg Pro
465                 470                 475                 480

Gly Gly Ile Leu Gly Asn Ser Thr Tyr Val Lys His Phe Ile Asn Pro
                485                 490                 495

Met Gly Asn His Cys Thr Asp Thr Tyr Arg Asn Ala Gly Ser Ile Trp
            500                 505                 510

Pro Glu Val Lys Ala Val Gln Glu Ala Gly Ile Lys Gln Ile Glu Lys
        515                 520                 525

Trp Ile Ala Met Phe Pro Lys His Lys Val
    530                 535
```

<210> 56
<211> 548
<212> PRT
<213> Myceliophtora thermophila

<400> 56

```
Met Lys Val Ser Ala Arg Ala Ile Leu Pro Phe Ala Pro Trp Ile Ala
1               5                   10                  15

Ala Lys Ala Ala Val Ile Arg Ser Ala Pro Asp Gly Thr Pro Leu Ser
            20                  25                  30

Glu Ser Ala Gln Ala Val Val Arg Ala Ala Gly Pro Gly Ala Thr Cys
        35                  40                  45

Glu Trp Phe Thr Gln Pro Ile Asp His Lys Asn Ala Ser His Lys Ser
    50                  55                  60

Trp Gln Gln Ile Tyr Cys Val Asp Pro Gln Trp Trp Thr Pro Gly Ala
65                  70                  75                  80

Pro Val Val Leu Met Thr Pro Gly Gly Glu Pro Ile Thr Trp Ala Val
                85                  90                  95

Asn Ser Ala Arg Gly Phe Ser Tyr Leu Lys Asn Thr Thr Leu Ala Gly
            100                 105                 110

Arg Tyr Ala Gln Glu Leu Gly Ala Ala Ala Val Val Val Glu His Arg
        115                 120                 125

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

Gln Tyr Leu Thr Leu Glu Gln Ala Ala Ala Asp Leu Val Asn Phe Ala
145                 150                 155                 160

Gln Asn Val Thr Phe Pro Phe Asp Lys Glu Gln Thr Ser Val Ala Ser
                165                 170                 175

Lys Val Pro Trp Val Tyr Trp Gly Ser Ser Tyr Ser Ala Thr Leu Gly
            180                 185                 190
```

```
Ser Trp Ile Glu His Leu His Pro Gly Val Phe His Ala Tyr His Leu
        195                 200                 205

Ser Ser Ala Thr Val Gln Ala Asn Thr Glu Asn Trp Tyr Tyr Tyr Asp
    210                 215                 220

Thr Ile Arg Lys Gly Ile Asp Ala Leu Arg Asn Asp Thr Arg Cys Ser
225                 230                 235                 240

Ala Ala Leu Glu Glu Val Val Gly Phe Val Asp Arg Phe Leu Leu Ala
                245                 250                 255

Ser Pro Val Asn Glu Thr Gln Met Asp Ala Leu Lys Gln Tyr Phe Gly
            260                 265                 270

Ala Val Phe Pro Ile Ala Asn Asp Asp Phe Ala Tyr Ala Ile Ala Thr
        275                 280                 285

Pro Phe Arg Tyr Trp Glu Glu Arg Gly Gly Tyr Arg Ala Val Leu Asp
    290                 295                 300

Met Cys Asp Gly Ile Val Gly Ser Asp Ala Thr Glu Glu His Glu Val
305                 310                 315                 320

Leu Gly Thr Ile Pro Ser Ser Val Gly Asn Tyr Ala Ala Tyr Phe Gln
                325                 330                 335

Met Asn Phe Arg Asp Ser Thr Cys Thr Tyr Leu Asp Val Trp Gly Gln
            340                 345                 350

Lys Asp Pro Leu Trp Cys Leu Asp Thr His Asp Pro Leu Asn Pro Phe
        355                 360                 365

Ile Glu Ala Arg Thr Leu Gly Asn Pro Trp Arg Thr Arg Met Trp Phe
    370                 375                 380
```

```
Pro Cys Asn Glu Pro Leu Ala Ser Trp Ala Thr Gly Ala Pro Arg Asp
385                 390                 395                 400

Arg Pro Ser Leu Val Ser Arg Arg Leu Asp Ala Ala Tyr Trp Gln Ala
                405                 410                 415

Gln Cys Glu Met His Phe Pro Ala Val Gly Asp His Arg Tyr Gly Ser
            420                 425                 430

Ala Asp Gly Leu Arg Thr Pro Asp Thr Leu Asn Ala Val Thr Gly Gly
        435                 440                 445

Trp Ala Arg Arg Ser Lys Arg Val Ile Trp Thr Val Gly Leu Glu Phe
    450                 455                 460

Asp Pro Trp Arg Ala Thr Ser Met Ala Ser Glu Leu Arg Pro Gly Gly
465                 470                 475                 480

Pro Leu Glu Ser Ser Gly Asp Val Tyr Val Phe Val Ile Lys Asn Ala
                485                 490                 495

Ala His Ala Asp Asp Ala Leu Thr Glu Ala Gly Leu Ala Asn Leu Asn
            500                 505                 510

Leu Pro Val Asn Pro Glu Val Val Lys Val Gln Gln Gln Ser Val Gly
        515                 520                 525

Ile Val Lys Glu Trp Val Gly Gln Phe Arg Pro Gly Gly Asp Glu Glu
    530                 535                 540

Gly Ser Asp Glu
545
```

<210> 57
<211> 537
<212> PRT

<213> Fusarium graminicola

<400> 57

```
Met Ala Arg Gly Trp Phe Val Asn Cys Ala Ala Val Leu Leu Ala Leu
1               5                  10                  15

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

Lys Asp Ser Gly Pro Lys Ala Val Asn Ile Ser Val Pro Val Asp His
        35                  40                  45

Phe His Asn Glu Thr Ile Tyr Glu Pro His Ser Asp Lys Lys Phe Pro
    50                  55                  60

Leu Arg Tyr Trp Phe Asp Ala Gln Tyr Tyr Arg Lys Gly Gly Pro Val
65                  70                  75                  80

Ile Ile Leu Ala Ser Gly Glu Thr Ser Gly Glu Asp Arg Ile Pro Phe
                85                  90                  95

Leu Glu His Gly Ile Leu Gln Met Leu Ala Asn Ala Thr Gly Gly Ile
            100                 105                 110

Gly Val Ile Leu Glu His Arg Tyr Tyr Gly Thr Ser Phe Pro Val Pro
        115                 120                 125

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

Ala Asp Thr Ala Tyr Phe Ala Gln His Val Glu Phe Pro Gly Met Glu
145                 150                 155                 160

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

```
Ser Tyr Ala Gly Ala Phe Ala Ala Phe Ala Arg Lys Ile Tyr Pro Asp
            180                 185                 190

Leu Phe Trp Gly Gly Ile Ser Ser Ser Gly Val Thr Glu Ala Ile Val
        195                 200                 205

Asp Tyr Trp Gln Tyr Phe Glu Ala Ala Arg Leu Phe Ala Pro Gly Asp
    210                 215                 220

Cys Ala Lys Val Thr Gln Lys Leu Thr His Ala Val Asp Asn Ile Leu
225                 230                 235                 240

Leu Gly Asp Asp Lys Glu Glu Lys Lys Gln Leu Lys Ile Ala Phe Gly
                245                 250                 255

Leu Leu Gly Leu Arg Asp Asp Asp Phe Ala Met Thr Ile Ser Gln Gly
            260                 265                 270

Ile Gly Gly Leu Gln Ser Asn Asn Trp Asp Pro Ala Ser Asp Ser Ser
        275                 280                 285

Ser Phe Gly Leu Tyr Cys Gly Ser Val Ser Ser Asp Asp Ile Leu Phe
    290                 295                 300

Ala Ser Thr Arg Pro Leu Ala Pro Tyr Val Lys Lys Trp Leu Ile Ser
305                 310                 315                 320

Ala Gly Tyr Lys Lys Gln Leu Lys Tyr Met Thr Asn Arg Phe Leu Asn
                325                 330                 335

Tyr Ile Gly Tyr Ile Arg Ser Asn Val Glu Ser Asp Lys Ser Gly Arg
            340                 345                 350

Cys Asp Gly Lys Thr Leu Asp Gln Cys Tyr Ser Ile Arg Gly Ser Met
        355                 360                 365
```

```
Asn Asp Thr Lys Leu Asp Pro Asn Asn Met Ser Arg Gln Trp Thr Tyr
    370                 375                 380

Gln Thr Cys Thr Gln Trp Gly Tyr Trp Gln Thr Gly Ser Gly Ala Pro
385                 390                 395                 400

Lys Asp Gln Leu Pro Met Val Ser Arg Leu Ile Asp Val Glu Tyr Asn
                405                 410                 415

Thr Ile Pro Cys Arg Glu Glu Phe Asn Ile Thr Thr Pro Pro Asn Val
            420                 425                 430

Glu Ser Ile Asn Lys Leu Gly Gly Phe Asn Phe Ser Tyr Pro Arg Val
        435                 440                 445

Ala Phe Ile Asp Gly Glu Tyr Asp Pro Trp Arg Ala Ala Thr Pro His
    450                 455                 460

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

Leu Ile Pro Tyr Gly Val His His Trp Asp Glu Asn Gly Leu Ala Pro
                485                 490                 495

Gly Ser Glu Glu Ile Gly Leu Pro Pro Pro Ala Val Lys Gln Ala Gln
            500                 505                 510

Gln Asp Ile Ile Asp Phe Thr Lys Ala Trp Leu Glu Asp Trp Glu Lys
        515                 520                 525

Glu Lys Gly Gly Ala Thr Ala Asp Leu
    530                 535
```

<210> 58
<211> 569
<212> PRT
<213> Aspergillus niger

<400> 58

```
Met Phe Leu Ser Leu Pro Leu Leu Gly Thr Leu Ile Ala Ser Thr Val
1               5                  10                  15


Ala Leu Asp Ser Ser Pro Leu Glu Leu Arg Val Pro His Leu His Gln
            20                  25                  30


Leu Ser Gln Leu Ser Lys Ser His Gln Ala Ser Leu Asn Gln Asp Ser
        35                  40                  45


Ala Ser Phe Pro Val Tyr Asn Leu Ser Val Pro Ile Asp His Phe His
    50                  55                  60


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


Tyr Trp Leu Asp Thr Ser His Tyr Gln Pro Gly Gly Pro Val Phe Val
                85                  90                  95


Ile Ala Ala Gly Glu Thr Asp Gly Ser Asp Arg Ile Pro Phe Leu Ser
            100                 105                 110


Gln Gly Val Val Thr Gln Leu Ala Ala Ala Tyr His Gly Ile Gly Leu
        115                 120                 125


Ile Leu Glu His Arg Tyr Tyr Gly Glu Ser Tyr Pro Phe Thr Asn Leu
    130                 135                 140


Thr Thr Glu Asn Ile Arg Phe Leu Thr Thr Glu Gln Ala Leu Ala Asp
145                 150                 155                 160


Tyr Ala Tyr Phe Ala Ser Asn Ile Val Phe Pro Gly Leu Glu Asp Leu
                165                 170                 175


Asp Leu Thr Ala Ala Thr Thr Pro Trp Ile Ala Tyr Gly Gly Ser Tyr
```

```
            180                 185                 190

Ala Gly Ala Phe Val Ala Phe Leu Arg Lys Leu Tyr Pro Glu Leu Tyr
        195                 200                 205

Trp Gly Ala Val Ser Ser Ser Gly Val Thr Glu Ala Ile Ile Asp Tyr
    210                 215                 220

Trp Glu Tyr Tyr Glu Pro Ile Arg Leu Tyr Gly Pro Ser Gln Cys Ile
225                 230                 235                 240

Ser Thr Ile Gln Thr Ser Ile Asp Ile Val Asp Arg Ile Leu Ile Asp
                245                 250                 255

His Ala Asp Asn Lys Thr Leu Ala Gln Gln Leu Lys Ser Ala Phe Gly
            260                 265                 270

Gly Ser Ala Thr Asn Leu Ser Asn Gln Asp Phe Val Ser Ser Leu Ser
        275                 280                 285

Tyr Gly Leu Asp Ser Phe Gln Ser Arg Asn Trp Asp Lys Thr Ile Gly
    290                 295                 300

Thr Pro Leu Phe Arg Ala Phe Cys Asn Asn Ile Thr Asn Ser Asp Leu
305                 310                 315                 320

Leu Tyr Pro Glu Ala Ala Glu Pro Ile Ser Ala Ser Val Lys Gln Leu
                325                 330                 335

Val Gln Ile Ala Gly Tyr Asp Pro Ser Asn Thr Thr Leu Val Asn Asn
            340                 345                 350

Phe Leu Asn Trp Ile Gly Phe Leu Ser Thr Ser Lys Val Phe Ala Asp
        355                 360                 365

Ser Ser Ser Glu Ser Ser Ser Ser Asn Ile Thr Asn Phe Thr Thr Pro
```

```
    370                 375                 380

Gln Pro Leu Ser Lys Asp Ser Gly Thr Ser Trp Asn Tyr Gln Val Cys
385                 390                 395                 400

Val Glu Trp Gly Tyr Phe Thr Thr Gly Ser Ser Val Pro Ser Thr Thr
                405                 410                 415

Lys Pro Leu Ile Ser Arg Leu Leu Asp Leu Pro Tyr Leu Ser Ser Phe
            420                 425                 430

Cys Pro Asn Thr Phe Gly Ile Lys Thr Pro Pro Asp Val Gln Arg Ile
        435                 440                 445

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

Gly Gly Leu Ala Asp Pro Trp Arg Asp Ala Thr Pro Leu Ala Asp Gly
465                 470                 475                 480

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

Leu Asp Ile Pro Ala Ala Asp Val Trp Asp Gly Val Arg Gly Ala Val
            500                 505                 510

His His Trp Asp Gln Asn Gly Leu Ser Gly Gln Gln Lys Lys Glu Gly
        515                 520                 525

Glu Lys Ala Pro Lys Glu Ile Val Ser Val His Glu Glu Val Val Arg
    530                 535                 540

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

Asp Glu Arg Val Tyr Gln Thr Val Leu
```

565

<210> 59
<211> 561
<212> PRT
<213> Myceliophtora thermophila

<400> 59

Met Leu Arg Gly Thr Ile Ala Val Gly Val Ala Cys Leu Ala Gln Leu
1 5 10 15

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

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

Leu Glu Ala Arg Ser Ser Asp Leu Gln Asp Leu Tyr Pro Ala His Thr
50 55 60

Leu Gln Val Pro Val Asp His Phe His Asn Asp Ser Leu Tyr Glu Pro
65 70 75 80

His Ser Ser Glu Thr Phe Pro Leu Arg Tyr Trp Phe Asp Ala Ser His
85 90 95

Tyr Lys Lys Gly Gly Pro Ile Ile Val Leu Gln Ser Gly Glu Thr Asp
100 105 110

Gly Val Gly Arg Leu Pro Phe Leu Gln Lys Gly Ile Val Ala Gln Leu
115 120 125

Ala Arg Ala Thr Asn Gly Leu Gly Val Ile Leu Glu His Arg Tyr Tyr
130 135 140

Gly Glu Ser Ile Pro Thr Pro Asp Phe Ser Thr Glu Lys Leu Arg Phe
145 150 155 160

```
Leu Thr Thr Asp Gln Ala Leu Ala Asp Met Ala Tyr Phe Ala Arg His
                165                 170                 175

Val Val Phe Lys Gly Leu Glu His Leu Asp Leu Thr Ser Ala Lys Asn
            180                 185                 190

Pro Tyr Ile Ala Tyr Gly Gly Ser Tyr Ala Gly Ala Phe Val Ala Phe
        195                 200                 205

Leu Arg Lys Leu Tyr Pro Asp Val Tyr Trp Gly Ala Ile Ser Ser Ser
    210                 215                 220

Gly Val Pro Glu Ala Ile Tyr Asp Tyr Trp Gln Tyr Tyr Glu Ala Ala
225                 230                 235                 240

Arg Ile Tyr Ala Pro His Asp Cys Val Val Ala Thr Gln Lys Leu Thr
                245                 250                 255

His Ile Val Asp Asn Ile Leu Leu Asp Lys Ala Asp Thr Asp Tyr Val
            260                 265                 270

Arg Arg Leu Lys Thr Gly Phe Gly Leu Gly Gly Val Thr Arg Asn Asp
        275                 280                 285

Asp Phe Ala Asn Ala Ile Ser Trp Gly Ile Gly Gly Leu Gln Gly Leu
    290                 295                 300

Asn Trp Asp Pro Ala Leu Asn Asp Thr Gly Phe Gly Glu Tyr Cys Asn
305                 310                 315                 320

Asn Leu Thr Ala Thr Lys Pro Leu Tyr Pro Thr Ser Pro Ala Leu Glu
                325                 330                 335

Gln Glu Ala Arg Glu Leu Val Lys Ala Gly Gly Tyr Gly Lys Glu Ala
            340                 345                 350
```

```
Asp Thr Leu Thr Thr Gln Leu Leu Asn Tyr Met Gly Tyr Val Asn Ala
        355                 360                 365

Thr Thr Val Gln Thr Cys His Lys Asp Ser Gln Asp Glu Cys Phe Thr
    370                 375                 380

Asn Tyr Asn Ser Thr Phe Tyr Gln Gln Asp Asp Lys Thr Gln Asp Trp
385                 390                 395                 400

Arg Leu Trp Pro Tyr Gln Tyr Cys Phe Glu Trp Gly Tyr Leu Gln Thr
                405                 410                 415

Gly Ser Gly Val Pro Ala Asn Gln Leu Pro Leu Ile Ser Arg Leu Ile
            420                 425                 430

Asp Leu Asn Phe Thr Ser Val Val Cys Arg Glu Ala Phe Asn Ile Thr
        435                 440                 445

Thr Pro Ser Gln Val Glu Arg Ile Asn Lys Leu Gly Gly Val Asn Ile
    450                 455                 460

Ser Tyr Pro Arg Leu Ala Phe Val Asp Gly Glu Arg Asp Pro Trp Arg
465                 470                 475                 480

Tyr Ala Ser Pro His Arg Ile Gly Leu Pro Glu Arg Lys Asn Thr Ile
                485                 490                 495

Ser Glu Pro Phe Ile Leu Ile Lys Asp Gly Val His His Trp Asp Glu
            500                 505                 510

Asn Gly Leu Phe Pro Asn Glu Thr Arg Pro Gly Leu Pro Pro Lys Pro
        515                 520                 525

Val Ala Asp Ala Gln Arg Ala Glu Val Lys Phe Val Lys Ala Trp Leu
    530                 535                 540
```

```
Lys Glu Trp Lys Glu Lys Glu Lys Cys Arg Gly Arg Lys Phe Cys Trp
545                 550                 555                 560


Pro
```

<210> 60
<211> 561
<212> PRT
<213> Neurospora crassa

<400> 60

```
Met Met Gly Leu Gly Arg Leu Leu Ala Ala Thr Ala Cys Val Ala Gln
1               5                   10                  15


Leu Ala Ser Ala Leu Ala Pro Ala Phe Ala Pro Leu Ser Val Arg Asn
            20                  25                  30


Leu Arg Leu Ser Ser Glu Ser Asp Leu Ala Leu Glu Pro Glu Gly Asp
        35                  40                  45


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


Thr Ile Lys Val Pro Val Asp His Phe His Asn Asp Thr Lys Tyr Glu
65                  70                  75                  80


Pro His Thr Asn Asp Thr Phe Asp Leu Arg Tyr Trp Phe Asp Ala Thr
                85                  90                  95


Tyr Tyr Lys Lys Gly Gly Pro Val Ile Val Leu Ala Ala Gly Glu Thr
            100                 105                 110


Ser Gly Val Gly Arg Leu Gln Phe Leu Gln Lys Gly Ile Val Tyr Gln
        115                 120                 125
```

```
Leu Ala Lys Ala Thr Gly Gly Val Gly Val Ile Leu Glu His Arg Tyr
    130                 135                 140

Tyr Gly Lys Ser Leu Pro Thr Ser Asp Phe Ser Thr Lys Asn Leu Arg
145                 150                 155                 160

Phe Leu Thr Thr Asp Gln Ala Leu Ala Asp Thr Val Tyr Phe Ala Lys
                165                 170                 175

Asn Val Lys Phe Ala Gly Leu Glu His Leu Asp Leu Thr Ala Pro Asn
            180                 185                 190

Thr Pro Tyr Ile Ala Tyr Gly Gly Ser Tyr Ala Gly Ala Phe Val Ala
        195                 200                 205

Phe Leu Arg Lys Leu Tyr Pro Asp Val Tyr Trp Gly Ala Ile Ser Ser
    210                 215                 220

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

Ala Arg Ile Tyr Gly Pro Lys Asp Cys Val Thr Ala Thr Gln Lys Leu
                245                 250                 255

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

Val Gln Lys Leu Lys Asp Thr Phe Gly Leu Gly Asn Leu Thr His Thr
        275                 280                 285

Asp Asp Phe Ala Asn Thr Ile Ser Phe Gly Ile Ala Gly Leu Gln Ser
    290                 295                 300

Thr Asn Trp Asp Pro Ala Leu Asn Asp Thr Ser Tyr Gly Glu Tyr Cys
305                 310                 315                 320
```

```
Asn Asn Val Ser Ser Asn Ala Leu Leu Tyr Pro Glu Thr Ala Arg Leu
                325                 330                 335

Glu Lys Asp Val Gln Glu Leu Leu Thr Val Gly Gly Tyr Gly Lys Glu
            340                 345                 350

Val Lys Thr Leu Thr Asn Gln Phe Leu Asn Tyr Ile Gly Tyr Val Asn
        355                 360                 365

Val Thr Ser Val Gln Ser Cys Asp Gly Asp Gln Asn Ala Cys Phe Thr
    370                 375                 380

Ser Tyr Asp Ser Glu Phe Tyr Lys Lys Asp Asp Leu Lys Gln Thr Trp
385                 390                 395                 400

Arg Leu Trp Leu Tyr Gln Val Cys Asp Gln Trp Gly Phe Leu Gln Thr
                405                 410                 415

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

Asp Leu Asn Tyr Thr Ser Ile Ala Cys Arg Glu Ala Phe Asn Ile Asn
        435                 440                 445

Lys Pro Ser Asp Val Glu Ser Ile Asn Lys Tyr Gly Gly Phe Gly Ile
    450                 455                 460

Ser Tyr Pro Arg Leu Ala Ile Ile Asp Gly Glu Lys Asp Pro Trp Arg
465                 470                 475                 480

Ala Ala Thr Pro His Ala Ile Gly Leu Lys Asp Arg Lys Ser Thr Ile
                485                 490                 495

Ser Glu Pro Phe Ile Leu Ile Lys Asp Gly Val His His Trp Asp Glu
            500                 505                 510
```

```
Asn Gly Leu Phe Pro Asn Glu Thr Ala Pro Asn Phe Pro Pro Lys Pro
        515                 520                 525


Val Glu Glu Thr Gln Arg Ala Ile Lys Asn Phe Val Gln Ala Trp Leu
    530                 535                 540


Gln Asp Phe Lys Lys Ser Gly His Gly His Gly His Gly Ser Thr Lys
545                 550                 555                 560


Pro
```

<210> 61
<211> 572
<212> PRT
<213> Aspergillus fumigatus

<400> 61

```
Met Gln Leu Gln Ala Val Leu Phe Leu Ile Gly Thr Phe Leu Ala Ser
1               5                   10                  15


Ala Ala Gln Gly Phe Asp Ile Ser Pro Leu Glu Leu Gln Phe Pro Leu
            20                  25                  30


Leu His Gln Leu Arg Leu Leu Glu Asp Glu Thr Gly Ala Ser Leu His
        35                  40                  45


Leu Thr Ser Leu Lys Glu Phe Val Asp His Asn Phe Ser Val Pro Ile
    50                  55                  60


Asp His Phe His Asn Glu Ser Arg Tyr Glu Pro His Thr Arg Asp His
65                  70                  75                  80


Phe Asn Leu Arg Tyr Trp Phe Asp Ala Ser His Tyr Lys Glu Gly Gly
                85                  90                  95
```

```
Pro Val Phe Leu Ile Ala Ala Gly Glu Thr Asn Gly Arg Asp Arg Phe
            100                 105                 110

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

Gly Leu Gly Val Ile Leu Glu His Arg Tyr Tyr Gly Glu Ser Tyr Pro
    130                 135                 140

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

Ala Met Ala Asp Tyr Ala Tyr Phe Ala Ser Asn Val Val Phe Pro Gly
                165                 170                 175

Leu Glu His Leu Asn Leu Thr Ala Asp Ala Val Pro Trp Ile Gly Tyr
            180                 185                 190

Gly Gly Ser Tyr Ala Gly Ala Phe Val Ala Phe Leu Arg Lys Val Tyr
        195                 200                 205

Pro Glu Val Phe Phe Gly Val Val Ser Ser Ser Gly Val Thr Glu Ala
    210                 215                 220

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

Ser Asp Cys Ile Trp Ser Ile Glu Thr Phe Met Asp Ile Val Asp Thr
                245                 250                 255

Ile Leu Ile Glu His Ala Lys Asn Glu Thr Leu Lys Ser His Leu Lys
            260                 265                 270

Ala Val Phe Gly Ala Thr Ser Ser Asp Val Asp Asp Glu Phe Phe Ala
        275                 280                 285
```

```
Ala Ala Leu Ser Ser Thr Leu Gly Ala Phe Gln Gly Arg Asn Trp Asp
    290                 295                 300

Pro Ala Val Gly Asp Gly Thr Phe Gln Arg Tyr Cys Lys Asn Leu Thr
305                 310                 315                 320

Ser Pro Ser Leu Leu Tyr Gln Gln Asn Asn Thr Met Lys Ala Trp Thr
                325                 330                 335

Glu Glu Val Ile Ser Ala Thr Lys Tyr Asp Ala Thr Asn Ser Ser Leu
            340                 345                 350

Val Thr Gly Met Leu Asn Tyr Ala Gly Tyr Met Asn Ala Thr Met Phe
        355                 360                 365

Ser His Leu Asp Glu Val Arg Gly Thr Ser Ser His Lys Ser Pro Gln
    370                 375                 380

Ser Leu Gln Lys Ser Ser Gly Val Ser Trp Gly Tyr Gln Val Cys Thr
385                 390                 395                 400

Glu Trp Gly Tyr Phe Met Pro Gly Ser Ser Val Pro Lys Asp Arg Leu
                405                 410                 415

Pro Leu Ile Ser Arg Leu Ile Thr Leu Ala Gly Glu Ser Arg Phe Cys
            420                 425                 430

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

Lys His Gly Gly Phe Asn Phe Ser Tyr Pro Arg Ala Ala Ile Ile Asp
    450                 455                 460

Gly Leu Ala Asp Pro Trp Arg Asp Ala Thr Pro His Ala Asp Gly Thr
465                 470                 475                 480
```

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

Pro Ala Glu Asp Val Trp Asp Gly Ile Arg Gly Ala Val His His Trp
500 505 510

Asp Gln Asn Gly Leu Ser Glu Gln Asp Val Gln Gln Gly Lys Thr Ala
515 520 525

Pro Lys Ala Ile Val Ala Leu Gln Gln Glu Ile Ile Arg Phe Val Gly
530 535 540

Val Trp Leu Lys Gln Trp Arg Lys His Glu Asp Val Ser Asp Pro Thr
545 550 555 560

Ala Asn Thr Ala Val Arg Asn Arg Gln Leu Val Leu
565 570

<210> 62
<211> 566
<212> PRT
<213> Aspergillus oryzae

<400> 62

Met Val Ser Leu Thr His Ile Phe Ser Lys Ala Leu Leu Thr Leu Leu
1 5 10 15

Val Gly Gln Ser Ala Ala Leu Ser Phe Leu Pro Gly Ile Lys Ala Asn
20 25 30

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

Phe Asn Pro Glu Lys Ile Ala Glu Thr Ala Ile Ser Arg Gly Ser Gly
50 55 60

Ser Glu Val Pro Ala Arg Arg Ile Ser Ile Pro Ile Asp His Glu Asp

```
65                  70                  75                  80

Pro Ser Met Gly Thr Tyr Gln Asn Arg Tyr Trp Val Ser Ala Asp Phe
                85                  90                  95

Tyr Lys Pro Gly Gly Pro Val Phe Val Leu Asp Ala Gly Glu Gly Asn
            100                 105                 110

Ala Tyr Ser Val Ala Gln Ser Tyr Leu Gly Gly Ser Asp Asn Phe Phe
        115                 120                 125

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

Arg Tyr Tyr Gly Asp Ser Leu Pro Phe Pro Val Asn Thr Ser Thr Pro
145                 150                 155                 160

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

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

Lys Ser Ser Pro Trp Ile Met Leu Gly Gly Ser Tyr Pro Gly Met Arg
        195                 200                 205

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

Ala Met Ser Ala Pro Val Glu Ala Arg Val Asn Met Thr Ile Tyr Phe
225                 230                 235                 240

Glu Gln Val Tyr Arg Gly Met Val Ala Asn Gly Leu Gly Gly Cys Ala
                245                 250                 255

Lys Asp Leu Lys Ala Ile Asn Asp Tyr Ile Asp Ser Gln Leu Asp Lys
```

```
            260                 265                 270

Lys Gly Gln Ala Ala Asp Ala Ile Lys Thr Leu Phe Leu Gly Lys Glu
        275                 280                 285

Gly Ile His Asn Ser Asn Gly Asp Phe Thr Ala Ala Leu Gly Ser Ile
    290                 295                 300

Tyr Asn Leu Phe Gln Ser Tyr Gly Val Asp Gly Gly Glu Glu Ser Leu
305                 310                 315                 320

Ser Gln Leu Cys Ser Tyr Leu Asp Lys Glu Ala Ser Pro Asn Gly Ile
                325                 330                 335

Ala Arg Lys Ile Gly Val Lys Glu Leu Thr Glu Lys Phe Ala Ala Trp
            340                 345                 350

Pro Pro Leu Leu Tyr Leu Ile Asn Gln Trp Gly Ser Gln Val Gly Asn
        355                 360                 365

Gly Asp Ser Asn Cys Lys Gly Gln Asn Asn Ser Thr Glu Thr Val Cys
    370                 375                 380

Glu Leu Gly Gly Gln Phe Thr Asp Pro Asp Thr Ile Ser Trp Thr Trp
385                 390                 395                 400

Gln Tyr Cys Thr Glu Trp Gly Tyr Leu Gln Ala Asp Asn Val Gly Pro
                405                 410                 415

His Ser Leu Leu Ser Lys Tyr Gln Ser Leu Glu Tyr Gln Gln Ser Leu
            420                 425                 430

Cys Tyr Arg Gln Phe Pro Gly Ala Lys Glu Ser Gly Leu Leu Pro Glu
        435                 440                 445

His Pro Glu Ala Asn Glu Thr Asn Ala Glu Thr Gly Gly Trp Thr Ile
```

```
    450                 455                 460

Arg Pro Ser Asn Val Phe Trp Ser Ala Gly Glu Phe Asp Pro Trp Arg
465                 470                 475                 480

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

Ile Ser Thr Asn Ile Pro Lys Cys Gly Val Glu Thr Pro Glu Asn Val
            500                 505                 510

Leu Phe Gly Tyr Val Ile Pro Arg Ala Glu His Cys Phe Asp Tyr Asp
        515                 520                 525

Leu Ser Tyr Lys Pro Ala Asp Lys Ser Arg Lys Leu Phe Ser Leu Ala
    530                 535                 540

Leu Lys Lys Trp Leu Pro Cys Trp Arg Ser Glu His Ala Pro Lys Gly
545                 550                 555                 560

Val Gln Arg Lys Trp Met
                565
```

<210> 63
<211> 557
<212> PRT
<213> Penicilium Chrysogenum

<400> 63

```
Met His Phe Ser Thr Val Val Lys Gly Ile Ala Thr Leu Thr Ala Leu
1               5                   10                  15

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

Lys Leu Ser Ala Glu Leu Gly Ile His Pro Asp Thr Leu Leu Gly Gln
        35                  40                  45
```

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

Glu Ala Glu Tyr Val Ser Ile Pro Ile Asp His Ser Asn Ser Ser Val
65                  70                  75                  80

Gly His Tyr Arg Asn Arg Tyr Trp Val Ser Glu Glu His Tyr Lys Glu
                85                  90                  95

Asp Gly Pro Ile Phe Val Phe Asp Val Gly Glu Ser Thr Ala Glu Pro
            100                 105                 110

Ala Gly Gln Thr Tyr Leu Ser Asn Ser Ser Thr Phe Phe Tyr Gln Leu
        115                 120                 125

Val Lys Glu Phe Gly Gly Ile Gly Ile Val Trp Glu His Arg Tyr Tyr
    130                 135                 140

Gly Asp Ser Leu Pro Tyr Asn Val Ser Leu Asp Met Glu Pro Glu His
145                 150                 155                 160

Leu Gln Tyr Leu Asn Asn Lys Gln Ala Leu Ala Asp Ile Pro Tyr Phe
                165                 170                 175

Ala Ala Gln Phe Thr Arg Gln Asp Tyr Ser Asp Val Asp Leu Thr Pro
            180                 185                 190

Ala Gly Thr Pro Trp Val Met Val Gly Gly Ser Tyr Ala Gly Met Arg
        195                 200                 205

Ala Ala Phe Thr Arg Gln Ser Tyr Pro Asp Thr Ile Tyr Ala Ala Phe
    210                 215                 220

Ala Ser Ser Ala Pro Val Glu Ala Arg Ile Asp Met Ser Val Tyr Phe
225                 230                 235                 240
```

```
Asp Gln Val Tyr Asp Gly Met Val Thr Tyr Gly His Leu Asn Cys Thr
                245                 250                 255

Arg Asp Ile Lys Ala Ala Leu Glu Tyr Ile Asp Glu Gln Leu Ser Lys
            260                 265                 270

Ser Glu Ser Ala Ala Ala Ala Ile Lys Arg Glu Phe Phe Gly Glu Gly
        275                 280                 285

Ala Glu Lys Asn Ser Asn Gly Asp Phe Thr Ala Ala Leu Val Thr Ile
    290                 295                 300

Tyr Asn Phe Phe Gln Ser Tyr Gly Met Gly Gly Gly Val Gly Ser Leu
305                 310                 315                 320

Glu Ser Phe Cys Glu His Met Glu Thr Asp Pro Lys Thr Ser Ala Ala
                325                 330                 335

Ala Pro Ser Glu Gly Phe Ala Pro Thr Arg Gly Lys Lys Tyr Val Ala
            340                 345                 350

Glu Arg Tyr Ala Ser Trp Pro Val Phe Thr Gln Val Val Asn Met Asn
        355                 360                 365

Met Lys Thr Asn Cys Lys Lys Leu Glu Thr Ser Glu Pro Leu Glu Cys
    370                 375                 380

Asp Leu Gly Pro Pro Ser Ala Asn Pro Asp Thr Ile Ser Trp Thr Trp
385                 390                 395                 400

Gln Tyr Cys Thr Glu Trp Gly Tyr Phe Gln Thr Asn Asn Phe Gly Ala
                405                 410                 415

His Ser Leu Leu Ser Lys Tyr Gln Thr Leu Glu Tyr Ala Gln Glu Tyr
            420                 425                 430
```

```
Cys Asn Arg Phe Phe Pro Glu Ala Val Ala Lys Gly Leu Phe Pro Lys
        435                 440                 445

His Pro Gln Thr Glu Ala Thr Asn Ala Glu Thr Gly Gly Trp Ser Ile
    450                 455                 460

Arg Pro Ser Asn Val Tyr Trp Ser Gly Gly Gln Phe Asp Pro Trp Arg
465                 470                 475                 480

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

Leu Thr Thr Glu Ile Pro Lys Cys Asn Val Glu Thr Glu Glu Asn Thr
            500                 505                 510

Ile Phe Gly Tyr Ile Met Gln Lys Ala Glu His Cys Phe Asp Phe His
        515                 520                 525

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

Leu Lys Glu Trp Leu Gly Cys Phe Lys Ala Lys Thr Arg
545                 550                 555


<210>  64
<211>  573
<212>  PRT
<213>  Aspergillus oryzae

<400>  64

Met His Ser Ser Leu Lys Leu Leu Leu Ser Ala Ala Ser Leu Leu Pro
1               5                   10                  15

Leu Ala Gln Ala Phe Gln Tyr Thr Pro Leu Gln Leu Ala Tyr Pro Glu
            20                  25                  30
```

```
Leu Arg Ala Lys Gln Gln Leu Thr Pro Glu Ser Ala Val Lys Gln Gln
        35                  40                  45

Ser Thr Thr Ala Glu Tyr Pro Glu Tyr Tyr Leu Ser Val Pro Val Asp
    50                  55                  60

His Phe His Asn Asp Ser Arg Tyr Ala Pro His Ser Asp Asp His Phe
65                  70                  75                  80

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

Val Phe Val Ile Ala Ala Gly Glu Thr Asp Ala Thr Asp Arg Phe Pro
            100                 105                 110

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

Ile Gly Val Ile Leu Glu His Arg Tyr Tyr Gly Lys Ser Tyr Pro Val
    130                 135                 140

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

Leu Ala Asp Tyr Ala Tyr Phe Ala Ser Asn Val Val Phe Pro Gly Leu
                165                 170                 175

Glu His Val Asn Leu Thr Ser Lys Thr Thr Pro Trp Ile Ala Tyr Gly
            180                 185                 190

Gly Ser Tyr Ala Gly Ala Phe Val Ala Phe Leu Arg Lys Leu Tyr Pro
        195                 200                 205

Asp Val Tyr Trp Gly Ala Val Ser Ser Ser Gly Val Thr Glu Ala Ile
    210                 215                 220
```

```
Ile Asp Phe Trp Gln Tyr Tyr Glu Pro Ile Arg Lys Phe Gly Pro Ser
225                 230                 235                 240


Asp Cys Ile Trp Ser Thr Gln Thr Phe Ile Asp Val Val Asp Arg Ile
                245                 250                 255


Leu Ile Asp His Ala Asp Asn Lys Thr Leu Gly Gln Gln Leu Lys Thr
            260                 265                 270


Ser Leu Gly Val Ser Pro Asp Lys Asp Asp Val Ser Phe Val Ser Leu
        275                 280                 285


Leu Ser Ser Gly Leu Asp Ser Phe Gln Ser Arg Asn Trp Asp Ser Asn
    290                 295                 300


Ile Gly Ser Tyr Ser Phe Arg Ser Tyr Cys Asp Asn Ile Thr Ser Ser
305                 310                 315                 320


Asp Leu Leu Tyr Pro Asp Thr Glu Ala Val Lys Pro Thr Ile Gln Glu
                325                 330                 335


Leu Ile Glu Val Ala Gly Tyr Asp Ala Thr Asn Ser Ser Phe Val Asn
            340                 345                 350


Gly Phe Leu Asn His Val Gly Leu Phe Lys Lys Ser Ile Thr Ser Asp
        355                 360                 365


Glu Asp Ser Ala Glu Thr Glu Gln Ser Asp Ser Ser Asp Pro Lys Ser
    370                 375                 380


Leu Pro Lys Asp Asp Gly Thr Ser Trp Glu Tyr Gln Val Cys Thr Glu
385                 390                 395                 400


Trp Gly Tyr Phe Met Ser Gly Ala Ser Val Pro Lys Asp Ile Met Pro
                405                 410                 415
```

```
Leu Ile Ser Arg Val Leu Asp Val Ala Ser Val Ser Thr Phe Cys Glu
            420                 425                 430

Thr Thr Tyr Gly Ile Thr Ser Pro Pro Asn Val Thr Asn Ile Asn Lys
        435                 440                 445

His Gly Gly Phe Asn Phe Ser Tyr Pro Arg Val Ala Ile Ile Asp Gly
    450                 455                 460

Leu Ala Asp Pro Trp Arg Asp Ala Thr Pro His Ala Asp Gly Thr Lys
465                 470                 475                 480

Glu Arg Glu Ser Thr Asp Asp Glu Pro Phe Ile Leu Ile Asp Val Pro
                485                 490                 495

Ala Glu Asp Val Trp Asp Gly Ile Arg Gly Ala Val His His Trp Asp
            500                 505                 510

Gln Asn Gly Leu Ser Lys Thr Asp Glu Gly Lys Gly Gln Glu Pro Pro
        515                 520                 525

Ala Ala Ile Val Glu Val Gln Lys Glu Val Leu Arg Phe Ile Gly Val
    530                 535                 540

Trp Leu Asp Gln Trp Lys Lys Arg Ser Arg Asp Ser Ser Arg Pro Leu
545                 550                 555                 560

Gly Gly Ile Arg Gly Pro Gly Arg Ser Gln Val Pro Leu
                565                 570
```

<210> 65
<211> 557
<212> PRT
<213> Aspergillus nidulans

<400> 65

```
Met Arg Phe Asn Pro Leu Ile Ser Thr Ala Phe Val Ala Ser Leu Ala
1               5                  10                  15

Ser Phe Ala Ser Gly Leu Gly Leu Arg Ser Asp Leu Ala Lys Ser Leu
            20                  25                  30

Gln Leu Ala Ala Glu Leu Gly Leu Asp Ser Asp Leu Leu Leu Lys Asp
        35                  40                  45

Ser Gln Ser Phe Arg Thr Ala Val Thr Gln Thr Asn Pro Pro Ala Glu
    50                  55                  60

Tyr Val Leu Val Asp Ser Arg Phe Leu Met Thr Met Cys Thr Gly Ser
65                  70                  75                  80

Asn Ala Leu Gln Leu Pro Ile Asp His His Asn Pro Ala Ile Gly Thr
                85                  90                  95

Phe Arg Asn Arg Tyr Trp Val Asn Asp Ala Tyr Tyr Val Pro Gly Gly
            100                 105                 110

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

Ala His Leu Arg Ser Asn Ser Ser Phe Leu Pro Pro Ile Leu Gln Glu
    130                 135                 140

Phe Gly Ala Ile Gly Ile Val Trp Glu His Arg Ser Val Val Ser Thr
145                 150                 155                 160

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

Ser Leu Pro Tyr Pro Val Asn Asn Asn Thr Leu Pro Glu His Leu Ile
            180                 185                 190
```

```
Tyr Leu Thr Thr Arg Gln Ala Leu Ala Asp Ile Pro Ala Phe Ala Glu
        195                 200                 205

Asn Phe Thr Arg Pro Gly Leu Gln Glu Tyr Asp Leu Thr Pro Ala Ser
    210                 215                 220

Thr Pro Trp Val Met Ile Gly Gly Ser Tyr Pro Gly Ala Arg Ala Ala
225                 230                 235                 240

Phe Ala Arg Asn Glu Tyr Pro Asp Thr Ile Phe Ala Ser Phe Ala Ala
                245                 250                 255

Ser Ala Pro Val Gln Ala Gln Ile Asn Met Ser Ile Tyr Tyr Glu Gln
            260                 265                 270

Val Tyr Arg Ser Met Val Ala Asn Gly Phe Arg Ser Cys Ala Ser Asn
        275                 280                 285

Ile His Ala Ala Leu Glu Tyr Ile Asp Asn Gln Leu Ser Gln Asn Asp
    290                 295                 300

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

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

Phe Gln Ala Tyr Gly Met Asp Gly Pro Ala Gly Ser Leu Gly Glu Phe
            340                 345                 350

Cys Arg Tyr Leu Glu Ser Asp Pro Val Thr Gly Gln Pro Ala Glu Thr
        355                 360                 365

Glu Gly Leu Ala Leu Arg His Gly Tyr Lys His Leu Ala Glu Arg Trp
    370                 375                 380
```

```
Ala Glu Trp Pro Ile Phe Thr Gln Leu Ile Asn Val Asn Tyr Glu Thr
385                 390                 395                 400


Asn Cys Lys Gly Leu Asp Lys Ser Val Ala Pro Ser Cys Glu Leu Asn
                405                 410                 415


Lys Pro Thr Thr Asn Pro Thr Ala Ile Ala Trp Thr Trp Gln Tyr Cys
            420                 425                 430


Thr Glu Trp Gly Phe Tyr Gln Ser Asn Asn Glu Gly Val His Ser Leu
        435                 440                 445


Leu Ser Arg Tyr Gln Thr Leu Glu Phe Gln Gln Val Met Cys Asn Arg
    450                 455                 460


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


Val Asp Ala Leu Asn Ala Glu Phe Gly Gly Trp Asn Ile Arg Pro Ser
                485                 490                 495


Asn Val Tyr Phe Ser Ala Gly Glu Phe Asp Pro Trp Arg Thr Leu Thr
            500                 505                 510


Leu Leu Ser Gly Glu Gln Phe Ser Leu Gln Leu Asn Val Thr Ser Asp
        515                 520                 525


Val Pro Arg Cys Gly Val Arg Thr Gly Pro Asp Thr Val Phe Gly Trp
    530                 535                 540


Ala Pro Cys Gly Arg Met Ser Ser Gln His Ser Ile Leu
545                 550                 555


<210>  66
<211>  562
<212>  PRT
<213>  Aspergillus niger
```

<400> 66

```
Met Pro Ser Tyr Ser Ala Thr Ile Ala Ala Ile Gly Ala Phe Leu Leu
1               5                  10                  15


Ser Gln Pro Val Met Gly Ser Arg Gln Gly Lys Ala Pro Phe Gly Trp
            20                  25                  30


Gly Thr Gln Ser Leu Ala His Phe Gly Ile Asn Pro Asp Leu Gly Leu
        35                  40                  45


His Asn Gln Gln Asn Leu Asn Ser Leu Ile Ser His Ser Ala Met Ala
    50                  55                  60


Thr Ala Leu Glu Thr Glu Tyr Ala Thr Ile Pro Ile Asp His Asn Asn
65                  70                  75                  80


Ala Ser Ala Gly Thr Tyr Gln Asn Arg Phe Trp Val Ser Asp Glu Phe
                85                  90                  95


Tyr Gln Pro Gly Asn Pro Ile Phe Val Tyr Asp Thr Gly Glu Ser Asp
            100                 105                 110


Gly Gly Ser Ile Ala Gln Ser Tyr Leu Thr Ser Thr Leu Ser Phe Phe
        115                 120                 125


Arg Glu Phe Leu Ile Glu Phe Asn Ala Met Gly Ile Ala Trp Glu His
    130                 135                 140


Arg Tyr Tyr Gly Asn Ser Thr Pro Ala Pro Val Ser Tyr Glu Thr Pro
145                 150                 155                 160


Pro Glu Ala Trp Gln Tyr Leu Thr Thr Lys Gln Ala Leu Ala Asp Leu
                165                 170                 175


Pro Tyr Phe Ala Ser Asn Phe Ser Arg Glu Lys Tyr Pro Asp Met Asp
```

```
            180                 185                 190

Leu Thr Pro Gln Gly Thr Pro Trp Ile Met Val Gly Gly Ser Tyr Ala
        195                 200                 205

Gly Ile Arg Ala Ala Leu Thr Arg Lys Glu Tyr Pro Glu Thr Ile Phe
    210                 215                 220

Ala Ala Phe Ser Ser Ser Ser Pro Val Glu Ala Gln Val Asn Met Ser
225                 230                 235                 240

Ala Tyr Tyr Asp Gln Val Tyr Arg Gly Met Val Ala Ser Gly Trp Thr
                245                 250                 255

Asn Cys Ser Ala Asp Ile His Ala Ala Leu Glu Tyr Ile Asp Asp Gln
            260                 265                 270

Leu Ser Asp Glu Asp Thr Ala Thr Ser Val Lys Gln Leu Phe Phe Gly
        275                 280                 285

Ser Gly Ala Glu Thr Asn Ser Asn Gly Asp Phe Thr Ala Ala Leu Thr
    290                 295                 300

Ala Ile Tyr Gly Tyr Phe Gln Ser Tyr Gly Met Ala Gly Gly Ile Gly
305                 310                 315                 320

Gly Leu Gly Ala Phe Cys Glu Tyr Leu Glu Ile Asp Pro Lys Thr Asn
                325                 330                 335

Gly Thr Thr Gly Pro Asp Gly Leu Ala Pro Thr Tyr Gly Gly Gln Tyr
            340                 345                 350

Val Ala Glu Arg Trp Ala Ala Trp Pro Thr Phe Leu Glu Leu Val Asn
        355                 360                 365

Leu Asn Met Gly Thr Asn Cys Gly Pro Gln Asp Ala Ser Gln Pro Ile
```

```
    370                 375                 380

Asp Cys Asp Phe Ser Lys Pro Tyr Gly Asp Pro Ser Ala Ile Thr Trp
385                 390                 395                 400

Thr Trp Gln Tyr Cys Ser Glu Trp Gly Phe Phe Gln Ala Asn Asn Asp
                405                 410                 415

Gly Pro His Ser Leu Ala Ser Arg Tyr Gln Ser Val Glu Tyr Gln Gln
            420                 425                 430

Glu Val Cys Asn Arg Gln Phe Pro Asp Ala Val Asp Lys Gly Leu Leu
        435                 440                 445

Pro Pro Ser Pro Arg Ala Asp Asp Val Asn Gln Glu Phe Gly Gly Trp
    450                 455                 460

Thr Ile Arg Pro Ser Asn Val Tyr Phe Ser Gly Gly Glu Phe Asp Pro
465                 470                 475                 480

Trp Arg Ser Leu Ser Ile Leu Ser Thr Glu Asp Phe Ala Pro Gln Gly
                485                 490                 495

Val Glu Phe Thr Ser Ala Ile Pro Ala Cys Gly Val Gln Thr Asn Glu
            500                 505                 510

Asp Thr Val Phe Gly Tyr Val Met Gln Asn Ser Glu His Cys Phe Asp
        515                 520                 525

Phe Gln Ala Thr Pro Thr Val Gly Lys Leu Ser Arg Gly Ile Phe Thr
    530                 535                 540

Ser Ala Leu Leu Gln Trp Leu Glu Cys Phe Gly Gln Asn Ser Ser Gln
545                 550                 555                 560

Ser Arg
```

<210> 67
<211> 541
<212> PRT
<213> Aspergillus oryzae

<400> 67

```
Met Val Ser Leu Thr His Ile Phe Ser Lys Ala Leu Leu Thr Leu Leu
1               5                   10                  15


Val Gly Gln Ser Ala Ala Leu Ser Phe Leu Pro Gly Ile Lys Ala Asn
            20                  25                  30


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


Phe Asn Pro Glu Lys Ile Ala Glu Thr Ala Ile Ser Arg Gly Ser Gly
    50                  55                  60


Ser Glu Val Pro Ala Arg Arg Ile Ser Ile Pro Ile Asp His Glu Asp
65                  70                  75                  80


Pro Ser Met Gly Thr Tyr Gln Asn Arg Tyr Trp Val Ser Ala Asp Phe
                85                  90                  95


Tyr Lys Pro Gly Gly Pro Val Phe Val Leu Asp Ala Gly Glu Gly Asn
            100                 105                 110


Ala Tyr Ser Val Ala Gln Ser Tyr Leu Gly Gly Ser Asp Asn Phe Phe
        115                 120                 125


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


Arg Gln Ala Leu Ala Asp Leu Pro Tyr Phe Ala Glu Lys Phe Thr Leu
145                 150                 155                 160
```

```
Asn Gly Thr Asp Leu Ser Pro Lys Ser Ser Pro Trp Ile Met Leu Gly
                165                 170                 175

Gly Ser Tyr Pro Gly Met Arg Ala Ala Phe Thr Arg Asn Glu Tyr Pro
            180                 185                 190

Asp Thr Ile Phe Ala Ser Phe Ala Met Ser Ala Pro Val Glu Ala Arg
        195                 200                 205

Val Asn Met Thr Ile Tyr Phe Glu Gln Val Tyr Arg Gly Met Val Ala
    210                 215                 220

Asn Gly Leu Gly Gly Cys Ala Lys Asp Leu Lys Ala Ile Asn Asp Tyr
225                 230                 235                 240

Ile Asp Ser Gln Leu Asp Lys Lys Gly Gln Ala Ala Asp Ala Ile Lys
                245                 250                 255

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

Thr Ala Ala Leu Gly Ser Ile Tyr Asn Leu Phe Gln Ser Tyr Gly Val
        275                 280                 285

Asp Gly Gly Glu Glu Ser Leu Ser Gln Leu Cys Ser Tyr Leu Asp Lys
    290                 295                 300

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

Thr Glu Lys Phe Ala Ala Trp Pro Pro Leu Leu Tyr Leu Ile Asn Gln
                325                 330                 335

Trp Gly Ser Gln Val Gly Asn Gly Asp Ser Asn Cys Lys Gly Gln Asn
            340                 345                 350
```

```
Asn Ser Thr Glu Thr Val Cys Glu Leu Gly Gly Gln Phe Thr Asp Pro
        355                 360                 365

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

Gln Ala Asp Asn Val Gly Pro His Ser Leu Leu Ser Lys Tyr Gln Ser
385                 390                 395                 400

Leu Glu Tyr Gln Gln Ser Leu Cys Tyr Arg Gln Phe Pro Gly Ala Lys
                405                 410                 415

Glu Ser Gly Leu Leu Pro Glu His Pro Glu Ala Asn Glu Thr Asn Ala
            420                 425                 430

Glu Thr Gly Gly Trp Thr Ile Arg Pro Ser Asn Val Phe Trp Ser Ala
        435                 440                 445

Gly Glu Phe Asp Pro Trp Arg Thr Leu Thr Pro Leu Ser Asn Glu Thr
    450                 455                 460

Phe Ala Pro Lys Gly Val Gln Ile Ser Thr Asn Ile Pro Lys Cys Gly
465                 470                 475                 480

Val Glu Thr Pro Glu Asn Val Leu Phe Gly Tyr Val Ile Pro Arg Ala
                485                 490                 495

Glu His Cys Phe Asp Tyr Asp Leu Ser Tyr Lys Pro Ala Asp Lys Ser
            500                 505                 510

Arg Lys Leu Phe Ser Leu Ala Leu Lys Lys Trp Leu Pro Cys Trp Arg
        515                 520                 525

Ser Glu His Ala Pro Lys Gly Val Gln Arg Lys Trp Ile
    530                 535                 540
```

<210> 68
<211> 612
<212> PRT
<213> Trichoderma reesei

<400> 68

```
Met Ala Lys Leu Ser Thr Leu Arg Leu Ala Ser Leu Leu Ser Leu Val
1               5                   10                  15


Ser Val Gln Val Ser Ala Ser Val His Leu Leu Glu Ser Leu Glu Lys
            20                  25                  30


Leu Pro His Gly Trp Lys Ala Ala Glu Thr Pro Ser Pro Ser Ser Gln
        35                  40                  45


Ile Val Leu Gln Val Ala Leu Thr Gln Gln Asn Ile Asp Gln Leu Glu
    50                  55                  60


Ser Arg Leu Ala Ala Val Ser Thr Pro Thr Ser Ser Thr Tyr Gly Lys
65                  70                  75                  80


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


Ser Ser Ser Ala Val Glu Ser Trp Leu Gln Ser His Gly Val Thr Ser
            100                 105                 110


Tyr Thr Lys Gln Gly Ser Ser Ile Trp Phe Gln Thr Asn Ile Ser Thr
        115                 120                 125


Ala Asn Ala Met Leu Ser Thr Asn Phe His Thr Tyr Ser Asp Leu Thr
    130                 135                 140


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

```
Ile Gly His Val Asp Leu Ile Ser Pro Thr Thr Tyr Phe Gly Thr Thr
                165                 170                 175

Lys Ala Met Arg Lys Leu Lys Ser Ser Gly Val Ser Pro Ala Ala Asp
            180                 185                 190

Ala Leu Ala Ala Arg Gln Glu Pro Ser Ser Cys Lys Gly Thr Leu Val
        195                 200                 205

Phe Glu Gly Glu Thr Phe Asn Val Phe Gln Pro Asp Cys Leu Arg Thr
    210                 215                 220

Glu Tyr Ser Val Asp Gly Tyr Thr Pro Ser Val Lys Ser Gly Ser Arg
225                 230                 235                 240

Ile Gly Phe Gly Ser Phe Leu Asn Glu Ser Ala Ser Phe Ala Asp Gln
                245                 250                 255

Ala Leu Phe Glu Lys His Phe Asn Ile Pro Ser Gln Asn Phe Ser Val
            260                 265                 270

Val Leu Ile Asn Gly Gly Thr Asp Leu Pro Gln Pro Pro Ser Asp Ala
        275                 280                 285

Asn Asp Gly Glu Ala Asn Leu Asp Ala Gln Thr Ile Leu Thr Ile Ala
    290                 295                 300

His Pro Leu Pro Ile Thr Glu Phe Ile Thr Ala Gly Ser Pro Pro Tyr
305                 310                 315                 320

Phe Pro Asp Pro Val Glu Pro Ala Gly Thr Pro Asn Glu Asn Glu Pro
                325                 330                 335

Tyr Leu Gln Tyr Tyr Glu Phe Leu Leu Ser Lys Ser Asn Ala Glu Ile
            340                 345                 350
```

```
Pro Gln Val Ile Thr Asn Ser Tyr Gly Asp Glu Glu Gln Thr Val Pro
        355                 360                 365

Arg Ser Tyr Ala Val Arg Val Cys Asn Leu Ile Gly Leu Leu Gly Leu
    370                 375                 380

Arg Gly Ile Ser Val Leu His Ser Ser Gly Asp Glu Gly Val Gly Ala
385                 390                 395                 400

Ser Cys Val Ala Thr Asn Ser Thr Thr Pro Gln Phe Asn Pro Ile Phe
                405                 410                 415

Pro Ala Thr Cys Pro Tyr Val Thr Ser Val Gly Gly Thr Val Ser Phe
            420                 425                 430

Asn Pro Glu Val Ala Trp Ala Gly Ser Ser Gly Gly Phe Ser Tyr Tyr
        435                 440                 445

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

Lys Tyr Val Ser Ala Glu Thr Lys Lys Tyr Tyr Gly Pro Tyr Val Asp
465                 470                 475                 480

Phe Ser Gly Arg Gly Phe Pro Asp Val Ala Ala His Ser Val Ser Pro
                485                 490                 495

Asp Tyr Pro Val Phe Gln Gly Gly Glu Leu Thr Pro Ser Gly Gly Thr
            500                 505                 510

Ser Ala Ala Ser Pro Val Val Ala Ala Ile Val Ala Leu Leu Asn Asp
        515                 520                 525

Ala Arg Leu Arg Glu Gly Lys Pro Thr Leu Gly Phe Leu Asn Pro Leu
    530                 535                 540
```

```
Ile Tyr Leu His Ala Ser Lys Gly Phe Thr Asp Ile Thr Ser Gly Gln
545                 550                 555                 560


Ser Glu Gly Cys Asn Gly Asn Asn Thr Gln Thr Gly Ser Pro Leu Pro
                565                 570                 575


Gly Ala Gly Phe Ile Ala Gly Ala His Trp Asn Ala Thr Lys Gly Trp
            580                 585                 590


Asp Pro Thr Thr Gly Phe Gly Val Pro Asn Leu Lys Lys Leu Leu Ala
        595                 600                 605


Leu Val Arg Phe
    610


<210>  69
<211>  439
<212>  PRT
<213>  Neurospora crassa

<400>  69

Met Val Ala Leu Thr Asn Leu Leu Leu Thr Thr Leu Leu Ala Ser Ala
1               5                   10                  15


Gly Leu Gly Ala Ala Leu Pro Pro Arg Ile Gly Ser Thr Val Ile Glu
            20                  25                  30


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


Gln Gln Lys Asn Pro Arg Phe His Lys Phe Asn Gly Ala Leu Ser Val
    50                  55                  60


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

```
Gln Ala Val Ala Asn His Leu Gly Ile Ser Val Glu Glu Val His Asn
                85                  90                  95

Tyr Ala Asn Thr Thr Ala Asn Ala Arg Arg Asp Gln Gly Ser Ala Thr
            100                 105                 110

Ala Ala Pro Ile Asp Gln Ser Asp Ser Ala Tyr Ile Thr Pro Val Ser
        115                 120                 125

Ile Gly Thr Pro Ala Gln Thr Leu Asn Leu Asp Phe Asp Thr Gly Ser
    130                 135                 140

Ser Asp Leu Trp Val Phe Ser Asn Ser Leu Pro Ser Ser Gln Arg Ala
145                 150                 155                 160

Gly His Thr Ile Tyr Asn Pro Ser Lys Ser Ser Thr Ala Lys Arg Val
                165                 170                 175

Asn Gly Ala Ser Trp Asp Ile Ser Tyr Gly Asp Gly Ser Ser Ser Lys
            180                 185                 190

Gly Gln Val Tyr Leu Asp Lys Val Thr Ile Gly Gly Leu Val Val Ser
        195                 200                 205

Asn Gln Ala Val Glu Thr Ala Gln Gln Val Ser Gln Ser Phe Thr Ala
    210                 215                 220

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

Thr Val Arg Pro Arg Gln Gln Lys Thr Trp Phe Glu Asn Ala Ile Gly
                245                 250                 255

Gln Leu Asp Gln Pro Leu Phe Ala Ala Asp Leu Lys Tyr Glu Ala Ser
            260                 265                 270
```

```
Gly Thr Tyr Asp Phe Gly Phe Ile Asp Pro Ala Lys His Thr Gly Asp
        275                 280                 285

Ile Thr Tyr Val Pro Val Asn Thr Asn Pro Gly Tyr Trp Thr Trp Thr
    290                 295                 300

Ser Thr Gly Tyr Gln Val Gly Ser Ser Pro Phe Val Ser Gln Ser Ile
305                 310                 315                 320

Thr Asn Ile Ala Asp Thr Gly Thr Thr Leu Met Tyr Val Pro Asp Ser
                325                 330                 335

Ile Leu Arg Ala Tyr Tyr Gly Gln Ile Arg Gly Ala Thr Asn Ser Gln
            340                 345                 350

Ser Tyr Gly Gly Tyr Val Phe Pro Cys Ser Thr Glu Ala Pro Asp Phe
        355                 360                 365

Thr Phe Gly Val Thr Asp Glu Ala Thr Ile Thr Ile Pro Gly Arg Phe
    370                 375                 380

Ile Asn Tyr Gly Pro Val Thr Asp Asp Gly Glu Thr Cys Phe Gly Gly
385                 390                 395                 400

Leu Gln Thr Ser Ser Asp Val Gly Ile Asn Ile Phe Gly Asp Val Ala
                405                 410                 415

Leu Lys Ala Ala Tyr Val Val Phe Lys Gly Gly Asp Ser Pro Ser Leu
            420                 425                 430

Gly Trp Ala Ser Lys Gln Leu
        435
```

<210> 70
<211> 417
<212> PRT
<213> Myceliophtora thermophila

<400> 70

```
Met His Leu Thr Pro Ala Leu Val Ala Ala Thr Cys Ala Val Glu Val
1               5                  10                  15

Cys Ala Gly Val Leu Pro Arg Ser Ser Ser Thr Pro Thr Thr Phe Gly
            20                  25                  30

Ser Gly Thr Leu Ser Leu Lys Gln Val Arg Asn Pro Asn Phe Val Arg
        35                  40                  45

Asn Gly Pro Val Gln Leu Ala Arg Ile Tyr His Lys Tyr Gly Val Pro
    50                  55                  60

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

Arg Lys Arg Ser Asn Gly Ser Thr Glu Thr Asn Pro Glu Thr Asn Asp
                85                  90                  95

Val Glu Tyr Leu Thr Pro Val Ser Ile Gly Thr Pro Pro Gln Val Leu
            100                 105                 110

Asn Leu Asp Phe Asp Thr Gly Ser Ser Asp Leu Trp Val Phe Ser Ser
        115                 120                 125

Glu Thr Arg Ser Ser Asp Val Gln Gly Gln Thr Ile Tyr Asp Pro Asn
    130                 135                 140

Glu Ser Ser Thr Ala Gln Lys Leu Gln Gly Tyr Ser Trp Gln Ile Ser
145                 150                 155                 160

Tyr Gly Asp Gly Ser Ser Ser Ser Gly Asp Val Tyr Thr Asp Ala Val
                165                 170                 175

Thr Val Gly Gly Leu Thr Val Pro Ser Gln Ala Val Glu Val Ala Arg
```

```
            180                 185                 190

Arg Val Ser Asp Glu Phe Thr Ser Asp Pro Asn Asn Asp Gly Leu Leu
        195                 200                 205

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

Thr Phe Phe Asp Asn Ala Lys Ala Asp Leu Asp Ala Pro Ile Phe Thr
225                 230                 235                 240

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

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

Ser Asp Gly Phe Trp Ala Trp Thr Ser Pro Gly Tyr Ala Val Gly Ser
        275                 280                 285

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

Ser Leu Phe Leu Leu Pro Ser Ser Val Val Ser Ala Tyr Tyr Gly Gln
305                 310                 315                 320

Ile Ser Gly Ala Lys Tyr Asp Ser Ile Gln Gly Gly Tyr Thr Leu Pro
                325                 330                 335

Cys Ser Gly Ser Val Pro Asp Phe Ala Phe Gly Ile Gly Asp Ser Asn
            340                 345                 350

Thr Thr Ile Ser Val Pro Gly Asp Tyr Val Arg Tyr Ala Ala Thr Asp
        355                 360                 365

Ser Ser Gly Ile Ile Cys Phe Gly Gly Ile Gln Ala Asn Thr Gly Ile
```

370 375 380

Gly Phe Ser Ile Phe Gly Asp Val Ala Leu Lys Ala Ala Phe Val Val
385 390 395 400

Phe Asp Gly Ala Lys Gln Gln Leu Gly Trp Ala Ser Lys Pro Leu Pro
405 410 415

Ser

<210> 71
<211> 434
<212> PRT
<213> Neurospora crassa

<400> 71

Met Leu Leu Phe Pro Thr Ile Leu Thr Ala Ala Leu Ala Ala Thr Gly
1 5 10 15

Met Ala Ala Ala Ile Pro Ser Arg Asp Asp Thr Thr Ala Asn Lys Gly
20 25 30

Thr Ala Ser Leu Leu Gln Val Arg Asn Pro Ser Phe Glu Phe Arg His
35 40 45

Gly Pro Leu Ala Leu Ala Lys Ala Tyr Gln Lys Phe Gly Ala Pro Met
50 55 60

Pro Glu Asp Leu Arg Ala Ala Ile Ala Arg Phe Arg Gln Asn Gln Lys
65 70 75 80

Arg Thr Thr Gly Thr Ile Ala Thr Asp Pro Glu Lys His Asp Val Glu
85 90 95

Tyr Leu Thr Pro Ile Ser Val Gly Thr Pro Ser Gln Asp Leu Val Val
100 105 110

```
Asp Phe Asp Thr Gly Ser Ser Asp Leu Trp Val Phe Ser Thr Glu Met
        115                 120                 125

Ser Thr Ser Asp Ile Lys Gly Gln Thr Val Tyr Asp Pro Asn Asn Ser
    130                 135                 140

Ser Thr Ser Glu Lys Val Gln Gly Ser Thr Trp Lys Ile Thr Tyr Gly
145                 150                 155                 160

Asp Gly Ser Ser Ser Ser Gly Asp Val Tyr Leu Asp Thr Val Thr Ile
                165                 170                 175

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

Ser Ser Glu Phe Thr Asp Asp Ser His Asn Asp Gly Leu Leu Gly Leu
        195                 200                 205

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

Phe Asp Asn Ile Lys Gly Ser Leu Asp Ala Pro Leu Phe Thr Val Asp
225                 230                 235                 240

Leu Lys His Gly Thr Pro Gly Ser Phe Asn Phe Gly Tyr Ile Asp Pro
                245                 250                 255

Ala Ala Tyr Ile Gly Asn Ile Ser Trp Thr Pro Val Asp Ser Ser Gln
            260                 265                 270

Gly Tyr Trp Gly Phe Thr Ser Pro Gly Tyr Ala Val Gly Thr Gly Ala
        275                 280                 285

Phe Arg Asn His Ser Ile Ser Gly Ile Ala Asp Thr Gly Thr Thr Leu
    290                 295                 300
```

```
Leu Leu Leu Pro Lys Ser Val Val Ser Ala Tyr Tyr Lys Glu Ile Gln
305                 310                 315                 320


Gly Ala Gln Tyr Asp Ser Asp Gln Gly Gly Tyr Ile Phe Pro Cys Ser
                325                 330                 335


Pro Thr Pro Pro Asp Phe Val Phe Gly Val Asn Lys Gly Ile Val Thr
            340                 345                 350


Val Pro Gly Asp Met Val Ser Tyr Ala Pro Ala Asp Ser Ala Asn Gln
        355                 360                 365


Asn Cys Phe Gly Gly Ile Gln Thr Asp Thr Gly Ile Gly Phe Ser Ile
    370                 375                 380


Phe Gly Asp Val Ala Leu Lys Thr Ser Phe Val His Leu His Gly Ser
385                 390                 395                 400


Ile Val Pro Gly Tyr Tyr Ala Asp Cys Ala Met Arg Phe Asn Arg Met
                405                 410                 415


Leu Arg Ser Tyr Ser Asn Asp Gln Leu Val Asp Phe Ser Ser Ser Gly
            420                 425                 430


Pro Leu
```

<210> 72
<211> 466
<212> PRT
<213> Myceliophtora thermophila

<400> 72

```
Met Asp Ala Leu Phe Glu Thr His Ala Lys Leu Arg Lys Arg Met Ala
1               5                   10                  15
```

```
Leu Tyr Arg Val Arg Ala Val Pro Asn Gln Asn Tyr Gln Arg Asp Gly
            20                  25                  30

Thr Lys Ser Tyr Val Ser Val Leu Asn Arg Phe Gly Phe Gln Pro Thr
        35                  40                  45

Lys Pro Gly Pro Tyr Phe Gln Ile Phe Glu Glu Ser Glu Glu Ala Pro
    50                  55                  60

Ser Met Ser Ala Ala Pro Gly Val Lys Pro Gly His Val Trp Gln Gly
65                  70                  75                  80

Leu Phe Lys Lys Leu Lys Asp Gln Glu Glu Pro Gly Glu Val Thr Ala
                85                  90                  95

Glu Asp Gln Gln Asn Asp Ser Glu Tyr Leu Cys Glu Val Met Ile Gly
            100                 105                 110

Thr Ala Trp Thr Ala Glu Arg Gln Ile Val Lys Met Asp Phe Asp Thr
        115                 120                 125

Gly Leu Ala Asp Phe Trp Val Ser Gln Lys Ser Phe Asp Pro Lys Lys
    130                 135                 140

Ser Val Thr Trp Gln Leu Ala Lys Asp Lys Ser Trp Lys Val Gln Tyr
145                 150                 155                 160

Gly Asp Gly Ser Ser Ala Ser Gly Ile Val Gly His Asp Ile Leu Ile
                165                 170                 175

Ile Gly Gly Ile Gln Ile Lys Arg Gln Ala Ile Glu Ile Ala Thr Glu
            180                 185                 190

Met Ser Ala Gln Phe Ser Glu Gly Thr Met Asp Gly Ile Leu Gly Leu
        195                 200                 205
```

```
Ala Phe Ser Lys Leu Asn Thr Val Gln Thr Asp Gly Lys Pro Asp Pro
    210                 215                 220


Gln Arg Thr Val Val Asp Asn Met Met Ala Gln Asp Asp Ile Pro Pro
225                 230                 235                 240


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


Gln Arg Ser Phe Tyr Thr Phe Gly Trp Ile Asp Glu Asp Leu Val Lys
            260                 265                 270


Ala Ser Gly Glu Glu Ile Val Trp Thr Asp Val Asp Asn Ser Glu Gly
        275                 280                 285


Phe Trp Met Phe Ser Ser Glu His Val Thr Ile Asp Gly Gln Gln Val
    290                 295                 300


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


Leu Val Ser Asp Gln Val Cys Asp Ala Leu Tyr Ala His Ile Pro Ser
                325                 330                 335


Ala Glu Tyr Ser Glu Glu Tyr Gln Gly Trp Thr Phe Pro Gln Glu Thr
            340                 345                 350


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


Phe Val Leu Gln Lys Glu Asp Leu Ile Phe Ala Pro Ala Asp Glu Arg
    370                 375                 380


Val Phe Tyr Gly Ser Val Gln Ser Arg Gly Glu Asn Pro Phe Asp Ile
385                 390                 395                 400
```

```
Leu Gly Ile Ala Phe Leu Lys Ser Ile Tyr Ala Ile Trp Asp Gln Gly
               405                 410                 415


His Lys Arg Phe Gly Ala Val Pro Lys Met Glu Ala Phe Val Pro Pro
            420                 425                 430


Thr Lys Tyr Asp Arg Pro Arg Leu Thr Asp Gln Asp Arg Lys Asp Leu
        435                 440                 445


Gly Val Thr Ile Gly Tyr Gly Asp Ile Ser Ser Thr Phe Phe Glu Lys
    450                 455                 460


Arg Ala
465


<210>  73
<211>  481
<212>  PRT
<213>  Neurospora crassa

<400>  73

Met Gly Ser Met Tyr Gln Val Gln Ser Lys Leu Arg Gln Asp Leu Gly
1               5                   10                  15


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


Thr Lys Ala Tyr Val Ser Ala Met Ala Arg Tyr Gly Phe Asn Pro Thr
        35                  40                  45


Glu Glu Ser Arg Phe Phe His Leu Lys Lys Thr Asp Leu Thr Lys Glu
    50                  55                  60


Phe Gln Arg Arg Gly Tyr Ile Arg His Trp Glu Gln Leu Val Arg Thr
65                  70                  75                  80
```

```
Pro Gln Glu Arg Pro Asp Asp Pro His Thr Asp Asn Glu Pro Val Pro
                85                  90                  95

Ala Glu Asp Gln Gln Tyr Asp Thr Gln Tyr Leu Cys Glu Ile Gly Ile
            100                 105                 110

Gly Thr Pro Gln Gln Lys Val Lys Leu Asp Phe Asp Thr Gly Ser Ala
        115                 120                 125

Asp Leu Trp Val Arg Cys Thr Asp Ser Ser Leu Leu His His Ala Asp
    130                 135                 140

Lys Lys Phe Asp Pro Lys Lys Ser Asp Thr Phe Gln Glu Ser Lys Thr
145                 150                 155                 160

Asp Gln Thr Trp Lys Ile Gln Tyr Gly Asp Gly Ser Thr Ala Ser Gly
                165                 170                 175

Thr Val Gly Thr Asp Val Ile Thr Val Gly Gly Leu Gln Ile Lys Asn
            180                 185                 190

Gln Ala Ile Glu Leu Ala Lys Lys Val Ser Ser Ala Phe Ser Ser Gly
        195                 200                 205

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

Glu Ser Asp Gly Lys Pro Asp Pro Gln Pro Thr Pro Val Glu Asn Met
225                 230                 235                 240

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

Phe Tyr Ser Ala Arg Asp Asp Lys Ser Glu Glu Lys Ser Phe Tyr Thr
            260                 265                 270
```

```
Phe Gly Trp Val Asp Glu Asp Leu Val Lys Ala Ser Gly Lys Asp Ile
        275                 280                 285

Thr Trp Thr Pro Ile Asp Asn Ser Glu Gly Phe Trp Lys Phe Pro Ser
    290                 295                 300

Glu Ser Ala Thr Val Asp Gly Asp Asn Val Ser Val Ser Gly Asn Thr
305                 310                 315                 320

Ala Ile Ala Asp Thr Gly Thr Thr Leu Ala Leu Val Ser Asp Thr Val
                325                 330                 335

Cys Lys Ala Leu Tyr Ala Lys Ile Pro Gly Ser Lys Tyr Ser Tyr Arg
            340                 345                 350

Tyr Gln Gly Tyr Leu Ile Pro Ser Thr Ile Thr Ala Asp Gln Leu Pro
        355                 360                 365

Gln Leu Ser Val Ala Val Gly Gly Glu Gln Phe Val Ile Gln Asn Glu
    370                 375                 380

Asp Leu Leu Leu Ala Pro Ala Asp Asp Asp His Trp Tyr Gly Gly Val
385                 390                 395                 400

Gln Ser Arg Gly Thr Met Pro Phe Asp Ile Leu Gly Asp Thr Phe Leu
                405                 410                 415

Lys Ser Ile Tyr Ala Ile Trp Asp Gln Gly Asn Asn Arg Phe Gly Ala
            420                 425                 430

Val Pro Lys Ile Glu Val Asn Gln His Thr Val Phe Pro Asp Thr Glu
        435                 440                 445

Pro Ser Pro Glu Ala Ser Ser Pro Glu Pro Ala Asp Lys Val Gly Asp
    450                 455                 460
```

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

Leu

<210> 74
<211> 397
<212> PRT
<213> Myceliophtora thermophila

<400> 74

Met Lys Asp Ala Phe Leu Leu Thr Ala Ala Val Leu Leu Gly Ser Ala
1 5 10 15

Gln Gly Ala Val His Lys Met Lys Leu Gln Lys Ile Pro Leu Ser Glu
20 25 30

Gln Leu Glu Ala Val Pro Ile Asn Thr Gln Leu Glu His Leu Gly Gln
35 40 45

Lys Tyr Met Gly Leu Arg Pro Arg Glu Ser Gln Ala Asp Ala Ile Phe
50 55 60

Lys Gly Met Val Ala Asp Val Lys Gly Asn His Pro Ile Pro Ile Ser
65 70 75 80

Asn Phe Met Asn Ala Gln Tyr Phe Ser Glu Ile Thr Ile Gly Thr Pro
85 90 95

Pro Gln Ser Phe Lys Val Val Leu Asp Thr Gly Ser Ser Asn Leu Trp
100 105 110

Val Pro Ser Val Glu Cys Gly Ser Ile Ala Cys Tyr Leu His Ser Lys
115 120 125

Tyr Asp Ser Ser Ala Ser Ser Thr Tyr Lys Lys Asn Gly Thr Ser Phe

```
    130                 135                 140

Glu Ile Arg Tyr Gly Ser Gly Ser Leu Ser Gly Phe Val Ser Gln Asp
145                 150                 155                 160

Thr Val Ser Ile Gly Asp Ile Thr Ile Gln Gly Gln Asp Phe Ala Glu
                165                 170                 175

Ala Thr Ser Glu Pro Gly Leu Ala Phe Ala Phe Gly Arg Phe Asp Gly
            180                 185                 190

Ile Leu Gly Leu Gly Tyr Asp Arg Ile Ser Val Asn Gly Ile Val Pro
        195                 200                 205

Pro Phe Tyr Lys Met Val Glu Gln Lys Leu Ile Asp Glu Pro Val Phe
    210                 215                 220

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

Gly Val Asp His Asp Lys Tyr Lys Gly Lys Ile Thr Thr Ile Pro Leu
                245                 250                 255

Arg Arg Lys Ala Tyr Trp Glu Val Asp Phe Asp Ala Ile Ser Tyr Gly
            260                 265                 270

Asp Asp Thr Ala Glu Leu Glu Asn Thr Gly Ile Ile Leu Asp Thr Gly
        275                 280                 285

Thr Ser Leu Ile Ala Leu Pro Ser Gln Leu Ala Glu Met Leu Asn Ala
    290                 295                 300

Gln Ile Gly Ala Lys Lys Ser Tyr Thr Gly Gln Tyr Thr Ile Asp Cys
305                 310                 315                 320

Asn Lys Arg Asp Ser Leu Lys Asp Val Thr Phe Asn Leu Ala Gly Tyr
```

325 330 335

Asn Phe Thr Leu Gly Pro Tyr Asp Tyr Val Leu Glu Val Gln Gly Ser
340 345 350

Cys Ile Ser Thr Phe Met Gly Met Asp Phe Pro Ala Pro Thr Gly Pro
355 360 365

Leu Ala Ile Leu Gly Asp Ala Phe Leu Arg Arg Tyr Tyr Ser Ile Tyr
370 375 380

Asp Leu Gly Ala Asp Thr Val Gly Leu Ala Glu Ala Lys
385 390 395

<210> 75
<211> 396
<212> PRT
<213> Neurospora crassa

<400> 75

Met Lys Gly Ala Leu Leu Thr Ala Ala Met Leu Leu Gly Ser Ala Gln
1 5 10 15

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

Leu Glu Ser Val Pro Ile Asp Val Gln Val Gln His Leu Gly Gln Lys
35 40 45

Tyr Thr Gly Leu Arg Thr Glu Ser His Thr Gln Ala Met Phe Lys Ala
50 55 60

Thr Asp Ala Gln Val Ser Gly Asn His Pro Val Pro Ile Thr Asn Phe
65 70 75 80

Met Asn Ala Gln Tyr Phe Ser Glu Ile Thr Ile Gly Thr Pro Pro Gln
85 90 95

```
Thr Phe Lys Val Val Leu Asp Thr Gly Ser Ser Asn Leu Trp Val Pro
            100                 105                 110

Ser Ser Gln Cys Gly Ser Ile Ala Cys Tyr Leu His Asn Lys Tyr Glu
        115                 120                 125

Ser Ser Glu Ser Ser Thr Tyr Lys Lys Asn Gly Thr Ser Phe Lys Ile
    130                 135                 140

Glu Tyr Gly Ser Gly Ser Leu Ser Gly Phe Val Ser Gln Asp Arg Met
145                 150                 155                 160

Thr Ile Gly Asp Ile Thr Ile Asn Asp Gln Leu Phe Ala Glu Ala Thr
                165                 170                 175

Ser Glu Pro Gly Leu Ala Phe Ala Phe Gly Arg Phe Asp Gly Ile Leu
            180                 185                 190

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

Tyr Lys Met Val Glu Gln Lys Leu Val Asp Glu Pro Val Phe Ser Phe
    210                 215                 220

Tyr Leu Ala Asp Gln Asp Gly Glu Ser Glu Val Val Phe Gly Gly Val
225                 230                 235                 240

Asn Lys Asp Arg Tyr Thr Gly Lys Ile Thr Thr Ile Pro Leu Arg Arg
                245                 250                 255

Lys Ala Tyr Trp Glu Val Asp Phe Asp Ala Ile Gly Tyr Gly Lys Asp
            260                 265                 270

Phe Ala Glu Leu Glu Gly His Gly Val Ile Leu Asp Thr Gly Thr Ser
        275                 280                 285
```

```
Leu Ile Ala Leu Pro Ser Gln Leu Ala Glu Met Leu Asn Ala Gln Ile
    290                 295                 300

Gly Ala Lys Lys Ser Trp Asn Gly Gln Phe Thr Ile Asp Cys Gly Lys
305                 310                 315                 320

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

Thr Leu Gly Pro Glu Asp Tyr Ile Leu Glu Ala Ser Gly Ser Cys Leu
            340                 345                 350

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

Ile Leu Gly Asp Ala Phe Leu Arg Lys Tyr Tyr Ser Ile Tyr Asp Leu
    370                 375                 380

Gly Ala Asp Thr Val Gly Ile Ala Thr Ala Lys Arg
385                 390                 395
```

<210> 76
<211> 454
<212> PRT
<213> Myceliophtora thermophila

<400> 76

```
Met Lys Phe Ala Ala Leu Ala Leu Ala Ala Ser Leu Val Ala Ala Ala
1               5                   10                  15

Pro Arg Val Val Lys Val Asp Pro Ser Asp Ile Lys Pro Arg Arg Leu
            20                  25                  30

Gly Gly Thr Lys Phe Lys Leu Gly Gln Ile His Asn Asp Leu Phe Arg
        35                  40                  45
```

```
Gln His Gly Arg Gly Pro Arg Ala Leu Ala Lys Ala Tyr Glu Lys Tyr
    50                  55                  60

Asn Ile Glu Leu Pro Pro Asn Leu Leu Glu Val Val Gln Arg Ile Leu
65                  70                  75                  80

Lys Asp Leu Gly Ile Glu Pro His Ser Lys Lys Ile Pro Gly Ser Lys
                85                  90                  95

Ser Ser Tyr Gly Asn Gly Ala Pro Tyr Thr Asn Glu Thr Asp Asp Ser
            100                 105                 110

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

Pro Val Gln Ile Gly Thr Pro Pro Gln Thr Leu Met Leu Asn Phe Asp
    130                 135                 140

Thr Gly Ser Ser Asp Leu Trp Val Phe Ser Ser Glu Thr Pro Ser Arg
145                 150                 155                 160

Gln Gln Asn Gly Gln Lys Ile Tyr Lys Ile Glu Glu Ser Ser Thr Ala
                165                 170                 175

Arg Arg Leu Ser Asn His Thr Trp Ser Ile Gln Tyr Gly Asp Gly Ser
            180                 185                 190

Arg Ser Ala Gly Asn Val Tyr Leu Asp Thr Val Ser Val Gly Gly Val
        195                 200                 205

Asn Val Phe Asn Gln Ala Val Glu Ser Ala Thr Phe Val Ser Ser Ser
    210                 215                 220

Phe Val Thr Asp Ala Ala Ser Ser Gly Leu Leu Gly Leu Gly Phe Asp
225                 230                 235                 240
```

```
Ser Ile Asn Thr Val Lys Pro Thr Lys Gln Lys Thr Phe Ile Ser Asn
                245                 250                 255

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

Ala Glu Pro Gly Asn Tyr Asn Phe Gly Phe Ile Asp Glu Thr Glu Phe
        275                 280                 285

Val Gly Pro Leu Ser Phe Ile Asp Val Asp Ser Thr Asp Gly Phe Trp
    290                 295                 300

Gln Phe Asp Ala Thr Gly Tyr Ser Ile Gln Leu Pro Glu Pro Ser Gly
305                 310                 315                 320

Asn Ile Thr Gly Thr Pro Phe Arg Ala Val Ala His Thr Ala Ile Ala
                325                 330                 335

Asp Thr Gly Thr Thr Leu Leu Leu Leu Pro Pro Gly Ile Ala Gln Ala
            340                 345                 350

Tyr Tyr Trp Gln Val Gln Gly Ala Arg Gln Ala Pro Glu Val Gly Gly
        355                 360                 365

Trp Val Met Pro Cys Asn Ala Ser Met Pro Asp Leu Thr Leu His Ile
    370                 375                 380

Gly Thr Tyr Lys Ala Val Ile Pro Gly Glu Leu Ile Pro Tyr Ala Pro
385                 390                 395                 400

Val Asp Thr Asp Asp Met Asp Thr Ala Thr Val Cys Tyr Gly Gly Ile
                405                 410                 415

Gln Ser Ala Ser Gly Met Pro Phe Ala Ile Tyr Gly Asp Ile Phe Phe
            420                 425                 430
```

```
Lys Ala Gln Phe Thr Val Phe Asp Val Glu Asn Leu Lys Leu Gly Phe
        435                 440                 445


Ala Pro Lys Pro Glu Leu
    450
```

<210> 77
<211> 489
<212> PRT
<213> Myceliophtora thermophila

<400> 77

```
Met Ala Ile Pro Val Leu Phe Ser Ala Leu Val Leu Leu Val Ala Leu
1               5                   10                  15


Leu Cys Cys His Ala Thr Ala Ala Leu Gln Gln Leu Ala His Asp Val
            20                  25                  30


Gly Cys Val His Leu Pro Val Val His Ser Thr Lys Val Asp Arg Phe
        35                  40                  45


Ser Asp Lys Arg Gly Ile Gln Leu Gln Leu Ala Asn Arg Ser Asp Val
    50                  55                  60


Ala Tyr Tyr Ala Gln Leu Ser Ile Gly Thr Pro Pro Gln Pro Val Phe
65                  70                  75                  80


Val Gln Leu Asp Thr Gly Ser Phe Glu Leu Trp Val Asn Pro Asp Cys
                85                  90                  95


Thr Thr Val Ser Gly Ser Asp Ala Val Phe Cys Glu Arg Ala Gly Arg
            100                 105                 110


Tyr Asp Val Thr Lys Ser Ser Thr Ala Thr Ser Leu Gly Thr Asn Arg
        115                 120                 125
```

```
Thr Leu Arg Tyr Gly Ile Gly Ala Ala Asn Ile Ser Tyr Phe Thr Asp
    130                 135                 140

Thr Ile Ser Leu Ala Gly Ser Pro Met Met Leu Gln Asp Val Gln Phe
145                 150                 155                 160

Gly Val Ala Thr Ala Ser Glu Asp Ala Phe Ser Gly Ile Leu Gly Ile
                165                 170                 175

Gly Tyr Gly Lys Gly Ile Gly Thr Gly Tyr Pro Asn Phe Val Asp Gln
            180                 185                 190

Leu Trp Glu Gln Asn Val Thr Arg Val Lys Ala Tyr Thr Leu Ala Leu
        195                 200                 205

Gly Ser Lys Asp Ser Gln Glu Gly Val Ile Val Phe Gly Gly Val Asp
    210                 215                 220

Thr Ser Lys Phe Ala Gly Lys Leu Ala Arg Leu Pro Val Ile Pro Pro
225                 230                 235                 240

Ala Gln Ser Pro Asp Gly Val Pro Arg Phe Trp Val Glu Met Lys Ser
                245                 250                 255

Leu Ser Ile Thr Arg Pro Ser Gly Leu Asn Thr Val Tyr Asp Gly Gly
            260                 265                 270

Ala Met Pro Val Phe Leu Asp Ser Gly Ser Thr Met Thr Leu Leu Pro
        275                 280                 285

Ala Asn Leu Thr Met Ala Val Ala Arg Asp Phe Gly Ala Gln Ala Pro
    290                 295                 300

Asp Ala Asn Gly Phe Tyr Lys Ile Asp Cys Ala Leu Thr Ala Leu Asn
305                 310                 315                 320
```

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

Lys Glu Leu Thr Arg Glu Val Ala Ser Asn Pro Pro Ser Cys Phe Leu
            340                 345                 350

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

Arg Ser Ala Tyr Thr Val Phe Asp Leu Glu Thr Asp Ser Ile Trp Met
    370                 375                 380

Ala Pro Ala Val Asn Cys Gly Ser Ser Pro Ala Ala Leu Ser Asn Val
385                 390                 395                 400

Gln Asp Leu Ser Ala Val Thr Gly Glu Cys Gly Val Arg Glu Ile Ala
                405                 410                 415

Glu Ser Thr Ser Ser Thr Gln Val Pro Ser Thr Gly Val Asp Asp Thr
            420                 425                 430

Glu Ala Gly Ala Val Pro Thr Ser Thr Thr Thr Val Val Ser Gln Pro
        435                 440                 445

Ser Gly Thr Thr Thr Gln Met Gly Ala Arg Pro Thr Leu Asp Asn Ala
    450                 455                 460

Ser Asn Pro Leu Gly Ala His Arg Leu Thr Trp Val Leu Val Ile Thr
465                 470                 475                 480

Ala Ala Leu His Leu Phe Thr Gly Ile
                485
```

<210> 78
<211> 518
<212> PRT
<213> Neurospora crassa

<400> 78

```
Met Ala Ala Phe Pro Phe Leu Ser Ala Ser Phe Val Leu Leu Gln Leu
1               5                  10                  15


Ala Leu Thr Cys Leu Ala Gln His Leu Asn Leu Thr Thr Gly Pro Leu
            20                  25                  30


His Leu Thr Gly His Thr Pro Gly Asp Gly Cys Val His Leu Pro Ile
        35                  40                  45


Ile His Ser Thr Asn Thr Asp His Phe Ala Arg Arg Gly Ile Gln Leu
    50                  55                  60


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


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


Glu Leu Trp Val Asn Pro Asp Cys Thr Thr Val Ser Pro Ser Asp Ser
            100                 105                 110


Ser Phe Cys Asp His Ile Gly Phe Tyr Asn Ala Ser Leu Ser Ser Thr
        115                 120                 125


Ser Lys Ser Leu Gly Thr Ser Lys Thr Leu Arg Tyr Gly Ile Gly Ala
    130                 135                 140


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


Thr Ser Leu Lys Asp Ile Gln Phe Gly Val Ala Thr Ser Ser Lys Asp
                165                 170                 175


Ala Phe Ser Gly Ile Leu Gly Ile Gly Tyr Gly Gln Gly Leu Ala Thr
```

```
            180                 185                 190

Lys Tyr Pro Asn Phe Ile Asp Gln Leu Tyr Ala Gln Lys Ile Thr Lys
        195                 200                 205

Val Lys Ala Tyr Thr Leu Ala Leu Gly Ser Lys Thr Ala Gln Gln Gly
    210                 215                 220

Ser Ile Val Phe Gly Gly Val Asp Thr Ser Lys Phe Ala Gly Pro Leu
225                 230                 235                 240

Gly Arg Leu Pro Ile Ile Pro Ala Glu Asp Ser Pro Asp Gly Val Pro
                245                 250                 255

Arg Phe Trp Val Gln Met Asn Gly Ile Ser Leu Thr Pro Pro Ser Gly
            260                 265                 270

Gln Ser Met Gly Val Tyr Glu Gly Ser Lys Ile Pro Ala Phe Leu Asp
        275                 280                 285

Ser Gly Ser Thr Met Thr Ile Leu Pro Pro Ala Leu Ala Asn Lys Ile
    290                 295                 300

Ala Glu Asp Phe Gly Ser Pro Glu Met Asp Ala Asn Gly Phe Tyr Arg
305                 310                 315                 320

Val Gly Cys Gly Tyr Val Glu Met Asn Gly Thr Met Asp Phe Glu Phe
                325                 330                 335

Val Gly Ala Gly Gln Lys Val Thr Val Arg Val Pro Tyr Lys Glu Met
            340                 345                 350

Ile Arg Glu Val Gly Gln Gly Glu Ser Lys Met Cys Phe Leu Gly Ile
        355                 360                 365

Met Gly Ser Glu Ser Phe Thr Leu Leu Gly Asp Thr Phe Leu Arg Ser
```

```
    370                 375                 380

Ala Tyr Ala Thr Ser Cys Gly Asn Thr Pro Ala Ala Leu Arg Asp Val
385                 390                 395                 400

Thr Asp Leu Ser Arg Val Val Gly Asn Cys Gln Ile Gln Leu Gly Glu
                405                 410                 415

Lys Glu Ala Val Val Asp Val Val Ser Glu Thr Ser Ile Ala Pro Pro
            420                 425                 430

Thr Gly Ser Thr Gly Asp Thr Asp Gly Val Thr Gly Thr Gly Gly Asn
        435                 440                 445

Gly Ser Gly Asn Gly Gly Thr Arg Thr Ala Trp Gly Phe Val Thr Thr
    450                 455                 460

Thr Leu Ala Val Pro Met Ala Thr Gly Leu Ala Gly Val Gly Gly Ser
465                 470                 475                 480

Gly Ser Gly Ser Met Ser Ala Thr Ala Leu Asp Ser Ser Gly Arg Ser
                485                 490                 495

Met Ala Gly Asp Val Val Leu Ser Ala Ala Val Ala Val Gly Ala Ala
            500                 505                 510

Val Leu Gly Ser Leu Leu
        515


<210>  79
<211>  501
<212>  PRT
<213>  Myceliophtora thermophila

<400>  79

Met Arg Gly Tyr Ala Ala Val Ala Phe Gly Ala Ile Leu Ala Gly Ala
1               5                   10                  15
```

```
Val His Ala Ser Ala Gly Asn Gly Val Val Gln Trp Asp Ile Arg Arg
            20                  25                  30

Thr Gln Arg Gln Glu Glu Leu Gln Arg Leu Asn Arg Arg Leu Arg Lys
        35                  40                  45

Arg Ala Asn Pro Val Leu Glu Val Ile Thr Asn Glu Lys Ile Arg Gly
    50                  55                  60

Gly Tyr Phe Ala Thr Cys Lys Ile Gly Thr Pro Gly Gln Asp Leu Thr
65                  70                  75                  80

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

Ala Gln Val Cys Arg Glu Ile Gly Thr Glu Gly Cys Ala Leu Gly Thr
            100                 105                 110

Phe Asn Pro Asn Arg Ser Ser Ser Phe Glu Val Ile Gly Glu Gly Gln
        115                 120                 125

Phe Asp Ile Glu Tyr Val Asp Gly Ser Ser Ser Lys Gly Asp Tyr Phe
    130                 135                 140

Thr Asp Val Phe Gln Ile Gly Asp Ile Ser Val Gln Asn Met Thr Met
145                 150                 155                 160

Gly Leu Gly Leu His Thr Asp Ile Ala Tyr Gly Leu Val Gly Val Gly
                165                 170                 175

Tyr Ala Ile Asn Glu Ala Ile Val Ala Thr Thr Gln Ser Arg Asp Ser
            180                 185                 190

Val Tyr Pro Asn Leu Pro Val Gln Met Val Asp Gln Gly Leu Ile Asn
        195                 200                 205
```

```
Thr Val Ala Tyr Ser Leu Trp Leu Asn Asp Leu Asp Ala Ser Ser Gly
    210                 215                 220

Ser Ile Leu Phe Gly Gly Ile Asp Thr Glu Lys Tyr Gln Gly Glu Leu
225                 230                 235                 240

Thr Arg Ile Asp Ile Tyr Pro Thr Ser Gln Gly Asp Phe Ser Ser Phe
                245                 250                 255

Val Val Ala Leu Thr Ser Leu Glu Ala Arg Ser Pro Ser Gly Gln Asp
            260                 265                 270

Thr Leu Thr Ser Gln Glu Phe Pro Ile Pro Val Val Leu Asp Ser Gly
        275                 280                 285

Thr Thr Leu Ser Tyr Leu Pro Thr Asp Leu Ala Thr Gln Ala Trp Lys
    290                 295                 300

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

Cys Asp Met Glu Asn Ser Lys Gly Ser Phe Ser Phe Gly Phe Ala Gly
                325                 330                 335

Pro Asp Gly Pro Arg Ile Thr Val Gly Met Asp Glu Leu Val Leu Asp
            340                 345                 350

Met Thr Asp Gly Gln Ala Pro Gln Phe Leu Ser Gly Pro Tyr Lys Gly
        355                 360                 365

Arg Asp Val Cys Gln Phe Gly Ile Gln Asn Phe Thr Ser Ala Pro Phe
    370                 375                 380

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

```
Val Asn Asn Gln Ile Gly Ile Ala Ala Thr Asp Phe Asn Ser Thr Asp
                405                 410                 415


Ser Asn Ile Val Pro Phe Pro Ser Met Gly Ala Pro Ile Pro Ser Ala
            420                 425                 430


Thr Val Ala Ala Asn Gln Arg Glu Val Thr Arg Val Pro Thr Val Thr
        435                 440                 445


Glu Pro Ala Tyr Ser Ala Ser Gln Gly Phe Met Glu Ser Ala Ser Gly
    450                 455                 460


Glu Glu Ser Leu Ala Pro Gly Met Pro Ala Ala Trp Gly Met Gly Gln
465                 470                 475                 480


Leu Leu Val Val Gly Val Thr Met Ala Leu Thr Ala Leu Gly Ser Gly
                485                 490                 495


Leu Phe Phe Val Leu
            500


<210>  80
<211>  492
<212>  PRT
<213>  Neurospora crassa

<400>  80

Met Lys Gly Tyr Thr Ser Ser Ala Leu Leu Leu Gly Pro Ala Leu Leu
1               5                   10                  15


Ser Gln Leu Ala Leu Ala Gln Gln Ala Pro Asn Gly Val Val His Trp
            20                  25                  30


Gly Ile Gln Lys Arg His Ala Pro Asn Ala Pro Asn Arg Leu Leu Arg
        35                  40                  45
```

```
Arg Ala Gly Pro Thr His Gln Ala Ile Leu Gln Asn Glu Gln Ala Arg
    50                  55                  60

Gly Gly Tyr Phe Ala Thr Cys Ala Met Gly Thr Pro Gly Gln Lys Val
65                  70                  75                  80

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

Thr Ala Ser Ile Cys Asn Lys Gly Ala Cys Asp Leu Gly Ser Trp Gln
            100                 105                 110

Gly Glu Phe Asp Ile Ser Tyr Val Asp Gly Ser Ser Ser Lys Gly Asp
        115                 120                 125

Tyr Phe Thr Asp Val Phe Asn Ile Gly Gly Thr Thr Val Thr Asn Leu
    130                 135                 140

Thr Met Gly Leu Gly Ala Gln Thr Asp Ile Ala Tyr Gly Leu Val Gly
145                 150                 155                 160

Ile Gly Tyr Ala Ile Asn Glu Ala Ile Val Gly Asn Ser His Ser Leu
                165                 170                 175

Ser Ser Gln Tyr Pro Asn Leu Pro Val Ala Met Val Asp Asp Gly Leu
            180                 185                 190

Ile Asn Thr Ile Ala Tyr Ser Leu Trp Leu Asn Asp Leu Asp Ala Gly
        195                 200                 205

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

Asp Leu Thr Arg Ile Arg Ile Tyr Pro Ser Ser Asn Gly Tyr Tyr Phe
225                 230                 235                 240
```

```
Ser Phe Ile Val Ala Leu Thr Ser Leu Gln Ala Ile Ser Pro Ser Gly
                245                 250                 255

Asn Asp Thr Leu Thr Ser Gln Glu Phe Pro Ile Pro Val Val Leu Asp
            260                 265                 270

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

Trp Gln Glu Val Gly Ala Glu Tyr Ser Asp Arg Leu Glu Leu Ala Val
    290                 295                 300

Ile Pro Cys Ser Lys Lys Ser Ser Asn Gly Tyr Phe Ser Phe Gly Phe
305                 310                 315                 320

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

Leu Asp Leu Thr Ser Gly Asp Pro Pro Lys Tyr Thr Ser Gly Pro Asn
            340                 345                 350

Lys Gly Gln Asp Val Cys Glu Phe Gly Ile Gln Asn Ser Thr Ser Ala
        355                 360                 365

Pro Tyr Leu Leu Gly Asp Thr Phe Leu Arg Ser Ala Tyr Val Val Tyr
    370                 375                 380

Asp Leu Val Asn Asn Glu Ile Gly Leu Ala Glu Thr Asp Phe Asn Ser
385                 390                 395                 400

Thr Glu Ser Asn Ile Val Ala Phe Ala Ser Met Ser Ala Thr Ile Pro
                405                 410                 415

Ser Ala Thr Gln Ala Pro Asn Gln Ala Ala Val Thr Asn Arg Pro Val
            420                 425                 430
```

```
Ala Thr Met Pro Ser Phe Ala Ala Ser Ser Gly Phe Ser Asp Thr Gly
        435                 440                 445


Gly Ser Gly Asn Asp Gly Lys Asp Glu Asn Ala Ser Ala Gly Met Pro
    450                 455                 460


Ser Ala Phe Gly Val Ala Gln Met Ser Val Met Gly Ile Ala Met Val
465                 470                 475                 480


Phe Ala Met Val Gly Ser Gly Val Phe Val Leu Leu
                485                 490


<210>  81
<211>  668
<212>  PRT
<213>  Myceliophtora thermophila

<400>  81

Met Ser Phe Ala Leu Tyr Ala Ala Ala Leu Leu Pro Val Ala Val Leu
1               5                   10                  15


Gly Ala Gly Leu Ser Val Pro Glu Asp Asn Arg Met Val Gln Gln Asp
            20                  25                  30


Gly Leu Leu Arg Tyr Pro Leu Met Pro Arg Leu Gly Asn Leu Leu Phe
        35                  40                  45


Gly Lys His Ala Asn Ile Thr Arg Arg Gln Ile Asp Thr Gly Ile Phe
    50                  55                  60


Asp Pro Leu Ser Gly Thr Leu Tyr Thr Ile Glu Leu Thr Leu Gly Thr
65                  70                  75                  80


Pro Gly Gln Thr Val Pro Val Gln Phe Asp Thr Gly Ser Asp Met Leu
                85                  90                  95
```

```
Trp Val Asn Pro Val Cys Ser Lys Ala Ala Glu Pro Glu Phe Cys Ala
            100                 105                 110

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

Gln Gly Asn Ile Thr Tyr Gly Thr Gly Tyr Ala Tyr Tyr Glu Tyr Val
    130                 135                 140

Ala Asp Tyr Val Ala Ile Gly Ser Ala Arg Ile Thr Gln Gln Val Phe
145                 150                 155                 160

Gly Val Ala Leu Asp Ser Ala His Ala Asp Val Gly Ile Phe Gly Ala
                165                 170                 175

Gly Pro Asn Leu Asp Gly Trp Asp Ser Ala Tyr Pro Leu Val Val Asp
            180                 185                 190

Ser Leu Ala Gln Gln Gly Tyr Thr Ser Ser Arg Ala Phe Ser Met Asp
        195                 200                 205

Leu Lys Gly Phe Glu Ser Ala Arg Gly Ser Val Ile Phe Gly Gly Ile
    210                 215                 220

Asp Thr Lys Lys Tyr Arg Gly Ser Leu Ile Lys Arg Leu Ile Ile Pro
225                 230                 235                 240

Ala Ala Glu Ser Pro Asp Gly Tyr Thr Arg Phe Trp Ile Tyr Leu Asp
                245                 250                 255

Gly Ile Ser Val Asn Gln Pro Asp Gly Asp Val Val Thr Val Phe Ser
            260                 265                 270

Thr Pro Asp Gly Gly Lys Gly Gln Pro Val Leu Leu Asp Ser Gly Tyr
        275                 280                 285
```

```
Thr Leu Ser Ala Leu Pro Arg Pro Ile Phe Gln Lys Leu Val Ala Ala
    290                 295                 300

Phe Pro Ser Ala Gln Tyr Val Ser Ser Ala Asp Val Tyr Val Val Asp
305                 310                 315                 320

Cys Val Asp His Gly Glu Gly Gly Ser Leu Asp Phe Ile Phe Gly Gly
                325                 330                 335

Lys Thr Ile Asn Val Pro Tyr His Glu Phe Val Trp Ala Gln Pro Glu
            340                 345                 350

Ser Asn Thr Cys Val Leu Gly Ala Phe Glu Asp Asp Phe Pro Val Leu
        355                 360                 365

Gly Asp Thr Phe Leu Arg Ser Ala Tyr Val Val Tyr Asp Trp Asp Asn
    370                 375                 380

Arg Asn Ile Tyr Leu Ala Gln Ser Asp Asp Cys Gly Ser Asn Leu Val
385                 390                 395                 400

Ala Ile Gly Ser Gly Pro Asp Ala Val Pro Ser Ile Val Gly Glu Cys
                405                 410                 415

Gly Lys Pro Lys Pro Thr Ser Thr Ser Thr Phe Ser Lys Thr Ser Ser
            420                 425                 430

Lys Thr Ser Thr Ala Ser Lys Thr Ser Ser Thr Ser Asp Ser Thr Ser
        435                 440                 445

Ser Ser Ser Ser His Val Thr Thr Ser Ser Ser Ser Thr Thr Ala Thr
    450                 455                 460

Thr Leu Ser Thr His Lys Pro Pro Phe Pro Thr Ala Ser Gly Asn Phe
465                 470                 475                 480
```

```
Thr Thr Thr Arg Ser Pro Thr Thr Thr Thr Ala Ser Ser Thr Ile Ser
                485                 490                 495

Lys Ser Thr Leu Thr Ile Thr Ser Ala Thr Thr Tyr Thr Ile Thr Ser
            500                 505                 510

Cys Pro Pro Thr Val Thr Arg Cys Pro Ala His Glu Val Thr Thr Glu
        515                 520                 525

Ile Ile Thr Lys Thr Thr Ala Val Cys Pro Glu Thr Thr Ala Thr Tyr
    530                 535                 540

Thr Ile Pro Arg Thr Ile Thr Cys Pro Gly Ser Gly Gly Gly Asp Asp
545                 550                 555                 560

Cys Pro Pro Gly Ala Thr Arg Thr Thr Thr Leu Thr Val Thr Leu Ser
                565                 570                 575

Pro Val Gly Pro Thr Asp Arg Thr Thr His Val Val Pro Gly Val Thr
            580                 585                 590

Thr Thr Thr Pro Thr Thr Ile Thr Ala Pro Pro Thr Gly Gln Thr Thr
        595                 600                 605

Thr Thr Leu Val Pro Ala Leu Pro Pro Thr Thr Thr Thr Met Ser Gly
    610                 615                 620

His Arg Gly Ile Asn Gly Thr Val Thr Ala Thr Ser Lys Pro Pro Ala
625                 630                 635                 640

Val Thr Ala Gly Ser Ala Lys Val Gly Leu Val Ser Gly Ala Thr Ala
                645                 650                 655

Ile Val Ala Gly Val Met Ala Val Leu Met Ala Leu
            660                 665
```

<210> 82
<211> 551
<212> PRT
<213> Neurospora crassa

<400> 82

```
Met Leu Pro Val Pro Leu Thr Thr Leu Ser Leu Tyr Val Val Ala Leu
1               5                  10                  15


Leu Ser Pro Pro Ala Ala Ala Gly Val Leu Ala Ser Ala Thr Thr Lys
            20                  25                  30


Leu Pro Ile Lys Leu Pro Ile Ser Pro Ala Gln Gly His Arg Ser Ser
        35                  40                  45


Thr Ala Ala Ser Pro Ser Leu Thr Ser Arg Ser Ser Ser Ser Gly Asn
    50                  55                  60


Gly Phe Ile Arg Ala Ser Val His Ala Ala His Gly Ala Pro Pro Lys
65                  70                  75                  80


Leu Arg Arg Arg Gln Glu Asp Glu Gly Leu Lys Asn Gln Asn Leu Gly
                85                  90                  95


Thr Thr Tyr Thr Ile Asp Ile Asp Ile Gly Thr Pro Pro Gln Thr Val
            100                 105                 110


Thr Leu Ile Leu Asp Thr Gly Ser Pro Asp Leu Trp Val Asn Pro Gln
        115                 120                 125


Cys Glu Thr Ser Gly Gln Glu Lys Tyr Cys Asn Ser Phe Arg Gln Phe
    130                 135                 140


Asp Tyr Thr Lys Ser Lys Thr Ile Gln Asp Thr Gly Ala Ala Asp Ile
145                 150                 155                 160


Leu Lys Tyr Gly Lys Gly Asn Val Thr Ile Glu Tyr Val Thr Asp Asp
```

```
                165                 170                 175

Val Ile Ile Gly Ser Ala Lys Ile Lys Ser Gln Ile Leu Gly Ile Gly
            180                 185                 190

Phe Glu Ser Ile Asp Ile Pro Leu Gly Ile Leu Gly Leu Ser Pro Ser
        195                 200                 205

Val Ser Pro Asp Gly Thr Ser Pro Tyr Pro Tyr Leu Leu Asp Ser Met
    210                 215                 220

Ala Ser Gln Gly Ile Ile Ser Ser Arg Ala Phe Ser Leu Asp Leu Arg
225                 230                 235                 240

Ser Ile Asp Asn Pro Ser Gly Ala Ile Ile Phe Gly Gly Val Asp Leu
                245                 250                 255

Gly Lys Phe Ser Gly Ser Leu Ala Lys Leu Pro Met Leu Asp Pro Ser
            260                 265                 270

Gln Thr Pro Ala Gly Val Asp Arg Tyr Trp Ile Val Leu Ser Gly Val
        275                 280                 285

Gly Met Thr Tyr Pro Asp Gly Glu Glu Val Glu Ser Glu Glu Ile Gly
    290                 295                 300

Val Pro Val Phe Leu Asp Ser Gly Gly Thr Leu Ser Arg Leu Pro Glu
305                 310                 315                 320

Thr Ile Phe Gln Ala Ile Gly Asp Ser Phe Pro Gly Ser Gln Tyr Asp
                325                 330                 335

Pro Glu Ser Gly Phe Tyr Ile Val Asp Cys Ala Val Ala Glu Gln Ala
            340                 345                 350

Gly Ser Val Asp Phe Ile Phe Gly Ser Ser Gly Ser Arg Ser Ser Lys
```

```
        355                 360                 365

Lys Ile Arg Val Pro Tyr Gly Asp Phe Val Trp Glu Val Gln Thr Gly
    370                 375                 380

Val Cys Val Val Gly Val Leu Pro Thr Asp Asp Glu Pro Val Phe Gly
385                 390                 395                 400

Asp Ser Phe Leu Arg Ala Ala Tyr Val Val Phe Asp Gln Asp Asn Arg
                405                 410                 415

Asn Leu His Leu Ala Gln Ala Ala Asn Cys Gly Glu Gln Ile Val Glu
            420                 425                 430

Ile Gly Ser Gly Gln Asp Ala Val Pro Ser Ser Thr Gly Lys Cys Lys
        435                 440                 445

Asp Gly Ser Ala Gly Ser Thr Lys Thr Ala Gly Gly Gly Gly Leu Asp
    450                 455                 460

Val Thr Ala Thr Arg Ala Pro Thr Arg Thr Ala Gly Gly Ser Gly Pro
465                 470                 475                 480

Ala Val Thr Asn Ser Asp Phe Gly Pro Gly Pro Ala Gly Thr Arg Val
                485                 490                 495

Ser Thr Gly Gly Ile Gly Leu Pro Thr Gly Thr Gly Gly Gly Gly Gly
            500                 505                 510

Ser Gly Asp Gly Asn Gly Asn Asn Asp Asp Asp Asp Ser Ala Ala Ser
        515                 520                 525

Gly Leu Asp Val Gly Val Thr Ala Ala Ala Val Leu Ala Gly Leu Asn
    530                 535                 540

Met Leu Ile Val Trp Leu Leu
```

545 550

<210> 83
<211> 529
<212> PRT
<213> Neurospora crassa

<400> 83

Met Lys Ser Thr Leu Ala Thr Leu Leu Ala Leu Ala Ser Val Ala Val
1 5 10 15

Ala Glu Asn Gly Val Val Asn Phe Pro Leu Asn Arg Gly Val Pro His
20 25 30

Phe Arg Val Gly Asn Val Arg Gln Asn Val Lys Arg Asp Thr Tyr Ser
35 40 45

Gln Ala Leu Ile Asn Asn Ile Thr Gly Gly Ala Tyr Tyr Ala Glu Val
50 55 60

Thr Val Gly Thr Pro Gly Gln Lys Val Ser Val Val Leu Asp Thr Gly
65 70 75 80

Ser Ser Asp Leu Trp Val Val Ser Tyr Lys Ala Asp Leu Cys Thr Asp
85 90 95

Pro Ser Ile Gln Arg Gln Trp Gly Asp Ser Cys Asp Lys Thr Tyr Asn
100 105 110

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

Ile Arg Tyr Leu Asp Asn Ser Thr Ala Ala Gly Asp Tyr Ile Thr Asp
130 135 140

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

```
Ala Thr Lys Thr Val Arg Gly Ala Gly Ile Leu Gly Val Gly Tyr Ser
                165                 170                 175

Ser Asn Val Ala Ser Gln Gln Arg Tyr Pro Asn Leu Ile Asp Gln Phe
            180                 185                 190

Val Ala Gln Lys Leu Ile Thr Thr Lys Ala Tyr Ser Leu Tyr Leu Asn
        195                 200                 205

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

Asp Lys Phe Ile Gly Asp Leu Ser Ile Leu Pro Ile Tyr Leu Ala Lys
225                 230                 235                 240

Gly Gln Ala Glu Pro Ile His Phe Glu Val Glu Met Gln Ser Val Ser
                245                 250                 255

Leu Ala Leu Thr Lys Asn Gly Lys Thr Thr Lys Ile Ile Ser Thr Asp
            260                 265                 270

Pro Ser Leu Ser Gln Thr Ser Thr Ile Ala Ile Leu Asp Ser Gly Thr
        275                 280                 285

Thr Leu Ser Tyr Leu Pro Ser Lys Ile Thr Asp Gln Ile His Thr Lys
    290                 295                 300

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

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

Gly Ala Asn Ala Thr Ile Ser Val Pro Val Trp Glu Leu Val Leu Asp
            340                 345                 350
```

```
Leu Leu Gly Glu Ser Gln Ser Glu Leu Pro Phe Lys Met Pro Phe Lys
        355                 360                 365

Asn Ala Cys Ile Phe Gly Ile Gln Ser Thr Ala Gly Phe Gln Glu Asp
    370                 375                 380

Asn Phe Asp Glu Asp Trp Ala Leu Leu Gly Glu Thr Phe Leu Arg Ser
385                 390                 395                 400

Ala Tyr Val Val Tyr Asp Leu Thr His His Gln Ile Gly Ile Ala Gln
                405                 410                 415

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

Asp Gly Gly Leu Pro Thr Gly Leu Thr Gly Val Lys Glu Gln Gln Thr
        435                 440                 445

Ser Asn Asp Pro Ser Gly Asn Ala Gly Ser Gly Ser Gly Ser Ser Thr
    450                 455                 460

Asp Lys Asp Gly Ala Lys Glu Thr Glu Thr Val Thr Ala Gly Ser Thr
465                 470                 475                 480

Ala Ala Thr Gly Thr Ala Ala Ser Gly Ala Lys Glu Thr Asp Ser Ala
                485                 490                 495

Ala Ala Gly Leu Ser Ala Arg Gly Gly Ala Val Gly Ala Leu Ala Val
            500                 505                 510

Ala Ser Leu Thr Gly Phe Leu Ala Leu Val Gly Gly Ala Val Val Ala
        515                 520                 525

Leu
```

<210> 84
<211> 566
<212> PRT
<213> Myceliophthora thermophila

<400> 84

```
Met Lys Pro Ser Ser Ala Ile Leu Leu Ala Leu Ala Pro Gly Ser Ser
1               5                   10                  15


Ser Lys Asn Val Val Glu Phe Ser Val Ser Arg Gly Leu Pro Gly Asn
            20                  25                  30


Arg Thr Pro Leu Ser Phe Pro Pro Leu Thr Arg Arg Glu Thr Tyr Ser
        35                  40                  45


Glu Arg Leu Ile Asn Asn Ile Ala Gly Gly Gly Tyr Tyr Val Gln Val
    50                  55                  60


Gln Val Gly Thr Pro Pro Gln Asn Leu Thr Met Leu Leu Asp Thr Gly
65                  70                  75                  80


Ser Ser Asp Ala Trp Val Leu Ser His Glu Ala Asp Leu Cys Ile Ser
                85                  90                  95


Pro Ala Leu Gln Asp Phe Tyr Gly Met Pro Cys Thr Asp Thr Tyr Asp
            100                 105                 110


Pro Ser Lys Ser Ser Ser Lys Lys Met Val Glu Glu Gly Gly Phe Lys
        115                 120                 125


Ile Thr Tyr Leu Asp Gly Gly Thr Ala Ser Gly Asp Tyr Ile Thr Asp
    130                 135                 140


His Phe Thr Ile Gly Gly Val Thr Val Gln Ser Leu Gln Met Ala Cys
145                 150                 155                 160
```

```
Val Thr Lys Ala Val Arg Gly Thr Gly Ile Leu Gly Leu Gly Phe Ser
                165                 170                 175

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

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

Asp Arg Arg Ala Asp Ser Gly Thr Leu Leu Phe Gly Gly Ile Asp Thr
    210                 215                 220

Asp Lys Phe Ile Gly Pro Leu Gly Val Leu Pro Leu His Lys Pro Pro
225                 230                 235                 240

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

Leu Thr Tyr Thr Asn Gly Ser Arg His Thr Ile Pro Thr Ala Ile Leu
            260                 265                 270

Asn His Pro Ala Pro Ala Val Leu Asp Ser Gly Thr Thr Leu Ser Tyr
        275                 280                 285

Leu Pro Asp Glu Leu Ala Asp Pro Ile Asn Thr Ala Leu Asp Thr Phe
    290                 295                 300

Tyr Asp Asp Arg Leu Gln Met Thr Leu Ile Asp Cys Ser His Pro Leu
305                 310                 315                 320

Leu Arg Thr Asp Pro Asp Phe His Leu Ala Phe Thr Phe Thr Pro Thr
                325                 330                 335

Thr Ser Ile Thr Val Pro Leu Gly Asp Leu Val Leu Asp Ile Leu Pro
            340                 345                 350
```

```
Pro Thr Tyr Pro Gln Ser Asn Ser Asn Asn Asn Asn Glu Val Glu Asp
        355                 360                 365

Asp Asp Asp Asp Asp Asp Asp Asp Asp Asp Asp Asp Lys Val Pro Pro
    370                 375                 380

Ala Thr Glu Arg Arg Trp Cys Val Phe Gly Ile Gln Ser Thr Thr Arg
385                 390                 395                 400

Phe Ala Ala Ser Ser Gly Gln Ser Glu Ala Asn Phe Thr Leu Leu Gly
                405                 410                 415

Asp Thr Phe Leu Arg Ser Ala Tyr Val Val Tyr Asp Leu Ser His Tyr
            420                 425                 430

Gln Ile Gly Leu Ala Gln Ala Asn Leu Asn Ser Ser Ser Ser Ser Thr
        435                 440                 445

Asn Thr Asn Thr Ile Val Glu Leu Thr Ala Asp Asn His Asp Asp Gly
    450                 455                 460

Ala Ser Glu Arg Gly Glu Gly Ala Gly Ala Gly Ala Asp Ala Gly Thr
465                 470                 475                 480

Arg Thr Val Ile Ala Gly Gly Leu Pro Ser Gly Leu Met Gly Val Glu
                485                 490                 495

Ala Gln Gln Thr Thr Phe Thr Pro Thr Ala Thr Ala Asn Gly His Pro
            500                 505                 510

Gly Tyr Gly Gly Gly Pro Gly Gly Ser Thr Arg Pro Gly Ser Glu Arg
        515                 520                 525

Asn Ala Ala Ala Gly Gly Phe Thr Ala Val Arg Thr Gly Leu Leu Gly
    530                 535                 540
```

```
Glu Leu Val Gly Val Ala Ala Val Thr Ala Leu Phe Ile Leu Leu Gly
545                 550                 555                 560


Gly Ala Leu Ile Ala Val
                565
```

<210> 85
<211> 897
<212> PRT
<213> Myceliophthora thermophila

<400> 85

```
Met Val Arg Leu Asp Trp Ala Ala Val Leu Leu Ala Ala Thr Ala Val
1               5                   10                  15


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


Ile Val Glu Tyr Glu Glu Asp Gln Asp Ser His Ala Phe Val Asn Lys
        35                  40                  45


Leu Gly Gly Lys Ala Ser Leu Arg Lys Asp Leu Arg Phe Lys Leu Phe
    50                  55                  60


Lys Gly Ala Ser Ile Gln Phe Lys Asp Thr Glu Thr Ala Asp Gln Met
65                  70                  75                  80


Val Ala Lys Val Ala Glu Met Pro Lys Val Lys Ala Val Tyr Pro Val
                85                  90                  95


Arg Arg Tyr Pro Val Pro Asn His Val Val His Ser Thr Gly Asn Val
            100                 105                 110


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

```
Ser Thr His Leu Met Thr Gln Val Asn Lys Phe Arg Asp Ala Gly Ile
    130                 135                 140

Thr Gly Lys Gly Ile Lys Ile Ala Val Ile Asp Thr Gly Ile Asp Tyr
145                 150                 155                 160

Leu His Glu Ala Leu Gly Gly Cys Phe Gly Pro Asp Cys Leu Val Ser
                165                 170                 175

Tyr Gly Thr Asp Leu Val Gly Asp Asp Phe Asn Gly Ser Asn Thr Pro
            180                 185                 190

Lys Pro Asp Pro Asp Pro Ile Asp Asn Cys Gln Gly His Gly Thr His
        195                 200                 205

Val Ala Gly Ile Ile Ala Ala Gln Thr Asn Asn Pro Phe Gly Ile Ile
    210                 215                 220

Gly Ala Ala Thr Asp Val Thr Leu Gly Ala Tyr Arg Val Phe Gly Cys
225                 230                 235                 240

Asn Gly Asp Thr Pro Asn Asp Val Leu Ile Ala Ala Tyr Asn Met Ala
                245                 250                 255

Tyr Glu Ala Gly Ser Asp Ile Ile Thr Ala Ser Ile Gly Gly Pro Ser
            260                 265                 270

Gly Trp Ser Glu Asp Pro Trp Ala Ala Val Val Thr Arg Ile Val Glu
        275                 280                 285

Asn Gly Val Pro Cys Val Val Ser Ala Gly Asn Asp Gly Asp Ala Gly
    290                 295                 300

Ile Phe Tyr Ala Ser Thr Ala Ala Asn Gly Lys Lys Val Thr Ala Ile
305                 310                 315                 320
```

```
Ala Ser Val Asp Asn Ile Val Thr Pro Ala Leu Leu Ser Asn Ala Ser
                325                 330                 335

Tyr Thr Leu Asn Gly Thr Asp Asp Phe Phe Gly Phe Thr Ala Gly Asp
            340                 345                 350

Pro Gly Ser Trp Asp Asp Val Asn Leu Pro Leu Trp Ala Val Ser Phe
        355                 360                 365

Asp Thr Thr Asp Pro Ala Asn Gly Cys Asn Pro Tyr Pro Asp Ser Thr
    370                 375                 380

Pro Asp Leu Ser Gly Tyr Ile Val Leu Ile Arg Arg Gly Thr Cys Thr
385                 390                 395                 400

Phe Val Glu Lys Ala Ser Tyr Ala Ala Ala Lys Gly Ala Lys Tyr Val
                405                 410                 415

Met Phe Tyr Asn Asn Val Gln Gln Gly Thr Val Thr Val Ser Ala Ala
            420                 425                 430

Glu Ala Lys Gly Ile Glu Gly Val Ala Met Val Thr Ala Gln Gln Gly
        435                 440                 445

Glu Ala Trp Val Arg Ala Leu Glu Ala Gly Ser Glu Val Val Leu His
    450                 455                 460

Met Lys Asp Pro Leu Lys Ala Gly Lys Phe Leu Thr Thr Thr Pro Asn
465                 470                 475                 480

Thr Ala Thr Gly Gly Phe Met Ser Asp Tyr Thr Ser Trp Gly Pro Thr
                485                 490                 495

Trp Glu Val Glu Val Lys Pro Gln Phe Gly Thr Pro Gly Gly Ser Ile
            500                 505                 510
```

```
Leu Ser Thr Tyr Pro Arg Ala Leu Gly Ser Tyr Ala Val Leu Ser Gly
        515                 520                 525

Thr Ser Met Ala Cys Pro Leu Ala Ala Ala Ile Tyr Ala Leu Leu Ile
    530                 535                 540

Asn Thr Arg Gly Thr Lys Asp Pro Lys Thr Leu Glu Asn Leu Ile Ser
545                 550                 555                 560

Ser Thr Ala Arg Pro Asn Leu Phe Arg Leu Asn Gly Glu Ser Leu Pro
                565                 570                 575

Leu Leu Ala Pro Val Pro Gln Gln Gly Gly Gly Ile Val Gln Ala Trp
            580                 585                 590

Asp Ala Ala Gln Ala Thr Thr Leu Leu Ser Val Ser Ser Leu Ser Phe
        595                 600                 605

Asn Asp Thr Asp His Phe Lys Pro Val Gln Thr Phe Thr Ile Thr Asn
    610                 615                 620

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

Thr Ala Tyr Thr Phe Ala Asp Ala Lys Ser Ile Glu Pro Ala Pro Phe
                645                 650                 655

Pro Asn Glu Leu Thr Ala Asp Phe Ala Ser Leu Thr Phe Val Pro Lys
            660                 665                 670

Arg Leu Thr Ile Pro Ala Gly Lys Arg Gln Thr Val Thr Val Ile Ala
        675                 680                 685

Lys Pro Ser Glu Gly Val Asp Ala Lys Arg Leu Pro Val Tyr Ser Gly
    690                 695                 700
```

```
Tyr Ile Ala Ile Asn Gly Ser Asp Ser Ser Ala Leu Ser Leu Pro Tyr
705                 710                 715                 720


Leu Gly Val Val Gly Ser Leu His Ser Ala Val Val Leu Asp Ser Asn
                725                 730                 735


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


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


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


Met Gly Ser Ala Leu Leu Arg Ala Asp Val Val Pro Leu Ser Gly Gly
785                 790                 795                 800


Ala Ala Thr Ala Thr Ala Arg Leu Thr Arg Thr Val Phe Gly Thr Arg
                805                 810                 815


Thr Ile Gly Gln Pro Tyr Gly Leu Pro Ala Arg Tyr Asn Pro Arg Gly
            820                 825                 830


Thr Phe Glu Tyr Ala Trp Asp Gly Arg Leu Asp Asp Gly Ser Tyr Ala
        835                 840                 845


Pro Ala Gly Arg Tyr Arg Phe Ala Val Lys Ala Leu Arg Ile Phe Gly
    850                 855                 860


Asp Ala Lys Arg Ala Arg Glu Tyr Asp Ala Ala Glu Thr Val Glu Phe
865                 870                 875                 880


Asn Ile Glu Tyr Leu Pro Gly Pro Ser Ala Lys Phe Arg Arg Arg Leu
                885                 890                 895
```

Phe

<210> 86
<211> 876
<212> PRT
<213> Neurospora crassa

<400> 86

```
Met Val Arg Leu Gly Leu Ala Thr Thr Leu Leu Ala Ala Ala Ser Phe
1               5                   10                  15


Ala Gln Ala Ala His Gln Lys Ala Pro Ala Val Val Pro Gly Ala Tyr
            20                  25                  30


Ile Val Glu Tyr Glu Asp Ser His Asp Pro Thr Ser Ile Leu Ala Ser
        35                  40                  45


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


Lys Gly Ala Ser Phe Gln Phe Lys Asp Leu Asn Lys Ala Asp Asp Leu
65                  70                  75                  80


Ala Ser Lys Val Ala Ala Met Ser Gly Val Lys Ala Leu Tyr Pro Val
                85                  90                  95


Arg Arg Tyr Ser Ile Pro Glu His Thr Val His Ser Thr Gly Ser Ala
            100                 105                 110


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


Pro His Leu Met Thr Gln Val Asn Lys Phe Arg Asp Ser Gly Ile Thr
    130                 135                 140


Gly Lys Gly Ile Lys Ile Ala Val Ile Asp Thr Gly Val Asp Tyr Leu
```

```
145                 150                 155                 160

His Pro Ala Leu Gly Gly Cys Phe Gly Pro Gly Cys Leu Val Ser Tyr
                165                 170                 175

Gly Thr Asp Leu Val Gly Asp Asp Phe Asn Gly Ser Asn Thr Pro Val
            180                 185                 190

Pro Asp Ser Asp Pro Met Asp Thr Cys Asn Gly His Gly Ser His Val
        195                 200                 205

Leu Gly Leu Leu Ser Ala Asn Thr Asn Asn Pro Tyr Gly Ile Ile Gly
    210                 215                 220

Ala Ala Pro Asp Val Thr Leu Gly Ala Tyr Arg Val Phe Gly Cys Ser
225                 230                 235                 240

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

Asp Asp Gly Ser Asp Ile Ile Thr Ala Ser Ile Gly Gly Ala Ser Gly
            260                 265                 270

Trp Pro Glu Asp Ser Trp Ala Ala Val Val Ser Arg Ile Val Glu Lys
        275                 280                 285

Gly Val Pro Cys Leu Val Ser Ala Gly Asn Asp Gly Ala Thr Gly Ile
    290                 295                 300

Phe Tyr Ala Ser Thr Ala Ala Asn Gly Lys Arg Val Thr Ala Val Ala
305                 310                 315                 320

Ser Val Asp Asn Ile Leu Ala Pro Ala Leu Leu Ser Glu Ala Ser Tyr
                325                 330                 335

Ser Val Ala Asn Gly Ser Leu Ser Thr Phe Gly Phe Thr Ala Gly Ser
```

```
            340                 345                 350

Pro Ser Ala Trp Ala Asn Val Ser Leu Pro Val Trp Ser Val Asn Phe
        355                 360                 365

Asn Thr Ala Asp Ala Ala Asn Gly Cys Glu Ala Phe Pro Asp Asp Thr
    370                 375                 380

Pro Asp Leu Ser Lys Tyr Ile Val Leu Ile Arg Arg Gly Thr Cys Thr
385                 390                 395                 400

Phe Val Gln Lys Ala Gln Asn Ala Ala Ala Lys Gly Ala Lys Tyr Ile
                405                 410                 415

Ile Tyr Tyr Asn Asn Ala Ser Gly Ser Thr Lys Val Asp Val Ser Ala
            420                 425                 430

Val Ala Asp Val Lys Ala Ala Ala Met Val Thr Ser Glu Thr Gly Ala
        435                 440                 445

Ala Trp Ile Lys Ala Leu Gln Ala Gly Thr Gln Val Thr Val Asn Met
    450                 455                 460

Ala Asp Pro Glu Thr Ala Pro Lys Asn Leu Asn Asn Phe Pro Asn Thr
465                 470                 475                 480

Ala Thr Pro Gly Phe Leu Ser Thr Tyr Thr Ser Trp Gly Pro Thr Tyr
                485                 490                 495

Glu Val Asp Val Lys Pro Gln Ile Ser Ser Pro Gly Gly Met Ile Leu
            500                 505                 510

Ser Thr Tyr Pro Arg Ala Leu Gly Ser Tyr Ala Val Leu Ser Gly Thr
        515                 520                 525

Ser Met Ala Cys Pro Leu Ala Ala Ala Thr Trp Ala Leu Val Met Gln
```

```
    530                 535                 540

Lys Arg Gly Thr Lys Asp Pro Lys Val Leu Glu Asn Leu Phe Ser Ala
545                 550                 555                 560

Thr Ala His Pro Asn Leu Phe Asn Asp Gly Thr Lys Thr Tyr Pro Met
                565                 570                 575

Leu Ala Pro Val Ala Gln Gln Gly Ala Gly Leu Ile Gln Ala Trp Asp
            580                 585                 590

Ala Ala Asn Ala Asn Ala Leu Leu Ser Val Ser Ser Ile Ser Phe Asn
        595                 600                 605

Asp Thr Glu His Phe Lys Pro Leu Gln Ser Phe Glu Val Thr Asn Thr
    610                 615                 620

Gly Lys Lys Ala Val Thr Tyr Gln Leu Gly His Thr Ser Ala Ala Thr
625                 630                 635                 640

Ala Tyr Thr Phe Ala Asn Asp Thr Ser Ile Gly Pro Ala Ala Phe Pro
                645                 650                 655

Asn Glu Leu Val Asp Ala Lys Ala Thr Leu Val Leu Thr Pro Ala Lys
            660                 665                 670

Leu Thr Leu Asn Pro Gly Gln Lys Lys Thr Val Thr Val Leu Ala Ile
        675                 680                 685

Pro Pro Leu Gly Leu Asp Ala Lys Arg Leu Pro Val Tyr Ser Gly Tyr
    690                 695                 700

Ile Thr Leu Asn Gly Thr Asp Ser Thr Gly Tyr Ser Leu Pro Tyr Gln
705                 710                 715                 720

Gly Val Val Gly Ser Met Arg Ser Val Thr Val Leu Asp Lys Gln Asn
```

```
                725                 730                 735

Ser Tyr Leu Ser Gln Ser Ser Asp Ala Thr Tyr Ala Pro Val Ala Ala
            740                 745                 750

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

Tyr Ala Thr Thr Val Tyr Pro Thr Ile Val Leu Thr Leu Ser Met Gly
    770                 775                 780

Ser Ala Glu Val His Ala Asp Val Val Asn Ser Lys Gly Lys Thr Ile
785                 790                 795                 800

Gly Gln Val Leu Thr Phe Pro Ala Arg Trp Asn Pro Arg Gly Thr Phe
                805                 810                 815

Glu Trp Asn Trp Asp Gly Ala Leu Ser Asp Gly Thr Tyr Ala Pro Ala
            820                 825                 830

Asp Thr Tyr Lys Ile Thr Leu Lys Ala Leu Lys Ile Tyr Gly Asn Ser
        835                 840                 845

Lys Trp Pro Leu Asp Trp Glu Thr Gln Thr Thr Glu Pro Phe Thr Ile
    850                 855                 860

Lys Tyr Ala Ala Lys Ser Lys Arg Ala Phe Thr Ala
865                 870                 875


<210>  87
<211>  534
<212>  PRT
<213>  Myceliophthora thermophila

<400>  87

Met Arg Gly Leu Val Ala Phe Ser Leu Ala Ala Cys Val Ser Ala Ala
1               5                   10                  15
```

```
Pro Ser Phe Lys Thr Glu Thr Ile Asn Gly Glu His Ala Pro Ile Leu
            20                  25                  30

Ser Ser Ser Asn Ala Glu Val Val Pro Asn Ser Tyr Ile Ile Lys Phe
        35                  40                  45

Lys Lys His Val Asp Glu Ser Ser Ala Ser Ala His His Ala Trp Ile
    50                  55                  60

Gln Asp Ile His Thr Ser Arg Glu Lys Val Arg Gln Asp Leu Lys Lys
65                  70                  75                  80

Arg Gly Gln Val Pro Leu Leu Asp Asp Val Phe His Gly Leu Lys His
                85                  90                  95

Thr Tyr Lys Ile Gly Gln Glu Phe Leu Gly Tyr Ser Gly His Phe Asp
            100                 105                 110

Asp Glu Thr Ile Glu Gln Val Arg Arg His Pro Asp Val Glu Tyr Ile
        115                 120                 125

Glu Arg Asp Ser Ile Val His Thr Met Arg Val Thr Glu Glu Thr Cys
    130                 135                 140

Asp Gly Glu Leu Glu Lys Ala Ala Pro Trp Gly Leu Ala Arg Ile Ser
145                 150                 155                 160

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

Ala Glu Gly Gly Glu Gly Val Asp Ala Tyr Val Ile Asp Thr Gly Thr
            180                 185                 190

Asn Ile Glu His Val Asp Phe Glu Gly Arg Ala Lys Trp Gly Lys Thr
        195                 200                 205
```

```
Ile Pro Ala Gly Asp Ala Asp Val Asp Gly Asn Gly His Gly Thr His
    210                 215                 220

Cys Ser Gly Thr Ile Ala Gly Lys Lys Tyr Gly Val Ala Lys Lys Ala
225                 230                 235                 240

Asn Val Tyr Ala Val Lys Val Leu Arg Ser Asn Gly Ser Gly Thr Met
                245                 250                 255

Ala Asp Val Val Ala Gly Val Glu Trp Ala Ala Lys Ser His Leu Glu
            260                 265                 270

Gln Val Gln Ala Ala Lys Asp Gly Lys Arg Lys Gly Phe Lys Gly Ser
        275                 280                 285

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

Thr Val Asn Ala Ala Val Ser Val Gly Ile His Phe Ala Val Ala Ala
305                 310                 315                 320

Gly Asn Asp Asn Ala Asp Ala Cys Asn Tyr Ser Pro Ala Ala Ala Glu
                325                 330                 335

Lys Ala Val Thr Val Gly Ala Ser Ala Ile Asp Asp Ser Arg Ala Tyr
            340                 345                 350

Phe Ser Asn Tyr Gly Lys Cys Thr Asp Ile Phe Ala Pro Gly Leu Ser
        355                 360                 365

Ile Leu Ser Thr Trp Ile Gly Ser Lys Tyr Ala Thr Asn Thr Ile Ser
    370                 375                 380

Gly Thr Ser Met Ala Ser Pro His Ile Ala Gly Leu Leu Ala Tyr Tyr
385                 390                 395                 400
```

```
Leu Ser Leu Gln Pro Ala Thr Asp Ser Glu Tyr Ser Val Ala Pro Ile
                405                 410                 415

Thr Pro Glu Lys Met Lys Ser Asn Leu Leu Lys Ile Ala Thr Gln Asp
            420                 425                 430

Ala Leu Thr Asp Ile Pro Asp Glu Thr Pro Asn Leu Leu Ala Trp Asn
        435                 440                 445

Gly Gly Gly Cys Asn Asn Tyr Thr Ala Ile Val Glu Ala Gly Gly Tyr
    450                 455                 460

Lys Ala Lys Lys Lys Thr Thr Thr Asp Lys Val Asp Ile Gly Ala Ser
465                 470                 475                 480

Val Ser Glu Leu Glu Lys Leu Ile Glu His Asp Phe Glu Val Ile Ser
                485                 490                 495

Gly Lys Val Val Lys Gly Val Ser Ser Phe Ala Asp Lys Ala Glu Lys
            500                 505                 510

Phe Ser Glu Lys Ile His Glu Leu Val Asp Glu Glu Leu Lys Glu Phe
        515                 520                 525

Leu Glu Asp Ile Ala Ala
    530
```

<210> 88
<211> 396
<212> PRT
<213> Neurospora crassa

<400> 88

```
Met Lys Leu Ser Ala Val Leu Ala Leu Leu Pro Leu Ala Met Ala Ala
1               5                   10                  15
```

```
Pro Ser Ala Pro Ile Asp Lys Arg Ala Pro Ile Leu Glu Ala Arg Ala
            20                  25                  30

Gly Thr Gln Ala Val Pro Gly Lys Tyr Ile Val Lys Leu Arg Glu Thr
        35                  40                  45

Ala Ser Asp Asp Asp Leu Asp Lys Ala Val Lys Lys Leu Gly Asn Ser
    50                  55                  60

Lys Ala Asp His Val Tyr Lys His Ala Phe Arg Gly Phe Ala Gly Arg
65                  70                  75                  80

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

Tyr Val Glu Gln Glu Ala Val Phe Thr Ile Asn Thr Tyr Thr Ser Gln
            100                 105                 110

Ser Ser Val Pro Ser Trp Gly Leu Ala Arg Leu Ser Ser Lys Thr Thr
        115                 120                 125

Gly Lys Thr Thr Tyr Val Tyr Asp Ser Ser Ala Gly Ala Gly Thr Cys
    130                 135                 140

Ala Tyr Ile Ile Asp Thr Gly Ile Asn Thr Ala His Ser Asp Phe Gly
145                 150                 155                 160

Gly Arg Ala Thr Trp Leu Ala Asn Tyr Ala Gly Asp Gly Ile Asn Ser
                165                 170                 175

Asp Gly Asn Gly His Gly Thr His Val Ala Gly Thr Val Gly Gly Thr
            180                 185                 190

Thr Tyr Gly Val Ala Lys Lys Thr Gln Leu Tyr Ala Val Lys Val Leu
        195                 200                 205
```

```
Asp Ser Asn Gly Ser Gly Ser Asn Ser Gly Val Ile Ala Gly Met Asn
    210                 215                 220

Phe Val Ala Gln Asp Ala Gln Ser Arg Asn Cys Pro Asn Gly Thr Val
225                 230                 235                 240

Ala Asn Met Ser Leu Gly Gly Gly Tyr Ser Ala Ser Thr Asn Ser Ala
                245                 250                 255

Ala Ala Ala Met Val Arg Ala Gly Val Phe Leu Ala Val Ala Ala Gly
            260                 265                 270

Asn Asp Gly Ala Asn Ala Ala Asn Tyr Ser Pro Ala Ser Glu Pro Thr
        275                 280                 285

Val Cys Thr Val Gly Ala Thr Thr Ser Ala Asp Ala Ile Ala Tyr Tyr
    290                 295                 300

Ser Asn Tyr Gly Thr Ile Val Asp Ile Phe Ala Pro Gly Thr Ser Ile
305                 310                 315                 320

Thr Ser Ala Trp Ile Gly Ser Thr Thr Ala Lys Asn Thr Ile Ser Gly
                325                 330                 335

Thr Ser Met Ala Thr Pro His Ile Thr Gly Leu Gly Ala Tyr Leu Leu
            340                 345                 350

Thr Leu Leu Gly Lys Lys Ser Pro Ala Ala Leu Cys Ser Tyr Ile Ala
        355                 360                 365

Ser Thr Ala Asn Ser Gly Val Ile Ser Gly Ile Pro Arg Gly Thr Val
    370                 375                 380

Asn Lys Leu Ala Phe Asn Gly Asn Pro Ser Ala Tyr
385                 390                 395
```

<210> 89
<211> 392
<212> PRT
<213> Myceliophthora thermophila

<400> 89

```
Met His Phe Ser Thr Ala Leu Leu Ala Phe Leu Pro Ala Ala Leu Ala
1               5                   10                  15


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


Arg Ala Gly Gln Val Val Pro Gly Lys Tyr Ile Ile Lys Leu Arg Asp
        35                  40                  45


Gly Ala Ser Asp Asp Val Leu Glu Ala Ala Ile Gly Lys Leu Arg Ser
    50                  55                  60


Lys Ala Asp His Val Tyr Arg Gly Lys Phe Arg Gly Phe Ala Gly Lys
65                  70                  75                  80


Leu Glu Asp Asp Val Leu Asp Ala Ile Arg Leu Leu Pro Glu Val Glu
                85                  90                  95


Tyr Val Glu Glu Glu Ala Ile Phe Thr Ile Asn Ala Tyr Thr Ser Gln
            100                 105                 110


Ser Asn Ala Pro Trp Gly Leu Ala Arg Leu Ser Ser Lys Thr Ala Gly
        115                 120                 125


Ser Thr Thr Tyr Thr Tyr Asp Thr Ser Ala Gly Glu Gly Thr Cys Ala
    130                 135                 140


Tyr Val Ile Asp Thr Gly Ile Tyr Thr Ser His Ser Asp Phe Gly Gly
145                 150                 155                 160
```

```
Arg Ala Thr Phe Ala Ala Asn Phe Val Asp Ser Ser Asn Thr Asp Gly
                165                 170                 175

Asn Gly His Gly Thr His Val Ala Gly Thr Ile Gly Gly Thr Thr Tyr
            180                 185                 190

Gly Val Ala Lys Lys Thr Lys Leu Tyr Ala Val Lys Val Leu Gly Ser
        195                 200                 205

Asp Gly Ser Gly Thr Thr Ser Gly Val Ile Ala Gly Ile Asn Phe Val
    210                 215                 220

Ala Asp Asp Ala Pro Lys Arg Ser Cys Pro Lys Gly Val Val Ala Asn
225                 230                 235                 240

Met Ser Leu Gly Gly Ser Tyr Ser Ala Ser Ile Asn Asn Ala Ala Ala
                245                 250                 255

Ala Leu Val Arg Ser Gly Val Phe Leu Ala Val Ala Ala Gly Asn Glu
            260                 265                 270

Asn Gln Asn Ala Ala Asn Ser Ser Pro Ala Ser Glu Ala Ser Ala Cys
        275                 280                 285

Thr Val Gly Ala Thr Asp Arg Asn Asp Ala Lys Ala Ser Tyr Ser Asn
    290                 295                 300

Tyr Gly Ser Val Val Asp Ile Gln Ala Pro Gly Ser Asn Ile Leu Ser
305                 310                 315                 320

Thr Trp Ile Gly Ser Thr Ser Ala Thr Asn Thr Ile Ser Gly Thr Ser
                325                 330                 335

Met Ala Ser Pro His Ile Ala Gly Leu Gly Ala Tyr Leu Leu Ala Leu
            340                 345                 350
```

```
Glu Gly Ser Lys Thr Pro Ala Glu Leu Cys Asn Tyr Ile Lys Ser Thr
        355                 360                 365


Gly Asn Ala Ala Ile Thr Gly Val Pro Ser Gly Thr Thr Asn Arg Ile
    370                 375                 380


Ala Phe Asn Gly Asn Pro Ser Ala
385                 390


<210>  90
<211>  433
<212>  PRT
<213>  Neurospora crassa

<400>  90

Met Val Arg Phe Ser Val Ala Ala Ala Phe Leu Leu Ser Ala Leu Gly
1               5                   10                  15


Val Thr Ala Ala Pro Ser Gly Gly Arg His Asn His Gln Asn Thr Gln
            20                  25                  30


Asn Thr Gly Ala Thr Ala Gly Asn Ala Ala Gly Val Pro Val Ala Asn
        35                  40                  45


Ser Asp Ile Ser Asn Ile Ile Pro Gly Arg Tyr Ile Val Val Tyr Asn
    50                  55                  60


Asn Thr Phe Gly Glu Glu Ala Ile Asn Ala His Gln Ile Lys Val Thr
65                  70                  75                  80


Ser Leu Val Ala Lys Arg Asn Leu Gly Lys Arg Asp Ala Lys Thr Gly
                85                  90                  95


Arg Ile Met Ser Pro Ser Val Lys Ala Phe Lys Met Gly Thr Trp Arg
            100                 105                 110


Ala Met Ala Leu Asp Ala Asp Asp Asp Met Ile Asn Asp Ile Asn Ser
```

```
        115                 120                 125

Ala Gln Glu Val Glu Tyr Ile Glu Ala Asp Gln Tyr Val Lys Leu Asn
    130                 135                 140

Ala Leu Thr Ser Gln Asn Ser Thr Thr Thr Gly Leu Ala Arg Leu Ser
145                 150                 155                 160

His Ala Gly Pro Ser Lys Lys Ala Ala Pro Tyr Ile Phe Asp Ser Ser
                165                 170                 175

Ala Gly Glu Gly Ile Thr Ala Phe Val Val Asp Thr Gly Ile Arg Val
            180                 185                 190

Thr His Ser Glu Tyr Glu Gly Arg Ala Thr Phe Ala Ala Asn Phe Val
        195                 200                 205

Asn Asn Val Asp Thr Asp Glu Asn Gly His Gly Ser His Val Ala Gly
    210                 215                 220

Thr Ile Ala Gly Ala Thr Phe Gly Val Ala Lys Lys Ala Lys Leu Val
225                 230                 235                 240

Ala Val Lys Val Leu Asp Gly Ser Gly Ser Gly Ser Asn Ser Gly Val
                245                 250                 255

Leu Gln Gly Met Gln Phe Val Ala Asp Thr Ala Thr Ser Gln Lys Leu
            260                 265                 270

Gly Gly Lys Ala Val Leu Asn Met Ser Leu Gly Gly Gly Lys Ser Arg
        275                 280                 285

Ala Ile Asn Ser Ala Ile Asn Gln Ile Ala Ala Ala Gly Val Val Pro
    290                 295                 300

Val Val Ala Ala Gly Asn Glu Asn Gln Asp Thr Ala Asn Thr Ser Pro
```

305 310 315 320

Gly Ser Ala Pro Ala Ala Ile Thr Val Gly Ala Ile Asp Gln Arg Thr
325 330 335

Asp Ala Arg Ala Ser Phe Ser Asn Phe Gly Ala Gly Val Asp Ile Phe
340 345 350

Ala Pro Gly Val Asn Val Leu Ser Val Gly Ile Lys Ser Asp Thr Asp
355 360 365

Thr Asp Thr Leu Ser Gly Thr Ser Met Ala Ser Pro His Val Ala Gly
370 375 380

Leu Ala Ala Tyr Leu Met Ala Leu Glu Gly Leu Thr Asp Val Thr Ala
385 390 395 400

Val Gly Asn Arg Ile Lys Glu Leu Ala Gln Lys Thr Gly Ala Lys Val
405 410 415

Thr Asn Asn Val Arg Gly Thr Thr Ser Leu Ile Ala Asn Asn Gly Asn
420 425 430

Leu

<210> 91
<211> 420
<212> PRT
<213> Myceliophthora thermophila

<400> 91

Met Ala Gly Arg Leu Leu Leu Cys Leu Thr Ala Ala Leu Ser Ala Leu
1 5 10 15

Gly Val Ser Ala Ala Pro Ala Pro Asp Ala Ser Gly Arg Pro Phe Ile
20 25 30

```
Gly Val Pro Val Ser Asn Pro Gly Ile Ala Asn Ala Ile Pro Asn Arg
        35                  40                  45

Tyr Ile Val Val Tyr Asn Asn Thr Phe Asn Asp Glu Asp Ile Asp Leu
    50                  55                  60

His Gln Ser Asn Val Ile Lys Thr Ile Ala Lys Arg Asn Ile Ala Lys
65                  70                  75                  80

Arg Ser Leu Thr Gly Lys Leu Leu Ser Thr Thr Val Asn Thr Tyr Lys
                85                  90                  95

Ile Asn Asn Trp Arg Ala Met Ala Leu Glu Ala Asp Asp Ala Thr Ile
            100                 105                 110

Asn Glu Ile Phe Ala Ala Lys Glu Val Ser Tyr Ile Glu Gln Asp Ala
        115                 120                 125

Val Ile Ser Leu Asn Val Arg Gln Met Gln Ser Gln Ala Thr Thr Gly
    130                 135                 140

Leu Ala Arg Ile Ser His Ala Gln Pro Gly Ala Arg Thr Tyr Ile Phe
145                 150                 155                 160

Asp Ser Ser Ala Gly Glu Gly Ile Thr Ala Tyr Val Val Asp Thr Gly
                165                 170                 175

Ile Arg Val Thr His Glu Glu Phe Glu Gly Arg Ala Thr Phe Ala Ala
            180                 185                 190

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

Val Ala Gly Thr Ile Gly Gly Lys Thr Phe Gly Val Ala Lys Lys Val
    210                 215                 220
```

```
Asn Leu Val Ala Val Lys Val Leu Gly Ala Asp Gly Ser Gly Ser Asn
225                 230                 235                 240


Ser Gly Val Ile Ala Gly Met Gln Phe Val Ala Ser Asn Ala Thr Ala
                245                 250                 255


Met Gly Leu Lys Gly Arg Ala Val Met Asn Met Ser Leu Gly Gly Pro
            260                 265                 270


Ala Ser Arg Ala Val Asn Ser Ala Ile Asn Gln Val Glu Ala Ala Gly
        275                 280                 285


Val Val Pro Val Val Ala Ala Gly Asn Glu Ser Gln Asp Thr Ala Asn
    290                 295                 300


Thr Ser Pro Gly Ser Ala Glu Ala Ala Ile Thr Val Gly Ala Ile Asp
305                 310                 315                 320


Gln Thr Asn Asp Arg Met Ala Ser Phe Ser Asn Phe Gly Glu Leu Val
                325                 330                 335


Asp Ile Phe Ala Pro Gly Val Asn Val Gln Ser Val Gly Ile Arg Ser
            340                 345                 350


Asp Thr Ser Thr Asn Thr Leu Ser Gly Thr Ser Met Ala Ser Pro His
        355                 360                 365


Val Ala Gly Leu Ala Ala Tyr Ile Met Ser Leu Glu Asn Ile Thr Gly
    370                 375                 380


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


Ala Arg Ala Arg Gly Val Pro Arg Gly Thr Thr Thr Leu Ile Ala Asn
                405                 410                 415
```

```
Asn Gly Phe Ala
            420


<210>  92
<211>  421
<212>  PRT
<213>  Neurospora crassa

<400>  92

Met Val Gly Leu Lys Asn Val Ala Leu Phe Ala Ala Ser Ile Ile Leu
1               5                   10                  15


Pro Ala Ser Ile Thr Trp Ala Ala Pro Ile Ile Glu Val Glu Thr Lys
            20                  25                  30


Pro Ile Pro Glu Lys Tyr Ile Val Leu Leu Lys Pro His Ala Asp Leu
        35                  40                  45


Glu Gly His Leu Ser Trp Ala Lys Asp Val His Ala Arg Ser Leu Ser
    50                  55                  60


Arg Arg Asp Thr Ala Gly Val His Lys Ala Trp Ser Val Gly Ser Lys
65                  70                  75                  80


Phe Lys Ala Tyr Ala Gly Glu Phe Asp Glu Glu Thr Leu Lys Ile Ile
                85                  90                  95


Gln Arg Asp Glu Arg Asn Val His Ser Ile Glu Pro Asp Lys Ser Trp
            100                 105                 110


Arg Leu Tyr Lys Ser Asn Lys Lys Asp Asn Asp Asp Ser Asn Ser Asp
        115                 120                 125


Asn Thr Thr Ile Ile Thr Gln Lys Gln Ala Pro Trp Gly Leu Gly Tyr
    130                 135                 140
```

```
Leu Ser His Lys Gly Lys Thr Ser Ser Asp Tyr Val Tyr Asn Ser Thr
145                 150                 155                 160


Ala Gly Thr Gly Thr Tyr Ala Tyr Val Val Asp Thr Gly Cys Trp Lys
                165                 170                 175


Asp His Val Glu Phe Glu Gly Arg Val Gln Leu Gly Tyr Asn Ala Tyr
            180                 185                 190


Pro Asp Ser Pro Phe Ile Asp Met Asp Gly His Gly Thr His Val Thr
        195                 200                 205


Gly Thr Leu Ile Ser Lys Thr Tyr Gly Val Ala Lys Asn Ala Thr Val
    210                 215                 220


Ile Cys Val Lys Val Phe His Gly Gly Gly Ser Ala Asn Thr Ile Val
225                 230                 235                 240


Met Asp Gly Phe Glu Trp Ala Val Lys Asp Ile Ile Ala Lys Lys Arg
                245                 250                 255


Gln Arg Asn Ser Val Ile Asn Met Ser Leu Gly Cys Asp Arg Ser Glu
            260                 265                 270


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


Val Val Ala Ala Gly Asn Glu Asn Gln Pro Ala Ala Leu Val Ser Pro
    290                 295                 300


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


Thr Arg Ala Tyr Phe Ser Asn Tyr Gly Ala Ile Val Asp Ile Phe Ala
                325                 330                 335
```

```
Pro Gly Val Asn Ile Val Ser Thr Tyr Ile Gly Lys Lys Asp Gly Asp
            340                 345                 350


Asn Asn Arg Thr Met Thr Met Ser Gly Thr Ser Met Ala Ser Pro His
        355                 360                 365


Val Ala Gly Leu Ala Leu Tyr Leu Lys Ser Leu Asp Pro Glu Lys Tyr
    370                 375                 380


Gly Asn Ser Ser Asp Ala His Ser Gly Leu Arg Ala Leu Gly Val Pro
385                 390                 395                 400


Asp Lys Val Trp Asp Ala Gly Glu Met Ser Pro Asn Leu Val Ala Tyr
                405                 410                 415


Asn Gly Val Gln Gly
            420


<210>  93
<211>  243
<212>  PRT
<213>  Myceliophthora thermophila

<400>  93

Met Lys Leu Ala Val Leu Ile Ala Thr Thr Ala Gly Leu Ala Ala Ala
1               5                   10                  15


Leu Pro Gln Gly Val Ala Arg Arg Gly Val Gly Arg Pro Leu His His
            20                  25                  30


Ser Gly Pro Asn Ile Arg Asn Thr Thr Tyr Pro Gln Tyr Ser Ser Asn
        35                  40                  45


Trp Ala Gly Ala Val Gln Ile Gly Thr Gly Phe Thr Ser Val Tyr Gly
    50                  55                  60
```

```
Thr Ile Thr Val Pro Ser Val His Asp Arg Asn Pro Asn Ala Ala Ala
65                  70                  75                  80


Ser Ala Trp Val Gly Ile Asp Gly Asp Thr Cys Gln Gln Ala Ile Leu
                85                  90                  95


Gln Thr Gly Val Ser Phe Tyr Gly Asp Gly Ser Phe Asp Ala Trp Tyr
            100                 105                 110


Glu Trp Ile Pro Asp Tyr Ala Tyr Ser Phe Ser Asn Phe Arg Leu Ser
        115                 120                 125


Ala Gly Asp Gln Ile Arg Met Ser Val Glu Ala Ser Ser Lys Arg Ala
    130                 135                 140


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


Thr Phe Thr Ser Thr Pro Ser Thr Leu Cys Glu Thr Asn Ala Glu Trp
                165                 170                 175


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


Phe Gly Thr Val Thr Phe Thr Asp Ala Tyr Ala Thr Gly Ser Ser Gly
        195                 200                 205


Thr Val Thr Pro Ser Gly Ala Thr Ile Ile Asp Ile Lys Gln Gly Asn
    210                 215                 220


Glu Val Leu Thr Asn Cys Ala Thr Ser Gly Ser Asp Leu Thr Cys Ser
225                 230                 235                 240


Tyr Thr Gly
```

<210> 94
<211> 288
<212> PRT
<213> Neurospora crassa

<400> 94

```
Met Lys Leu Leu Ser Pro Ala Ile Ser Leu Leu Gly Val Ile Ser Gln
1               5                  10                  15


Pro Ile Leu Ala Gln Phe Thr Phe Thr Ser Thr Val Glu His Asn Gly
            20                  25                  30


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


Thr Leu Gly Arg Ile Arg Ser Arg Thr Asp Asp Asp Ser Gly Pro Glu
    50                  55                  60


Ile Gly Thr Thr Thr Leu Arg Arg Val Lys Arg Thr Asn Pro Thr Ala
65                  70                  75                  80


Asn Ser Asn Asn Trp Cys Gly Ser Val Gln Ser Thr Thr Ser Ser Asn
                85                  90                  95


Gln Ile Lys Leu Val His Gly Thr Phe Gln His Pro Thr Cys Thr Gln
            100                 105                 110


Arg Pro Gly Val Thr Gln Tyr Pro Gln Ala Ala Ala Ala Trp Ile Gly
        115                 120                 125


Ile Asp Gly Asp Ser Trp Thr Ser Ala Leu Leu Gln Ala Gly Thr Val
    130                 135                 140


Cys Lys Ile Asn Asn Ser Thr Gly Ile Val Glu Asn Glu Val Trp Trp
145                 150                 155                 160


Gln Trp Val Pro Asn Gly Ala Tyr Thr Ile Thr Asn Ile Pro Val Phe
```

```
                165                 170                 175


Ala Gly Asp Trp Phe Asp Ile Thr Ile Asn Thr Thr Ser Ser Thr Ala
            180                 185                 190


Ala Thr Ile Lys Ile Met Ser Asn Arg Gly Tyr Thr Tyr Ser Val Asn
        195                 200                 205


Ala Trp Gln Gly Ala Thr Leu Ala Arg Val Asp Ala Asp Trp Val Val
    210                 215                 220


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


Gln Val Trp Phe Gln Asn Ala Tyr Ala Thr Leu Thr Ser Gly Thr Ser
                245                 250                 255


Ser Leu Gly Ile Thr Gly Ala Lys Gln Tyr Gln Ile Pro Gly Gly Cys
            260                 265                 270


Ala Ser Ala Glu Tyr Asp Asn Ser Lys Leu Tyr Ala Ala Val Ala Ala
        275                 280                 285


<210>  95
<211>  285
<212>  PRT
<213>  Myceliophthora thermophila

<400>  95

Met Trp Ser Ile Val Arg Ser Leu Ser Leu Ala Ser Leu Ile Ser Ser
1               5                   10                  15


Ala Cys Thr Val Thr Ala Gln Leu Ser Phe Val Ala Ser Val Lys Gln
            20                  25                  30


His Gly Lys Asp Val Asp Ala Ser Gly Leu Ser Phe Val Arg Ile Pro
        35                  40                  45
```

```
Pro Leu Glu His Arg Trp His Ala Ser Arg Pro Arg Arg Gly Gln Asn
    50                  55                  60

Asn Arg Thr Val Glu Arg Asp Ala Val Ser Tyr Ser Ala Asn Trp Cys
65                  70                  75                  80

Gly Ala Ser Gln His Ala Ser Asp Ser Asp Gly Ile Lys Ser Val Leu
                85                  90                  95

Gly Tyr Phe Thr Ala Pro Asp Leu Thr Leu Arg Pro Gly Thr Pro Ala
            100                 105                 110

Pro Gln Phe Ala Ala Ala Trp Val Gly Ile Asp Gly Ala Ala Cys Asn
        115                 120                 125

Thr Thr Leu Leu Gln Ala Gly Val Thr Thr Ile Val Asn Ser Asp Gly
    130                 135                 140

Gly Gln Ser Ala Ser Ala Trp Trp Glu Trp Tyr Pro Glu Ala Ser Tyr
145                 150                 155                 160

Thr Ile Ser Gly Leu Lys Val Lys Ala Gly Glu Trp Met Ser Val Asn
                165                 170                 175

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

Asp Thr Gly Thr Ser Val Thr Leu Glu Leu Asn Asn Gly Pro Gln Leu
        195                 200                 205

Cys Arg Arg Asp Ala Glu Trp Ile Leu Glu Asp Phe Tyr Glu Ser Gly
    210                 215                 220

Lys Gln Val Ala Leu Ala Asn Phe Ala Asp Leu Trp Phe Val Asp Ser
225                 230                 235                 240
```

```
Gly Ala Thr Thr Val Gly Gly Lys Asn Val Gly Phe Asp Gly Ala Thr
                245                 250                 255


Met Val His Leu Arg Asp Glu Asn Gly Asn Val Leu Cys Ser Pro Glu
            260                 265                 270


Pro Tyr Asp Asn Ser Asn Phe Val Val Val Ser Lys Pro
        275                 280                 285


<210>  96
<211>  307
<212>  PRT
<213>  Myceliophthora thermophila

<400>  96

Met Lys Pro Thr Val Leu Phe Thr Leu Leu Ala Ser Gly Ala Tyr Ala
1               5                   10                  15


Ala Ala Thr Pro Ala Ile Pro Gly Tyr Ser Pro Arg Thr Arg Gly Met
            20                  25                  30


Asn Pro His His His Ala Pro Leu Arg Leu Leu His Thr Phe Thr Pro
        35                  40                  45


Ile Ser Thr Ser Gly Lys Ser Phe Arg Leu Leu Ala Ser Ser Thr Glu
    50                  55                  60


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


Thr Val Arg Thr Thr Ile Arg Ile Pro Ala Ala Lys Met Pro Thr Ala
                85                  90                  95


Gly Pro Thr Ala Asn Asn Thr Val Gly Glu Tyr Ala Ala Ser Phe Trp
            100                 105                 110
```

```
Val Gly Ile Asp Ser Ala Thr Asp Ala Cys Gly Ala Gly Gly Ser Leu
        115                 120                 125

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

Thr Pro Phe Ala Trp Tyr Gln Gly Pro Gly Gln Ala Asp Val Val Gly
145                 150                 155                 160

Phe Gly Gly Gly Phe Pro Val Gly Glu Gly Asp Leu Val Arg Leu Thr
                165                 170                 175

Leu Glu Ala Gly Pro Ala Gly Gly Glu Glu Ile Ala Val Val Ala Glu
            180                 185                 190

Asn Phe Gly Arg Asn Val Thr Arg Ala Asp Glu Gly Ala Val Pro Val
        195                 200                 205

Arg Lys Val Arg Lys Val Leu Pro Ala Glu Ala Gly Gly Gln Lys Leu
    210                 215                 220

Cys Arg Gly Glu Ala Ala Trp Met Val Glu Asp Phe Pro Leu Gln Gly
225                 230                 235                 240

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

Asn Thr Gly Ile Thr Leu Asp Asp Gly Thr Glu Lys Asp Leu Thr Gly
            260                 265                 270

Ala Glu Val Leu Asp Ile Gln Leu Glu Ala Gln Gly Gly Arg Leu Thr
        275                 280                 285

Ser Cys Glu Val Val Asp Asp Arg Asn Val Lys Cys Ala Arg Val Val
    290                 295                 300
```

Gly Asp Asn
305

<210> 97
<211> 197
<212> PRT
<213> Myceliophthora thermophila

<400> 97

Met Arg Trp Pro Leu Ala Ala Leu Leu Gly Ser Ala Leu Val Ala Arg
1 5 10 15

Gln Ala Leu Ala Glu Leu Thr Phe Thr Val Glu Ala Thr Arg Asn Gly
20 25 30

Val Pro Ile Pro Ala Ser Glu Ile Arg Leu Glu Pro Phe Glu Pro Gly
35 40 45

Arg Thr Arg Met Gly Ala Val Ala Glu Ala Pro Arg Ala Gln Arg Lys
50 55 60

Thr Arg Arg Ser Asn Ala Gln Ala Asp Ser Ala Asn Trp Cys Gly Ser
65 70 75 80

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

Phe Gln His Pro Ser Cys Ser Ile Arg Pro Gly Tyr Thr Phe Pro Gln
100 105 110

Ala Ala Ala Ser Trp Val Gly Ile Asp Gly Asp Ser Tyr Arg Asp Ala
115 120 125

Leu Leu Gln Ala Gly Thr Val Cys Lys Ile Asp Asn Ser Thr Gly Val
130 135 140

Val Arg His Glu Ala Trp Trp Gln Trp Val Pro Ser Ala Ala Phe Thr
145 150 155 160

Ile Thr Ser Met Pro Gly Gln Ser Asn Thr Thr Gly Phe Cys Ile Pro
165 170 175

Tyr Ser Ala Pro Phe Val Ser Leu Cys Phe Phe Gly Arg Thr Arg Thr
180 185 190

Cys Leu Phe Leu His
195

<210> 98
<211> 621
<212> PRT
<213> Myceliophthora thermophila

<400> 98

Met Leu Arg Asn Ile Phe Leu Thr Ala Ala Leu Ala Ala Phe Gly Gln
1 5 10 15

Cys Gly Ser Thr Val Phe Glu Ser Val Pro Ala Lys Pro Arg Gly Trp
20 25 30

Thr Arg Leu Gly Asp Ala Ser Ala Asp Gln Pro Leu Arg Leu Arg Ile
35 40 45

Ala Leu Gln Gln Pro Asn Glu Asp Leu Phe Glu Arg Thr Leu Tyr Glu
50 55 60

Val Ser Asp Pro Ser His Ala Arg Tyr Gly Gln His Leu Ser Arg Asp
65 70 75 80

Glu Leu Ser Ala Leu Leu Ala Pro Arg Ala Glu Ser Thr Ala Ala Val
85 90 95

Leu Asn Trp Leu Arg Asp Ala Gly Ile Pro Ser Asp Lys Ile Glu Glu

```
            100                 105                 110

Asp Gly Glu Trp Ile Asn Leu Arg Val Thr Val Arg Glu Ala Ser Glu
        115                 120                 125

Leu Leu Asp Ala Asp Phe Gly Val Trp Ala Tyr Glu Gly Thr Asn Val
    130                 135                 140

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

His Ile Arg Met Val Ala Pro Val Val Arg Phe Gly Gln Ile Arg Pro
                165                 170                 175

Glu Arg Ser Gln Val Phe Glu Val Val Glu Thr Ala Pro Ser Gln Val
            180                 185                 190

Lys Val Ala Ala Ala Ile Pro Pro Gln Asp Leu Asp Val Lys Ala Cys
        195                 200                 205

Asn Thr Ser Ile Thr Pro Glu Cys Leu Arg Ala Leu Tyr Lys Val Gly
    210                 215                 220

Ser Tyr Gln Ala Glu Pro Ser Lys Lys Ser Leu Phe Gly Val Ala Gly
225                 230                 235                 240

Tyr Leu Glu Gln Trp Ala Lys Tyr Asp Gln Leu Glu Leu Phe Ala Ser
                245                 250                 255

Thr Tyr Ala Pro Tyr Ala Ala Asp Ala Asn Phe Thr Ser Val Gly Val
            260                 265                 270

Asn Gly Gly Glu Asn Asn Gln Gly Pro Ser Asp Gln Gly Asp Ile Glu
        275                 280                 285

Ala Asn Leu Asp Ile Gln Tyr Ala Val Ala Leu Ser Tyr Lys Thr Pro
```

```
    290                 295                 300

Ile Thr Tyr Tyr Ile Thr Gly Gly Arg Gly Pro Leu Val Pro Asp Leu
305                 310                 315                 320

Asp Gln Pro Asp Pro Asn Asp Val Ser Asn Glu Pro Tyr Leu Glu Phe
                325                 330                 335

Phe Ser Tyr Leu Leu Lys Leu Pro Asp Ser Glu Leu Pro Gln Thr Leu
            340                 345                 350

Thr Thr Ser Tyr Gly Glu Asp Glu Gln Ser Val Pro Arg Pro Tyr Ala
        355                 360                 365

Glu Lys Val Cys Gln Met Ile Gly Gln Leu Gly Ala Arg Gly Val Ser
    370                 375                 380

Val Ile Phe Ser Ser Gly Asp Thr Gly Val Gly Ser Ala Cys Gln Thr
385                 390                 395                 400

Asn Asp Gly Lys Asn Thr Thr Arg Phe Leu Pro Ile Phe Pro Gly Ala
                405                 410                 415

Cys Pro Tyr Val Thr Ser Ile Gly Ala Thr Arg Tyr Val Glu Pro Glu
            420                 425                 430

Gln Ala Ala Ala Phe Ser Ser Gly Gly Phe Ser Asp Ile Phe Lys Arg
        435                 440                 445

Pro Ala Tyr Gln Glu Ala Ala Val Ser Thr Tyr Leu His Lys His Leu
    450                 455                 460

Gly Ser Arg Trp Lys Gly Leu Tyr Asn Pro Gln Gly Arg Gly Phe Pro
465                 470                 475                 480

Asp Val Ser Ala Gln Gly Val Ala Tyr His Val Phe Ser Gln Asp Lys
```

485 490 495

Asp Ile Lys Val Ser Gly Thr Ser Ala Ser Ala Pro Leu Phe Ala Ala
500 505 510

Leu Val Ser Leu Leu Asn Asn Ala Arg Leu Ala Gln Gly Arg Pro Pro
515 520 525

Leu Gly Phe Leu Asn Pro Trp Leu Tyr Ser Glu Lys Val Gln Lys Ala
530 535 540

Gly Ala Leu Thr Asp Ile Val His Gly Gly Ser Ser Gly Cys Thr Gly
545 550 555 560

Lys Asp Met Tyr Ser Gly Leu Pro Thr Pro Tyr Val Pro Tyr Ala Ser
565 570 575

Trp Asn Ala Thr Pro Gly Trp Asp Pro Val Thr Gly Leu Gly Thr Pro
580 585 590

Val Phe Asp Lys Leu Leu Glu Leu Ser Ser Pro Gly Lys Lys Leu Pro
595 600 605

His Ile Gly Gly Gly His Gly His Gly Ala Gly Gly His
610 615 620

<210> 99
<211> 587
<212> PRT
<213> Neurospora crassa

<400> 99

Met Leu Trp Ser Val Leu Leu Leu Ala Ala Gly Ala Ser Ala His Val
1 5 10 15

Lys Ser Ser Leu Pro Ser Val Pro Ser Gly Trp Lys Lys Val Arg Ala
20 25 30

```
Ala Ser Ala Asp Glu Ser Val Ser Leu Lys Ile Ala Leu Pro Ala His
        35                  40                  45

Gln Pro Asp Ala Leu Glu Thr Ala Ile Leu Arg Val Ser Asp Pro Asn
    50                  55                  60

His His Glu Tyr Gly Met His Leu Ser Ser Glu Glu Val Arg Ser Leu
65                  70                  75                  80

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

Arg Asn Gly Ile Lys Gly Lys Val Asp Asn Asp Trp Val Ser Phe Thr
            100                 105                 110

Thr Ser Val Ala Lys Ala Asn Asn Leu Leu Asn Thr Thr Phe Asp Trp
        115                 120                 125

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

Tyr Ser Val Pro Asp Glu Leu Asp Ala His Val Asp Met Ile Gln Pro
145                 150                 155                 160

Thr Thr Arg Phe Gly Lys Leu Ala Ala Lys Ala Ser Thr Ile Phe Glu
                165                 170                 175

Ile Phe Asp Glu Pro Glu Pro Lys Asn Ile Ala Asn Val Lys Val Gly
            180                 185                 190

Gly Asp His Pro Thr Cys Thr Gly Cys Ile Tyr Pro Asp Glu Ile Arg
        195                 200                 205

Ser Leu Tyr Asn Ile Lys Tyr Lys Pro Ser Ala Ser Asp Lys Asn Thr
    210                 215                 220
```

```
Ile Ala Phe Ala Ser Tyr Leu Glu Gln Tyr Ser Asn Tyr Asp Asp Phe
225                 230                 235                 240

Thr Ser Phe Ala Lys Ala Phe Ile Pro Asp Ala Ala Asp Arg Asn Tyr
                245                 250                 255

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

Ile Gly Val Glu Ala Asn Leu Asp Leu Gln Tyr Ile Leu Ala Ile Ser
        275                 280                 285

Asn Pro Ile Pro Ile Arg Glu Tyr Ser Ile Gly Gly Arg Gly Pro Leu
    290                 295                 300

Val Pro Thr Ala Asn Gln Pro Gly Pro Glu Ile Ser Asn Glu Pro Tyr
305                 310                 315                 320

Leu Asp Phe Phe Gln Tyr Leu Leu Ser Leu Lys Asn Ser Glu Leu Pro
                325                 330                 335

Ala Thr Leu Ser Thr Ser Tyr Gly Glu Glu Glu Gln Ser Val Pro Arg
            340                 345                 350

Glu Tyr Ala Leu Lys Val Cys Ser Met Ile Gly Gln Leu Gly Ala Arg
        355                 360                 365

Gly Val Ser Val Ile Phe Ser Ser Gly Asp Ser Gly Pro Gly Asp Ala
    370                 375                 380

Cys Ile Arg Asn Asp Gly Thr Asn Ser Thr Tyr Phe Glu Pro Thr Phe
385                 390                 395                 400

Pro Gly Ala Cys Pro Trp Val Thr Ser Val Gly Gly Thr Tyr Gln Thr
                405                 410                 415
```

```
Gly Pro Glu Lys Ala Val Asp Phe Ser Ser Gly Gly Phe Ser Met Tyr
            420                 425                 430

His Lys Arg Pro Val Tyr Gln Glu Arg Val Val Lys Lys Tyr Leu Asp
        435                 440                 445

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

Phe Pro Asp Val Ser Ala Gln Ala Ser Arg Tyr Ala Val Tyr Val Asp
465                 470                 475                 480

Gly Arg Leu Val Gly Val Ser Gly Thr Ser Ala Ser Ala Pro Met Phe
                485                 490                 495

Ala Gly Leu Val Ala Leu Leu Asn Ala Ala Arg Lys Ser His Gly Leu
            500                 505                 510

Pro Ser Leu Gly Phe Ile Asn Pro Leu Leu Tyr Ala Ser Lys Asp Ala
        515                 520                 525

Phe Thr Asp Ile Val Asn Gly Ala Gly Thr Gly Cys Arg Gly Arg Pro
    530                 535                 540

Glu Phe Ala Gly Asp Val Gly Gly Thr Ala Lys Trp Asn Ala Thr Glu
545                 550                 555                 560

Gly Trp Asp Pro Val Thr Gly Leu Gly Thr Pro Lys Phe Asp Lys Leu
                565                 570                 575

Leu Ala Leu Ala Ala Pro Gly Val Lys Asn Ala
            580                 585
```

<210> 100
<211> 720

<212> PRT
<213> Myceliophthora thermophila

<400> 100

```
Met Arg Ile Arg His Ala Leu Val Gly Ile Ala Ser Leu Cys Cys Leu
1               5                  10                  15


Leu Gly Thr Ala Ser Gly Ala Arg Ile Ser Ser Arg Asp Met Leu Ser
            20                  25                  30


Arg Arg Val Val Pro Pro Ser His Thr Leu His Glu Arg His Glu Ala
        35                  40                  45


Gly Asn Val Glu Gly Trp Val Lys Arg Gly Leu Ala Asp Ala Glu Ser
    50                  55                  60


Thr Val Pro Val Arg Ile Gly Leu Lys Gln Ser Asn Val Asp Ala Ala
65                  70                  75                  80


His Asp Leu Leu Met Asp Ile Ser Asp Pro Arg Ser Pro Asn Tyr Gly
                85                  90                  95


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


His Ser Val Ala Lys Val Lys Arg Trp Leu Ala Ser Ala Gly Val Asp
        115                 120                 125


Glu Gly Arg Ile Ser Gln Ser Ala Asn Lys Gln Trp Ile Gln Phe Asp
    130                 135                 140


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


Phe Glu Asn Leu Glu Thr Gly Val Gln Asn Ile Ala Cys Ser Glu Tyr
                165                 170                 175
```

```
His Val Pro Arg Asp Val Ser His His Ile Asp Tyr Ile Thr Pro Gly
            180                 185                 190

Ile Lys Leu Met Ala Gly Gly Arg Glu Glu Arg Met Val Arg Trp Arg
        195                 200                 205

Lys Ala Asp Arg Arg Ser Leu Val Ala Gly Leu Ala Ser Gln Gly Arg
    210                 215                 220

Lys Gly Ala His Gly Met Gly His Gly Gly Gly Gly Gly Ser Arg Ser
225                 230                 235                 240

Pro Asp Asp Pro Val Val Asp Asp Ser Pro Phe Arg Val Thr Gly Pro
                245                 250                 255

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

Pro Asn Gly Thr Arg Ala Ala Ser Gly Asn Glu Leu Gly Ile Phe Gln
        275                 280                 285

Gly Leu Gly Gln His Tyr Ser Gln Glu Asp Leu Asp Asn Tyr Trp Lys
    290                 295                 300

Tyr Val Ala Pro Trp Val Pro Arg Gly Thr His Pro Glu Leu Arg Ser
305                 310                 315                 320

Ile Asn Gly Ala Leu Gly Pro Ala Asn Asp Thr Leu Arg Ala Gly Glu
                325                 330                 335

Glu Ala Asp Leu Asp Phe Gln Ile Ala Ile Pro Leu Ile Trp Pro Gln
            340                 345                 350

Arg Thr Val Leu Phe Gln Thr Asp Asp Glu Trp Tyr Gln Gln Asp Gln
        355                 360                 365
```

```
Gln Arg Ala Asp Thr Lys Tyr Pro Gly Phe Phe Asn Thr Phe Phe Asp
    370                 375                 380

Ala Ile Asp Gly Ser Tyr Cys His Met Thr Ala Phe Asn Met Thr Gly
385                 390                 395                 400

Asn Cys Val Thr Pro Glu Cys Arg Asp Pro Glu Tyr Pro Asn Pro Asn
                405                 410                 415

Ala Thr Pro Glu Gln Gly Gly Tyr Ala Gly Ala Leu Met Cys Gly Arg
            420                 425                 430

His Arg Pro Thr Ser Val Val Ser Val Ser Tyr Ser Gly Thr Glu Asp
        435                 440                 445

Ser Trp Pro Ala Ser Tyr Met Arg Arg Gln Cys Leu Glu Val Leu Lys
    450                 455                 460

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

Val Gly Gly Arg Pro Phe Asp Pro Arg Ala Gly Cys Leu Gly Pro Asp
                485                 490                 495

Arg Ala Val Phe Ser Pro Arg Val Met Ala Asn Cys Pro Tyr Val Leu
            500                 505                 510

Ser Val Gly Ala Thr Ala Leu Val Asp Pro Glu Gln Glu Gln Gln Gln
        515                 520                 525

Gln His Ala Asp Arg Gly Gly Ser Gly Lys Glu Pro Arg Leu Val Glu
    530                 535                 540

Val Ala Ala Arg Thr Phe Ala Ser Gly Gly Gly Phe Ser Asn Ile Phe
545                 550                 555                 560
```

```
Gly Arg Pro Lys Trp Gln Asp Arg His Val Arg Glu Tyr Leu Arg Lys
                565                 570                 575

Thr Asn Leu Ser Glu Leu Gly Tyr Asp Asn Ala Ala Gly Met Ser Phe
            580                 585                 590

Asp Ser Leu Arg Pro Pro Pro Ala Gly Gly Lys Leu Phe Asn Arg Leu
        595                 600                 605

Gly Arg Gly Tyr Pro Asp Val Ala Ala Val Gly Gln Asn Phe Arg Val
    610                 615                 620

Val Leu Arg Gly Tyr Pro Asn Arg Met His Gly Thr Ser Ala Ala Ala
625                 630                 635                 640

Pro Val Trp Ala Ser Ile Leu Thr Leu Ile Asn Glu Glu Arg Arg Ala
                645                 650                 655

Val Gly Lys Gly Pro Val Gly Phe Val His Gln Val Leu Tyr Gln His
            660                 665                 670

Pro Glu Val Phe Thr Asp Ile Thr Val Gly Ser Asn Pro Gly Cys Gly
        675                 680                 685

Thr Asp Gly Phe Pro Val Glu Glu Gly Trp Asp Pro Val Thr Gly Leu
    690                 695                 700

Gly Ser Pro Ile Tyr Pro Lys Leu Leu Lys Leu Phe Met Ser Leu Pro
705                 710                 715                 720
```

<210> 101
<211> 719
<212> PRT
<213> Neurospora crassa

<400> 101

```
Met Phe Arg Phe His Leu Trp Thr Leu Leu Arg Leu Phe Ala Leu Leu
1               5                  10                  15

Ser Ser Leu Val Thr Ala Ser Arg Ile Val Leu Glu Glu Ala Gly His
            20                  25                  30

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

Ile Gln Leu Ser Ile Ala Leu Lys Glu Pro Gly Ile Glu Glu Leu Lys
    50                  55                  60

Arg Arg Leu Leu Gln Gln Ser Thr Ser Asp Asp His Pro Asn Ser Arg
65                  70                  75                  80

Gln Phe Thr Lys Glu Glu Val Glu Lys His Arg Gln Pro Asp Gln Arg
                85                  90                  95

Ser Val Thr Ala Val Gly Arg Trp Leu Gln Ser His Gly Ile Lys Ser
            100                 105                 110

Tyr Asn Ala Asp Asn Ser Trp Ile Thr Phe Lys Ala Thr Ala Ala Thr
        115                 120                 125

Val Gln Met Leu Phe Glu Ala Asp Leu Ala Tyr Tyr Ser Tyr Asn Gly
    130                 135                 140

Asp Pro Ser Thr Gln Ile Leu Arg Ser Arg Ser Tyr Thr Ile Pro Arg
145                 150                 155                 160

Trp Leu Ser Asp Asp Ile Asp Phe Val His Pro Leu Thr Asn Phe Met
                165                 170                 175

Pro Pro Arg Asn Arg Asn Asp Gly Thr Leu Gly Ile Gly Arg Arg Gln
            180                 185                 190
```

```
Pro Ile Gln Pro Lys Leu Ser Ala Arg Glu Asp Phe Phe Ala Pro Pro
        195                 200                 205

Cys Trp Thr Gly Thr Phe Pro Gly Cys Ile Arg Lys Leu Tyr Asn Leu
    210                 215                 220

Thr Tyr Thr Pro Ser Pro Asp Phe Arg Ser Pro Ser Pro Val Arg Phe
225                 230                 235                 240

Gly Ile Ala Ser Phe Leu Glu Gln Tyr Ile Thr His Arg Asp Val Thr
                245                 250                 255

Ser Phe Leu Ala Thr Tyr Ala Arg Glu Leu Leu Pro Leu Arg Pro Thr
            260                 265                 270

Pro Ser Arg Gly Gly Ser Gly Gly Ser Leu Thr Leu Pro Pro Val Thr
        275                 280                 285

Asn Thr Thr Ser Glu Pro Pro Tyr Asn Ile Thr Ile Thr Leu Leu Asn
    290                 295                 300

Asn Ala Thr Arg Trp Asp Pro His Ser Thr Asp Pro Ala Leu Ser Gly
305                 310                 315                 320

Leu Glu Ala Asn Leu Asp Val Gln Tyr Ala Leu Ser Leu Gly His Pro
                325                 330                 335

Thr Arg Val Ile Tyr Tyr Ala Thr Gly Gly Arg Gly Thr Lys Leu Asp
            340                 345                 350

Ser Ser Gly Arg Pro Leu Pro Thr Asn Asp Pro Arg Ala Asn Asn Glu
        355                 360                 365

Pro Phe Leu Glu Phe Leu Gln Ala Leu Leu Ala Leu Pro Asp Asn Gln
    370                 375                 380
```

```
Ile Pro His Val Leu Ser Ile Ser Tyr Ala Asp Asp Glu Gln Ser Val
385                 390                 395                 400


Pro Arg Lys Tyr Ala His Arg Val Cys Asp Leu Phe Ala Ala Val Ala
                405                 410                 415


Ala Arg Gly Thr Ser Val Leu Val Ala Thr Gly Asp Gly Gly Ala Ala
            420                 425                 430


Gly Ile Gly Phe Ser Ala Gly Gly Gly Asp Thr Cys Ile Lys Asn Asp
        435                 440                 445


Gly Ser Gly Arg Arg Ala Phe Val Pro Thr Phe Pro Ala Ser Cys Pro
    450                 455                 460


Trp Val Thr Ser Val Gly Ala Thr Asp Asn Thr Ala Leu Asn Leu Thr
465                 470                 475                 480


Gly Ala Ala Phe Ser Ser Gly Gly Phe Ser Glu Tyr Phe Asp Arg Pro
                485                 490                 495


Leu Trp Gln Arg Ala Ala Val Asp Pro Tyr Val Ser Ser Leu Leu Arg
            500                 505                 510


Ser Arg Ser Ser Lys Pro Gly Gln Pro Ser Gln Pro Arg Asp Leu Lys
        515                 520                 525


Gly Val Tyr Phe Ser His Asn Gly Arg Gly Met Pro Asp Met Ala Ala
    530                 535                 540


Ile Gly Ser Gly Phe Gln Ile Ile His Arg Gly Glu Met Val Glu Val
545                 550                 555                 560


Arg Gly Thr Ser Ala Ser Thr Pro Val Val Ala Ala Met Val Ala Leu
                565                 570                 575
```

Val Asn Asp Gln Arg Leu Arg Gln Gly Lys Arg Ser Leu Gly Trp Leu
580 585 590

Asn Gly His Leu Tyr Leu Asp Pro Arg Val Arg Arg Val Leu Thr Asp
595 600 605

Val Lys Trp Gly Arg Ser Glu Gly Cys Val Phe Pro Gly Glu Ala Leu
610 615 620

Glu Glu Gly Arg Gly Lys Gly Lys Glu Lys Tyr Trp Arg His Ser Val
625 630 635 640

Val Glu Lys Arg Gln Gly Asn Ser Glu Glu Asp Gly Gly Thr His Gly
645 650 655

Gly Asp Gly Glu Gly Lys Ala Asp Glu Glu Asp Trp Gly Gly Glu Gly
660 665 670

Glu Val Gly Glu Gly Glu Gly Asp Gln Ser Glu Asn Val Ile Leu Gly
675 680 685

Gly Trp Asp Ala Arg Lys Gly Trp Asp Pro Val Thr Gly Leu Gly Val
690 695 700

Pro Gly Asp Phe Gln Glu Met Leu Lys Val Leu Gly Ser Val Trp
705 710 715

<210> 102
<211> 454
<212> PRT
<213> Neurospora crassa

<400> 102

Met Arg Ala Thr Leu Val Val Val Leu Cys His Leu Ser Leu Ala Phe
1 5 10 15

Ala Leu Ala Ile Ser Pro Ala Ala Ser His Trp Lys Arg Ser Ala Arg

```
            20                  25                  30

Leu Ala Ser Asp Gln Thr Ala Ser Glu Arg Tyr Ser Leu Pro Ser Arg
        35                  40                  45

Val Ala Arg Tyr Ile Asp Tyr Val Leu Pro Ala Pro Asp Pro Asp Pro
    50                  55                  60

Val Ser Ser Ala Pro Lys Ser Val Ala Val Gln Asp Pro Pro Thr Leu
65                  70                  75                  80

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

Tyr Ile Ala Pro Gln Cys Leu Arg Gln Leu Ala Trp Leu Ala Glu Asp
            100                 105                 110

Leu Asp Met Phe Phe Gly Asp Phe Ala Pro Asp Leu Leu Thr Asn Phe
        115                 120                 125

Asn Leu Glu Pro Asn Leu Asp Tyr Lys Tyr Thr Met Ala Met Ala Lys
    130                 135                 140

Pro Ile Pro Val Thr Asn Ile Gln Val Gly Asp Phe Val Val Gln Gly
145                 150                 155                 160

Asn Met Asn Ile Met Leu Ala Ala Phe Asn Ala His Tyr Cys Arg Thr
                165                 170                 175

Gly Leu Asp Pro Gln Phe Asp Pro Val Tyr Pro Asn Pro Ala Pro Gly
            180                 185                 190

Gly Tyr Asn Ala Ser Asp Cys Gly Thr His Val Pro Pro Arg Val Ile
        195                 200                 205

Ala Ile Met Tyr Ala Trp Asn Lys Ala Trp Tyr Ser Asp Ala Asp Phe
```

```
    210                 215                 220

Ala Ser Ile Phe Pro Ala Ser Asp Pro Trp Val Thr Ser Val Gly Gly
225                 230                 235                 240

Thr Gln Phe Leu Pro Val Val Ser Asn Gly Ser Ser Ser Thr Thr Ala
                245                 250                 255

Ser Ser Gly Met Pro Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser
            260                 265                 270

Ser Ser Ser Ser Ser Ser Ser Ser Ser Leu Phe Pro Gly Glu Thr Ala
        275                 280                 285

Leu Asp Asp Asn Asn Thr Gly Ser Ser Gly Gly Ser Phe Ser Arg Leu
    290                 295                 300

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

Ser Ala Pro Gly Ala Ala Glu Leu Ala Arg Gln Gly Tyr Phe Asn Gly
                325                 330                 335

Ser Gly Arg Gly Tyr Pro Asp Ile Ser Ala Met Ala Arg Ser Phe Leu
            340                 345                 350

Val Ala Leu His Gly Gly Tyr His Ala Val Ser Gly Thr Ser Ala Ser
        355                 360                 365

Thr Pro Val Val Ala Ala Met Val Ala Lys Ile Asn Asp Ala Arg Leu
    370                 375                 380

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

Ala Ala Ala Gly Lys Ala Gly Val Leu Arg Asp Val Pro Leu Gly Lys
```

405 410 415

Asn His Asp Cys Gly Val Gly Glu Ala Phe Pro Ala Arg Arg Ala Trp
420 425 430

Asp Ala Val Thr Gly Leu Gly Thr Pro Asp Phe Glu Lys Leu Lys Glu
435 440 445

Leu Tyr Leu Gly Leu Pro
450

<210> 103
<211> 857
<212> PRT
<213> Leishmania major

<400> 103

Met Gly Lys Arg Lys Gly Asn Ser Leu Gly Asp Ser Gly Ser Ala Ala
1 5 10 15

Thr Ala Ser Arg Glu Ala Ser Ala Gln Ala Glu Asp Ala Ala Ser Gln
20 25 30

Thr Lys Thr Ala Ser Pro Pro Ala Lys Val Ile Leu Leu Pro Lys Thr
35 40 45

Leu Thr Asp Glu Lys Asp Phe Ile Gly Ile Phe Pro Phe Pro Phe Trp
50 55 60

Pro Val His Phe Val Leu Thr Val Val Ala Leu Phe Val Leu Ala Ala
65 70 75 80

Ser Cys Phe Gln Ala Phe Thr Val Arg Met Ile Ser Val Gln Ile Tyr
85 90 95

Gly Tyr Leu Ile His Glu Phe Asp Pro Trp Phe Asn Tyr Arg Ala Ala
100 105 110

```
Glu Tyr Met Ser Thr His Gly Trp Ser Ala Phe Phe Ser Trp Phe Asp
        115                 120                 125

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

Pro Gly Leu Gln Leu Thr Ala Val Ala Ile His Arg Ala Leu Ala Ala
145                 150                 155                 160

Ala Gly Met Pro Met Ser Leu Asn Asn Val Cys Val Leu Met Pro Ala
                165                 170                 175

Trp Phe Gly Ala Ile Ala Thr Ala Thr Leu Ala Phe Cys Thr Tyr Glu
            180                 185                 190

Ala Ser Gly Ser Thr Val Ala Ala Ala Ala Ala Ala Leu Ser Phe Ser
        195                 200                 205

Ile Ile Pro Ala His Leu Met Arg Ser Met Ala Gly Glu Phe Asp Asn
    210                 215                 220

Glu Cys Ile Ala Val Ala Ala Met Leu Leu Thr Phe Tyr Cys Trp Val
225                 230                 235                 240

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

Val Ala Tyr Gly Tyr Met Ala Ala Ala Trp Gly Gly Tyr Ile Phe Val
            260                 265                 270

Leu Asn Met Val Ala Met His Ala Gly Ile Ser Ser Met Val Asp Trp
        275                 280                 285

Ala Arg Asn Thr Tyr Asn Pro Ser Leu Leu Arg Ala Tyr Thr Leu Phe
    290                 295                 300
```

```
Tyr Val Val Gly Thr Ala Ile Ala Val Cys Val Pro Pro Val Gly Met
305                 310                 315                 320

Ser Pro Phe Lys Ser Leu Glu Gln Leu Gly Ala Leu Leu Val Leu Val
                325                 330                 335

Phe Leu Cys Gly Leu Gln Val Cys Glu Val Leu Arg Ala Arg Ala Gly
            340                 345                 350

Val Glu Val Arg Ser Arg Ala Asn Phe Lys Ile Arg Val Arg Val Phe
        355                 360                 365

Ser Val Met Ala Gly Val Ala Ala Leu Ala Ile Ser Val Leu Ala Pro
    370                 375                 380

Thr Gly Tyr Phe Gly Pro Leu Ser Val Arg Val Arg Ala Leu Phe Val
385                 390                 395                 400

Glu His Thr Arg Thr Gly Asn Pro Leu Val Asp Ser Val Ala Glu His
                405                 410                 415

Gln Pro Ala Ser Pro Glu Ala Met Trp Ala Phe Leu His Val Cys Gly
            420                 425                 430

Val Thr Trp Gly Leu Gly Ser Ile Val Leu Ala Val Ser Thr Phe Val
        435                 440                 445

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

Tyr Tyr Phe Ser Thr Arg Met Ala Arg Leu Leu Leu Leu Ser Gly Pro
465                 470                 475                 480

Ala Ala Cys Leu Ser Thr Gly Ile Phe Val Gly Thr Ile Leu Glu Ala
                485                 490                 495
```

```
Ala Val Gln Leu Ser Phe Trp Asp Ser Asp Ala Thr Lys Ala Lys Lys
            500                 505                 510

Gln Gln Lys Gln Ala Gln Arg His Gln Arg Gly Ala Gly Lys Gly Ser
        515                 520                 525

Gly Arg Asp Asp Ala Lys Asn Ala Thr Thr Ala Arg Ala Phe Cys Asp
    530                 535                 540

Val Phe Ala Gly Ser Ser Leu Ala Trp Gly His Arg Met Val Leu Ser
545                 550                 555                 560

Ile Ala Met Trp Ala Leu Val Thr Thr Thr Ala Val Ser Phe Phe Ser
                565                 570                 575

Ser Glu Phe Ala Ser His Ser Thr Lys Phe Ala Glu Gln Ser Ser Asn
            580                 585                 590

Pro Met Ile Val Phe Ala Ala Val Val Gln Asn Arg Ala Thr Gly Lys
        595                 600                 605

Pro Met Asn Leu Leu Val Asp Asp Tyr Leu Lys Ala Tyr Glu Trp Leu
    610                 615                 620

Arg Asp Ser Thr Pro Glu Asp Ala Arg Val Leu Ala Trp Trp Asp Tyr
625                 630                 635                 640

Gly Tyr Gln Ile Thr Gly Ile Gly Asn Arg Thr Ser Leu Ala Asp Gly
                645                 650                 655

Asn Thr Trp Asn His Glu His Ile Ala Thr Ile Gly Lys Met Leu Thr
            660                 665                 670

Ser Pro Val Val Glu Ala His Ser Leu Val Arg His Met Ala Asp Tyr
        675                 680                 685
```

```
Val Leu Ile Trp Ala Gly Gln Ser Gly Asp Leu Met Lys Ser Pro His
    690                 695                 700

Met Ala Arg Ile Gly Asn Ser Val Tyr His Asp Ile Cys Pro Asp Asp
705                 710                 715                 720

Pro Leu Cys Gln Gln Phe Gly Phe His Arg Asn Asp Tyr Ser Arg Pro
                725                 730                 735

Thr Pro Met Met Arg Ala Ser Leu Leu Tyr Asn Leu His Glu Ala Gly
            740                 745                 750

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

Ser Ser Lys Tyr Gly Leu Val Arg Ile Phe Lys Val Met Asn Val Ser
    770                 775                 780

Ala Glu Ser Lys Lys Trp Val Ala Asp Pro Ala Asn Arg Val Cys His
785                 790                 795                 800

Pro Pro Gly Ser Trp Ile Cys Pro Gly Gln Tyr Pro Pro Ala Lys Glu
                805                 810                 815

Ile Gln Glu Met Leu Ala His Arg Val Pro Phe Asp Gln Val Thr Asn
            820                 825                 830

Ala Asp Arg Lys Asn Asn Val Gly Ser Tyr Gln Glu Glu Tyr Met Arg
        835                 840                 845

Arg Met Arg Glu Ser Glu Asn Arg Arg
    850                 855
```

<210> 104
<211> 836

<212> PRT
<213> Leishmania infantum

<400> 104

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Met Gly Lys Lys Gly Asn Leu Leu Gly Asp Ser Gly Ser Ala Ala Thr
1               5                  10                  15


Ala Ser Pro Pro Ala Asn Met Ile Leu Leu Pro Lys Thr Pro Ile Asp
            20                  25                  30


Thr Lys Asp Phe Ile Gly Ile Phe Ser Phe Pro Phe Trp Pro Val Arg
        35                  40                  45


Phe Val Val Thr Val Val Ala Leu Phe Val Val Gly Ala Ser Cys Phe
    50                  55                  60


Gln Ala Phe Thr Val Arg Met Thr Ser Val Gln Ile Tyr Gly Tyr Leu
65                  70                  75                  80


Ile His Glu Phe Asp Pro Trp Phe Asn Tyr Arg Ala Ala Glu Tyr Met
                85                  90                  95


Ser Thr His Gly Trp Ser Ala Phe Phe Ser Trp Phe Asp Tyr Met Ser
            100                 105                 110


Trp Tyr Pro Leu Gly Arg Pro Val Gly Ser Thr Thr Tyr Pro Gly Leu
        115                 120                 125


Gln Leu Thr Ala Val Ala Ile His Arg Ala Leu Ala Ala Ala Gly Met
    130                 135                 140


Pro Met Ser Leu Asn Asn Val Cys Val Leu Met Pro Ala Trp Phe Gly
145                 150                 155                 160


Ala Ile Ala Thr Ala Thr Leu Ala Phe Cys Thr Tyr Glu Ala Ser Gly
                165                 170                 175
```

```
Ser Thr Val Ala Ala Ala Ala Ala Ala Leu Ser Phe Ser Ile Ile Pro
            180                 185                 190

Ala His Leu Met Arg Ser Met Ala Gly Glu Phe Asp Asn Glu Cys Ile
        195                 200                 205

Ala Val Ala Ala Met Leu Leu Thr Phe Tyr Cys Trp Val Arg Ser Leu
    210                 215                 220

Arg Thr Arg Ser Ser Trp Pro Ile Gly Val Leu Thr Gly Val Ala Tyr
225                 230                 235                 240

Gly Tyr Met Val Ala Ala Trp Gly Gly Tyr Ile Phe Val Leu Asn Met
                245                 250                 255

Val Ala Met His Ala Gly Ile Ser Ser Met Val Asp Trp Ala Arg Asn
            260                 265                 270

Thr Tyr Asn Pro Ser Leu Leu Arg Ala Tyr Thr Leu Phe Tyr Val Val
        275                 280                 285

Gly Thr Ala Ile Ala Val Cys Val Pro Pro Val Gly Met Ser Pro Phe
    290                 295                 300

Lys Ser Leu Glu Gln Leu Gly Ala Leu Leu Val Leu Val Phe Leu Cys
305                 310                 315                 320

Gly Leu Gln Ala Cys Glu Val Phe Arg Ala Arg Ala Gly Val Glu Val
                325                 330                 335

Arg Ser Arg Ala Asn Phe Lys Ile Arg Val Arg Val Phe Ser Val Met
            340                 345                 350

Ala Gly Val Ala Ala Leu Ala Ile Ala Val Leu Ala Pro Thr Gly Tyr
        355                 360                 365
```

```
Phe Gly Pro Leu Ser Val Arg Val Arg Ala Leu Phe Val Glu His Thr
    370                 375                 380

Arg Thr Gly Asn Pro Leu Val Asp Ser Val Ala Glu His Gln Pro Ala
385                 390                 395                 400

Gly Pro Glu Ala Met Trp Ser Phe Leu His Val Cys Gly Val Thr Trp
                405                 410                 415

Gly Leu Gly Ser Ile Val Leu Ala Leu Ser Thr Phe Val His Tyr Ala
            420                 425                 430

Pro Ser Lys Leu Phe Trp Leu Leu Asn Ser Gly Ala Val Tyr Tyr Phe
        435                 440                 445

Ser Thr Arg Met Ala Arg Leu Leu Leu Leu Ser Gly Pro Ala Ala Cys
    450                 455                 460

Leu Ser Thr Gly Ile Phe Val Gly Thr Ile Leu Glu Ala Ala Val Gln
465                 470                 475                 480

Leu Ser Phe Trp Asp Ser Asp Ala Thr Lys Ala Arg Lys Gln Gln Lys
                485                 490                 495

Pro Ala Gln Arg His Arg Arg Gly Ala Gly Lys Asp Ser Asp Arg Asp
            500                 505                 510

Asp Ala Glu Ser Ala Thr Thr Ala Arg Thr Leu Cys Asp Val Phe Ala
        515                 520                 525

Gly Ser Pro Leu Ala Trp Gly His Arg Met Val Leu Phe Ile Ala Val
    530                 535                 540

Trp Ala Leu Val Thr Thr Thr Ala Val Ser Phe Phe Ser Ser Asp Phe
545                 550                 555                 560
```

```
Ala Ser His Ser Thr Thr Phe Ala Glu Gln Ser Ser Asn Pro Met Ile
                565                 570                 575

Val Phe Ala Ala Val Val Gln Asn Arg Ala Thr Gly Lys Pro Met Asn
            580                 585                 590

Ile Leu Val Asp Asp Tyr Leu Arg Ser Tyr Ile Trp Leu Arg Asp Asn
        595                 600                 605

Thr Pro Glu Asp Ala Arg Ile Leu Ala Trp Trp Asp Tyr Gly Tyr Gln
    610                 615                 620

Ile Thr Gly Ile Gly Asn Arg Thr Ser Leu Ala Asp Gly Asn Thr Trp
625                 630                 635                 640

Asn His Glu His Ile Ala Thr Ile Gly Lys Met Leu Thr Ser Pro Val
                645                 650                 655

Ala Glu Ala His Ser Leu Val Arg His Met Ala Asp Tyr Val Leu Ile
            660                 665                 670

Trp Ala Gly Gln Ser Gly Asp Leu Met Lys Ser Pro His Met Ala Arg
        675                 680                 685

Ile Gly Asn Ser Val Tyr His Asp Ile Cys Pro His Asp Pro Leu Cys
    690                 695                 700

Gln Gln Phe Gly Phe Tyr Arg Asn Asp Tyr Ser Arg Pro Thr Pro Met
705                 710                 715                 720

Met Arg Ala Ser Leu Leu Tyr Asn Leu His Glu Val Gly Lys Thr Lys
                725                 730                 735

Gly Val Lys Val Asp Pro Ser Leu Phe Gln Glu Val Tyr Ser Ser Lys
            740                 745                 750
```

```
Tyr Gly Leu Val Arg Val Phe Lys Val Met Asn Val Ser Glu Glu Ser
        755                 760                 765


Lys Lys Trp Val Ala Asp Pro Ala Asn Arg Val Cys His Pro Pro Gly
    770                 775                 780


Ser Trp Ile Cys Pro Gly Gln Tyr Pro Pro Ala Lys Glu Ile Gln Glu
785                 790                 795                 800


Met Leu Ala His Arg Val Pro Phe Asp Gln Val Glu Lys Val Asp Arg
                805                 810                 815


Lys Asn His Val Gly Ser Tyr His Glu Glu Tyr Met Arg Arg Met Arg
            820                 825                 830


Glu Ser Glu Ser
        835
```

<210> 105
<211> 854
<212> PRT
<213> Leishmania braziliensis

<400> 105

```
Met Gly Lys Lys Lys Ala Ile Pro Ser Gly Ser Val Gly Pro Ala Thr
1               5                   10                  15


Thr Thr Ser Arg Glu Ala Pro Gly Lys Asp Glu Gly Ala Ser Gln Pro
            20                  25                  30


Ala Lys Thr Ala Ala Leu Pro Val Lys Pro Phe Val Leu Pro Asn Thr
        35                  40                  45


Leu Thr Asp Glu Glu Glu Phe Val Gly Ile Phe Pro Cys Pro Phe Trp
    50                  55                  60
```

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

Ser Cys Ile Arg Ala Phe Thr Ile Arg Met Leu Ser Val Gln Leu Tyr
                85                  90                  95

Gly Tyr Ile Ile His Glu Phe Asp Pro Trp Phe Asn Tyr Arg Ala Ala
            100                 105                 110

Glu Tyr Met Ser Ala His Gly Trp Ser Ala Phe Phe Ser Trp Phe Asp
        115                 120                 125

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

Pro Gly Leu Gln Leu Thr Ala Val Ala Ile His Arg Ala Leu Ala Ala
145                 150                 155                 160

Ala Gly Val Pro Met Ser Leu Asn Asn Val Cys Val Leu Ile Pro Ala
                165                 170                 175

Trp Tyr Gly Ala Ile Ala Thr Ala Ile Leu Ala Leu Cys Ala Tyr Glu
            180                 185                 190

Val Ser Arg Ser Met Val Ala Ala Ala Val Ala Ala Leu Ser Phe Ser
        195                 200                 205

Ile Ile Pro Ala His Leu Met Arg Ser Met Ala Gly Glu Phe Asp Asn
    210                 215                 220

Glu Cys Ile Ala Val Ala Ala Met Leu Leu Thr Phe Tyr Leu Trp Val
225                 230                 235                 240

Arg Ser Leu Arg Thr Arg Cys Ser Trp Pro Ile Gly Ile Leu Thr Gly
                245                 250                 255
```

```
Ile Ala Tyr Gly Tyr Met Val Ala Ala Trp Gly Gly Tyr Ile Phe Val
            260                 265                 270

Leu Asn Met Val Ala Met His Ala Gly Ile Ser Ser Met Val Asp Trp
        275                 280                 285

Ala Arg Asn Thr Tyr Asn Pro Ser Leu Leu Arg Ala Tyr Ala Leu Phe
    290                 295                 300

Tyr Val Val Gly Thr Ala Ile Ala Thr Arg Val Pro Pro Val Gly Met
305                 310                 315                 320

Ser Pro Phe Arg Ser Leu Glu Gln Leu Gly Ala Leu Ala Val Leu Leu
                325                 330                 335

Phe Leu Cys Gly Leu Gln Ala Cys Glu Val Phe Arg Ala Arg Ala Asp
            340                 345                 350

Val Glu Val Arg Ser Arg Ala Asn Phe Lys Ile Arg Met Arg Ala Phe
        355                 360                 365

Ser Val Met Ala Gly Val Gly Ala Leu Ala Ile Ala Val Leu Ser Pro
    370                 375                 380

Thr Gly Tyr Phe Gly Pro Leu Thr Ala Arg Val Arg Ala Leu Phe Met
385                 390                 395                 400

Glu His Thr Arg Thr Gly Asn Pro Leu Val Asp Ser Val Ala Glu His
                405                 410                 415

His Pro Ala Ser Pro Glu Ala Met Trp Thr Phe Leu His Val Cys Gly
            420                 425                 430

Val Thr Trp Gly Leu Gly Ser Ile Val Leu Leu Val Ser Leu Leu Val
        435                 440                 445
```

```
Asp Tyr Ser Ser Ala Lys Leu Phe Trp Leu Met Asn Ser Gly Ala Val
    450                 455                 460

Tyr Tyr Phe Ser Thr Arg Met Ser Arg Leu Leu Leu Leu Thr Gly Pro
465                 470                 475                 480

Ala Ala Cys Leu Ser Thr Gly Cys Phe Val Gly Thr Leu Leu Glu Ala
                485                 490                 495

Ala Ile Gln Phe Thr Phe Trp Ser Ser Asp Ala Thr Lys Ala Lys Lys
            500                 505                 510

Gln Gln Glu Thr Gln Leu His Gln Lys Gly Ala Arg Lys His Ser Asp
        515                 520                 525

Arg Ser Asn Ser Lys Asn Ala Leu Thr Val Arg Thr Leu Gly Asp Val
    530                 535                 540

Leu Arg Ser Thr Ser Leu Ala Trp Gly His Arg Met Val Leu Cys Phe
545                 550                 555                 560

Ala Met Trp Ala Leu Val Ile Thr Val Ala Val Cys Leu Leu Gly Ser
                565                 570                 575

Asp Phe Thr Ser His Ala Thr Met Phe Ala Arg Gln Thr Ser Asn Pro
            580                 585                 590

Leu Ile Val Phe Ala Thr Val Leu Arg Asp Arg Ala Thr Gly Lys Pro
        595                 600                 605

Thr Gln Val Leu Val Asp Asp Tyr Leu Arg Ser Tyr Leu Trp Leu Arg
    610                 615                 620

Asp Asn Thr Pro Arg Asn Ala Arg Val Leu Ser Trp Trp Asp Tyr Gly
625                 630                 635                 640
```

```
Tyr Gln Ile Thr Gly Ile Gly Asn Arg Thr Ser Leu Ala Asp Gly Asn
                645                 650                 655

Thr Trp Asn His Glu His Ile Ala Thr Ile Gly Lys Met Leu Thr Ser
            660                 665                 670

Pro Val Ala Glu Ala His Ser Leu Val Arg His Met Ala Asp Tyr Val
        675                 680                 685

Leu Ile Trp Ala Gly Gln Gly Gly Asp Leu Met Lys Ser Pro His Met
    690                 695                 700

Ala Arg Ile Gly Asn Ser Val Tyr His Asp Ile Cys Pro Asn Asp Pro
705                 710                 715                 720

Leu Cys Gln His Phe Gly Phe Tyr Lys Asn Asp Arg Asn Arg Pro Lys
                725                 730                 735

Pro Met Met Arg Ala Ser Leu Leu Tyr Asn Leu His Glu Ala Gly Arg
            740                 745                 750

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

Ser Lys Tyr Gly Leu Val Arg Ile Phe Lys Val Met Asn Val Ser Ala
    770                 775                 780

Glu Ser Lys Lys Trp Val Ala Asp Pro Ala Asn Arg Val Cys His Pro
785                 790                 795                 800

Pro Gly Ser Trp Ile Cys Pro Gly Gln Tyr Pro Pro Ala Lys Glu Ile
                805                 810                 815

Gln Glu Met Leu Ala His Arg Val Pro Phe Asp His Val Asn Ser Phe
            820                 825                 830
```

Ser Arg Lys Lys Ala Gly Ser Tyr His Glu Glu Tyr Met Arg Arg Met
835 840 845

Arg Glu Glu Gln Asp Arg
850

<210> 106
<211> 852
<212> PRT
<213> Leishmania mexicana

<400> 106

Met Gly Lys Asn Lys Ala Asn Ser Val Ala Asp Ser Gly Ser Ala Ala
1 5 10 15

Thr Ala Pro Arg Glu Ala Pro Ala Gln Ala Lys Asp Ala Ala Pro Gln
20 25 30

Ala Gln Thr Ala Ser Pro Pro Pro Lys Lys Thr Leu Leu Pro Lys Thr
35 40 45

Leu Thr Asp Glu Thr Glu Phe Val Gly Ile Phe Pro Phe Pro Phe Trp
50 55 60

Pro Val Arg Phe Val Val Thr Val Val Ala Leu Phe Gly Leu Gly Ala
65 70 75 80

Ser Cys Leu Gln Ala Phe Thr Val Arg Met Thr Ser Val Lys Ile Tyr
85 90 95

Gly Tyr Leu Ile His Glu Phe Asp Pro Trp Phe Asn Tyr Arg Ala Ala
100 105 110

Glu Tyr Met Ser Thr His Gly Trp Ser Ala Phe Phe Ser Trp Phe Asp
115 120 125

Tyr Met Ser Trp Tyr Pro Leu Gly Arg Pro Val Gly Ser Thr Thr Tyr

```
    130                 135                 140

Pro Gly Leu Gln Phe Thr Ala Val Ala Ile His Arg Ala Leu Ala Ala
145                 150                 155                 160

Ala Gly Ile Pro Met Ser Leu Asn Asp Val Cys Val Leu Ile Pro Ala
                165                 170                 175

Trp Phe Gly Ala Ile Ala Thr Ala Leu Leu Ala Leu Cys Thr Tyr Glu
            180                 185                 190

Ala Ser Gly Ser Thr Val Ala Ala Ala Ala Ala Ala Leu Ser Phe Ser
        195                 200                 205

Ile Ile Pro Ala His Leu Met Arg Ser Met Ala Gly Glu Phe Asp Asn
    210                 215                 220

Glu Cys Ile Ala Val Ala Ala Met Leu Leu Thr Phe Tyr Cys Trp Val
225                 230                 235                 240

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

Val Ala Tyr Gly Tyr Met Val Ala Ala Trp Gly Gly Tyr Ile Phe Val
            260                 265                 270

Leu Asn Met Val Ala Met His Ala Gly Ile Ser Ser Met Val Asp Trp
        275                 280                 285

Ala Arg Asn Thr Tyr Asn Pro Ser Leu Leu Arg Ala Tyr Thr Leu Phe
    290                 295                 300

Tyr Val Val Gly Thr Ala Ile Ala Val Cys Val Pro Pro Val Gly Met
305                 310                 315                 320

Ser Pro Phe Lys Ser Leu Glu Gln Leu Gly Ala Leu Leu Val Leu Val
```

```
                325                 330                 335

Phe Leu Cys Gly Leu Gln Val Cys Glu Val Leu Arg Ala Arg Ala Gly
            340                 345                 350

Val Glu Val Arg Ser Arg Ala Asn Phe Lys Ile Arg Ala Arg Val Phe
        355                 360                 365

Ser Ala Met Ala Gly Gly Ala Ala Leu Ala Ile Ala Leu Leu Ala Pro
    370                 375                 380

Arg Gly Tyr Phe Gly Pro Leu Ser Ala Arg Val Arg Ala Leu Phe Val
385                 390                 395                 400

Glu His Thr Arg Thr Gly Asn Pro Leu Val Asp Ser Val Ala Glu His
                405                 410                 415

Gln Pro Ala Ser Pro Glu Ala Met Trp Ser Phe Leu His Val Cys Gly
            420                 425                 430

Val Thr Trp Gly Leu Gly Phe Ile Val Leu Ala Val Ser Thr Phe Val
        435                 440                 445

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

Tyr Tyr Phe Ser Thr Arg Met Ala Arg Leu Leu Leu Leu Ser Gly Pro
465                 470                 475                 480

Ala Ala Cys Leu Ser Thr Gly Ile Phe Val Gly Ala Ile Leu Glu Ala
                485                 490                 495

Ala Val Gln Leu Ser Phe Trp Asp Ser Asp Ala Thr Lys Ala Lys Pro
            500                 505                 510

Gln Lys Gln Thr Gln Arg His Gln Arg Gly Ala Arg Lys Asp Asn Lys
```

```
        515                 520                 525

Arg Asn Asp Ala Glu Ser Gly Met Thr Ala Leu Ser Leu Cys Asp Ile
    530                 535                 540

Val Ser Gly Ser Ser Leu Ala Trp Gly His Arg Met Val Leu Cys Ile
545                 550                 555                 560

Ala Met Trp Ala Leu Val Thr Thr Thr Val Val Thr Phe Ile Ser Ser
                565                 570                 575

Gly Phe Ala Ser His Ser Leu Lys Phe Ala Glu Gln Ser Ser Asn Pro
            580                 585                 590

Met Ile Val Phe Ala Ala Ser Val Pro Asn Arg Ala Thr Gly Lys Pro
        595                 600                 605

Met Met Ile Leu Val Asp Asp Tyr Leu His Ser Tyr Leu Trp Leu Arg
    610                 615                 620

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

Tyr Gln Ile Thr Gly Ile Gly Asn Arg Thr Ser Leu Ala Asp Gly Asn
                645                 650                 655

Thr Trp Asn His Glu His Ile Ala Thr Ile Gly Lys Met Leu Thr Ser
            660                 665                 670

Pro Val Ala Glu Ala His Ser Leu Val Arg His Met Ala Asp Tyr Val
        675                 680                 685

Leu Ile Trp Ala Gly Gln Ser Gly Asp Leu Met Lys Ser Pro His Met
    690                 695                 700

Ala Arg Ile Gly Asn Ser Val Tyr His Asp Ile Cys Pro Asn Asp Pro
```

705 710 715 720

Leu Cys Gln Gln Phe Gly Phe Tyr Arg Asn Asp Tyr His Arg Pro Thr
725 730 735

Pro Met Met Arg Ala Ser Leu Leu Tyr Asn Leu His Glu Ala Gly Lys
740 745 750

Thr Ala Ala Val Lys Val Asp Pro Ser Leu Phe Gln Glu Val Tyr Ser
755 760 765

Ser Lys Tyr Gly Leu Val Arg Ile Phe Lys Val Met Asn Val Ser Ala
770 775 780

Glu Ser Lys Lys Trp Val Ala Asp Pro Ala Asn Arg Val Cys Arg Pro
785 790 795 800

Pro Gly Ser Trp Ile Cys Pro Gly Gln Tyr Pro Pro Ala Lys Glu Ile
805 810 815

Gln Glu Met Leu Ala His Arg Val Ser Phe Asp Gln Val Asp Lys Asp
820 825 830

Lys Lys Arg Lys Ala Thr Tyr His Glu Glu Tyr Met Arg Arg Met Arg
835 840 845

Glu Asn Glu Ile
850

<210> 107
<211> 2575
<212> DNA
<213> Leishmania major

<400> 107
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agaggcctct gcccaggccg aggacgccgc cagccagacc aagaccgcca gccccctgc 120

caaggtcatc ctcctgccca agaccctcac cgacgagaag gacttcatcg gcatcttccc 180

gttcccgttc tggcccgtcc acttcgtcct caccgtcgtc gccctcttcg tcctcgccgc 240

cagctgcttc caggccttca ccgtccgcat gatcagcgtc cagatctacg gctacctcat 300

ccacgagttc gacccctggt tcaactaccg agccgccgag tacatgagca cccacggctg 360

gtccgccttt ttcagctggt tcgactacat gagctggtat ccgctcggcc gacccgtcgg 420

cagcaccacc taccccggcc tccagctcac cgccgtggcc atccatcgag ccctcgccgc 480

tgccggcatg cctatgagcc tcaacaacgt ctgcgtcctc atgcccgcct ggttcggcgc 540

cattgcgacc gccaccctcg cgttctgcac ctacgaggcc agcggctcta cagtggccgc 600

tgccgcggct gccctcagct tcagcatcat ccccgcccac ctcatgcgct ccatggccgg 660

cgagttcgac aacgagtgca ttgccgtcgc cgccatgctc ctcaccttct actgctgggt 720

ccgcagcctc cgcacgcgca gcagctggcc catcggcgtc ctgaccggcg tcgcctacgg 780

ctacatggct gccgcctggg gcggctacat cttcgtcctc aacatggtgg ccatgcacgc 840

cggcatcagc agcatggtcg actgggcccg caacacctac aaccccagcc tgctccgcgc 900

ctacaccctc ttctacgtcg tcggcaccgc cattgccgtc tgcgtccccc ccgtcggcat 960

gagccccttc aagagcctcg agcagctcgg cgccctcctc gtcctggtct ttctgtgcgg 1020

cctccaggtc tgcgaggtcc tccgagcccg agccggcgtc gaggtccgct ctcgcgccaa 1080

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cgagcacacc cgcaccggca acccccctcgt cgacagcgtc gccgagcacc agcccgccag 1260

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cgtcctggcc gtcagcacct tcgtccacta cagccccagc aaggtctttt ggctcctcaa 1380

ctctggcgcc gtctactact tctcgacccg aatggcccgc ctcctcctcc tgtccggccc 1440

tgccgcctgc ctgagcaccg gcatcttcgt cggcacgatc ctcgaggccg ccgtccagct 1500

cagcttctgg gacagcgacg ccaccaaggc caagaagcag cagaagcagg cccagcgcca 1560

ccagcgaggc gctggcaagg gctctggccg cgacgacgcc aagaacgcga cgaccgcccg 1620

agccttctgc gacgtctttg ccggcagcag cctcgcctgg ggccaccgca tggtcctctc 1680

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cgtccagaac cgcgccaccg gcaagccgat gaacctcctc gtcgacgact acctcaaggc 1860

ctacgagtgg ctccgcgaca gcacccctga ggacgcccgc gtcctggcct ggtgggacta 1920

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gaagtccccc cacatggccc gcatcggcaa cagcgtctac cacgacatct gccccgacga 2160

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ccccccctggc agctggatct gccctggcca gtaccctccc gccaaggaaa tccaggagat 2460

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cagctaccaa gaggagtaca tgcgccgcat gcgcgagagc gagaaccgcc gctag 2575

<210> 108
<211> 2511
<212> DNA
<213> Leishmania infantum

<400> 108
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agcttcccgt tctggcccgt ccgcttcgtc gtcaccgtcg tcgccctctt cgtcgtcggc 180

gccagctgct tccaggcctt caccgtccgc atgaccagcg tccagatcta cggctacctc 240

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tggtccgcct ttttcagctg gttcgactat atgagctggt atcccctcgg ccgacccgtc 360

ggcagcacca cctaccccgg cctccagctc accgctgtcg ccatccaccg agccctcgct 420

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gcctacaccc tcttctacgt cgtcggcacc gccattgccg tctgcgtccc ccccgtcggc 900

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aacttcaaga tccgcgtccg cgtgttcagc gtcatggccg gcgtcgccgc cttggctatc 1080

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<212> DNA
<213> Leishmania mexicana

<400> 109
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aagaagactt tgttgcccaa aacgctaaca gatgagacgg aatttgtcgg catctttccg 180

ttccctttct ggccagtacg gttcgtcgtt acggtggtgg cactcttcgg cttaggcgcc 240

agctgcctcc aagccttcac ggttcgcatg acctcggtta agatttacgg atacctgatc 300

cacgagttcg acccgtggtt caactaccgc gctgccgagt acatgtccac gcacggctgg 360

tccgccttct tcagctggtt cgactacatg agctggtacc cgctgggccg ccccgtcggc 420

tccaccacgt acccgggcct gcagttcact gccgtcgcca ttcaccgcgc actggcggct 480

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gagttcgaca acgagtgcat cgccgtcgcc gccatgctgc tcaccttcta ctgctgggtg 720

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taccagatca caggcatcgg caaccgcacc tcgctggccg atggcaacac ctggaaccac 1980

gagcacatcg ccaccatcgg caagatgttg acgtcgcccg tggcggaggc gcactcgctg 2040

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cctgggtcgt ggatctgccc cgggcagtac ccgccggcga aggagatcca ggagatgctg 2460

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<210> 110
<211> 2565
<212> DNA
<213> Leishmania braziliensis

<400> 110
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aagccctttg tgttgcccaa cacgctgaca gacgaggagg agtttgttgg catctttccc 180

tgccctttct ggccagtgcg atttgtcatc acagtgatgg cactcgtcct cttgggtgcc 240

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ctctggctgc gcgacaacac gcccagaaat gcgcgcgtgc tgtcctggtg ggactacggc 1920

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<210> 111
<211> 514
<212> PRT
<213> Trichoderma virens

<400> 111

Met Arg Phe Ile Ser Ser Ser Val Phe Ala Leu Gly Leu Val Ala Pro
1 5 10 15

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

Pro Thr Arg Ala Ala Ala Val Lys Ala Ala Phe Gln Thr Ser Trp Asn
35 40 45

Ala Tyr Arg Gln Phe Ala Phe Pro His Asp Asp Leu His Pro Val Ser
50 55 60

```
Asn Gly Phe Asp Asp Glu Arg Asn Gly Trp Gly Ser Ser Ala Ile Asp
65                  70                  75                  80

Gly Leu Asp Thr Ala Ile Leu Met Gly Ala Ser Asp Ile Val Asn Thr
                85                  90                  95

Ile Leu Gln Arg Val Pro Gln Ile Asn Phe Thr Thr Thr Ala Val Ala
            100                 105                 110

Asn Gln Gly Ile Ser Val Phe Glu Thr Asn Ile Arg Tyr Ile Gly Gly
        115                 120                 125

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

Thr Asn Gln Thr Leu Val Asn Asn Leu Leu Ser Gln Ala Gln Thr Leu
145                 150                 155                 160

Ala Asn Gly Leu Lys Val Ala Phe Asn Thr Thr Ser Gly Val Pro Asp
                165                 170                 175

Pro Thr Val Tyr Phe Asn Pro Thr Tyr Arg Arg Ser Gly Ala Ser Ser
            180                 185                 190

Asn Asn Ile Ala Glu Ile Gly Thr Leu Val Leu Glu Trp Thr Arg Leu
        195                 200                 205

Ser Asp Leu Thr Gly Asn Pro Leu Tyr Ala Gln Leu Ala Gln Lys Gly
    210                 215                 220

Glu Ser Tyr Leu Leu Asn Pro Thr Gly Ser Pro Glu Ala Trp Pro Gly
225                 230                 235                 240

Leu Val Gly Thr Phe Val Ser Thr Ser Ser Gly Ala Phe Gln Asp Ser
                245                 250                 255
```

```
Asn Gly Ser Trp Ser Ala Leu Ser Asp Ser Phe Tyr Glu Tyr Leu Ile
            260                 265                 270

Lys Met Tyr Leu Tyr Asp Pro Val Ala Phe Ala Asn Tyr Lys Asp Arg
        275                 280                 285

Trp Val Leu Ala Ala Asp Ser Thr Ile Ala His Leu Ala Ser His Pro
    290                 295                 300

Thr Thr Arg Lys Asp Leu Thr Phe Leu Ser Ala Tyr Ser Gly Gln Ser
305                 310                 315                 320

Thr Ser Pro Asn Ser Gly His Leu Ala Ser Phe Ala Gly Gly Asn Phe
                325                 330                 335

Ile Leu Gly Gly Ile Leu Leu Gly Gln Gln Lys Tyr Ile Asp Phe Gly
            340                 345                 350

Ile Gln Leu Thr Asn Ser Tyr Tyr Ala Thr Tyr Asn Gln Thr Ala Ser
        355                 360                 365

Gly Ile Gly Pro Glu Gly Phe Ala Trp Val Asp Ser Val Thr Gly Ala
    370                 375                 380

Gly Gly Ser Pro Pro Ser Ser Gln Ser Ser Phe Tyr Ser Lys Ala Gly
385                 390                 395                 400

Phe Trp Val Ser Ala Gly Tyr Tyr Ile Leu Arg Pro Glu Thr Leu Glu
                405                 410                 415

Ser Leu Tyr Tyr Ala Tyr Arg Val Thr Gly Asp Ser Lys Tyr Gln Asp
            420                 425                 430

Trp Ala Trp Ala Ala Phe Ser Ala Ile Thr Lys Val Cys Arg Ala Gly
        435                 440                 445
```

Ser Ala Tyr Ser Ser Ile Asn Asp Val Thr Gln Ala Asn Gly Gly Gly
450 455 460

Ala Ser Asp Asp Met Glu Ser Phe Trp Phe Ala Glu Ala Leu Lys Tyr
465 470 475 480

Ala Tyr Leu Ile Phe Ala Glu Glu Ser Asp Val Gln Leu Asn Pro Asn
485 490 495

Gly Gly Asn Lys Phe Val Phe Asn Thr Glu Ala His Pro Phe Ser Ile
500 505 510

Arg Lys

<210> 112
<211> 514
<212> PRT
<213> Trichoderma atroviride

<400> 112

Met Arg Phe Ile Ser Ser Ser Val Phe Ala Leu Gly Leu Val Ala Pro
1 5 10 15

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

Pro Thr Arg Ala Ala Ala Val Lys Ala Ala Phe Gln Thr Ser Trp Asn
35 40 45

Ala Tyr Arg Gln Phe Ala Phe Pro His Asp Asp Leu His Pro Val Ser
50 55 60

Asn Gly Phe Asp Asp Glu Arg Asn Gly Trp Gly Ser Ser Ala Ile Asp
65 70 75 80

Gly Leu Asp Thr Ala Ile Leu Met Gly Ala Ser Asp Ile Val Asn Thr

```
                85                  90                  95

Ile Leu Gln Arg Val Pro Gln Ile Asn Phe Thr Thr Thr Ala Val Ala
            100                 105                 110

Asn Gln Gly Ile Ser Val Phe Glu Thr Asn Ile Arg Tyr Ile Gly Gly
        115                 120                 125

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

Thr Asn Gln Thr Leu Val Asn Asn Leu Leu Ser Gln Ala Gln Thr Leu
145                 150                 155                 160

Ala Asn Gly Leu Lys Val Ala Phe Asn Thr Thr Ser Gly Val Pro Asp
                165                 170                 175

Pro Thr Val Tyr Phe Asn Pro Thr Tyr Arg Arg Ser Gly Ala Ser Ser
            180                 185                 190

Asn Asn Ile Ala Glu Ile Gly Thr Leu Val Leu Glu Trp Thr Arg Leu
        195                 200                 205

Ser Asp Leu Thr Gly Asn Pro Leu Tyr Ala Gln Leu Ala Gln Lys Gly
    210                 215                 220

Glu Ser Tyr Leu Leu Asn Pro Thr Gly Ser Pro Glu Ala Trp Pro Gly
225                 230                 235                 240

Leu Val Gly Thr Phe Val Ser Thr Ser Ser Gly Ala Phe Gln Asp Ser
                245                 250                 255

Asn Gly Ser Trp Ser Ala Leu Ser Asp Ser Phe Tyr Glu Tyr Leu Ile
            260                 265                 270

Lys Met Tyr Leu Tyr Asp Pro Val Ala Phe Ala Asn Tyr Lys Asp Arg
```

```
        275                 280                 285

Trp Val Leu Ala Ala Asp Ser Thr Ile Ala His Leu Ala Ser His Pro
    290                 295                 300

Thr Thr Arg Lys Asp Leu Thr Phe Leu Ser Ala Tyr Ser Gly Gln Ser
305                 310                 315                 320

Thr Ser Pro Asn Ser Gly His Leu Ala Ser Phe Ala Gly Gly Asn Phe
                325                 330                 335

Ile Leu Gly Gly Ile Leu Leu Gly Gln Gln Lys Tyr Ile Asp Phe Gly
            340                 345                 350

Ile Gln Leu Thr Asn Ser Tyr Tyr Ala Thr Tyr Asn Gln Thr Ala Ser
        355                 360                 365

Gly Ile Gly Pro Glu Gly Phe Ala Trp Val Asp Ser Val Thr Gly Ala
    370                 375                 380

Gly Gly Ser Pro Pro Ser Ser Gln Ser Ser Phe Tyr Ser Lys Ala Gly
385                 390                 395                 400

Phe Trp Val Ser Ala Gly Tyr Tyr Ile Leu Arg Pro Glu Thr Leu Glu
                405                 410                 415

Ser Leu Tyr Tyr Ala Tyr Arg Val Thr Gly Asp Ser Lys Tyr Gln Asp
            420                 425                 430

Trp Ala Trp Ala Ala Phe Ser Ala Ile Thr Lys Val Cys Arg Ala Gly
        435                 440                 445

Ser Ala Tyr Ser Ser Ile Asn Asp Val Thr Gln Ala Asn Gly Gly Gly
    450                 455                 460

Ala Ser Asp Asp Met Glu Ser Phe Trp Phe Ala Glu Ala Leu Lys Tyr
```

465 470 475 480

Ala Tyr Leu Ile Phe Ala Glu Glu Ser Asp Val Gln Leu Asn Pro Asn
485 490 495

Gly Gly Asn Lys Phe Val Phe Asn Thr Glu Ala His Pro Phe Ser Ile
500 505 510

Arg Lys

<210> 113
<211> 523
<212> PRT
<213> Trichoderma reesei

<400> 113

Met Arg Phe Pro Ser Ser Ser Val Leu Ala Leu Gly Leu Ile Gly Pro
1 5 10 15

Ala Leu Ala Tyr Pro Lys Pro Gly Ala Thr Lys Arg Gly Ser Pro Asn
20 25 30

Pro Thr Arg Ala Ala Ala Val Lys Ala Ala Phe Gln Thr Ser Trp Asn
35 40 45

Ala Tyr His His Phe Ala Phe Pro His Asp Asp Leu His Pro Val Ser
50 55 60

Asn Ser Phe Asp Asp Glu Arg Asn Gly Trp Gly Ser Ser Ala Ile Asp
65 70 75 80

Gly Leu Asp Thr Ala Ile Leu Met Gly Asp Ala Asp Ile Val Asn Thr
85 90 95

Ile Leu Gln Tyr Val Pro Gln Ile Asn Phe Thr Thr Thr Ala Val Ala
100 105 110

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

Leu Leu Ser Ala Tyr Asp Leu Leu Arg Gly Pro Phe Ser Ser Leu Ala
    130                 135                 140

Thr Asn Gln Thr Leu Val Asn Ser Leu Leu Arg Gln Ala Gln Thr Leu
145                 150                 155                 160

Ala Asn Gly Leu Lys Val Ala Phe Thr Thr Pro Ser Gly Val Pro Asp
                165                 170                 175

Pro Thr Val Phe Phe Asn Pro Thr Val Arg Arg Ser Gly Ala Ser Ser
            180                 185                 190

Asn Asn Val Ala Glu Ile Gly Ser Leu Val Leu Glu Trp Thr Arg Leu
        195                 200                 205

Ser Asp Leu Thr Gly Asn Pro Gln Tyr Ala Gln Leu Ala Gln Lys Gly
    210                 215                 220

Glu Ser Tyr Leu Leu Asn Pro Lys Gly Ser Pro Glu Ala Trp Pro Gly
225                 230                 235                 240

Leu Ile Gly Thr Phe Val Ser Thr Ser Asn Gly Thr Phe Gln Asp Ser
                245                 250                 255

Ser Gly Ser Trp Ser Gly Leu Met Asp Ser Phe Tyr Glu Tyr Leu Ile
            260                 265                 270

Lys Met Tyr Leu Tyr Asp Pro Val Ala Phe Ala His Tyr Lys Asp Arg
        275                 280                 285

Trp Val Leu Ala Ala Asp Ser Thr Ile Ala His Leu Ala Ser His Pro
    290                 295                 300
```

```
Ser Thr Arg Lys Asp Leu Thr Phe Leu Ser Ser Tyr Asn Gly Gln Ser
305                 310                 315                 320

Thr Ser Pro Asn Ser Gly His Leu Ala Ser Phe Ala Gly Gly Asn Phe
                325                 330                 335

Ile Leu Gly Gly Ile Leu Leu Asn Glu Gln Lys Tyr Ile Asp Phe Gly
            340                 345                 350

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

Gly Ile Gly Pro Glu Gly Phe Ala Trp Val Asp Ser Val Thr Gly Ala
    370                 375                 380

Gly Gly Ser Pro Pro Ser Ser Gln Ser Gly Phe Tyr Ser Ser Ala Gly
385                 390                 395                 400

Phe Trp Val Thr Ala Pro Tyr Tyr Ile Leu Arg Pro Glu Thr Leu Glu
                405                 410                 415

Ser Leu Tyr Tyr Ala Tyr Arg Val Thr Gly Asp Ser Lys Trp Gln Asp
            420                 425                 430

Leu Ala Trp Glu Ala Phe Ser Ala Ile Glu Asp Ala Cys Arg Ala Gly
        435                 440                 445

Ser Ala Tyr Ser Ser Ile Asn Asp Val Thr Gln Ala Asn Gly Gly Gly
    450                 455                 460

Ala Ser Asp Asp Met Glu Ser Phe Trp Phe Ala Glu Ala Leu Lys Tyr
465                 470                 475                 480

Ala Tyr Leu Ile Phe Ala Glu Glu Ser Asp Val Gln Val Gln Ala Asn
                485                 490                 495
```

```
Gly Gly Asn Lys Phe Val Phe Asn Thr Glu Ala His Pro Phe Ser Ile
            500                 505                 510

Arg Ser Ser Ser Arg Arg Gly Gly His Leu Ala
        515                 520
```

<210> 114
<211> 527
<212> PRT
<213> Trichoderma reesei

<400> 114

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Met Arg Phe Pro Ser Ser Ser Val Leu Ala Leu Gly Leu Ile Gly Pro
1               5                   10                  15

Ala Leu Ala Tyr Pro Lys Pro Gly Ala Thr Lys Arg Gly Ser Pro Asn
            20                  25                  30

Pro Thr Arg Ala Ala Ala Val Lys Ala Ala Phe Gln Thr Ser Trp Asn
        35                  40                  45

Ala Tyr His His Phe Ala Phe Pro His Asp Asp Leu His Pro Val Ser
    50                  55                  60

Asn Ser Phe Asp Asp Glu Arg Asn Gly Trp Gly Ser Ser Ala Ile Asp
65                  70                  75                  80

Gly Leu Asp Thr Ala Ile Leu Met Gly Asp Ala Asp Ile Val Asn Thr
                85                  90                  95

Ile Leu Gln Tyr Val Pro Gln Ile Asn Phe Thr Thr Thr Ala Val Ala
            100                 105                 110

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

```
Leu Leu Ser Ala Tyr Asp Leu Leu Arg Gly Pro Phe Ser Ser Leu Ala
    130                 135                 140

Thr Asn Gln Thr Leu Val Asn Ser Leu Leu Arg Gln Ala Gln Thr Leu
145                 150                 155                 160

Ala Asn Gly Leu Lys Val Ala Phe Thr Thr Pro Ser Gly Val Pro Asp
                165                 170                 175

Pro Thr Val Phe Phe Asn Pro Thr Val Arg Arg Ser Gly Ala Ser Ser
            180                 185                 190

Asn Asn Val Ala Glu Ile Gly Ser Leu Val Leu Glu Trp Thr Arg Leu
        195                 200                 205

Ser Asp Leu Thr Gly Asn Pro Gln Tyr Ala Gln Leu Ala Gln Lys Gly
    210                 215                 220

Glu Ser Tyr Leu Leu Asn Pro Lys Gly Ser Pro Glu Ala Trp Pro Gly
225                 230                 235                 240

Leu Ile Gly Thr Phe Val Ser Thr Ser Asn Gly Thr Phe Gln Asp Ser
                245                 250                 255

Ser Gly Ser Trp Ser Gly Leu Met Asp Ser Phe Tyr Glu Tyr Leu Ile
            260                 265                 270

Lys Met Tyr Leu Tyr Asp Pro Val Ala Phe Ala His Tyr Lys Asp Arg
        275                 280                 285

Trp Val Leu Ala Ala Asp Ser Thr Ile Ala His Leu Ala Ser His Pro
    290                 295                 300

Ser Thr Arg Lys Asp Leu Thr Phe Leu Ser Ser Tyr Asn Gly Gln Ser
305                 310                 315                 320
```

```
Thr Ser Pro Asn Ser Gly His Leu Ala Ser Phe Ala Gly Gly Asn Phe
                325                 330                 335

Ile Leu Gly Gly Ile Leu Leu Asn Glu Gln Lys Tyr Ile Asp Phe Gly
            340                 345                 350

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

Gly Ile Gly Pro Glu Gly Phe Ala Trp Val Asp Ser Val Thr Gly Ala
    370                 375                 380

Gly Gly Ser Pro Pro Ser Ser Gln Ser Gly Phe Tyr Ser Ser Ala Gly
385                 390                 395                 400

Phe Trp Val Thr Ala Pro Tyr Tyr Ile Leu Arg Pro Glu Thr Leu Glu
                405                 410                 415

Ser Leu Tyr Tyr Ala Tyr Arg Val Thr Gly Asp Ser Lys Trp Gln Asp
            420                 425                 430

Leu Ala Trp Glu Ala Phe Ser Ala Ile Glu Asp Ala Cys Arg Ala Gly
        435                 440                 445

Ser Ala Tyr Ser Ser Ile Asn Asp Val Thr Gln Ala Asn Gly Gly Gly
    450                 455                 460

Ala Ser Asp Asp Met Glu Ser Phe Trp Phe Ala Glu Ala Leu Lys Tyr
465                 470                 475                 480

Ala Tyr Leu Ile Phe Ala Glu Glu Ser Asp Val Gln Val Gln Ala Asn
                485                 490                 495

Gly Gly Asn Lys Phe Val Phe Asn Thr Glu Ala His Pro Phe Ser Ile
            500                 505                 510
```

Arg Ser Ser Ser Arg Arg Gly Gly His Leu Ala Lys Asp Glu Leu
515 520 525

<210> 115
<211> 773
<212> PRT
<213> Trichoderma reesei

<400> 115

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

Ala Ser Lys Gln Ala Pro Val Glu Ser Ala Phe Val Pro Glu Val Glu
20 25 30

Leu Asp Lys Leu Ser Lys Ala Ala Leu Ser Ser Arg Arg Asn Ile Gln
35 40 45

Arg Gly Glu Leu Glu His Lys Leu Ala Leu Thr Leu Val Thr Ile Leu
50 55 60

Gly Phe Val Thr Arg Phe Trp Gly Ile Ser His Pro Asp Glu Val Val
65 70 75 80

Phe Asp Glu Val His Phe Gly Lys Phe Ala Ser Tyr Tyr Leu Gln Arg
85 90 95

Thr Tyr Phe Phe Asp Val His Pro Pro Phe Ala Lys Leu Leu Phe Ala
100 105 110

Phe Val Gly Trp Leu Val Gly Tyr Asp Gly His Phe His Phe Asp Asn
115 120 125

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

```
Ala Leu Pro Ala Phe Leu Gly Ala Leu Thr Val Ser Val Thr Tyr Leu
145                 150                 155                 160


Ile Met Trp Glu Ser Gly Tyr Ser Val Pro Ala Cys Leu Val Ala Thr
                165                 170                 175


Gly Leu Ile Leu Leu Asp Asn Ala His Ile Gly Gln Thr Arg Leu Ile
            180                 185                 190


Leu Leu Asp Ala Thr Leu Val Leu Ala Met Ala Cys Ser Leu Leu Phe
        195                 200                 205


Tyr Ile Lys Phe Tyr Lys Leu Arg His Glu Pro Phe Ser Arg Lys Trp
    210                 215                 220


Trp Lys Trp Leu Ile Leu Thr Gly Phe Ala Leu Ser Cys Asp Ile Ser
225                 230                 235                 240


Thr Lys Tyr Val Gly Leu Phe Ala Phe Val Thr Ile Gly Ser Ala Val
                245                 250                 255


Ile Ile Asp Leu Trp Asp Leu Leu Asp Ile Lys Arg Arg Tyr Gly Ala
            260                 265                 270


Ile Ser Met Pro Glu Phe Gly Lys His Phe Ala Ala Arg Ala Phe Gly
        275                 280                 285


Leu Ile Ile Leu Pro Phe Leu Phe Tyr Leu Phe Trp Phe Gln Val His
    290                 295                 300


Phe Ser Val Leu Thr Arg Ser Gly Pro Gly Asp Asp Phe Met Thr Pro
305                 310                 315                 320


Glu Phe Gln Glu Thr Leu Ser Asp Asn Val Met Leu Ala Ser Ala Val
                325                 330                 335
```

```
Asp Ile Gln Tyr Tyr Asp Thr Ile Thr Ile Arg His Lys Glu Thr Lys
            340                 345                 350

Ala Tyr Leu His Ser His Thr Asp Thr Tyr Pro Leu Arg Tyr Asp Asp
        355                 360                 365

Gly Arg Ile Ser Ser Gln Gly Gln Gln Val Thr Gly Tyr Pro His Asn
    370                 375                 380

Asp Thr Asn Asn Tyr Trp Gln Ile Leu Pro Ala Asp Asn Asp Gln Lys
385                 390                 395                 400

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

Val Thr Asp Lys Ile Leu Leu Ser His Asp Val Ala Ser Pro Tyr Tyr
            420                 425                 430

Pro Thr Asn Gln Glu Phe Thr Cys Val Thr Pro Glu Glu Ala Phe Gly
        435                 440                 445

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

Thr Gly Gln Asp Phe Lys Thr Val Ala Ser His Phe Lys Leu Ile His
465                 470                 475                 480

Phe Pro Ser Lys Val Ala Met Trp Thr His Thr Thr Pro Leu Pro Glu
                485                 490                 495

Trp Ala Tyr Arg Gln Gln Glu Ile Asn Gly Asn Lys Gln Ile Thr Pro
            500                 505                 510

Ser Ser Asn Val Trp Ile Ala Glu Asp Ile Pro Ser Leu Pro Glu Asp
        515                 520                 525
```

```
Asp Ala Arg Arg His Lys Glu Gln Arg Lys Val Lys Ser Leu Pro Phe
    530                 535                 540

Leu Arg Lys Trp Phe Glu Leu Gln Arg Ser Met Phe Tyr His Asn Asn
545                 550                 555                 560

Lys Leu Thr Ser Ser His Pro Tyr Ser Ser Gln Pro Tyr His Trp Pro
                565                 570                 575

Phe Leu Leu Arg Gly Val Ser Phe Trp Thr Gln Asn Asp Thr Arg Gln
            580                 585                 590

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

Leu Leu Ala Val Phe Ala Gly Ile Ile Gly Ala Asp Gln Val Ser Leu
    610                 615                 620

Arg Arg Gly Ile Asp Ala Leu Asp His Arg Thr Arg Ser Arg Leu Tyr
625                 630                 635                 640

Asn Ser Thr Gly Phe Phe Phe Leu Ala Trp Ala Thr His Tyr Phe Pro
                645                 650                 655

Phe Phe Leu Met Gly Arg Gln Leu Phe Leu His His Tyr Leu Pro Ala
            660                 665                 670

His Leu Ala Ser Cys Leu Val Thr Gly Ser Leu Val Glu Phe Ile Phe
        675                 680                 685

Asn Thr Asp Pro Ala Asp Glu Glu Pro Ser Arg Ser Lys Asn Pro Lys
    690                 695                 700

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

Lys Ser Met Ala Gly Ala Trp Ile Ala Cys Phe Val Ile Leu Ala Ala
725 730 735

Ala Ala Ala Ser Trp Tyr Phe Phe Leu Pro Leu Thr Tyr Gly Tyr Pro
740 745 750

Gly Leu Ser Val Glu Glu Val Leu Arg Arg Lys Trp Leu Gly Tyr Asp
755 760 765

Leu His Phe Ala Lys
770

<210> 116
<211> 944
<212> PRT
<213> Trichoderma reesei

<400> 116

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

Ala Glu Lys Met Pro Val Ala Val Thr Ala Pro Val Ala Ser Ser Lys
20 25 30

Ser Lys Ala Ala Lys Lys Asn Ser Ser Tyr Arg Ser Asp Gly Val Ala
35 40 45

Asp Asn Asp Val Phe Leu Leu Pro Gly Ala Asp Tyr Val Ala Ala Leu
50 55 60

Gly Val Thr Val Leu Ala Thr Ile Val Arg Leu Phe Lys Ile Tyr Thr
65 70 75 80

Pro Thr Ser Val Val Phe Asp Glu Val His Phe Gly Gly Phe Ala Ser
85 90 95

Lys Tyr Ile Lys Gly Arg Phe Phe Met Asp Val His Pro Pro Leu Ala

```
            100                 105                 110

Lys Met Leu Ile Ala Leu Thr Gly Trp Leu Ala Gly Phe Asp Gly Asn
        115                 120                 125

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

Tyr Val Ala Met Arg Met Phe Pro Ala Val Cys Gly Ile Leu Leu Ala
145                 150                 155                 160

Pro Phe Met Phe Phe Thr Leu Lys Ala Val Gly Cys Arg Thr Thr Thr
                165                 170                 175

Ala Ile Leu Gly Ala Ser Phe Ile Ile Phe Glu Asn Gly Leu Leu Thr
            180                 185                 190

Gln Ala Arg Leu Ile Leu Leu Asp Ser Pro Leu Val Ala Ala Thr Ala
        195                 200                 205

Phe Thr Ala Met Ser Phe Asn Cys Phe Thr Asn Gln His Glu Gln Gly
    210                 215                 220

Pro Asp Lys Ala Phe Ser Leu Ser Trp Trp Phe Trp Leu Ala Met Thr
225                 230                 235                 240

Gly Leu Gly Leu Gly Ile Thr Ser Ser Ile Lys Trp Val Gly Leu Phe
                245                 250                 255

Thr Ile Ala Trp Val Gly Ser Leu Thr Leu Val Gln Leu Trp Val Leu
            260                 265                 270

Leu Gly Asp Ser Lys Asn Val Ser Met Arg Leu Trp Phe Lys His Phe
        275                 280                 285

Met Ala Arg Val Phe Cys Leu Ile Ile Ile Pro Leu Thr Phe Tyr Leu
```

```
    290                 295                 300

Ser Met Phe Ala Ile His Phe Leu Cys Leu Thr Asn Pro Gly Glu Gly
305                 310                 315                 320

Asp Gly Phe Met Ser Ser Glu Phe Gln Ala Thr Leu Asn Ser Lys Gly
                325                 330                 335

Met Lys Asp Val Pro Ala Asp Val Val Phe Gly Ser Arg Val Thr Ile
            340                 345                 350

Arg His Val Asn Thr Gln Gly Gly Tyr Leu His Ser His Pro Leu Met
        355                 360                 365

Tyr Pro Thr Gly Ser Leu Gln Gln Gln Ile Thr Leu Tyr Pro His Lys
    370                 375                 380

Asp Glu Asn Asn Ile Trp Ile Met Glu Asn Gln Thr Gln Pro Leu Gly
385                 390                 395                 400

Val Asp Gly Gln Pro Ile Asn Gly Thr Glu Ala Trp Asp Ala Leu Pro
                405                 410                 415

Glu Val His His Val Val Asp Gly Ser Val Ile Arg Leu Tyr His Lys
            420                 425                 430

Pro Thr Phe Arg Arg Leu His Ser His Asp Val Arg Pro Pro Val Thr
        435                 440                 445

Glu Ala Glu Trp Gln Asn Glu Val Ser Ala Tyr Gly Tyr Glu Gly Phe
    450                 455                 460

Glu Gly Asp Ala Asn Asp Leu Phe Arg Val Glu Ile Val Lys Lys Gln
465                 470                 475                 480

Ser Lys Gly Pro Leu Ala Lys Glu Arg Leu Arg Thr Ile Glu Thr Lys
```

```
                485                 490                 495

Phe Arg Leu Ile His Val Met Thr Gly Cys Ala Leu Phe Ser His Lys
            500                 505                 510

Val Lys Leu Pro Glu Trp Ala Ser Glu Gln Gln Glu Val Thr Cys Ala
        515                 520                 525

Arg Gly Gly Ser Leu Pro Asn Ser Ile Trp Tyr Ile Glu Tyr Asn Glu
    530                 535                 540

His Pro Leu Leu Gly Asp Asp Val Glu Lys Val Asn Tyr Ala Asn Pro
545                 550                 555                 560

Gly Phe Phe Gly Lys Phe Trp Glu Leu His Lys Val Met Trp Lys Thr
                565                 570                 575

Asn Ala Gly Leu Thr Asp Ser His Ala Trp Asp Ser Arg Pro Pro Ser
            580                 585                 590

Trp Pro Ile Leu Arg Arg Gly Ile Asn Phe Trp Gly Lys His His Met
        595                 600                 605

Gln Val Tyr Leu Leu Gly Asn Pro Phe Ile Trp Trp Ser Ser Thr Ala
    610                 615                 620

Ala Val Ala Ile Trp Val Ile Phe Lys Gly Val Ala Ile Leu Arg Trp
625                 630                 635                 640

Gln Arg Gly Cys Asn Asp Tyr Ala Ser Ser Thr Phe Lys Arg Phe Asp
                645                 650                 655

Tyr Glu Ile Gly Thr Ser Val Leu Gly Trp Ala Leu His Tyr Phe Pro
            660                 665                 670

Phe Tyr Leu Met Glu Arg Gln Leu Phe Leu His His Tyr Phe Pro Ala
```

```
        675                 680                 685

Leu Tyr Phe Ala Ile Leu Ala Leu Cys Gln Met Phe Asp Phe Ala Thr
    690                 695                 700

Val Arg Ile Pro Ala Ala Leu Gly Tyr Arg Ser Thr Leu Ile Asn Arg
705                 710                 715                 720

Val Gly Thr Val Ser Leu Leu Val Ile Ser Ala Ala Val Phe Thr Leu
                725                 730                 735

Phe Ala Pro Leu Ala Tyr Gly Thr Pro Trp Thr Lys Ala Glu Cys Asn
            740                 745                 750

Arg Val Lys Leu Phe Asp Lys Trp Asp Phe Asp Cys Asn Thr Phe Leu
        755                 760                 765

Asp Asp Tyr Lys Ser Tyr Thr Leu Thr Ser Leu Ala Pro Ser Ser Ile
    770                 775                 780

Ala Pro Ser Pro Pro Ala Ala Asn Val Pro Val Val Asn Gln Glu Gln
785                 790                 795                 800

Lys Pro Leu Ala Lys Gln Pro Glu Pro Val Ile Ser Gln Ala Ala Val
                805                 810                 815

Pro Gln Glu Pro Gln Ile Leu Ser Lys Glu Glu Lys Ile Glu Tyr Arg
            820                 825                 830

Asp Gln Asp Gly Asn Leu Leu Asn Asp Glu Gln Val Lys Ala Leu Gln
        835                 840                 845

Gly Lys Val Glu Phe Lys Thr Lys Tyr Glu Thr Lys Thr Arg Val Val
    850                 855                 860

Asp Ala Gln Gly His Glu Ile Pro Val Pro Glu Gly Gly Trp Pro Asp
```

865 870 875 880

Asp Met Ile Ala Gly Val Ala Pro Pro His Pro Asp Val Glu Gly Val
885 890 895

Asp Lys Glu Thr Pro Lys Val Glu Ser Ala Glu Val Pro Lys Glu Ala
900 905 910

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

Pro Ala Ser Glu Gly Gln Glu Val Glu Ala Thr Val Gln Glu Glu Leu
930 935 940

<210> 117
<211> 740
<212> PRT
<213> Trichoderma reesei

<400> 117

Met Ala Ala Asp Lys Ala Ala Leu Ala Ser Gly Ala Asp Leu Gly Asp
1 5 10 15

Gly Leu Arg Lys Arg Gln Ala Ala Ser Gln Ala Val Pro Ser Phe Ile
20 25 30

Pro Ala Gln Thr Glu Asp Thr Lys Lys Leu Ala Lys Lys Asp Lys Thr
35 40 45

Phe Val Gln Val Leu Ala Asp Trp Glu Ser Val Leu Ala Pro Leu Ile
50 55 60

Phe Thr Ala Val Ala Ile Phe Thr Arg Leu Tyr Lys Ile Gly Leu Ser
65 70 75 80

Asn Ile Val Thr Trp Asp Glu Ala His Phe Gly Lys Phe Gly Ser Tyr
85 90 95

```
Tyr Ile Lys His Glu Tyr Tyr Phe Asp Val His Pro Pro Leu Gly Lys
            100                 105                 110

Met Leu Val Gly Leu Ser Gly Val Leu Ala Gly Tyr Asn Gly Ser Phe
        115                 120                 125

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

Met Arg Ala Phe Asn Ala Ala Phe Gly Ile Ala Cys Ile Pro Met Ala
145                 150                 155                 160

Tyr Phe Thr Ala Lys Glu Leu Lys Leu Thr Arg Pro Ala Val Trp Phe
                165                 170                 175

Val Thr Leu Met Val Leu Cys Glu Asn Ser Tyr Thr Thr Ile Ser Arg
            180                 185                 190

Phe Ile Leu Leu Asp Ser Met Leu Leu Cys Gly Thr Phe Ala Thr Thr
        195                 200                 205

Leu Cys Trp Ala Lys Phe His Asn Gln Arg His Asn Ser Phe Glu Pro
    210                 215                 220

Glu Trp Phe Phe Trp Leu Phe Met Thr Gly Leu Ser Ile Gly Cys Val
225                 230                 235                 240

Cys Ser Val Lys Leu Val Gly Leu Phe Val Thr Ala Leu Val Gly Leu
                245                 250                 255

Tyr Thr Ile Glu Asp Leu Trp Arg Lys Tyr Gly Asp Arg Lys Met Pro
            260                 265                 270

Ile Pro Val Leu Ala Ala His Phe Ser Ala Arg Val Val Gly Leu Ile
        275                 280                 285
```

```
Ile Val Pro Phe Leu Ile Tyr Met Leu Ser Phe Ala Leu His Phe Ala
    290                 295                 300

Ile Leu Asp His Ser Gly Pro Gly Asp Ala Gln Met Ser Ser Leu Phe
305                 310                 315                 320

Gln Ala Asn Leu Lys Gly Thr Glu Val Gly Lys Asn Ser Pro Leu Glu
                325                 330                 335

Ile Ala Leu Gly Ser Arg Ala Thr Ile Lys Asn Met Gly Tyr Gly Gly
            340                 345                 350

Gly Leu Leu His Ser His Val Gln Thr Tyr Pro Glu Gly Ser Gly Gln
        355                 360                 365

Gln Gln Val Thr Cys Tyr His His Lys Asp Ala Asn Asn Asp Trp Phe
    370                 375                 380

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

Arg Phe Ile Gly Asp Gly Ser Val Ile Arg Leu Ile His Ala Gln Thr
                405                 410                 415

Gly Arg Asn Leu His Ser His Asp Ile Asp Ala Pro Ile Thr Lys Ser
            420                 425                 430

His Arg Glu Val Ser Ser Tyr Gly Asn Leu Thr Val Gly Asp Glu Lys
        435                 440                 445

Asp His Trp Lys Ile Glu Val Val Arg Asp Ala Ala Ser Arg Asp Arg
    450                 455                 460

Ser Arg Ile Arg Thr Leu Thr Thr Ala Phe Arg Leu Lys His Thr Val
465                 470                 475                 480
```

```
Leu Gly Cys Tyr Leu Arg Ala Gly Asn Val Asn Leu Pro Gln Trp Gly
                485                 490                 495

Phe Lys Gln Ile Glu Val Thr Cys Asp Lys Gln Asn Asn Pro Arg Asp
            500                 505                 510

Thr Tyr Thr His Trp Asn Val Glu Ala His Trp Asn Asp Arg Leu Pro
        515                 520                 525

Pro Ser Asp Pro Gly Val Tyr Lys Ser Pro Phe Ile His Asp Phe Ile
    530                 535                 540

His Leu Asn Val Ala Met Met Thr Ser Asn Asn Ala Leu Val Pro Asp
545                 550                 555                 560

Pro Asp Lys Gln Asp Asp Leu Ala Ser Gln Trp Trp Gln Trp Pro Ile
                565                 570                 575

Leu His Val Gly Leu Arg Met Cys Ser Trp Asp Asp Asn Ile Val Lys
            580                 585                 590

Tyr Phe Leu Leu Gly Asn Pro Phe Val Tyr Trp Ala Ser Thr Ala Ser
        595                 600                 605

Leu Gly Ala Val Ala Leu Val Ile Ala Trp Tyr Val Val Arg Trp Gln
    610                 615                 620

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

Ala Gly Ile Tyr Pro Val Ile Gly Trp Phe Leu His Tyr Leu Pro Phe
                645                 650                 655

Val Ile Met Ala Arg Val Thr Tyr Val His His Tyr Tyr Pro Ala Leu
            660                 665                 670
```

```
Tyr Phe Ala Ile Leu Ser Leu Gly Phe Leu Val Asp Trp Val Leu Arg
        675                 680                 685

Asn Arg Ala Ala Val Val Gln Gly Val Ala Tyr Gly Ile Leu Tyr Thr
    690                 695                 700

Val Val Ile Gly Leu Tyr Ile Leu Phe Met Pro Ile Cys Trp Gly Met
705                 710                 715                 720

Thr Gly Ser Ser Lys Gln Tyr Ser Tyr Leu Lys Trp Phe Asp Asn Trp
                725                 730                 735

Arg Ile Ser Asp
            740
```

<210> 118
<211> 2322
<212> DNA
<213> Trichoderma reesei

<400> 118

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gcgcctgtcg agtcggcatt cgttcccgag gtcgagctcg acaagctctc caaggccgct      120

ctgtcgtcgc gccgaaacat ccagagaggc gagctcgagc acaagcttgc cctgacgctg      180

gtgacgatcc tcggctttgt cacgcgattc tggggcatca gccaccccga cgaggtcgtc      240

tttgacgagg tgcattttgg aaagttcgcc tcctactacc tccagcgaac ctacttcttc      300

gacgtccacc ccccttttcgc caagctgctc ttcgccttcg ttggctggct ggttggctac      360

gacggtcact tccacttcga caacattggc gactcctacg tggccaacaa ggtgccctat      420

gtcgccttcc gagccttgcc cgccttcctc ggcgcattga ctgtgtcggt cacatacctc      480

atcatgtggg agtctggcta tagtgtgccg gcttgccttg tcgcgaccgg cctgatcctc      540

ctggacaatg cgcacattgg ccagacccgc ctcattctgc tcgacgccac cctggtgctc      600
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gccatggcct gcagtctctt gttctacatc aagttctaca agctgcggca cgagcccttt 660

agccgcaagt ggtggaagtg gctcatcctg accggctttg cgctgtcgtg cgacatctcg 720

accaagtatg tcggtctctt tgcctttgtc accattggct ccgccgtcat cattgatctg 780

tgggatcttt tggatatcaa gcgccgctat ggagccatca gcatgccaga gtttggaaag 840

cactttgcag cccgcgcctt tggcctcatc atcttgccct tcctcttcta cctcttctgg 900

ttccaggtgc acttttccgt cctgacccga tccggtcccg gcgacgactt catgactccc 960

gagttccagg agacgttgag cgacaacgtc atgctggcaa gcgccgtcga catccagtac 1020

tacgatacca tcaccatcag gcacaaggag accaaggcgt atcttcacag ccacaccgac 1080

acctaccctc tgcgatatga cgacggccgc atctccagcc aaggccaaca ggtcaccggc 1140

taccccaca acgacaccaa caactactgg cagatcctcc ctgccgacaa tgaccagaag 1200

ctcggccgta acgttaagaa tcaagacttg gtgcgacttc gacacattgt cacggacaag 1260

atcctgctct cccatgatgt cgcctcgccc tactacccta ccaaccagga gttcacctgt 1320

gtgacccccg aggaagcatt cggcgagcgc caaaacgaca ctctgttcga gatccggatt 1380

gagggaggca agaccggcca ggacttcaag accgttgcca gccacttcaa gctcattcac 1440

ttccccagca aggtggccat gtggactcat accacgcccc ttcccgagtg ggcctacagg 1500

cagcaggaaa tcaacggcaa caagcaaatc actcccagct ccaacgtctg gattgccgaa 1560

gacattcctt cgctcccgga agacgacgct cgccgccaca aggagcagcg caaggtcaag 1620

tcgctgccgt tcctccgcaa gtggtttgag ctgcagaggt ccatgttcta ccacaacaac 1680

aagctgacca gcagccaccc ctactccagc cagccctacc actggccatt cctcctccgc 1740

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caggtctcgc tgcgccgagg catcgatgct ctggatcacc gcacccgctc ccgactgtac 1920

aactctaccg gcttcttctt ccttgcctgg gccacccact acttcccctt tttcctcatg 1980

ggtcgtcagc tgttcttgca tcactacttg cctgcccatt tggcgtcctg cctggtcacg 2040

ggctccctcg tcgagttcat ctttaacacg gacccggcag acgaggagcc ttcgcgatcc 2100

aaaaacccca aggctactgg tcctcggaga cacatcacgg ctcgcgagcg gtttgctggc 2160

aagagcatgg ccggtgcctg gatcgcttgc tttgtgattc tcgctgccgc cgcggctagc 2220

tggtacttct tcttgccgtt gacgtatggc taccccggac tgtctgttga ggaggttctc 2280

aggagaaagt ggcttggata tgatcttcac tttgccaagt ag 2322

<210> 119
<211> 775
<212> PRT
<213> Aspergillus oryzae

<400> 119

Met Ser Gln Ser Pro Ser Pro Ser Leu Arg Lys Arg Gly Gly Lys Lys
1 5 10 15

Glu Ala Ser Pro Gly Pro Ser Glu Val Ser Ser Pro Tyr Pro Thr Asn
20 25 30

Gln Gly Ala Thr Pro Lys Pro Gln Ser Glu Trp Asp Tyr Arg Leu Ala
35 40 45

Ile Thr Val Leu Thr Val Leu Ala Phe Ile Thr Arg Phe Tyr Arg Ile
50 55 60

Ser Tyr Pro Asp Glu Val Val Phe Asp Glu Val His Phe Gly Lys Phe
65 70 75 80

Ala Ser Tyr Tyr Leu Gln Arg Thr Tyr Phe Phe Asp Val His Pro Pro
85 90 95

Phe Gly Lys Leu Leu Phe Ala Ala Val Gly Trp Leu Ile Gly Tyr Asp
100 105 110

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

```
Val Pro Tyr Val Ala Phe Arg Ala Leu Pro Ala Thr Leu Gly Ala Leu
    130                 135                 140

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

Pro Ala Cys Val Leu Ala Ala Gly Leu Val Leu Phe Asp Asn Ala His
                165                 170                 175

Ile Gly Glu Asp Arg Leu Ile Leu Leu Asp Ala Thr Leu Val Ile Thr
            180                 185                 190

Met Ala Leu Ser Ile Leu Cys Tyr Val Arg Phe Tyr Lys Leu Arg His
        195                 200                 205

Glu Pro Phe Gly Arg Lys Trp Trp Lys Trp Leu Leu Leu Thr Gly Val
    210                 215                 220

Ser Leu Ser Cys Val Ile Ser Thr Lys Tyr Val Gly Val Phe Thr Phe
225                 230                 235                 240

Val Thr Ile Gly Ala Ala Val Met Val Asp Leu Trp Asn Leu Leu Asp
                245                 250                 255

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

Phe Ala Ala Arg Gly Phe Ala Leu Ile Val Val Pro Phe Phe Phe Tyr
        275                 280                 285

Leu Phe Trp Phe Gln Val His Phe Ala Ile Leu Thr Arg Ser Gly Pro
    290                 295                 300

Gly Asp Asp Phe Met Thr Pro Glu Phe Gln Glu Thr Leu Ser Asp Asn
305                 310                 315                 320
```

```
Ala Leu Ala Ala Glu Ser Ile Gly Ile Gln Tyr Tyr Asp Ala Ile Thr
                325                 330                 335

Ile Arg His Lys Asp Thr Lys Val Phe Leu His Ser His Trp Glu Arg
            340                 345                 350

Tyr Pro Leu Arg Tyr Asp Asp Gly Arg Ile Ser Ser Gln Gly Gln Gln
        355                 360                 365

Val Thr Gly Tyr Pro Phe Asn Asp Thr Asn Asn Gln Trp Gln Ile Leu
    370                 375                 380

Pro Thr Val Pro Leu Glu Asp Asn Glu Gly Gln Gly His Ser Val Lys
385                 390                 395                 400

Asn Gly Asp Leu Val Gln Leu Leu His Leu Gly Thr Asp Ser Ile Leu
                405                 410                 415

Leu Thr His Asp Val Ala Ser Pro Phe Tyr Pro Thr Asn Gln Glu Phe
            420                 425                 430

Thr Thr Val Thr Lys Asp Val Ala Ser Gly Glu Arg His Asn Glu Thr
        435                 440                 445

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

Thr Leu Ser Ser His Phe Lys Leu Ile His Tyr Pro Thr Arg Val Ala
465                 470                 475                 480

Met Trp Thr His Thr Thr Pro Leu Pro Glu Trp Gly Phe Lys Gln Ala
                485                 490                 495

Glu Ile Asn Gly Asn Lys Asn Val Leu Gln Thr Ser Asn Leu Trp Tyr
            500                 505                 510
```

```
Ala Glu Ser Ile Glu Ser Leu Glu Glu Asp Ser Pro Arg Lys Gln Lys
        515                 520                 525

Glu Glu Arg Lys Val Lys Gln Leu Pro Phe Leu Arg Lys Tyr Leu Glu
    530                 535                 540

Leu Gln Arg Ala Met Phe Phe His Asn Asn Ala Leu Thr Ser Ser His
545                 550                 555                 560

Pro Tyr Ala Ser Glu Pro Phe Gln Trp Pro Phe Leu Leu Arg Gly Val
                565                 570                 575

Ser Phe Trp Thr Lys Asn Asp Thr Arg Glu Gln Ile Tyr Phe Leu Gly
            580                 585                 590

Asn Pro Ile Gly Trp Trp Ile Ala Ser Ser Leu Leu Ala Val Phe Ala
        595                 600                 605

Gly Val Ile Gly Ala Asp Gln Leu Ser Leu Arg Arg Gly Val Asp Ala
    610                 615                 620

Val Glu Glu Ile Trp Gly Pro Gly Ala Arg Ser Arg Leu Tyr Asn Ser
625                 630                 635                 640

Thr Gly Phe Leu Phe Leu Cys Trp Gly Ala His Tyr Phe Pro Phe Trp
                645                 650                 655

Leu Met Gly Arg Gln Arg Phe Leu His His Tyr Leu Pro Ala His Leu
            660                 665                 670

Ala Ser Cys Leu Val Thr Gly Ala Leu Ile Glu Phe Ile Phe Asn Leu
        675                 680                 685

Gln Pro Val Gln Ala Val Ile Asp Ser Glu Val Asp Pro Ser Gly Lys
    690                 695                 700
```

```
Ser Lys Ser Ile Arg Pro Arg His Phe Val Thr Ala Lys Glu Arg Met
705                 710                 715                 720


Ser Arg Lys Ser Leu Val Ala Cys Trp Ile Ala Thr Leu Ser Ile Leu
                725                 730                 735


Ala Val Thr Val Trp Gly Phe Trp Phe Tyr Ala Pro Leu Thr Tyr Gly
            740                 745                 750


Thr Pro Gly Leu Asp Val Ala Gly Val Asn Ala Arg Arg Trp Leu Gly
        755                 760                 765


Tyr Asp Leu His Phe Ala Lys
    770                 775


<210>  120
<211>  775
<212>  PRT
<213>  Aspergillus niger

<400>  120

Met Ser Ser Ser Pro Ser Pro Ser Leu Arg Lys Arg Gly Gly Lys Lys
1               5                   10                  15


Glu Ser Thr Pro Val Pro Ala Asp Asn Phe Ser Ser Pro Leu Ser Lys
            20                  25                  30


Ala Ser Ala Pro Arg Ser Glu Trp Asp Tyr Trp Leu Ala Ile Ser Ile
        35                  40                  45


Leu Thr Val Leu Ala Phe Val Thr Arg Phe Tyr Lys Ile Ser Tyr Pro
    50                  55                  60


Asn Glu Val Val Phe Asp Glu Val His Phe Gly Lys Phe Ala Ser Tyr
65                  70                  75                  80
```

```
Tyr Leu Gln Arg Thr Tyr Phe Phe Asp Val His Pro Pro Phe Gly Lys
                85                  90                  95

Leu Leu Phe Ala Phe Met Gly Trp Leu Val Gly Tyr Asp Gly His Phe
            100                 105                 110

Leu Phe Asp Asn Ile Gly Asp Ser Tyr Ile Glu His Gln Val Pro Tyr
        115                 120                 125

Val Ala Leu Arg Ala Met Pro Ala Thr Leu Gly Ala Leu Thr Val Pro
    130                 135                 140

Val Val Phe Leu Ile Met Trp Glu Ser Gly Tyr Ser Leu Pro Ala Cys
145                 150                 155                 160

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

Asp Arg Leu Ile Leu Leu Asp Ala Ser Leu Val Leu Thr Met Ala Leu
            180                 185                 190

Ser Ile Leu Cys Tyr Ile Arg Phe Tyr Lys Leu Arg His Glu Ala Phe
        195                 200                 205

Gly Arg Lys Trp Trp Lys Trp Leu Leu Leu Thr Gly Val Ser Leu Ser
    210                 215                 220

Cys Val Ile Ser Thr Lys Tyr Val Gly Val Phe Thr Phe Val Thr Ile
225                 230                 235                 240

Gly Ser Ala Val Met Val Asp Leu Trp Asn Leu Leu Asp Ile Arg Arg
                245                 250                 255

Arg Gly Gly Ala Leu Thr Met Phe Gln Trp Gly Gln His Phe Val Ala
            260                 265                 270
```

```
Arg Ala Phe Ala Leu Ile Ile Val Pro Phe Phe Phe Tyr Leu Phe Trp
        275                 280                 285

Phe Gln Val His Phe Ala Ile Leu Thr Arg Ser Gly Pro Gly Asp Asp
    290                 295                 300

Phe Met Thr Pro Glu Phe Gln Glu Thr Leu Ser Asp Asn Val Leu Ser
305                 310                 315                 320

Ala Gln Ser Ile Gly Ile Glu Tyr Tyr Asp Thr Ile Thr Met Lys His
                325                 330                 335

Lys Asp Thr Lys Val Tyr Leu His Ser His Leu Glu Arg Tyr Pro Leu
            340                 345                 350

Arg Tyr Asp Asp Gly Arg Ile Ser Ser Gln Gly Gln Gln Val Thr Gly
        355                 360                 365

Tyr Pro Tyr Asn Asp Thr Asn Asn Gln Trp Gln Ile Ile Pro Thr Val
    370                 375                 380

Pro Leu Asp Val Thr Asp Thr Ser Gly His Lys Val Arg Asn Gly Asp
385                 390                 395                 400

Val Val Gln Leu Arg His Met Gly Thr Asp Thr Ile Leu Leu Thr His
                405                 410                 415

Asp Val Ala Ser Pro Tyr Tyr Pro Thr Asn Gln Glu Phe Thr Thr Val
            420                 425                 430

Ser His Glu Val Ala Asn Gly Asp Arg His Asn Asp Thr Leu Phe Glu
        435                 440                 445

Ile Lys Ile Glu Asn Gly Lys Pro His Gln Glu Phe Arg Thr Leu Ser
    450                 455                 460
```

```
Ser His Phe Lys Leu Ile His Met Pro Thr Arg Val Ala Met Trp Thr
465                 470                 475                 480

His Thr Thr Pro Leu Pro Asp Trp Ala Phe Lys Gln Ala Glu Ile Asn
                485                 490                 495

Gly Asn Lys Asn Ile Leu Gln Thr Ser Asn Leu Trp Phe Val Glu Ser
            500                 505                 510

Ile Glu Ser Leu Glu Glu Asp Ser Pro Arg Leu Val Lys Glu Glu Arg
        515                 520                 525

Gln Val Lys His Leu Pro Phe Phe Arg Lys Tyr Leu Glu Leu Gln Arg
    530                 535                 540

Ala Met Phe Phe His Asn Asn Ala Leu Thr Ser Ser His Pro Tyr Ala
545                 550                 555                 560

Ser Glu Pro Phe Gln Trp Pro Phe Leu Leu Arg Gly Val Ser Phe Trp
                565                 570                 575

Thr Lys Asn Asp Thr Arg Glu Gln Ile Tyr Phe Leu Gly Asn Pro Val
            580                 585                 590

Gly Trp Trp Ile Ala Ser Ser Leu Leu Ala Val Phe Ala Gly Val Ile
        595                 600                 605

Gly Ala Asp Gln Leu Ser Leu Arg Arg Gly Val Asp Ala Val Glu Glu
    610                 615                 620

Ile Trp Gly Gln Gly Ser Arg Ser Arg Leu Tyr Asn Ser Met Gly Phe
625                 630                 635                 640

Leu Phe Leu Cys Trp Ala Ala His Tyr Phe Pro Phe Trp Leu Met Gly
                645                 650                 655
```

```
Arg Gln Arg Phe Leu His His Tyr Leu Pro Ala His Leu Ala Ser Ala
            660                 665                 670


Leu Val Ala Gly Ala Leu Ile Glu Phe Ile Phe Asn Leu Glu Pro Leu
        675                 680                 685


Ser Val Ile Gln Arg Val Arg Ser Glu Asp Asp Pro Ser Gly Lys Ala
    690                 695                 700


Lys Ala Ser Ala Ser Val Gly Arg Phe Val Thr Ala Lys Glu Arg Met
705                 710                 715                 720


Gly Thr Lys Ser Leu Leu Ala Gly Trp Ile Ala Thr Leu Val Ile Leu
                725                 730                 735


Ala Gly Thr Ile Tyr Gly Phe Val Phe Tyr Ala Pro Leu Thr Tyr Gly
            740                 745                 750


Thr Pro Gly Leu Asp Val Pro Gly Ile Leu Ala Arg Lys Trp Leu Gly
        755                 760                 765


Tyr Asp Leu His Phe Ala Lys
    770                 775


<210>  121
<211>  773
<212>  PRT
<213>  Aspergillus nidulans

<400>  121

Met Ser Ser Ser Pro Ser Leu Arg Lys Arg Gly Gly Lys Arg Glu Asp
1               5                   10                  15


Thr Pro Val Pro Ser Asp Arg Ser Phe Ala Pro Ser Ala Ser Gln Leu
            20                  25                  30
```

```
Gly Ala Ala Ser Arg Ser Ser Glu Trp Asp Tyr Arg Leu Ala Ile Thr
        35                  40                  45

Ile Leu Thr Val Leu Ala Phe Ile Thr Arg Phe Tyr Lys Ile Ser Tyr
    50                  55                  60

Pro Asp Gln Val Val Phe Asp Glu Val His Phe Gly Lys Phe Ala Ser
65                  70                  75                  80

Tyr Tyr Leu Arg Arg Thr Tyr Phe Phe Asp Val His Pro Pro Phe Ala
                85                  90                  95

Lys Leu Leu Leu Ala Phe Thr Gly Trp Leu Val Gly Tyr Asp Gly His
            100                 105                 110

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

Tyr Val Ala Leu Arg Ala Met Pro Ala Val Leu Gly Ala Leu Thr Ile
    130                 135                 140

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

Cys Val Leu Ala Ser Gly Leu Val Leu Phe Asp Asn Ala His Val Gly
                165                 170                 175

Glu Asp Arg Leu Ile Leu Leu Asp Ser Thr Leu Val Ile Thr Met Ala
            180                 185                 190

Leu Ser Ile Leu Cys Tyr Ile Arg Phe Tyr Lys Leu Arg His Glu Pro
        195                 200                 205

Phe Gly Arg Lys Trp Trp Lys Trp Leu Leu Leu Thr Gly Val Ser Leu
    210                 215                 220
```

```
Ser Cys Val Ile Ser Thr Lys Tyr Val Gly Val Phe Thr Phe Val Thr
225                 230                 235                 240


Ile Gly Ser Ala Val Met Val Asp Leu Trp Asn Leu Leu Asp Ile Arg
                245                 250                 255


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


Ala Arg Phe Phe Ser Leu Ile Val Val Pro Phe Phe Phe Tyr Leu Phe
        275                 280                 285


Trp Phe Gln Val His Phe Ala Ile Leu Thr His Ser Gly Pro Gly Asp
    290                 295                 300


Asp Phe Met Thr Pro Ala Phe Gln Glu Thr Leu Ser Asp Asn Ala Met
305                 310                 315                 320


Ala Ala Gln Ser Val Ser Ile Glu Tyr Phe Asp Thr Ile Thr Met Arg
                325                 330                 335


His Lys Asp Thr Lys Val Phe Leu His Ser His Ser Asp Thr Tyr Pro
            340                 345                 350


Leu Arg Tyr Asp Asp Gly Arg Ile Ser Ser Gln Gly Gln Gln Val Thr
        355                 360                 365


Gly Tyr Pro Tyr Asn Asp Thr Asn Asn His Trp Gln Ile Ile Pro Thr
    370                 375                 380


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


Asp Ile Val Gln Leu Arg His Val Ala Thr Asp Thr Ile Leu Leu Thr
                405                 410                 415
```

```
His Asp Val Ala Ser Pro Tyr Tyr Pro Thr Asn Gln Glu Phe Thr Thr
            420                 425                 430

Val Ser His Glu Leu Ala Asp Gly Lys Arg His Asn Asp Thr Leu Phe
        435                 440                 445

Glu Ile Arg Val Glu His Gly Lys Ser Lys Gln Glu Phe Arg Thr Leu
    450                 455                 460

Ser Ser Gln Phe Lys Leu Val His Val Pro Thr Lys Val Ala Met Trp
465                 470                 475                 480

Thr His Thr Thr Pro Leu Pro Asp Trp Ala Tyr Lys Gln Ala Glu Ile
                485                 490                 495

Asn Gly Asn Lys Asn Val Leu Gln Ser Ser Asn Ile Trp Tyr Val Glu
            500                 505                 510

Ala Ile Glu Ser Leu Glu Glu Asp Ser Pro Arg Leu Lys Lys Glu Glu
        515                 520                 525

Arg Lys Val Lys His Leu Pro Phe Trp Arg Lys Tyr Ile Glu Leu Gln
    530                 535                 540

Arg Ala Met Phe Phe His Asn Asn Ala Leu Thr Ser Ser His Pro Tyr
545                 550                 555                 560

Ala Ser Glu Pro Phe Gln Trp Pro Phe Leu Leu Arg Gly Val Ser Phe
                565                 570                 575

Trp Thr Lys Ser Asp Thr Arg Glu Gln Ile Tyr Phe Leu Gly Asn Pro
            580                 585                 590

Val Gly Trp Trp Ile Ser Ser Ser Leu Leu Ala Val Phe Ala Gly Val
        595                 600                 605
```

```
Ile Gly Ala Asp Gln Leu Ser Leu Arg Arg Gly Val Asp Ala Val Glu
    610                 615                 620

Glu Ile Trp Gly Pro Gly Ser Arg Ser Arg Leu Tyr Asn Ser Thr Gly
625                 630                 635                 640

Phe Leu Phe Leu Cys Trp Ala Ala His Tyr Phe Pro Phe Trp Leu Met
                645                 650                 655

Gly Arg Gln Arg Phe Leu His His Tyr Leu Pro Ala His Val Ala Ser
            660                 665                 670

Ala Leu Val Thr Gly Ala Leu Ile Glu Phe Ile Phe Asn Ile Gln Pro
        675                 680                 685

Ile Ser Val Pro Ala Thr Ile Pro Val Ala Ala Asp Asp Pro Thr Gly
    690                 695                 700

Lys Gly Lys Thr Arg Arg Phe Val Thr Ala Arg Glu Arg Met Gly Val
705                 710                 715                 720

Lys Ser Ile Val Ala Gly Trp Ile Ala Ser Leu Thr Ile Leu Ala Ala
                725                 730                 735

Thr Ile Trp Gly Phe Trp Phe Phe Ala Pro Leu Thr Tyr Gly Thr Pro
            740                 745                 750

Gly Leu Asp Val Ala Gln Val Asn Ala Arg Lys Trp Leu Gly Tyr Asp
        755                 760                 765

Leu His Phe Ala Lys
    770
```

<210> 122
<211> 774
<212> PRT
<213> Trichoderma virens

<400> 122

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


Val Ala Ser Lys Gln Pro Val Ser Glu Ala Thr Phe Ala Pro Glu Val
            20                  25                  30


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


Gln Arg Gly Glu Thr Glu His Arg Val Ala Leu Thr Leu Val Thr Ile
    50                  55                  60


Leu Gly Phe Val Thr Arg Phe Trp Gly Ile Ser His Pro Asp Glu Val
65                  70                  75                  80


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


Arg Thr Tyr Phe Phe Asp Val His Pro Pro Phe Ala Lys Leu Leu Phe
            100                 105                 110


Ala Phe Val Gly Trp Leu Val Gly Tyr Asp Gly His Phe His Phe Glu
        115                 120                 125


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


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


Leu Ile Met Trp Glu Ser Gly Tyr Ser Val Pro Ala Cys Leu Val Ala
                165                 170                 175


Thr Gly Leu Ile Leu Leu Asp Asn Ala His Ile Gly Gln Thr Arg Leu
```

```
            180                 185                 190

Ile Leu Leu Asp Ala Thr Leu Val Leu Ala Met Ala Cys Ser Leu Leu
        195                 200                 205

Phe Tyr Ile Lys Phe Tyr Lys Leu Arg His Glu Pro Phe Ser Arg Lys
    210                 215                 220

Trp Trp Lys Trp Leu Val Leu Thr Gly Phe Ala Leu Ser Cys Asp Ile
225                 230                 235                 240

Ser Thr Lys Tyr Val Gly Leu Phe Ala Phe Val Thr Ile Gly Ser Ala
                245                 250                 255

Val Ile Ile Asp Leu Trp Glu Leu Leu Asp Ile Arg Arg Pro Gly Gly
            260                 265                 270

Ala Ile Ser Leu Pro Leu Phe Gly Lys His Phe Ala Ala Arg Ala Val
        275                 280                 285

Gly Leu Ile Ile Leu Pro Phe Leu Phe Tyr Leu Phe Trp Phe Gln Val
    290                 295                 300

His Phe Ala Val Leu Thr Arg Ser Gly Pro Gly Asp Asp Phe Met Ser
305                 310                 315                 320

Pro Glu Phe Gln Glu Thr Leu Ser Asp Asn Val Met Leu Ala Ser Ala
                325                 330                 335

Val Asp Ile Gln Tyr Tyr Asp Thr Ile Thr Ile Arg His Lys Glu Thr
            340                 345                 350

Lys Ala Tyr Leu His Ser His Leu Asp Thr Tyr Pro Leu Arg Tyr Asp
        355                 360                 365

Asp Gly Arg Ile Ser Ser Gln Gly Gln Gln Val Thr Gly Tyr Pro His
```

```
    370                 375                 380

Asn Asp Thr Asn Asn Tyr Trp Gln Ile Ile Pro Ala Ser Asn Asp Gln
385                 390                 395                 400

Lys Leu Gly Arg Ile Val Arg Asn Gln Glu Leu Val Arg Leu Arg His
                405                 410                 415

Ile Val Thr Asp Lys Ile Leu Leu Ser His Asp Val Ala Ser Pro Tyr
            420                 425                 430

Tyr Pro Thr Asn Gln Glu Phe Thr Ala Val Ser Ala Glu Glu Ala Tyr
        435                 440                 445

Gly Asp Arg Leu Asn Asp Thr Leu Phe Glu Ile Arg Ile Glu Gly Gly
    450                 455                 460

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

His Phe Pro Ser Lys Val Ala Met Trp Thr His Thr Thr Pro Leu Pro
                485                 490                 495

Glu Trp Ala Tyr Arg Gln Gln Glu Ile Asn Gly Asn Lys Gln Ile Thr
            500                 505                 510

Pro Ser Ser Asn Val Trp Ile Ala Glu Asp Ile Pro Ser Leu Pro Glu
        515                 520                 525

Asp His Ser Arg Arg Gln Lys Glu Glu Arg Lys Val Lys Ser Leu Pro
    530                 535                 540

Phe Leu Arg Lys Trp Phe Glu Leu Gln Arg Ser Met Phe Tyr His Asn
545                 550                 555                 560

Asn Lys Leu Thr Ser Ser His Pro Tyr Ser Ser Gln Pro Tyr His Trp
```

```
                565                 570                 575

Pro Phe Leu Leu Arg Gly Val Ser Phe Trp Thr Gln Asn Asp Thr Arg
            580                 585                 590

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

Gly Leu Leu Ala Val Phe Ala Gly Ile Ile Gly Ala Asp Gln Val Ser
    610                 615                 620

Leu Arg Arg Gly Ile Asp Ala Leu Asp His Arg Thr Arg Ser Arg Leu
625                 630                 635                 640

Tyr Asn Ser Thr Gly Phe Phe Trp Leu Ala Trp Ala Thr His Tyr Phe
                645                 650                 655

Pro Phe Phe Leu Met Gly Arg Gln Leu Phe Leu His His Tyr Leu Pro
            660                 665                 670

Ala His Leu Ala Ser Cys Leu Val Thr Gly Ser Leu Val Glu Phe Ile
        675                 680                 685

Phe Asn Thr Asp Pro Ala Asp Glu Glu Pro Ser Arg Ala Thr Asn Pro
    690                 695                 700

Arg Ala Ser Gly Pro Lys Arg His Ile Thr Ala Arg Glu Arg Phe Ala
705                 710                 715                 720

Gly Lys Ser Met Ala Gly Ala Trp Ile Ala Cys Phe Val Ile Leu Thr
                725                 730                 735

Val Ala Ala Ala Ser Trp Tyr Phe Phe Leu Pro Leu Thr Tyr Gly Tyr
            740                 745                 750

Pro Gly Leu Ser Val Asp Glu Val Asn Arg Arg Lys Trp Leu Gly Tyr
```

755 760 765

Asp Leu His Phe Ala Lys
770

<210> 123
<211> 771
<212> PRT
<213> Trichoderma atroviride

<400> 123

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

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

Leu Asp Lys Leu Ser Lys Ala Ala Ala Ser Ser Arg Gln Asn Val Gln
35 40 45

Arg Gly Glu Ile Glu His Lys Ile Ala Leu Thr Leu Val Thr Ile Leu
50 55 60

Gly Phe Val Thr Arg Phe Trp Gly Ile Ser His Pro Asp Glu Val Val
65 70 75 80

Phe Asp Glu Val His Phe Gly Lys Phe Ala Ser Tyr Tyr Leu Gln Arg
85 90 95

Thr Tyr Phe Phe Asp Val His Pro Pro Phe Ala Lys Leu Leu Phe Ala
100 105 110

Phe Val Gly Trp Leu Val Gly Tyr Asp Gly His Phe His Phe Glu Asn
115 120 125

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

```
Ala Leu Pro Ala Val Leu Gly Ala Leu Thr Val Ser Val Thr Tyr Leu
145                 150                 155                 160

Ile Met Trp Glu Ser Gly Tyr Ser Leu Pro Ala Cys Leu Val Ala Thr
                165                 170                 175

Gly Leu Ile Leu Leu Asp Asn Ala His Ile Gly Gln Thr Arg Leu Ile
            180                 185                 190

Leu Leu Asp Ala Thr Leu Val Leu Ala Met Ala Cys Ser Leu Leu Phe
        195                 200                 205

Tyr Ile Lys Phe Tyr Lys Leu Arg His Glu Ala Phe Ser Arg Lys Trp
    210                 215                 220

Trp Lys Trp Leu Ile Leu Thr Gly Phe Ala Leu Ser Cys Asp Ile Ser
225                 230                 235                 240

Thr Lys Tyr Val Gly Leu Phe Ala Phe Val Thr Ile Gly Ser Ala Val
                245                 250                 255

Ile Ile Asp Leu Trp Asp Leu Leu Asp Ile Lys Arg Arg Asn Gly Ala
            260                 265                 270

Ile Ser Leu Gln Leu Phe Gly Lys His Phe Ala Ala Arg Ala Ile Gly
        275                 280                 285

Leu Ile Val Leu Pro Phe Leu Phe Tyr Leu Phe Trp Phe Gln Val His
    290                 295                 300

Phe Ala Val Leu Thr Arg Ser Gly Pro Gly Asp Asp Phe Met Thr Pro
305                 310                 315                 320

Glu Phe Gln Glu Thr Leu Ser Asp Asn Val Met Leu Ala Asn Ala Val
                325                 330                 335
```

```
Asp Ile His Tyr Tyr Asp Tyr Ile Thr Ile Arg His Lys Glu Thr Lys
            340                 345                 350

Ala Tyr Leu His Ser His Pro Asp Thr Tyr Pro Leu Arg Tyr Asp Asp
        355                 360                 365

Gly Arg Ile Ser Ser Gln Gly Gln Gln Ile Thr Gly Tyr Pro His Asn
    370                 375                 380

Asp Thr Asn Asn Tyr Trp Gln Val Leu Pro Ser Asp Asn Val His Asn
385                 390                 395                 400

Thr Glu Arg Ile Val Arg Asn Phe Asp Leu Val Arg Leu Arg His Ile
                405                 410                 415

Val Thr Asp Lys Ile Leu Leu Ser His Asp Val Ala Ser Pro Tyr Phe
            420                 425                 430

Pro Thr Asn Gln Glu Phe Thr Ala Val Thr Ser Glu Glu Ala Phe Gly
        435                 440                 445

Glu Arg Gln Asn Asp Thr Leu Phe Glu Ile Arg Val Glu Thr Ala Lys
    450                 455                 460

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

Phe Pro Ser Lys Val Ala Met Trp Thr His Thr Thr Pro Leu Pro Glu
                485                 490                 495

Trp Gly Tyr Lys Gln Gln Glu Ile Asn Gly Asn Lys Gln Val Thr Val
            500                 505                 510

Ser Ser Asn Met Trp Ile Ala Glu Asp Ile Pro Ser Leu Pro Gln Asp
        515                 520                 525
```

```
Asp Ala Arg Arg Gln Lys Glu Gln Arg Gln Val Lys Ser Leu Pro Phe
    530                 535                 540

Leu Arg Lys Trp Phe Glu Leu Gln Arg Ser Met Phe Tyr His Asn Asn
545                 550                 555                 560

Lys Leu Thr Ser Ser His Pro Tyr Ser Ser Gln Pro Tyr His Trp Pro
                565                 570                 575

Phe Leu Leu Arg Gly Val Ser Phe Trp Thr Gln Asn Asp Thr Arg Gln
            580                 585                 590

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

Leu Leu Ala Val Phe Ala Gly Ile Ile Ala Ala Asp Gln Ile Ser Leu
    610                 615                 620

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

Asn Ser Thr Gly Phe Phe Trp Leu Ala Trp Ala Thr His Tyr Phe Pro
                645                 650                 655

Phe Tyr Leu Met Gly Arg Gln Leu Phe Leu His His Tyr Leu Pro Ala
            660                 665                 670

His Leu Ala Ser Cys Leu Val Thr Gly Ala Leu Val Glu Phe Ile Phe
        675                 680                 685

Asn Ser Asp Ala Val Glu Glu Glu Ser Ser Lys Ser Gly Asn Arg Ser
    690                 695                 700

Ser Pro Lys Arg His Val Thr Ala Arg Glu Arg Phe Ala Gly Lys Ser
705                 710                 715                 720
```

```
Met Leu Gly Ala Trp Ile Ala Cys Gly Val Ile Leu Ser Ala Ala Ala
                725                 730                 735


Ala Cys Trp Tyr Phe Phe Leu Pro Leu Thr Tyr Gly Tyr Pro Gly Leu
            740                 745                 750


Ser Val Glu Glu Val Val Arg Arg Lys Trp Leu Gly Tyr Asp Leu His
        755                 760                 765


Phe Ala Lys
    770
```

<210> 124
<211> 770
<212> PRT
<213> Fusarium oxysporum

<400> 124

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


Pro Ser Lys Lys Pro Phe Glu Glu Asp Ser Phe Asp Pro Asn Ile Glu
            20                  25                  30


Leu Asp Lys Leu Ala Lys Ala Gly Ala Gln Arg Ala Ala Ala Gln Ser
        35                  40                  45


Glu Thr Glu Tyr Lys Ile Gly Leu Phe Leu Ile Thr Ile Leu Ser Phe
    50                  55                  60


Val Thr Arg Phe Trp Gly Ile Ser His Pro Asn Glu Val Val Phe Asp
65                  70                  75                  80


Glu Val His Phe Gly Lys Phe Ala Ser Tyr Tyr Leu Glu Arg Thr Tyr
                85                  90                  95
```

```
Phe Phe Asp Val His Pro Pro Phe Gly Lys Leu Leu Phe Ala Phe Val
            100                 105                 110

Gly Trp Leu Val Gly Tyr Asp Gly Asn Phe His Phe Glu Asn Ile Gly
        115                 120                 125

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

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

Trp Glu Ser Gly Tyr Ser Leu Pro Ala Cys Ile Leu Ala Ala Gly Leu
                165                 170                 175

Val Leu Leu Asp Asn Ala His Ile Gly Gln Thr Arg Leu Ile Leu Leu
            180                 185                 190

Asp Ala Thr Leu Val Leu Ala Met Ala Cys Ser Leu Leu Phe Tyr Ile
        195                 200                 205

Lys Trp Tyr Lys Leu Arg His Glu Pro Phe Ser Arg Lys Trp Trp Lys
    210                 215                 220

Trp Leu Ile Leu Thr Gly Phe Ala Leu Ser Cys Asp Ile Ser Val Lys
225                 230                 235                 240

Tyr Val Gly Val Phe Ala Phe Val Thr Ile Gly Ser Ala Val Val Ile
                245                 250                 255

Asp Leu Trp Asp Leu Leu Asn Ile Asn Arg Pro Gly Gly Ala Ile Ser
            260                 265                 270

Leu Gln Glu Phe Thr Lys His Phe Ala Ala Arg Ala Phe Gly Leu Ile
        275                 280                 285
```

```
Ile Met Pro Phe Leu Phe Tyr Leu Phe Trp Phe Gln Val His Phe Ala
    290                 295                 300

Val Leu Tyr Arg Ser Gly Pro Gly Asp Asp Phe Met Thr Pro Glu Phe
305                 310                 315                 320

Gln Glu Thr Leu Ser Asp Asn Val Met Leu Ala Asn Ser Ile Asp Ile
                325                 330                 335

Gln Tyr Tyr Asp Gln Ile Thr Ile Arg His Lys Glu Thr Lys Thr Tyr
            340                 345                 350

Leu His Ser His Glu Asp Arg Tyr Pro Leu Arg Tyr Asp Asp Gly Arg
        355                 360                 365

Val Ser Ser Gln Gly Gln Gln Ile Thr Gly Tyr Pro Tyr Asn Asp Thr
    370                 375                 380

Asn Asn Tyr Trp Glu Ile Leu Pro Ala Asn Asn Asp Lys Gln Ile Gly
385                 390                 395                 400

Arg Ile Val Lys Asn His Glu Leu Val Arg Leu Arg His Val Gly Thr
                405                 410                 415

Asp Lys Ile Leu Leu Ser His Asp Val Ala Ser Pro Tyr Tyr Pro Thr
            420                 425                 430

Asn Gln Glu Phe Thr Ala Val Thr Pro Glu Glu Ala Phe Gly Lys Arg
        435                 440                 445

Glu Lys Asp Thr Leu Phe Glu Val Arg Ile Glu His Gly Lys Lys Asn
    450                 455                 460

Gln Asn Phe Lys Thr Val Ala Gly His Phe Lys Leu Ile His Asn Pro
465                 470                 475                 480
```

```
Ser Lys Val Ala Met Trp Thr His Thr Lys Pro Leu Pro Glu Trp Gly
                485                 490                 495

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

Asn Val Trp Ile Ala Glu Asp Ile Pro Ser Leu Pro Ala Asp His Pro
        515                 520                 525

Arg Arg Gln Lys Pro Glu Arg Lys Val Lys Ser Leu Pro Phe Leu Gln
    530                 535                 540

Lys Trp Phe Glu Leu Gln Arg Ala Met Phe Tyr His Asn Ser Lys Leu
545                 550                 555                 560

Thr Ser Ser His Pro Tyr Ala Ser His Pro Tyr Gln Trp Pro Phe Leu
                565                 570                 575

Leu Arg Gly Val Ser Phe Trp Thr Gln Ser Glu Thr Arg Gln Gln Ile
            580                 585                 590

Tyr Phe Leu Gly Asn Pro Ile Gly Trp Trp Leu Ala Ser Ser Leu Leu
        595                 600                 605

Ala Val Tyr Ala Gly Ile Leu Leu Ala Asp Gln Val Ser Leu Arg Arg
    610                 615                 620

Gly Val Asp Ala Leu Asp Arg Arg Thr Arg Ser Arg Leu Tyr Asn Ser
625                 630                 635                 640

Thr Gly Phe Phe Phe Leu Ala Trp Ala Thr His Tyr Phe Pro Phe Phe
                645                 650                 655

Leu Met Gly Arg Gln Leu Phe Leu His His Tyr Leu Pro Ala His Leu
            660                 665                 670
```

```
Ala Ser Cys Leu Val Ala Gly Ala Leu Leu Glu Phe Ile Phe Asn Ser
        675                 680                 685


Glu Ala Pro Glu Glu Val Thr Ile Lys Asp Lys Lys Gly Pro Val Ser
    690                 695                 700


Pro Arg His His Val Thr Ala Arg Glu Arg Phe Ala Gly Gln Ser Met
705                 710                 715                 720


Leu Gly Ala Trp Ile Ala Cys Gly Val Ile Leu Ser Leu Ile Ile Ala
                725                 730                 735


Gly Trp Tyr Phe Phe Leu Pro Leu Thr Tyr Gly Tyr Pro Gly Leu Ser
            740                 745                 750


Val Asp Ala Ile Leu Arg Arg Lys Trp Leu Gly Tyr Asp Leu His Phe
        755                 760                 765


Ala Lys
    770
```

<210> 125
<211> 788
<212> PRT
<213> Gibberella zeae

<400> 125

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


Ala Pro Ser Lys Lys Pro Ser Glu Glu Ser Phe Asn Pro Asn Pro Glu
            20                  25                  30


Leu Asp Lys Leu Ala Lys Ala Gly Ala Gln Arg Ala Ala Ala Gln Ser
        35                  40                  45
```

```
Glu Thr Glu His Lys Ile Gly Leu Ala Val Ile Thr Ile Leu Ser Phe
    50                  55                  60

Val Thr Arg Phe Trp Gly Ile Ser His Pro Asn Glu Val Val Phe Asp
65                  70                  75                  80

Glu Val His Phe Gly Lys Phe Ala Ser Tyr Tyr Leu Glu Arg Thr Tyr
                85                  90                  95

Phe Phe Asp Val His Pro Pro Phe Gly Lys Leu Leu Phe Ala Phe Val
            100                 105                 110

Gly Trp Leu Val Gly Tyr Asp Gly His Phe His Phe Asp Asn Ile Gly
        115                 120                 125

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

Pro Ala Thr Leu Gly Ala Leu Thr Val Ala Val Thr Tyr Leu Ile Met
145                 150                 155                 160

Trp Glu Ser Gly Tyr Ser Leu Pro Ala Cys Val Leu Ala Ala Gly Leu
                165                 170                 175

Leu Leu Leu Asp Asn Ala His Ile Gly Gln Thr Arg Leu Ile Leu Leu
            180                 185                 190

Asp Ala Thr Leu Val Leu Ala Met Ala Cys Ser Leu Leu Phe Tyr Ile
        195                 200                 205

Lys Trp Tyr Lys Leu Arg His Glu Pro Phe Ser Arg Lys Trp Trp Lys
    210                 215                 220

Trp Leu Ile Leu Thr Gly Phe Ala Leu Ser Cys Asp Ile Ser Val Lys
225                 230                 235                 240
```

```
Tyr Val Gly Val Phe Ala Phe Val Thr Ile Gly Cys Ala Val Val Ile
                245                 250                 255

Asp Leu Trp Asp Leu Leu Asn Ile Asn Arg Pro Gly Gly Ala Ile Ser
            260                 265                 270

Met Gln Glu Phe Gly Lys His Phe Ala Ala Arg Ala Phe Gly Leu Ile
        275                 280                 285

Val Leu Pro Phe Leu Phe Tyr Leu Phe Trp Phe Gln Val His Phe Ala
    290                 295                 300

Val Leu Tyr Arg Ser Gly Pro Gly Asp Asp Phe Met Thr Pro Glu Phe
305                 310                 315                 320

Gln Glu Thr Leu Ser Asp Asn Val Met Leu Ala Asn Ala Ile Asp Ile
                325                 330                 335

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

Leu His Ser His Glu Asp Arg Tyr Pro Leu Arg Tyr Asp Asp Gly Arg
        355                 360                 365

Val Ser Ser Gln Gly Gln Gln Ile Thr Gly Tyr Pro Tyr Asn Asp Thr
    370                 375                 380

Asn Asn Tyr Trp Glu Ile Trp Pro Ala Asp Asn Asn Lys Thr Pro Gly
385                 390                 395                 400

Arg Ile Val Lys Asn His Asp Leu Val Arg Leu Arg His Val Gly Thr
                405                 410                 415

Asp Lys Ile Leu Leu Ser His Asp Val Ala Ser Pro Tyr Tyr Pro Thr
            420                 425                 430
```

```
Asn Gln Glu Phe Thr Ala Val Thr Pro Glu Glu Ala Leu Gly Lys Arg
        435                 440                 445

Glu Lys Glu Thr Leu Phe Glu Val Arg Leu Glu His Gly Lys Lys Asn
    450                 455                 460

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

Ser Lys Val Ala Met Trp Thr His Thr Lys Pro Leu Pro Glu Trp Gly
                485                 490                 495

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

Asn Val Trp Ile Ala Glu Asp Ile Ala Ser Leu Glu Ala Asp His Pro
        515                 520                 525

Arg Arg Gln Lys Pro Glu Arg Lys Val Lys Ser Leu Pro Phe Leu Gln
    530                 535                 540

Lys Trp Phe Glu Leu Gln Arg Ala Met Phe Tyr His Asn Ser Lys Leu
545                 550                 555                 560

Thr Ser Ser His Pro Tyr Ala Ser His Pro Tyr Gln Trp Pro Phe Leu
                565                 570                 575

Leu Arg Gly Val Ser Phe Trp Thr Gln Ser Glu Thr Arg Gln Gln Ile
            580                 585                 590

Tyr Phe Leu Gly Asn Pro Val Gly Trp Trp Leu Ala Ser Ser Leu Leu
        595                 600                 605

Ala Val Tyr Ala Gly Ile Leu Leu Ala Asp Gln Val Ser Leu Arg Arg
    610                 615                 620
```

```
Gly Ile Asp Ala Leu Asp Arg Arg Lys Leu Met Leu Gln Ser Gln Leu
625                 630                 635                 640

Met Asn Pro Thr Leu Thr Asn Ser Lys Gly Thr Arg Ser Arg Leu Tyr
                645                 650                 655

Asn Ser Thr Gly Phe Phe Phe Leu Ala Trp Ala Thr His Tyr Phe Pro
            660                 665                 670

Phe Phe Leu Met Gly Arg Gln Leu Phe Leu His His Tyr Leu Pro Ala
        675                 680                 685

His Leu Ala Ser Cys Leu Val Ala Gly Ala Leu Leu Glu Phe Ile Phe
    690                 695                 700

Asn Ser Glu Pro Ala Glu Glu Ile Thr Ile Lys Asp Lys Lys Gly Pro
705                 710                 715                 720

Val Ser Pro Arg His His Val Thr Ala Arg Glu Arg Phe Ser Gly Gln
                725                 730                 735

Ser Met Ala Ser Ala Trp Ile Ala Cys Gly Val Val Leu Ala Leu Val
            740                 745                 750

Val Ala Gly Trp Tyr Phe Phe Leu Pro Leu Thr Tyr Gly Tyr Pro Gly
        755                 760                 765

Leu Ser Val Glu Ala Ile Leu Arg Arg Lys Trp Leu Gly Tyr Asp Leu
    770                 775                 780

His Phe Ala Lys
785
```

<210> 126
<211> 775
<212> PRT
<213> Myceliophthora thermophila

<400> 126

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


Gly Val Ser Thr Lys Lys Pro Lys Asp Gly Ala Ser Ser Asp Val Glu
            20                  25                  30


Leu Asp Lys Leu Val Lys Ala Ala Ala Glu Lys Ser Ser Lys Asn Ser
        35                  40                  45


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


Leu Thr Arg Phe Trp Gly Ile Ser His Pro Asn Glu Val Val Phe Asp
65                  70                  75                  80


Glu Val His Phe Gly Lys Phe Ala Ser Tyr Tyr Leu Glu Arg Thr Tyr
                85                  90                  95


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


Gly Trp Leu Val Gly Tyr Asp Gly His Phe His Phe Glu Asn Ile Gly
        115                 120                 125


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


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


Trp Glu Ser Gly Tyr Ser Leu Pro Ala Cys Ile Ile Ala Ala Gly Leu
                165                 170                 175


Ile Leu Leu Asp Asn Ala His Ile Gly Gln Thr Arg Leu Ile Leu Leu
```

```
            180                 185                 190

Asp Ala Thr Leu Val Phe Ala Met Ala Cys Ser Leu Leu Cys Tyr Ile
        195                 200                 205

Lys Phe Tyr Lys Leu Arg His Glu Pro Phe Ser Arg Lys Trp Trp Lys
    210                 215                 220

Trp Leu Ile Leu Thr Gly Phe Ala Leu Ser Cys Asp Ile Ser Thr Lys
225                 230                 235                 240

Tyr Val Gly Leu Phe Ala Phe Ile Thr Ile Gly Ser Ala Val Val Ile
                245                 250                 255

Asp Leu Trp Asp Leu Leu Asp Ile Lys Arg Pro Gly Gly Ala Leu Thr
            260                 265                 270

Leu Ala Glu Phe Gly Lys His Phe Ala Ala Arg Ala Phe Gly Leu Ile
        275                 280                 285

Ile Met Pro Phe Leu Phe Tyr Leu Phe Trp Phe Gln Val His Phe Ser
    290                 295                 300

Ile Leu Thr Arg Ser Gly Pro Gly Asp Asp Phe Met Thr Pro Glu Phe
305                 310                 315                 320

Gln Glu Thr Leu Ser Asp Asn Ile Met Leu Ala Asn Ala Val Thr Ile
                325                 330                 335

Asp Tyr Tyr Asp Thr Ile Leu Ile Lys His Lys Glu Thr Lys Val Tyr
            340                 345                 350

Leu His Ser His Pro Asp Arg Tyr Pro Leu Arg Tyr Asp Asp Gly Arg
        355                 360                 365

Val Ser Ser Gln Gly Gln Gln Val Thr Gly Tyr Pro Phe Asn Asp Thr
```

```
    370                 375                 380

Asn Asn Tyr Trp Gln Ile Leu Pro Gly Gly Ala Asp Asp Gln Lys Leu
385                 390                 395                 400

Gly Arg His Val Arg Asn His Asp Leu Val Arg Leu Arg His Leu Gly
                405                 410                 415

Thr Asp Thr Ile Leu Leu Ser His Asp Val Ala Ser Pro Tyr Tyr Pro
            420                 425                 430

Thr Asn Gln Glu Phe Thr Thr Val Ser Ile Ala Asp Ala Tyr Gly Glu
        435                 440                 445

Arg Ala Ala Asp Thr Leu Phe Glu Ile Arg Ile Glu His Gly Lys Asp
    450                 455                 460

Gly Gln Glu Phe Lys Ser Val Ser Ser His Phe Lys Leu Ile His Asn
465                 470                 475                 480

Pro Ser Lys Val Ala Met Trp Thr His Pro Lys Pro Leu Pro Asp Trp
                485                 490                 495

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

Ser Asn Val Trp Leu Val Glu Asp Ile Val Ser Leu Pro Pro Asp His
        515                 520                 525

Lys Arg Arg Glu Lys Pro Glu Arg Lys Val Lys Thr Leu Pro Phe Leu
    530                 535                 540

Arg Lys Trp Phe Glu Leu Gln Arg Ser Met Phe Trp His Asn Asn Gln
545                 550                 555                 560

Leu Thr Ala Ser His Pro Tyr Ala Ser Leu Pro Tyr Gln Trp Pro Phe
```

```
                565                 570                 575

Leu Leu Arg Gly Val Ser Phe Trp Thr Gln Asn Glu Thr Arg Gln Gln
            580                 585                 590

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

Leu Ala Ile Tyr Ala Gly Ile Val Leu Ala Asp Gln Phe Ser Leu Arg
    610                 615                 620

Arg Gly Ile Asp Ala Leu Asp His Arg Ser Arg Ser Arg Leu Tyr Asn
625                 630                 635                 640

Ser Thr Gly Phe Phe Phe Leu Ala Trp Ala Thr His Tyr Phe Pro Phe
                645                 650                 655

Tyr Val Met Gly Arg Gln Leu Phe Leu His His Tyr Leu Pro Ala His
            660                 665                 670

Leu Ala Ser Ala Leu Val Thr Gly Ala Ile Val Glu Phe Ile Phe Ala
        675                 680                 685

Gln Asp Ser Leu Glu His Glu Val Ala Tyr Gln Ala Ala Lys Ala Gly
    690                 695                 700

Lys Lys Thr Gly Val Gln Lys Arg His Leu Ser Ala Arg Glu Arg Phe
705                 710                 715                 720

Ala Gly Gln Ser Met Val Ala Ser Trp Ile Ala Thr Val Val Ile Leu
                725                 730                 735

Ile Ala Val Ala Ala Ser Trp Tyr Phe Phe Leu Pro Leu Thr Tyr Gly
            740                 745                 750

Tyr Pro Gly Leu Ser Val Asp Gln Val Leu Arg Arg Lys Trp Leu Gly
```

755 760 765

Tyr Asp Leu His Phe Ala Lys
770 775

<210> 127
<211> 774
<212> PRT
<213> Neurospora crassa

<400> 127

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

Val Pro Ala Ser Ser Lys Lys Ala Lys Asn Gly Val Ser Ser Asp Val
20 25 30

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

Glu Leu Glu Tyr Lys Leu Ala Leu Ile Leu Ile Thr Gly Leu Ala Phe
50 55 60

Leu Thr Arg Phe Trp Gly Ile Ser His Pro Asp Glu Val Val Phe Asp
65 70 75 80

Glu Val His Phe Gly Lys Phe Ala Ser Tyr Tyr Leu Glu Arg Thr Tyr
85 90 95

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

Gly Trp Leu Val Gly Tyr Asp Gly His Phe His Phe Glu Asn Ile Gly
115 120 125

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

```
Pro Ala Ile Leu Gly Ala Leu Thr Val Ser Val Val Tyr Met Ile Met
145                 150                 155                 160

Trp Glu Ser Gly Tyr Ser Leu Pro Ala Cys Leu Ile Ala Ala Gly Leu
                165                 170                 175

Val Leu Leu Asp Asn Ala His Ile Gly Gln Thr Arg Leu Ile Leu Leu
            180                 185                 190

Asp Ala Thr Leu Val Phe Ala Met Ala Cys Ser Leu Leu Cys Tyr Ile
        195                 200                 205

Lys Phe His Lys Leu Arg His Glu Pro Phe Ser Arg Lys Trp Trp Lys
    210                 215                 220

Trp Leu Ile Leu Thr Gly Phe Ala Leu Ser Cys Asp Ile Ser Thr Lys
225                 230                 235                 240

Tyr Val Gly Leu Phe Ala Phe Ile Thr Ile Gly Ser Ala Val Cys Ile
                245                 250                 255

Asp Leu Trp Asp Leu Leu Asp Ile Lys Arg Pro Gly Gly Ala Leu Thr
            260                 265                 270

Leu Pro Gln Phe Gly Lys His Phe Ala Ala Arg Ala Phe Gly Leu Ile
        275                 280                 285

Ile Met Pro Phe Ile Phe Tyr Leu Phe Trp Phe Gln Val His Phe Ser
    290                 295                 300

Ile Leu Thr Arg Ser Gly Pro Gly Asp Asp Phe Met Thr Pro Glu Phe
305                 310                 315                 320

Gln Glu Thr Leu Ser Asp Asn Ile Met Leu Ala Asn Ala Val Thr Ile
                325                 330                 335
```

```
Asp Tyr Tyr Asp Thr Ile Ser Ile Arg His Lys Glu Thr Lys Ala Tyr
            340                 345                 350

Leu His Ser His Pro Asp Lys Tyr Pro Leu Arg Tyr Asp Asp Gly Arg
        355                 360                 365

Val Ser Ser Gln Gly Gln Gln Val Thr Gly Tyr Pro Phe Asn Asp Thr
    370                 375                 380

Asn Asn Tyr Trp Gln Ile Leu Pro Pro Gly Pro Asp Asp Gln Lys Leu
385                 390                 395                 400

Gly His Pro Ile Lys Asn His Asp Leu Val Arg Leu Arg His Ile Val
                405                 410                 415

Thr Asp Thr Ile Leu Leu Ser His Asp Val Ala Ser Pro Tyr Tyr Pro
            420                 425                 430

Thr Asn Gln Glu Phe Thr Thr Val Ser Ile Gly Asp Ala Tyr Gly Asp
        435                 440                 445

Arg Ala Ala Asp Thr Leu Phe Glu Ile Arg Ile Glu His Gly Lys Ala
    450                 455                 460

Asn Gln Glu Phe Lys Ser Ile Ser Ser His Phe Lys Leu Ile His Asn
465                 470                 475                 480

Pro Ser Lys Val Ala Met Trp Thr His Ser Lys Pro Leu Pro Glu Trp
                485                 490                 495

Gly His Lys Gln Gln Glu Ile Asn Gly Asn Lys Gln Leu Ala Gln Ser
            500                 505                 510

Ser Asn Val Trp Leu Val Glu Asp Ile Val Ser Leu Pro Ala Asp His
        515                 520                 525
```

```
Ala Arg Arg Glu Lys Pro Glu Lys Lys Val Lys Thr Leu Pro Phe Leu
    530                 535                 540

Arg Lys Trp Phe Glu Leu Gln Arg Ser Met Phe Trp His Asn Asn Gln
545                 550                 555                 560

Leu Thr Ser Ser His Pro Tyr Ala Ser Leu Pro Tyr Gln Trp Pro Phe
                565                 570                 575

Leu Leu Arg Gly Val Ser Phe Trp Thr Gln Asn Asp Thr Arg Gln Gln
            580                 585                 590

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

Leu Ala Ile Tyr Ala Gly Ile Ile Leu Ala Asp Gln Phe Ser Leu Arg
    610                 615                 620

Arg Gly Leu Asp Ala Met Asp Arg Arg Thr Arg Ser Arg Leu Tyr Asn
625                 630                 635                 640

Ser Thr Gly Phe Phe Phe Leu Ala Trp Ala Thr His Tyr Phe Pro Phe
                645                 650                 655

Phe Val Met Gly Arg Gln Leu Phe Leu His His Tyr Leu Pro Ala His
            660                 665                 670

Leu Ala Ser Ala Leu Val Thr Gly Ser Val Val Glu Phe Leu Phe Ser
        675                 680                 685

Thr Asp Ser Ala Glu Pro Glu Tyr Gln Pro Ser Lys Ser Gly Lys Lys
    690                 695                 700

Val Ala Pro Thr Thr Lys Arg Arg Leu Ser Ala Arg Glu Arg Leu Ala
705                 710                 715                 720
```

```
Gly Gln Ser Met Ala Gly Ala Trp Ile Ala Thr Ala Val Ile Met Val
                725                 730                 735


Leu Val Ala Phe Gly Trp Tyr Phe Phe Leu Pro Leu Thr Tyr Gly Tyr
            740                 745                 750


Pro Gly Leu Thr Ala Pro Glu Val Asn Arg Arg Lys Trp Leu Gly Tyr
        755                 760                 765


Asp Leu His Phe Ala Lys
    770
```

<210> 128
<211> 776
<212> PRT
<213> Penicillium chrysogenum

<400> 128

```
Met Ser Ser Pro Ser Pro Ser Leu Arg Lys Arg Gly Gly Lys Lys Asp
1               5                   10                  15


Val Tyr Thr Ala Leu Pro Ser Asp Asp Thr Ser Thr Pro Val Ser Val
            20                  25                  30


Pro Val Lys Gln Lys Ser Glu Trp Asp Tyr Trp Leu Ala Ile Val Ile
        35                  40                  45


Leu Thr Leu Leu Ala Phe Ala Thr Arg Phe Tyr Arg Leu Asp Tyr Pro
    50                  55                  60


Asn Glu Val Val Phe Asp Glu Val His Phe Gly Lys Phe Ala Ser Tyr
65                  70                  75                  80


Tyr Leu Gln Arg Thr Tyr Phe Phe Asp Val His Pro Pro Phe Gly Lys
                85                  90                  95
```

```
Leu Leu Phe Ala Leu Met Gly Trp Leu Val Gly Phe Asp Gly Ser Phe
            100                 105                 110

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

Leu Ser Leu Arg Ala Met Pro Ala Thr Leu Gly Ala Leu Thr Ile Pro
    130                 135                 140

Val Val Phe Leu Ile Met Trp Glu Ser Gly Tyr Ser Leu Pro Ala Cys
145                 150                 155                 160

Val Leu Ser Ala Gly Leu Met Val Phe Asp Asn Ala His Val Gly Glu
                165                 170                 175

Asp Arg Leu Ile Leu Leu Asp Ala Thr Leu Val Leu Ser Met Ala Leu
            180                 185                 190

Ser Ile Leu Cys Tyr Val Arg Phe Tyr Lys Leu Arg His Gln Pro Phe
        195                 200                 205

Gly Arg Lys Trp Trp Lys Trp Leu Leu Leu Thr Gly Phe Cys Met Ser
    210                 215                 220

Cys Val Ile Ser Thr Lys Tyr Val Gly Phe Phe Thr Phe Val Thr Ile
225                 230                 235                 240

Gly Ala Ala Val Leu Ile Asp Leu Trp Asn Leu Leu Asp Ile Asn Arg
                245                 250                 255

Glu Gln Gly Ala Leu Ser Met Ile Ser Trp Gly Lys His Phe Ile Ala
            260                 265                 270

Arg Ala Val Gly Leu Val Ile Ile Pro Phe Met Phe Tyr Leu Phe Trp
        275                 280                 285
```

```
Phe Gln Val His Phe Ala Ile Leu Asn Arg Ser Gly Pro Gly Asp Asp
    290                 295                 300

Phe Met Thr Pro Glu Phe Gln Glu Thr Leu Ser Asp Asn Gln Met Thr
305                 310                 315                 320

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

Lys Asp Thr Lys Val Phe Leu His Ser His Trp Asp Lys Tyr Pro Leu
            340                 345                 350

Arg Tyr Asp Asp Gly Arg Ile Ser Ser Gln Gly Gln Gln Val Thr Gly
        355                 360                 365

Tyr Pro His Asn Asp Thr Asn Asn Gln Trp Gln Ile Leu Pro Ala Glu
    370                 375                 380

Pro Leu Ala Asp Ser Ser Glu Pro Lys Ser Val Arg Asn Gly Asp Ile
385                 390                 395                 400

Ile Gln Leu Arg His Ile Gly Thr Glu Ser Tyr Leu Leu Thr His Asp
                405                 410                 415

Val Ala Ser Pro Phe Phe Pro Thr Asn Gln Glu Phe Thr Thr Val Ser
            420                 425                 430

Gln Glu Leu Ala Asp Gly Glu Arg His Asn Asp Thr Leu Phe Glu Leu
        435                 440                 445

Lys Ile Glu Ser Gly Lys Thr Ala Gln Glu Phe Arg Thr Leu Ala Ser
    450                 455                 460

Leu Phe Lys Leu Val His Val Pro Thr Arg Val Ala Leu Trp Thr His
465                 470                 475                 480
```

```
Thr Thr Pro Leu Pro Glu Trp Gly Tyr Lys Gln Ala Glu Ile Asn Gly
                485                 490                 495

Asn Lys Asn Ile Leu Gln Ser Ser Asn Met Trp Tyr Val Glu Asn Ile
            500                 505                 510

Glu Asn Leu Ala Glu Asp Ser Pro Arg Leu Val Lys Glu Glu Arg Lys
        515                 520                 525

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

Met Phe His His Asn Asn Ala Leu Thr Ser Ser His Pro Tyr Ala Thr
545                 550                 555                 560

Glu Pro Phe Gln Trp Pro Phe Leu Leu Arg Gly Val Ser Phe Trp Thr
                565                 570                 575

Lys Asn Asp Thr Arg Glu Gln Ile Tyr Phe Leu Gly Asn Pro Ile Gly
            580                 585                 590

Trp Trp Ile Ala Ser Ser Ile Leu Ala Val Phe Ala Gly Val Val Gly
        595                 600                 605

Ala Asp Gln Leu Ser Leu Arg Arg Gly Val Asp Ala Leu Glu Glu Ile
    610                 615                 620

Trp Gly Pro Gly Thr Arg Ser Arg Leu Tyr Asn Ser Thr Gly Phe Leu
625                 630                 635                 640

Phe Leu Cys Trp Ala Ala His Tyr Phe Pro Phe Trp Leu Met Gly Arg
                645                 650                 655

Gln Arg Phe Leu His His Tyr Leu Pro Ser His Leu Ala Ser Thr Met
            660                 665                 670
```

```
Val Cys Gly Ala Leu Ile Glu Phe Ile Phe Asn Leu Gln Pro Leu Asp
        675                 680                 685

Pro Arg Thr Ala Leu Pro Pro Val Asp Asp Pro Ser Gly Lys Ser Lys
    690                 695                 700

Ala Arg Ser Leu Ser Ser Leu Arg Arg Phe Ile Thr Ala Lys Glu Arg
705                 710                 715                 720

Met Gly Cys Arg Ser Leu Ile Ala Gly Trp Ile Ala Thr Leu Ile Ile
                725                 730                 735

Leu Ala Ala Thr Ile Trp Gly Phe Ile Phe Tyr Ala Pro Leu Thr Tyr
            740                 745                 750

Gly Thr Pro Gly Leu Asp Val Ala Gly Val Asn Ala Arg Lys Trp Leu
        755                 760                 765

Asn Tyr Asp Leu His Phe Ala Lys
    770                 775
```

<210> 129
<211> 373
<212> PRT
<213> Trichoderma reesei

<400> 129

```
Met Leu Asn Pro Arg Arg Ala Leu Ile Ala Ala Ala Phe Ile Leu Thr
1               5                   10                  15

Val Phe Phe Leu Ile Ser Arg Ser His Asn Ser Glu Ser Ala Ser Thr
            20                  25                  30

Ser Glu Pro Lys Asp Ala Glu Ala Glu Ala Leu Ser Ala Ala Asn Ala
        35                  40                  45
```

```
Gln Gln Arg Ala Ala Pro Pro Pro Pro Gln Lys Pro Met Ile Asp
    50                  55                  60

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

Asp Ile Glu Ser Lys Phe Pro Ala Tyr Ile Trp Gln Thr Trp Arg Lys
                85                  90                  95

Thr Pro Ser Glu Gly Asp Phe Glu Phe Arg Glu Gln Glu Ala Ser Trp
            100                 105                 110

Ser Ile Glu His Pro Gly Phe Ile His Glu Val Ile Thr Asp Ser Val
        115                 120                 125

Ala Asp Thr Leu Leu Gln Leu Leu Tyr Gly Ser Ile Pro Glu Val Leu
    130                 135                 140

Glu Ala Tyr His Ala Leu Pro Leu Pro Val Leu Lys Ala Asp Leu Phe
145                 150                 155                 160

Arg Tyr Leu Ile Leu Tyr Ala Arg Gly Gly Ile Tyr Ser Asp Ile Asp
                165                 170                 175

Thr Tyr Ala Ile Arg Ser Ala Leu Glu Trp Ile Pro Pro Gln Ile Pro
            180                 185                 190

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

Pro Asp Trp Ala Asp Trp Tyr Ser Arg Arg Ile Gln Phe Cys Gln Trp
    210                 215                 220

Thr Ile Gln Ser Lys Pro Gly His Pro Val Leu Arg Asp Ile Ile Ser
225                 230                 235                 240
```

```
Arg Ile Thr Asn Gln Thr Leu Glu Met Lys Lys Ser Gly Lys Leu Ser
                245                 250                 255


Ala Phe Gln Gly Asn Arg Val Val Asp Leu Thr Gly Pro Ala Val Trp
            260                 265                 270


Thr Asp Thr Ile Met Asp Tyr Phe Asn Asp Glu Arg Tyr Phe Asp Met
        275                 280                 285


Glu Asn Ser Lys Gly Arg Ile Asp Tyr Arg Asn Phe Thr Gly Met Glu
    290                 295                 300


Thr Ser Lys Arg Val Gly Asp Val Val Val Leu Pro Ile Thr Ser Phe
305                 310                 315                 320


Ser Pro Gly Val Gly Gln Met Gly Ala Lys Asp Tyr Asp Asp Pro Met
                325                 330                 335


Ala Phe Val Lys His Asp Phe Glu Gly Thr Trp Lys Pro Glu Ser Glu
            340                 345                 350


Arg His Ile Gly Glu Ile Val Gln Glu Leu Gly Glu Gly Gln Gly Glu
        355                 360                 365


Ala Pro Lys Glu Gln
    370


<210>  130
<211>  344
<212>  PRT
<213>  Trichoderma reesei

<400>  130

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


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

```
            20                  25                  30

Arg Pro Ile Ser Met Leu Pro Leu Ile Thr Glu Lys Gly Ile Ala Leu
        35                  40                  45

Thr His Leu Ile Val Cys Ser Phe His Ile Asn Gln Gly Gly Val Val
    50                  55                  60

His Leu Asn Asp Phe Pro Pro Asp Asp Pro His Phe Tyr Thr Leu Trp
65                  70                  75                  80

Asn Glu Thr Ile Thr Met Lys Gln Ala Gly Val Lys Val Met Gly Met
                85                  90                  95

Val Gly Gly Ala Ala Pro Gly Ser Phe Asn Thr Gln Thr Leu Asp Ser
            100                 105                 110

Pro Asp Ser Ala Thr Phe Glu His Tyr Tyr Gly Gln Leu Arg Asp Ala
        115                 120                 125

Ile Val Asn Phe Gln Leu Glu Gly Met Asp Leu Asp Val Glu Gln Pro
    130                 135                 140

Met Ser Gln Gln Gly Ile Asp Arg Leu Ile Ala Arg Leu Arg Ala Asp
145                 150                 155                 160

Phe Gly Pro Asp Phe Leu Ile Thr Leu Ala Pro Val Ala Ser Ala Leu
                165                 170                 175

Glu Asp Ser Ser Asn Leu Ser Gly Phe Ser Tyr Thr Ala Leu Gln Gln
            180                 185                 190

Thr Gln Gly Asn Asp Ile Asp Trp Tyr Asn Thr Gln Phe Tyr Ser Gly
        195                 200                 205

Phe Gly Ser Met Ala Asp Thr Ser Asp Tyr Asp Arg Ile Val Ala Asn
```

```
    210                 215                 220

Gly Phe Ala Pro Ala Lys Val Val Ala Gly Gln Leu Thr Thr Pro Glu
225                 230                 235                 240

Gly Ala Gly Trp Ile Pro Thr Ser Ser Leu Asn Asn Thr Ile Val Ser
                245                 250                 255

Leu Val Ser Glu Tyr Gly Gln Ile Gly Gly Val Met Gly Trp Glu Tyr
            260                 265                 270

Phe Asn Ser Leu Pro Gly Gly Thr Ala Glu Pro Trp Glu Trp Ala Gln
        275                 280                 285

Ile Val Thr Glu Ile Leu Arg Pro Gly Leu Val Pro Glu Leu Lys Ile
    290                 295                 300

Thr Glu Asp Asp Ala Ala Arg Leu Thr Gly Ala Tyr Glu Glu Ser Val
305                 310                 315                 320

Lys Ala Ala Ala Ala Asp Asn Lys Ser Phe Val Lys Arg Pro Ser Ile
                325                 330                 335

Asn Tyr Tyr Ala Met Val Asn Ala
            340
```

<210> 131
<211> 964
<212> PRT
<213> Trichoderma reesei

<400> 131

```
Met Arg Ser Thr Met Gly Leu Ser Trp Lys Trp Thr Ala Leu Phe Ser
1               5                   10                  15

Leu Leu Gly Ala Ile Leu Cys Leu Ile Gly Pro Ala Leu Ala Val Lys
            20                  25                  30
```

```
Glu His Glu Phe Lys Lys Cys His Gln Ala Gly Phe Cys Asn Arg Asn
        35                  40                  45

Arg Ala Leu Ala Asp Leu Ala Ala Ser Gln Ser Ser Thr Trp Val Ser
    50                  55                  60

Pro Tyr Lys Ala Val Phe Glu Ser Pro Ser Leu Glu Asp Gly Lys Ile
65                  70                  75                  80

Gln Gly Val Ile Leu Lys Thr Ile Asn Ala Ala Gly Asp Thr Val Arg
                85                  90                  95

Leu Pro Val Thr Ile Ser Phe Leu Glu Ser Gly Val Ala Arg Leu Thr
            100                 105                 110

Ile Asp Glu Glu Arg Arg Gln Asn Lys Asp Ile Glu Leu Arg His Gly
        115                 120                 125

Ser Ala Ala Arg Lys Glu Arg Tyr Asn Glu Ala Ala Asn Trp Ser Val
    130                 135                 140

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

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

Val Ile Arg Leu Ser Pro Phe Arg Ile Asp Phe Arg Arg Asp Gly Val
            180                 185                 190

Ser His Ile Glu Leu Asn Glu Arg Gly Leu Leu Asn Val Glu His Trp
        195                 200                 205

Arg Pro Lys Val Glu Arg Pro Glu Gly Glu Glu Asn Thr Glu Glu Asp
    210                 215                 220
```

```
Glu Ser Thr Trp Trp Asp Glu Thr Phe Asn Gly His Thr Asp Thr Lys
225                 230                 235                 240

Pro Arg Gly Pro Glu Ser Val Ala Leu Asp Ile Ser Phe His Gly Tyr
                245                 250                 255

Glu His Val Tyr Gly Ile Pro Glu His Thr Gly Pro Leu Ser Leu Lys
            260                 265                 270

Glu Thr Arg Gly Gly Glu Gly Asn Tyr Ala Glu Pro Tyr Arg Met Tyr
        275                 280                 285

Asn Ala Asp Val Phe Glu Tyr Ile Leu Asp Ser Pro Met Thr Leu Tyr
    290                 295                 300

Gly Ser Ile Pro Phe Met Gln Ala His Arg Lys Asp Ser Ser Val Gly
305                 310                 315                 320

Leu Leu Trp Leu Asn Ala Ala Asp Thr Trp Val Asp Ile Thr Lys Val
                325                 330                 335

Lys Gly Ser Thr Asn Pro Leu Ser Leu Thr Ser Gly Ala Pro Lys Asn
            340                 345                 350

Thr Gln Thr His Trp Ile Ser Glu Ser Gly Ile Ile Asp Leu Phe Val
        355                 360                 365

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

Thr Gly Thr Thr Ala Met Pro Gln Glu Phe Ala Leu Gly Tyr His Gln
385                 390                 395                 400

Cys Arg Trp Asn Tyr Phe Ser Glu Asp Asp Val Lys Asp Val Asp Arg
                405                 410                 415
```

```
Arg Phe Asp Lys Ala His Ile Pro Tyr Asp Val Ile Trp Leu Asp Ile
            420                 425                 430

Glu Tyr Thr Asp Glu Ile Lys Tyr Phe Thr Trp Asp Pro His Ser Phe
        435                 440                 445

Thr Asp Pro Ile Thr Met Gly Lys Gln Leu Asp Ser His Gly Arg Lys
    450                 455                 460

Leu Val Thr Ile Ile Asp Pro His Ile Lys Arg Val Asp Asn Tyr Pro
465                 470                 475                 480

Ile Asn Glu Gln Leu Leu Ala Leu Asp Leu Ala Ile His Asp Lys Asp
                485                 490                 495

Gly Lys Ala Tyr Glu Gly Ser Cys Trp Pro Gly Asn Ser Asn Trp Ile
            500                 505                 510

Asp Cys Phe Asn Pro Lys Ala Arg Glu Trp Trp Lys Gly Leu Tyr Lys
        515                 520                 525

Tyr Asp Gln Phe Lys Gly Thr Met Glu Asn Thr Phe Ile Trp Asn Asp
    530                 535                 540

Met Asn Glu Pro Ser Val Phe Glu Gly Pro Glu Thr Thr Met Pro Lys
545                 550                 555                 560

Asp Asn Leu His Trp Asp Asn Trp Glu His Arg Asp Val His Asn Leu
                565                 570                 575

Asn Gly Met Thr Tyr His His Ser Thr Phe Glu Ala Leu Lys Ser Arg
            580                 585                 590

Lys Lys Gly Glu Tyr Arg Arg Pro Phe Val Leu Thr Arg Ala Phe Phe
        595                 600                 605
```

```
Ser Gly Ser Gln Arg Phe Gly Ala Met Trp Thr Gly Asp Asn Leu Ala
    610                 615                 620

Asp Trp Gly His Leu Gln Thr Ser Val Thr Met Leu Ile Asn Gln Gly
625                 630                 635                 640

Ile Ser Gly Phe Pro Phe Ser Gly Ala Asp Val Ala Gly Phe Phe Gly
                645                 650                 655

Asp Pro Glu Lys Asp Leu Leu Ala Arg Trp Tyr Gln Thr Ala Ala Phe
            660                 665                 670

Tyr Pro Phe Phe Arg Ala His Ala His Ile Asp Thr Arg Arg Arg Glu
        675                 680                 685

Pro Tyr Leu Leu Gly Glu Pro Tyr Thr Ala Ile Val Thr Ala Ala Leu
    690                 695                 700

Arg Leu Arg Tyr Ser Leu Leu Pro Ala Trp Tyr Thr Ala Phe Phe His
705                 710                 715                 720

Ala Asn Arg Asp Gly Ser Pro Ile Leu Arg Pro Met Phe Trp Thr His
                725                 730                 735

Pro Ser Ala Glu Gly Gly Leu Ala Ile Asp Asp Gln Phe Phe Leu Ala
            740                 745                 750

Ser Thr Gly Leu Leu Val Lys Pro Val Ala Glu Lys Asp Lys Tyr Ser
        755                 760                 765

Ala Asp Ile Trp Ile Pro Asp Asp Glu Val Tyr Tyr Glu Tyr Asp Thr
    770                 775                 780

Tyr Asn Val Ala Lys Thr Glu Gln Gly Lys His Val Thr Phe Asp Ala
785                 790                 795                 800
```

```
Pro Ile Asp Arg Ile Pro Ile Leu Met Arg Gly Gly His Ile Ile Pro
                805                 810                 815

Arg Arg Asp Ile Pro Arg Arg Ser Ser Ser Leu Met Arg Phe Asp Pro
            820                 825                 830

Tyr Thr Leu Val Val Ser Val Ser Lys Asp Gly Gln Ala Glu Gly Glu
        835                 840                 845

Leu Tyr Val Asp Asp Gly Asp Ser Tyr Glu Tyr Gln Asp Gly Gln Tyr
    850                 855                 860

Ile His Arg Gln Phe Ser Leu Lys Asp Asp Val Leu Ser Ser Val Asp
865                 870                 875                 880

Ala Glu Gly Arg Asp Thr Arg Lys Ile Lys Pro Gly Lys Trp Leu Lys
                885                 890                 895

Ala Met Gln Asn Val His Ile Asp Lys Ile Ile Ile Val Gly Ala Pro
            900                 905                 910

Ala Ser Trp Asp Arg Glu Ala Val Gln Ile Glu Ser Asp Gly Arg Ala
        915                 920                 925

Trp Ala Ala Gln Val Val Tyr His Ala Ala Asp Lys Asp Arg Ala Ala
    930                 935                 940

Phe Ala Thr Val Thr His Val Lys Ala Arg Val Gly Asp Asp Trp Ser
945                 950                 955                 960

Ile Lys Leu Ala
```

<210> 132
<211> 562

<212> PRT
<213> Trichoderma reesei

<400> 132

```
Met Gln Arg Pro Ala Ser Leu Ala Leu Leu Gly Ala Val Cys Trp Thr
1               5                  10                  15


Val Ala Ala Ala Gly Ser Val Pro Arg Gly Val Gly Pro Glu Phe Val
            20                  25                  30


Ser Tyr Tyr Gln Asn Lys Asp Ser Phe Thr Cys Ile Ala Asn Pro Ser
        35                  40                  45


Ile Thr Ile Pro Trp Asp Arg Val Asn Asp Asn Thr Cys Asp Cys Pro
    50                  55                  60


Asp Gly Ser Asp Glu Pro Gly Thr Ala Ala Cys Ala Phe Ile Asp Pro
65                  70                  75                  80


Leu Ser Pro Glu Gln Pro Leu Ile Gly Ser Pro Ser Gly Thr Thr Asn
                85                  90                  95


Ala Thr Arg Ser Leu Pro Gly Phe Trp Cys Gln Asn Lys Gly His Ile
            100                 105                 110


Gly Ala Tyr Ile Pro Phe Ser Tyr Val Asn Asp Gly Val Cys Asp Tyr
        115                 120                 125


Asp Val Cys Cys Asp Gly Thr Asp Glu His Asn His Pro Thr Gly Ile
    130                 135                 140


Lys Cys Glu Asn Arg Cys Gly Pro Ile Gly Lys Glu His Arg Arg Leu
145                 150                 155                 160


Ala Asp Glu Arg Lys Lys Asn Val Ala Arg Ala Ile Val Lys Lys Gln
                165                 170                 175
```

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

Ile Thr Ala Leu Glu Lys Asp Ile Lys Asp Leu Ser Ala Gln Lys Glu
        195                 200                 205

Glu Leu Gln Arg Lys Tyr Asp Gln Val Gln Ser Glu Glu Gln Gly Lys
    210                 215                 220

Leu Val Lys Ser Glu Gly Gly Ala Gly Gly Lys Leu Gly Val Leu Val
225                 230                 235                 240

Gly Leu Ala Lys Glu Arg Val Glu Glu Leu Arg Glu Ala Leu Arg Leu
                245                 250                 255

Val Thr Glu Asp Arg Glu Val Leu Arg Gly Lys Arg Asp Glu Leu Glu
            260                 265                 270

Ala Ile Leu Lys Gln Leu Lys Asp Gly His Asn Pro Asp Ile Lys Asp
        275                 280                 285

Glu Gly Val Lys Ala Ala Val Gln Ala Tyr Glu Asp Tyr Ala Ala Arg
    290                 295                 300

Glu Ala Ser Ala Asp Gln Leu Glu Phe Leu Glu Ser Asp Ile Arg Glu
305                 310                 315                 320

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

Asp Glu Leu His Asp Asp Thr Asp Ile Leu Tyr Asn Phe Asp Ala Tyr
            340                 345                 350

Ile Pro Pro Phe Ile Arg Gly Val Ile His Asp Lys Ile Arg Val Ile
        355                 360                 365
```

```
Arg Lys Trp Leu Met Asp Asn Gly Met Ile Ala Asp Glu Ala Lys Thr
    370                 375                 380

Gly Ser Glu Ser Ser Ala Ala Arg Ala Ala Arg Glu Ala Val Glu Ala
385                 390                 395                 400

Ala Asp Gln Glu Leu Gly Asn Lys Glu Arg Glu Leu Gln Gln Glu Lys
                405                 410                 415

Thr Asp Leu Asp Lys Asp Tyr Gly Pro Ser Gly Ile Phe Arg Ser Leu
            420                 425                 430

Lys Gly Lys Cys Ala Glu Ile Asp Ala Gly Glu Tyr Thr Tyr Glu Leu
        435                 440                 445

Cys Trp Leu Asp Lys Thr Met Gln Lys Ser Lys Lys Gly His Ala Ala
    450                 455                 460

Thr Asn Met Gly Asn Phe Glu Arg Ile Glu Ile Ala Met Ala Asp Glu
465                 470                 475                 480

Asp Glu Arg Val Asp Gly Lys Ser Leu Gly Ser Gly Pro Arg Met Val
                485                 490                 495

Leu Arg Tyr Glu Asn Gly Gln Thr Cys Trp Asn Gly Pro Gln Arg Lys
            500                 505                 510

Thr Asn Val Trp Leu Gly Cys Ala Glu Lys Glu Glu Ile Trp Arg Val
        515                 520                 525

Thr Glu Ala Glu Lys Cys Val Tyr Lys Met Glu Val Gly Thr Pro Ala
    530                 535                 540

Ala Cys Glu Asp Glu Glu Pro Ala Ala Pro Lys Asp Ser Gly Lys Asp
545                 550                 555                 560
```

Glu Leu

<210> 133
<211> 568
<212> PRT
<213> Aspergillus niger

<400> 133

```
Met Ile Leu Pro Gln Gly Ser Leu Phe Leu Val Ser Ile Ala Ala Cys
1               5                   10                  15


Ser Thr Val Val Ala Ala Ala Gly Asp Ala Ser Ser Arg Pro Arg Gly
            20                  25                  30


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


Cys Ile Ser His Pro Ala Ile Gln Ile Pro Phe Ser Ala Val Asn Asp
    50                  55                  60


Asp Tyr Cys Asp Cys Pro Asp Gly Ser Asp Glu Pro Gly Thr Ser Ala
65                  70                  75                  80


Cys Ala Phe Leu Ser Arg Asn Phe Ala Leu Thr Pro Gly Glu Arg Pro
                85                  90                  95


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


Lys Asn Lys Gly His Lys Pro Gly Tyr Val Pro Phe Gln Arg Val Asn
        115                 120                 125


Asp Gly Ile Cys Asp Tyr Glu Leu Cys Cys Asp Gly Ser Asp Glu Trp
    130                 135                 140
```

```
Ala Arg Pro Gly Gly Thr Lys Cys Glu Asp Lys Cys Lys Glu Ile Gly
145                 150                 155                 160


Lys Glu Trp Arg Lys Lys Glu Glu Lys Arg Gln Lys Ser Met Thr Ala
                165                 170                 175


Ala Leu Lys Lys Lys Lys Asp Leu Leu Val Glu Ala Gly Arg Gln Gln
            180                 185                 190


Lys Glu Val Glu Asp Asn Ile Lys Arg Leu Glu Val Glu Ile Gln Ala
        195                 200                 205


Gln Glu Leu Lys Val Asn Asp Leu Gln Ala Glu Leu Glu Glu Val Glu
    210                 215                 220


Lys Gln Glu Ala Ser Lys Val Val Lys Gly Lys Thr Ala Gly Lys Val
225                 230                 235                 240


Asn Val Leu Ala Gly Leu Ala Lys Ser Arg Val Glu Glu Leu Arg Asn
                245                 250                 255


Ala Leu Met Asp Val Arg Lys Glu Arg Asp Asp Thr Arg Ala Arg Val
            260                 265                 270


Lys Glu Leu Glu Glu Ile Leu Ser Lys Phe Lys Val Glu Tyr Asn Pro
        275                 280                 285


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


Tyr Ala Ala Lys Gly Thr Leu Glu Gly Ala Val Asn Asn Ala Gln Asp
305                 310                 315                 320


Arg Asp Leu Asp Glu Ile Ala Lys Pro Asp Asp Glu Lys Ala Gly Ile
                325                 330                 335
```

```
Asn Trp Glu Gln Trp Glu Asn Glu Glu Asp Gly Cys Glu Ala Gly Leu
            340                 345                 350

Val Tyr Gln Leu Ala Ala Tyr Leu Pro Pro Ser Leu Val Glu Phe Ile
        355                 360                 365

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

Leu Pro Lys Ala Ala Glu Thr Ser Thr Ser Glu Ser Lys Val Val Ser
385                 390                 395                 400

Glu Ala Arg Glu Ala Val Lys Ser Ala Glu Lys Glu Leu Gly Asp Lys
                405                 410                 415

Gln Lys Gln Leu Lys Asp His Lys Ser Asp Leu Glu Thr Asp Tyr Gly
            420                 425                 430

Val Gly Ser Ile Phe Arg Ala Leu Lys Gly Val Cys Ile Ser Lys Asp
        435                 440                 445

Ser Gly Glu Tyr Thr Tyr Glu His Cys Phe Leu Asp Gln Thr Lys Gln
    450                 455                 460

Ile Pro Lys Lys Gly Gly Gly Ser Thr Arg Met Gly Lys Tyr Thr Gly
465                 470                 475                 480

Ile Gly Ser Val Ser Val Asp Val Leu Asn Glu Ala Gly Glu Ile Val
                485                 490                 495

Pro Glu Asp Arg Val Thr Leu Gln Tyr Ala Asn Gly Gln Gly Cys Trp
            500                 505                 510

Asn Gly Pro Ala Arg Ser Thr Thr Val Ile Leu Thr Cys Gly Glu Glu
        515                 520                 525
```

eolf-seql

Asp Ala Ile Leu Lys Val Ala Glu Asp Glu Lys Cys Val Tyr Ser Met
530 535 540

His Val Thr Ser Pro Ala Val Cys Pro Gly Gly Asp Glu Gly Ala Thr
545 550 555 560

Ala Pro Asn Arg Lys Asp Glu Leu
565

<210> 134
<211> 2897
<212> DNA
<213> Trichoderma reesei

<220>
<221> misc_feature
<222> (1)..(1)
<223> n is a, c, g, or t

<400> 134
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ccattctgtg cctgatcggg cctgccttgg ccgtcaagga acacgagttc aaaaagtgcc 120

accaggccgg cttctgcaac cgaaaccgtg cattggccga ccttgcggct tcccagagct 180

cgacctgggt gtctccctac aaggctgtct tcgaatctcc ctcgttggaa gacggaaaga 240

ttcagggtgt tatcctcaaa acgatcaatg ccgccggcga cactgtccga ctgccagtca 300

caatctcatt cctcgaatcg ggtgttgctc gcctcaccat tgacgaagag aggaggcaaa 360

acaaggacat tgagctgagg cacggcagcg ccgcaagaaa ggaacgctac aacgaggctg 420

cgaactggtc cgttgttggc ggccttgagc cggctttgaa agccgagatt gtccaccagg 480

acgactctca aatcaatgtc aaatacggtc ccgaaggcaa ctttgaggcc gtcatcagac 540

tctcgccctt taggattgat ttccggagag acggtgtctc gcacatcgag ctcaacgaac 600

gcggcctgct caatgttgag cattggagac caaaggtcga gagaccagag ggagaagaaa 660

acaccgagga ggacgaaagc acttggtggg acgaaacgtt taacggacat accgatacca 720

agccacgtgg ccccgaaagt gtggccttgg acatctcgtt ccatggatac gagcacgtct 780

atggtattcc cgagcatacg ggacctcttt ctctcaagga gactcgaggc ggcgaaggca 840

actatgcaga accctatcgc atgtacaacg ccgacgtctt cgagtatatc cttgacagcc 900

ccatgaccct ctacggctcc atccctttca tgcaggctca ccgaaaggat tcgtccgtcg 960

gtctcttgtg gctcaatgcc gccgatacgt gggttgatat caccaaggtc aagggcagta 1020

ctaaccctct gagcctgacc tccggtgccc caaagaacac ccagacccac tggatctccg 1080

agagcggtat catcgatctc tttgtcttct tgggccccac gccccaggac attacgaaga 1140

agtatggcga gctgacggga acaaccgcta tgcctcaaga gtttgccctc ggctaccacc 1200

agtgccgatg gaattacttc tccgaagacg acgtcaagga cgttgatcgg aggtttgaca 1260

aggctcatat cccgtacgac gtcatctggc tggatatcga atacaccgat gagatcaagt 1320

acttcacctg ggatcctcac tcattcaccg accccatcac catgggtaaa cagttggaca 1380

gccacggcag aaaactggtg acaatcattg atcctcacat caagagggtt gataactatc 1440

ctatcaatga gcaactcctg gctcttgacc tcgccattca tgacaaggac ggcaaggcat 1500

acgaaggctc gtgctggcca ggcaattcca actggatcga ctgcttcaac cccaaggccc 1560

gtgagtggtg gaagggtctg tacaaatacg atcagttcaa gggaacaatg gagaacacct 1620

ttatctggaa cgacatgaac gaaccttccg tctttgaagg gccagagact accatgccca 1680

aggacaatct ccactgggac aactgggagc accgagatgt ccacaacctg aacggaatga 1740

cgtatcatca ctctaccttt gaagctctga agagccgcaa gaagggcgag taccgacgtc 1800

cgtttgtgct gacccgagcg ttcttctccg gatcccagcg cttcggtgct atgtggaccg 1860

gtgacaacct ggcggactgg ggccacctgc agacttccgt caccatgctc atcaaccagg 1920

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aggacctgct tgcccgttgg taccagacgg ctgcattcta tccattcttc cgcgcccatg 2040

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ttactgcagc gctgcggctg cgatactctc tcttgcccgc ttggtacact gccttcttcc 2160

acgcgaaccg agatggtagc cctatcctcc gccccatgtt ttggacgcat ccgtctgccg 2220

agggaggctt ggcgattgat gaccagttct tcctggcatc tactggcttg ctcgttaagc 2280

ccgttgcaga gaaagacaag tacagcgctg acatctggat tccggatgac gaggtctact 2340

acgaatacga cacgtacaac gtggcgaaga ccgagcaggg caagcacgtc acatttgacg 2400

cccccattga ccgaatccct atcctgatgc gaggaggcca catcattcct cgccgcgata 2460

ttccccgccg ctcgagctct ctcatgcgtt tcgaccccta tacccttgtc gtctccgtct 2520

ccaaggatgg ccaggccgaa ggagagctgt acgtggacga tggcgatagc tacgagtacc 2580

aggatggtca atacattcat cgccagttca gcctaaagga cgatgtcctt tcttcagtcg 2640

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tgcagatcga atcagacgga cgcgcctggg ctgcccaggt ggtctaccac gccgccgaca 2820

aggacagggc tgcatttgca actgtgaccc atgtgaaggc ccgtgttggg gatgactgga 2880

gcatcaagct ggcttag 2897

<210> 135
<211> 1056
<212> PRT
<213> Caenorhabditis remanei

<400> 135

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

Val Ala Ala Pro Val Leu Gly Asn Arg Glu Met Val Lys Asp Ser Val
20 25 30

Ile Ser Ala Asn Arg Asp Gly Ser Cys Ser Leu Arg Thr Asp Val Val
35 40 45

Pro Gln Val Asp Val Gln Met Leu Glu Leu Tyr Glu Arg Thr Pro Phe
50 55 60

```
Asp Asn Val Asp Gly Gly Pro Trp Lys Gln Gly Trp Arg Ile Ser Tyr
65                  70                  75                  80

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

Pro His Ser His Asn Asp Pro Gly Trp Ile His Thr Phe Glu Glu Tyr
            100                 105                 110

Tyr Glu Arg Gln Thr Lys Gln Ile Phe Ala Asn Met Leu Arg His Leu
        115                 120                 125

Glu Glu Asn Pro Gly Met Arg Phe Ile Trp Ala Glu Ile Ser Tyr Phe
    130                 135                 140

Ala Arg Trp Tyr Asp Asn Leu Val Pro Gln Gln Lys Asp Val Val Lys
145                 150                 155                 160

Lys Leu Val Arg Asn Arg Gln Leu Glu Phe Val Thr Gly Gly Trp Val
                165                 170                 175

Met Pro Asp Glu Ala Asn Ser His Trp Tyr Ala Met Leu Leu Gln Leu
            180                 185                 190

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

Ser Ser Trp Ser Ile Asp Pro Phe Gly Gln Ser Pro Ser Met Pro Tyr
    210                 215                 220

Ile Leu Lys Lys Ser Gly Phe Asp Asn Leu Leu Ile Gln Arg Thr His
225                 230                 235                 240

Tyr Ile Val Lys Lys Asn Leu Ala Leu Lys Gln Gln Leu Glu Phe Arg
                245                 250                 255
```

```
Trp Arg Gln Leu Trp Asp Ser Thr Gly Glu Thr Glu Leu Leu Thr His
            260                 265                 270

Met Met Pro Phe Tyr Ser Tyr Asp Ile Pro His Thr Cys Gly Pro Asp
        275                 280                 285

Pro Lys Ile Cys Cys Gln Phe Asp Phe Lys Arg Leu Pro Asn Phe Gly
    290                 295                 300

Val Ser Cys Pro Trp Arg Val Pro Pro Gln Pro Ile Thr Asp Glu Asn
305                 310                 315                 320

Val Ala Lys Lys Ala Glu Leu Ile Val Asp Gln Trp Arg Lys Lys Ser
                325                 330                 335

Val Leu Tyr Lys Thr Arg Ser Val Leu Ile Pro Leu Gly Asp Asp Phe
            340                 345                 350

Arg Tyr Thr Gln Ser Lys Glu Trp Glu Ala Gln Arg Val Asn Phe Glu
        355                 360                 365

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

Lys Phe Gly Thr Leu Gln Glu Tyr Phe Asp Ser Ile Arg Ala Ala Gln
385                 390                 395                 400

Pro Leu Asp Lys Phe Pro Thr Leu Ser Gly Asp Phe Phe Thr Tyr Ala
                405                 410                 415

Asp Val Asn Glu Asp Tyr Trp Ser Gly Tyr Tyr Thr Ser Arg Pro Tyr
            420                 425                 430

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

```
Met Leu His Ala Trp His Thr Trp Asp Gly Glu Gly Glu Gly Glu Leu
    450                 455                 460

Ala Gln Arg Leu Gln Tyr Ala Arg Gln Gln Leu Ala Leu Phe Gln His
465                 470                 475                 480

His Asp Gly Ile Thr Gly Thr Ala Asp Asn His Val Val Glu Asp Tyr
                485                 490                 495

Ala Gln Arg Met Ser Lys Ala Ile Glu Glu Cys Lys Phe Val Met Gln
            500                 505                 510

Gln Ala Val Tyr Arg Leu Leu Thr Arg Pro Ser Val Tyr Gln Ala Asp
        515                 520                 525

Pro Lys Phe Ser Tyr Leu Ser Ile Asp Asp Ala Arg Thr Val Asp Gly
    530                 535                 540

Ser Asp Ser Phe Arg Pro Thr Ile Ile Ile Gly Asp Glu Leu Pro Ile
545                 550                 555                 560

Lys His Val Val Val His Asn Ser Leu Pro Val His Arg Gln Glu Leu
                565                 570                 575

Val Glu Val Tyr Leu Gly Arg Pro Phe Ala Thr Val Gln Asp Ser Arg
            580                 585                 590

Asp Gly Ser Thr Val Pro Ala Gln Ile Ala Pro Val Trp Ser Trp His
        595                 600                 605

Thr Arg Pro Asp Gly Val Ser Thr Pro Gln Ala Ser Thr Thr Lys Tyr
    610                 615                 620

Arg Leu Val Phe Arg Val Ser Val Pro Pro Met Gly Leu Val Val Tyr
625                 630                 635                 640
```

```
Thr Ile Asn Ala Arg Asn Arg Val Gln Asp Ser Glu Gly Val Ser Tyr
                645                 650                 655

Ala Lys Val Thr Ile Leu Ser Arg Thr Pro Phe Thr Ile Asn Leu Arg
            660                 665                 670

Asp Tyr Pro Glu Leu Pro Glu Phe Gly Glu Pro Arg Glu Thr Ser Leu
        675                 680                 685

Lys Val Gly Glu Ser Gly Pro Gly Ala Ser Phe Asn Thr Asn Gly Leu
    690                 695                 700

Leu Lys Ser Leu Ser Val Asp Ser Asn Thr Val Pro Val His Leu Glu
705                 710                 715                 720

Phe Leu Lys Tyr Gly Met Arg Phe Gly His Gly Lys Ser Gly Ala Tyr
                725                 730                 735

Leu Phe His Pro Asp Gly Pro Ala Thr Lys Leu Pro Leu Gly Asp Pro
            740                 745                 750

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

Leu Pro Phe Thr Asn His Gln Ala Val Leu Arg Gly Gly Ala Leu Glu
    770                 775                 780

Leu Arg Asn Leu Val Asp Ile Gly Ser Arg Glu Asn Thr Glu Ile Val
785                 790                 795                 800

Met Arg Leu Ser Thr Thr Ile Asp Ser Gly Glu Leu Phe Tyr Thr Asp
                805                 810                 815

Leu Asn Gly Met Gln Ile Ile Lys Arg Lys Arg Met Asp Lys Leu Pro
            820                 825                 830
```

```
Leu Gln Ala Asn Tyr Tyr Pro Val Pro Ser Ala Met Phe Ile Gln Asp
        835                 840                 845

Glu Asn Leu Arg Leu Thr Ile Leu Gly Gly Gln Pro Leu Gly Gly Ser
    850                 855                 860

Ser Leu Lys Ser Gly Glu Met Glu Ile Met Gln Asp Arg Arg Leu Ser
865                 870                 875                 880

Gln Asp Asp Asp Arg Gly Leu Gly His Gly Val Leu Asp Asn Leu Pro
                885                 890                 895

Val Leu His Leu Phe Arg Leu Val Leu Glu Ser Arg Glu Ser Cys Thr
            900                 905                 910

Lys Leu Asp Pro Gly Tyr Pro Ala Ala Phe Leu Thr Ala Ser Ala His
        915                 920                 925

Ala Glu Leu Arg Ser Leu Leu His Pro Pro Glu Lys Leu Ile Phe Asn
    930                 935                 940

Glu Asn Glu Trp Thr Gly Leu Val Pro Ser Phe Gly Ala Asn His Glu
945                 950                 955                 960

Pro Leu Asp Arg Asp Leu Glu Leu Val Ala Met Arg Ser Leu Pro His
                965                 970                 975

Val Lys Leu Gly Lys Asp Arg Arg Pro Thr Ile Gly Leu Val Val His
            980                 985                 990

Arg Thr Asn Leu Glu Asp Cys Gly  Ser Glu Ala Ser Gly  Glu Gly Asn
        995                 1000                1005

Leu Ser  Ile Lys Lys Leu Leu  Asn Leu Asp Asp Gly  His Glu Val
    1010                1015                1020
```

```
Tyr Ala  Ser Pro Leu Thr Leu  Leu Arg Arg Gln Glu  Pro Val Ser
    1025                1030                1035


Ala Asp  Asp Leu Asn Leu Cys  Pro Met Asp Thr Lys  Ala Phe Ile
    1040                1045                1050


Ile Gln  Arg
    1055
```

<210> 136
<211> 1038
<212> PRT
<213> Culex quinquefasciatus

<400> 136

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Glu Gly Met Ala His Ile His Gln Val Gln Lys His His Lys Pro Thr
1               5                   10                  15


Pro Pro Met Thr Asp Ile Cys Asn Ile Arg Glu Asn Ile Ser Val Ala
            20                  25                  30


His Ser Asp Leu Gln Met Leu Asp Leu Tyr Glu Thr Trp Lys Phe Glu
        35                  40                  45


Asn Leu Asp Gly Gly Val Trp Lys Gln Gly Trp Lys Ile Glu Tyr Asp
    50                  55                  60


Ala Glu Lys Val Lys Ala Leu Pro Arg Leu Glu Val Ile Val Ile Pro
65                  70                  75                  80


His Ser His Cys Asp Pro Gly Trp Ile Met Thr Phe Asp Glu Tyr Tyr
                85                  90                  95


Ser Arg Gln Thr Arg Asn Ile Leu Asn Gly Met Ala Lys His Leu Gly
            100                 105                 110
```

```
Glu Lys Asp Glu Met Arg Phe Ile Tyr Ala Glu Ile Ser Phe Phe Glu
        115                 120                 125


Thr Trp Trp Arg Glu Gln Ser Glu Glu Thr Arg Lys Lys Val Lys Gly
    130                 135                 140


Tyr Leu Glu Ala Gly Lys Leu Glu Ile Val Thr Gly Gly Trp Val Met
145                 150                 155                 160


Thr Asp Glu Ala Asn Ala His Tyr His Ser Met Val Thr Glu Leu Phe
                165                 170                 175


Glu Gly His Glu Trp Ile Gln Asn His Leu Gly Lys Asn Ala Ile Pro
            180                 185                 190


Lys Ser His Trp Ser Ile Asp Pro Phe Gly Leu Ser Pro Ser Leu Pro
        195                 200                 205


His Leu Leu Thr Ser Ala Asn Ile Thr Asn Ala Val Leu Gln Arg Val
    210                 215                 220


His Tyr Ser Val Lys Arg Glu Leu Ala Leu Lys Lys Asn Leu Glu Phe
225                 230                 235                 240


Tyr Trp Arg Gln Leu Phe Gly Ser Thr Gly His Pro Asp Leu Arg Ser
                245                 250                 255


His Ile Met Pro Phe Tyr Ser Tyr Asp Ile Pro His Thr Cys Gly Pro
            260                 265                 270


Glu Pro Ser Val Cys Cys Gln Phe Asp Phe Arg Arg Met Pro Asp Gly
        275                 280                 285


Gly Lys Ser Cys Asp Trp Gly Ile Pro Pro Gln Arg Ile Thr Asp Glu
    290                 295                 300
```

```
Asn Val Ala Glu Arg Ala Gln Met Ile Tyr Asp Gln Tyr Arg Lys Lys
305                 310                 315                 320

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

Phe Arg Tyr Asp Ile Asp Phe Glu Trp Asn Ser Gln Tyr Glu Asn Tyr
            340                 345                 350

Lys Lys Leu Phe Glu Tyr Met Asn Ser Lys Ser Glu Trp Asn Val His
        355                 360                 365

Ala Gln Phe Gly Thr Leu Ser Asp Tyr Phe Lys Lys Leu Asp Thr Ala
    370                 375                 380

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

Thr Tyr Ala Asp Arg Asp Asp His Tyr Trp Ser Gly Tyr Phe Thr Ser
                405                 410                 415

Arg Pro Phe Tyr Lys Gln Leu Asp Arg Val Leu Gln His Tyr Leu Arg
            420                 425                 430

Ser Ala Glu Ile Ala Phe Ser Leu Ala Asn Ile Glu Glu Glu Gly Met
        435                 440                 445

Met Glu Ser Lys Val Phe Glu Lys Leu Val Thr Ala Arg Arg Ala Leu
    450                 455                 460

Ser Leu Phe Gln His His Asp Gly Val Thr Gly Thr Ala Lys Asp His
465                 470                 475                 480

Val Val Leu Asp Tyr Gly Gln Lys Met Ile Asp Ala Leu Asn Ala Cys
                485                 490                 495
```

```
Glu Asp Val Leu Ser Glu Ser Leu Val Val Leu Leu Gly Ile Asp Ser
            500                 505                 510

Thr Lys Lys Met Glu Met Asp Glu Lys Arg Val Asn Glu Asn Leu Leu
        515                 520                 525

Pro Glu Lys Leu Val Tyr Lys Val Gly Gln Asn Val Val Leu Phe Asn
    530                 535                 540

Thr Leu Ser Arg Asn Arg Asn Glu Pro Val Cys Ile Arg Val Asp Ser
545                 550                 555                 560

Val Asp Ala Gly Ile Glu Ala Glu Pro Pro Val Thr Lys Gln Gln Ile
                565                 570                 575

Ser Pro Val Ile Glu Tyr Asn Glu Glu Ser Lys Lys Leu Val Ala Lys
            580                 585                 590

Asp Gly Val Phe Glu Leu Cys Phe Leu Ala Ser Leu Gly Pro Met Glu
        595                 600                 605

Ser Val Ser Leu Lys Leu Val Lys Ser Thr Thr Thr Ser Lys Ser Glu
    610                 615                 620

Ile Arg Thr Asn Ser Lys Ile Gln Val Asp Ser Ser Phe Lys Ser Ser
625                 630                 635                 640

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

Glu Phe Asp Gly Glu Asn Gly Met Ile Lys Lys Ala Thr Ser Leu Val
            660                 665                 670

Asp Asp Lys Pro Ile Asp Leu Asn Ser His Phe Val His Tyr Gly Ala
        675                 680                 685
```

```
Arg Lys Ala Arg Arg Lys Phe Ala Asn Gly Asn Glu Asp Asn Pro Ala
    690                 695                 700

Gly Ala Tyr Leu Phe Leu Pro Asp Gly Glu Ala Arg Glu Leu Lys Lys
705                 710                 715                 720

Glu Glu Asn Glu Trp Ile Val Ile Gly Gly Asp Leu Val Arg Arg Val
                725                 730                 735

Phe Ala Thr Pro Met Ser Asp Leu Lys Ile Leu Gln Thr Tyr Thr Leu
            740                 745                 750

Tyr Gln Gly Leu Pro Trp Ile Asp Leu Asp Asn Glu Val Asp Val Arg
        755                 760                 765

Ser Lys Glu Asn Phe Glu Leu Ala Leu Arg Phe Ser Thr Ser Ile Ser
    770                 775                 780

Ser Asn Asp Glu Phe Phe Thr Asp Leu Asn Gly Leu Gln Met Ile Lys
785                 790                 795                 800

Arg Arg Arg Gln Thr Lys Leu Pro Thr Gln Ala Asn Phe Tyr Pro Met
                805                 810                 815

Ser Ala Gly Val Tyr Ile Glu Asp Asp Ala Ser Arg Met Thr Ile His
            820                 825                 830

Ser Ala Gln Ala Leu Gly Val Ser Ser Leu Ala Ser Gly Gln Ile Glu
        835                 840                 845

Ile Met Leu Asp Arg Arg Leu Ser Ser Asp Asp Asn Arg Gly Leu Gln
    850                 855                 860

Gln Gly Val Arg Asp Asn Lys Arg Thr Val Ala His Phe Arg Ile Val
865                 870                 875                 880
```

```
Ile Glu Pro Met Ser Pro Thr Ser Ser Asn Lys Lys Asp Glu Arg Val
                885                 890                 895


Gly Phe His Ser His Val Gly His Leu Ala Thr Trp Ser Leu His Tyr
            900                 905                 910


Pro Val Val Lys Met Met Gly Glu Thr Thr Pro Lys Ser Ile Ala Ser
        915                 920                 925


Lys Asn Leu Glu Asn Glu Leu Asn Cys Asp Leu His Val Val Thr Phe
    930                 935                 940


Arg Thr Leu Ala Ser Pro Thr Thr Tyr Glu Ala Asn Glu Arg Ser Thr
945                 950                 955                 960


Ala Ala Glu Lys Lys Ala Ala Met Val Met His Arg Val Val Pro Asp
                965                 970                 975


Cys Arg Ser Arg Leu Thr Leu Pro Asp Thr Ser Cys Leu Thr Ser Gly
            980                 985                 990


Ile Glu Ile Glu Pro Leu Lys Leu  Ile Ser Ser Leu Lys  Ser Ala Arg
        995                 1000                1005


Gln Thr  Ser Leu Thr Asn Leu  Tyr Glu Gly Gln Lys  Ser Glu Gln
    1010                1015                1020


Phe Ile  Leu Gln Pro Asn Asp  Val Ser Ser Ile Leu  Val Ser Phe
    1025                1030                1035


<210>  137
<211>  1263
<212>  DNA
<213>  Trichoderma reesei

<400>  137
atggcgtcac tcatcaaaac tgccgtggac attgccaacg gccgccatgc gctgtccaga       60
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tatgtcatct ttgggctctg gcttgcggat gcggtgctgt gcgggctgat tatctggaaa 120

gtgccttata cggaaatcga ctgggtcgcc tacatggagc aagtcaccca gttcgtccac 180

ggagagcgag actaccccaa gatggagggc ggcacagggc ccctggtgta tcccgcggcc 240

catgtgtaca tctacacagg gctctactac ctgacgaaca agggcaccga catcctgctg 300

gcgcagcagc tctttgccgt gctctacatg gctactctgg cggtcgtcat gacatgctac 360

tccaaggcca aggtcccgcc gtacatcttc ccgcttctca tcctctccaa aagacttcac 420

agcgtcttcg tcctgagatg cttcaacgac tgcttcgccg ccttcttcct ctggctctgc 480

atcttcttct tccagaggcg agagtggacc atcggagctc tcgcatacag catcggcctg 540

ggcgtcaaaa tgtcgctgct actggttctc cccgccgtgg tcatcgtcct ctacctcggc 600

cgcggcttca agggcgccct gcggctgctc tggctcatgg tgcaggtcca gctcctcctc 660

gccataccct tcatcacgac aaattggcgc ggctacctcg gccgtgcatt cgagctctcg 720

aggcagttca agtttgaatg gacagtcaat tggcgcatgc tgggcgagga tctgttcctc 780

agccggggct tctctatcac gctactggca tttcacgcca tcttcctcct cgcctttatc 840

ctcggccggt ggctgaagat tagggaacgg accgtactcg ggatgatccc ctatgtcatc 900

cgattcagat cgccctttac cgagcaggaa gagcgcgcca tctccaaccg cgtcgtcacg 960

cccggctatg tcatgtccac catcttgtcg gccaacgtgg tgggactgct gtttgcccgg 1020

tctctgcact accagttcta tgcatatctg gcgtgggcga ccccctatct cctgtggacg 1080

gcctgcccca atcttttggt ggtggccccc ctctgggcgg cgcaagaatg ggcctggaac 1140

gtcttcccca gcacgcctct tagctcgagc gtcgtggtga gcgtgctggc cgtgacggtg 1200

gccatggcgt ttgcaggttc aaatccgcag ccacgtgaaa catcgaagcc gaagcagcac 1260

taa 1263

<210> 138
<211> 420
<212> PRT
<213> Trichoderma reesei

<400> 138

```
Met Ala Ser Leu Ile Lys Thr Ala Val Asp Ile Ala Asn Gly Arg His
1               5                  10                  15

Ala Leu Ser Arg Tyr Val Ile Phe Gly Leu Trp Leu Ala Asp Ala Val
            20                  25                  30

Leu Cys Gly Leu Ile Ile Trp Lys Val Pro Tyr Thr Glu Ile Asp Trp
        35                  40                  45

Val Ala Tyr Met Glu Gln Val Thr Gln Phe Val His Gly Glu Arg Asp
    50                  55                  60

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

His Val Tyr Ile Tyr Thr Gly Leu Tyr Tyr Leu Thr Asn Lys Gly Thr
                85                  90                  95

Asp Ile Leu Leu Ala Gln Gln Leu Phe Ala Val Leu Tyr Met Ala Thr
            100                 105                 110

Leu Ala Val Val Met Thr Cys Tyr Ser Lys Ala Lys Val Pro Pro Tyr
        115                 120                 125

Ile Phe Pro Leu Leu Ile Leu Ser Lys Arg Leu His Ser Val Phe Val
    130                 135                 140

Leu Arg Cys Phe Asn Asp Cys Phe Ala Ala Phe Phe Leu Trp Leu Cys
145                 150                 155                 160

Ile Phe Phe Phe Gln Arg Arg Glu Trp Thr Ile Gly Ala Leu Ala Tyr
                165                 170                 175

Ser Ile Gly Leu Gly Val Lys Met Ser Leu Leu Leu Val Leu Pro Ala
```

```
            180                 185                 190

Val Val Ile Val Leu Tyr Leu Gly Arg Gly Phe Lys Gly Ala Leu Arg
        195                 200                 205

Leu Leu Trp Leu Met Val Gln Val Gln Leu Leu Leu Ala Ile Pro Phe
    210                 215                 220

Ile Thr Thr Asn Trp Arg Gly Tyr Leu Gly Arg Ala Phe Glu Leu Ser
225                 230                 235                 240

Arg Gln Phe Lys Phe Glu Trp Thr Val Asn Trp Arg Met Leu Gly Glu
                245                 250                 255

Asp Leu Phe Leu Ser Arg Gly Phe Ser Ile Thr Leu Leu Ala Phe His
            260                 265                 270

Ala Ile Phe Leu Leu Ala Phe Ile Leu Gly Arg Trp Leu Lys Ile Arg
        275                 280                 285

Glu Arg Thr Val Leu Gly Met Ile Pro Tyr Val Ile Arg Phe Arg Ser
    290                 295                 300

Pro Phe Thr Glu Gln Glu Glu Arg Ala Ile Ser Asn Arg Val Val Thr
305                 310                 315                 320

Pro Gly Tyr Val Met Ser Thr Ile Leu Ser Ala Asn Val Val Gly Leu
                325                 330                 335

Leu Phe Ala Arg Ser Leu His Tyr Gln Phe Tyr Ala Tyr Leu Ala Trp
            340                 345                 350

Ala Thr Pro Tyr Leu Leu Trp Thr Ala Cys Pro Asn Leu Leu Val Val
        355                 360                 365

Ala Pro Leu Trp Ala Ala Gln Glu Trp Ala Trp Asn Val Phe Pro Ser
```

370 375 380

Thr Pro Leu Ser Ser Ser Val Val Val Ser Val Leu Ala Val Thr Val
385 390 395 400

Ala Met Ala Phe Ala Gly Ser Asn Pro Gln Pro Arg Glu Thr Ser Lys
405 410 415

Pro Lys Gln His
420

<210> 139
<211> 444
<212> PRT
<213> Phaedactylum tricornutum

<400> 139

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

Arg Arg Arg Gly Gly Arg Glu Glu Arg Leu Ala Ile Gly Leu Leu Leu
20 25 30

Thr Leu Ala Val Val Trp Gly Thr Val Leu Val Gly Thr Leu Val Ala
35 40 45

Leu Val Ala Ser Pro Thr Lys Ser Val Pro Thr Phe Pro Thr Val Pro
50 55 60

Thr Asp Ser Arg Pro Ser Ala Ala Phe Val Val Ser Asp Ala Pro Gly
65 70 75 80

Ala Tyr Glu Ser Pro Leu Leu Val Phe Thr Cys Arg Arg Asp Gln Tyr
85 90 95

Leu Arg Glu Thr Leu Arg Asp Ile Trp Asn Tyr Ile Pro Thr Asp Cys
100 105 110

```
Ser Val Gly Cys Pro Leu Val Ile Ser Gln Asp Gly Asn Asp Pro Ala
        115                 120                 125

Val Arg Arg Val Val Arg Glu Phe Thr Asp Glu Phe Ala Thr Lys Asn
    130                 135                 140

Val Pro Val Ile His Trp Thr His Thr Ser Ala Leu Arg Gly Ser Thr
145                 150                 155                 160

Asn Gly Tyr Gln Ala Leu Ala Ile His Tyr Gly Trp Ala Leu Arg Arg
                165                 170                 175

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

Gly Thr Pro Gln Arg Val Ile Ile Leu Glu Glu Asp Leu His Val Ala
        195                 200                 205

Pro Asp Phe Phe Asp Tyr Phe Ala Ala Thr Ala Pro Leu Leu Asp His
    210                 215                 220

Asp Ser Ser Leu Leu Ala Val Ser Ala Phe His Asp Asn Gly Phe Ala
225                 230                 235                 240

His Asn Val Arg Asn Ala Ser Arg Ile Leu Arg Ser Asp Phe Phe Pro
                245                 250                 255

Gly Leu Gly Trp Met Met Asn Arg Arg Leu Trp Val Asp Glu Leu Gln
            260                 265                 270

Ser Lys Trp Pro Gly Gly Tyr Trp Asp Asp Trp Leu Arg Glu Pro Ala
        275                 280                 285

Gln Arg Gln Asp Arg Ala Ile Leu Arg Pro Glu Ile Ser Arg Thr Tyr
    290                 295                 300
```

```
His Phe Gly Thr Glu Gly Gly Thr Ser Ser Asn Gln Phe Gly Ser His
305                 310                 315                 320

Leu Ser Lys Ile Leu Leu Asn Arg Glu Thr Val Asp Trp Ser Lys Ala
                325                 330                 335

Ala Asp Leu Glu Ala Gln Leu Arg Pro Glu Val Tyr Asp Pro Ala Tyr
            340                 345                 350

Trp Ala Met Val Gln Ala Ser Thr Leu Thr Tyr Thr Ile Pro Asp Ala
        355                 360                 365

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

Glu Gln Phe Lys Tyr Leu Ala His Lys Leu Lys Leu Met Ala Asp Glu
385                 390                 395                 400

Lys Ala Asn Val Pro Arg Thr Ala Tyr Lys Gly Ile Val Glu Thr Arg
                405                 410                 415

Pro His Gly Ala Asp Tyr Phe Leu Phe Leu Thr Pro Pro Leu Ala Glu
            420                 425                 430

Leu Gln Lys Glu Phe Asp Ile Pro Ser Pro Lys Arg
        435                 440
```

<210> 140
<211> 391
<212> PRT
<213> Phaedactylum tricornutum

<400> 140

```
Thr Lys Ser Val Pro Thr Phe Pro Thr Val Pro Thr Asp Ser Arg Pro
1               5                   10                  15
```

```
Ser Ala Ala Phe Val Val Ser Asp Ala Pro Gly Ala Tyr Glu Ser Pro
            20                  25                  30

Leu Leu Val Phe Thr Cys Arg Arg Asp Gln Tyr Leu Arg Glu Thr Leu
        35                  40                  45

Arg Asp Ile Trp Asn Tyr Ile Pro Thr Asp Cys Ser Val Gly Cys Pro
    50                  55                  60

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

Arg Glu Phe Thr Asp Glu Phe Ala Thr Lys Asn Val Pro Val Ile His
                85                  90                  95

Trp Thr His Thr Ser Ala Leu Arg Gly Ser Thr Asn Gly Tyr Gln Ala
            100                 105                 110

Leu Ala Ile His Tyr Gly Trp Ala Leu Arg Arg Val Phe Asp Gly Gln
        115                 120                 125

Thr Leu Ser Gly Ser Val His Gly Ala Lys His Gly Thr Pro Gln Arg
    130                 135                 140

Val Ile Ile Leu Glu Glu Asp Leu His Val Ala Pro Asp Phe Phe Asp
145                 150                 155                 160

Tyr Phe Ala Ala Thr Ala Pro Leu Leu Asp His Asp Ser Ser Leu Leu
                165                 170                 175

Ala Val Ser Ala Phe His Asp Asn Gly Phe Ala His Asn Val Arg Asn
            180                 185                 190

Ala Ser Arg Ile Leu Arg Ser Asp Phe Phe Pro Gly Leu Gly Trp Met
        195                 200                 205
```

```
Met Asn Arg Arg Leu Trp Val Asp Glu Leu Gln Ser Lys Trp Pro Gly
    210                 215                 220

Gly Tyr Trp Asp Asp Trp Leu Arg Glu Pro Ala Gln Arg Gln Asp Arg
225                 230                 235                 240

Ala Ile Leu Arg Pro Glu Ile Ser Arg Thr Tyr His Phe Gly Thr Glu
                245                 250                 255

Gly Gly Thr Ser Ser Asn Gln Phe Gly Ser His Leu Ser Lys Ile Leu
            260                 265                 270

Leu Asn Arg Glu Thr Val Asp Trp Ser Lys Ala Ala Asp Leu Glu Ala
        275                 280                 285

Gln Leu Arg Pro Glu Val Tyr Asp Pro Ala Tyr Trp Ala Met Val Gln
    290                 295                 300

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

Lys Ser Asn Ala Arg Leu Gln Tyr Thr Thr Ile Glu Gln Phe Lys Tyr
                325                 330                 335

Leu Ala His Lys Leu Lys Leu Met Ala Asp Glu Lys Ala Asn Val Pro
            340                 345                 350

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

Tyr Phe Leu Phe Leu Thr Pro Pro Leu Ala Glu Leu Gln Lys Glu Phe
    370                 375                 380

Asp Ile Pro Ser Pro Lys Arg
385                 390
```

<210> 141
<211> 445
<212> PRT
<213> Homo sapiens

<400> 141

```
Met Leu Lys Lys Gln Ser Ala Gly Leu Val Leu Trp Gly Ala Ile Leu
1               5                   10                  15


Phe Val Ala Trp Asn Ala Leu Leu Leu Leu Phe Phe Trp Thr Arg Pro
            20                  25                  30


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


Ser Leu Thr Arg Glu Val Ile Arg Leu Ala Gln Asp Ala Glu Val Glu
    50                  55                  60


Leu Glu Arg Gln Arg Gly Leu Leu Gln Gln Ile Gly Asp Ala Leu Ser
65                  70                  75                  80


Ser Gln Arg Gly Arg Val Pro Thr Ala Ala Pro Pro Ala Gln Pro Arg
                85                  90                  95


Val Pro Val Thr Pro Ala Pro Ala Val Ile Pro Ile Leu Val Ile Ala
            100                 105                 110


Cys Asp Arg Ser Thr Val Arg Arg Cys Leu Asp Lys Leu Leu His Tyr
        115                 120                 125


Arg Pro Ser Ala Glu Leu Phe Pro Ile Ile Val Ser Gln Asp Cys Gly
    130                 135                 140


His Glu Glu Thr Ala Gln Ala Ile Ala Ser Tyr Gly Ser Ala Val Thr
145                 150                 155                 160
```

```
His Ile Arg Gln Pro Asp Leu Ser Ser Ile Ala Val Pro Pro Asp His
                165                 170                 175

Arg Lys Phe Gln Gly Tyr Tyr Lys Ile Ala Arg His Tyr Arg Trp Ala
            180                 185                 190

Leu Gly Gln Val Phe Arg Gln Phe Arg Phe Pro Ala Ala Val Val Val
        195                 200                 205

Glu Asp Asp Leu Glu Val Ala Pro Asp Phe Phe Glu Tyr Phe Arg Ala
    210                 215                 220

Thr Tyr Pro Leu Leu Lys Ala Asp Pro Ser Leu Trp Cys Val Ser Ala
225                 230                 235                 240

Trp Asn Asp Asn Gly Lys Glu Gln Met Val Asp Ala Ser Arg Pro Glu
                245                 250                 255

Leu Leu Tyr Arg Thr Asp Phe Phe Pro Gly Leu Gly Trp Leu Leu Leu
            260                 265                 270

Ala Glu Leu Trp Ala Glu Leu Glu Pro Lys Trp Pro Lys Ala Phe Trp
        275                 280                 285

Asp Asp Trp Met Arg Arg Pro Glu Gln Arg Gln Gly Arg Ala Cys Ile
    290                 295                 300

Arg Pro Glu Ile Ser Arg Thr Met Thr Phe Gly Arg Lys Gly Val Ser
305                 310                 315                 320

His Gly Gln Phe Phe Asp Gln His Leu Lys Phe Ile Lys Leu Asn Gln
                325                 330                 335

Gln Phe Val His Phe Thr Gln Leu Asp Leu Ser Tyr Leu Gln Arg Glu
            340                 345                 350
```

```
Ala Tyr Asp Arg Asp Phe Leu Ala Arg Val Tyr Gly Ala Pro Gln Leu
        355                 360                 365

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

Arg Val Gln Tyr Thr Gly Arg Asp Ser Phe Lys Ala Phe Ala Lys Ala
385                 390                 395                 400

Leu Gly Val Met Asp Asp Leu Lys Ser Gly Val Pro Arg Ala Gly Tyr
                405                 410                 415

Arg Gly Ile Val Thr Phe Gln Phe Arg Gly Arg Arg Val His Leu Ala
            420                 425                 430

Pro Pro Leu Thr Trp Glu Gly Tyr Asp Pro Ser Trp Asn
        435                 440                 445
```

<210> 142
<211> 447
<212> PRT
<213> Homo sapiens

<400> 142

```
Met Arg Phe Arg Ile Tyr Lys Arg Lys Val Leu Ile Leu Thr Leu Val
1               5                   10                  15

Val Ala Ala Cys Gly Phe Val Leu Trp Ser Ser Asn Gly Arg Gln Arg
            20                  25                  30

Lys Asn Glu Ala Leu Ala Pro Pro Leu Leu Asp Ala Glu Pro Ala Arg
        35                  40                  45

Gly Ala Gly Gly Arg Gly Gly Asp His Pro Ser Val Ala Val Gly Ile
    50                  55                  60

Arg Arg Val Ser Asn Val Ser Ala Ala Ser Leu Val Pro Ala Val Pro
```

```
65                  70                  75                  80

Gln Pro Glu Ala Asp Asn Leu Thr Leu Arg Tyr Arg Ser Leu Val Tyr
                85                  90                  95

Gln Leu Asn Phe Asp Gln Thr Leu Arg Asn Val Asp Lys Ala Gly Thr
            100                 105                 110

Trp Ala Pro Arg Glu Leu Val Leu Val Val Gln Val His Asn Arg Pro
        115                 120                 125

Glu Tyr Leu Arg Leu Leu Leu Asp Ser Leu Arg Lys Ala Gln Gly Ile
    130                 135                 140

Asp Asn Val Leu Val Ile Phe Ser His Asp Phe Trp Ser Thr Glu Ile
145                 150                 155                 160

Asn Gln Leu Ile Ala Gly Val Asn Phe Cys Pro Val Leu Gln Val Phe
                165                 170                 175

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

Pro Arg Asp Cys Pro Arg Asp Leu Pro Lys Asn Ala Ala Leu Lys Leu
        195                 200                 205

Gly Cys Ile Asn Ala Glu Tyr Pro Asp Ser Phe Gly His Tyr Arg Glu
    210                 215                 220

Ala Lys Phe Ser Gln Thr Lys His His Trp Trp Trp Lys Leu His Phe
225                 230                 235                 240

Val Trp Glu Arg Val Lys Ile Leu Arg Asp Tyr Ala Gly Leu Ile Leu
                245                 250                 255

Phe Leu Glu Glu Asp His Tyr Leu Ala Pro Asp Phe Tyr His Val Phe
```

```
            260                 265                 270

Lys Lys Met Trp Lys Leu Lys Gln Gln Glu Cys Pro Glu Cys Asp Val
        275                 280                 285

Leu Ser Leu Gly Thr Tyr Ser Ala Ser Arg Ser Phe Tyr Gly Met Ala
    290                 295                 300

Asp Lys Val Asp Val Lys Thr Trp Lys Ser Thr Glu His Asn Met Gly
305                 310                 315                 320

Leu Ala Leu Thr Arg Asn Ala Tyr Gln Lys Leu Ile Glu Cys Thr Asp
                325                 330                 335

Thr Phe Cys Thr Tyr Asp Asp Tyr Asn Trp Asp Trp Thr Leu Gln Tyr
            340                 345                 350

Leu Thr Val Ser Cys Leu Pro Lys Phe Trp Lys Val Leu Val Pro Gln
        355                 360                 365

Ile Pro Arg Ile Phe His Ala Gly Asp Cys Gly Met His His Lys Lys
    370                 375                 380

Thr Cys Arg Pro Ser Thr Gln Ser Ala Gln Ile Glu Ser Leu Leu Asn
385                 390                 395                 400

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

Phe Thr Val Val Ala Ile Ser Pro Pro Arg Lys Asn Gly Gly Trp Gly
            420                 425                 430

Asp Ile Arg Asp His Glu Leu Cys Lys Ser Tyr Arg Arg Leu Gln
        435                 440                 445
```

<210> 143

<211> 1728
<212> DNA
<213> Homo sapiens

<400> 143
atgcgcccct ggaccggcag ctggcggtgg atcatgctca ttctgttcgc ctggggtacg 60

ctccttttt acatcggcgg acacctggtc cgagacaacg accaccctga tcattcctct 120

cgcgagttgt ctaagatcct ggctaagctc gagaggctca agcagcagaa cgaggacctg 180

cgccgtatgg ccgaaagcct tcgcatcccc gaggggccga ttgaccaagg cccagcgatc 240

ggccgagtca gagtgctcga ggaacagctg gttaaggcca aagagcagat tgagaattac 300

aagaagcaga ctcggaacgg cctcggtaag gatcacgaga tcttgcgccg taggatcgag 360

aacggcgcaa aagaactctg gttcttcctg cagtccgagc tgaagaagct caagaacctt 420

gagggaaacg agctgcaacg ccacgccgac gagtttctct tggacctggg ccaccatgaa 480

cgatcaatta tgaccgatct ctactatctc tcgcagacag acggcgctgg cgactggcgc 540

gagaaagagg ccaaggacct gaccgagctt gtccagcgcc ggatcacgta cctccagaac 600

cccaaggatt gcagcaaggc gaagaagctg gtctgcaata ttaacaaggg ctgcggttac 660

ggatgtcaac tccaccacgt cgtgtattgc ttcatgatcg cctacggcac ccagcgaacg 720

ctgatcttgg agtcccagaa ctggcgttac gcaaccggcg ggtgggaaac tgttttccgc 780

cctgtcagtg agacatgcac ggacaggtct ggcattagca ccggccactg gtcgggtgag 840

gtcaaggaca agaacgtcca ggtggtggag cttccgatcg ttgactccct ccatcccaga 900

ccccttacc tccccctggc cgtcccggaa gatctcgctg accgcctggt ccgagtgcac 960

ggcgacccag ccgtctggtg ggtcagccag tttgttaagt atctcatccg cccccaacct 1020

tggttggaga aagagattga ggaagcgact aagaagctgg gattcaagca ccccgtcatc 1080

ggcgtccacg tgcgccggac cgataaggtt ggaaccgagg ccgctttcca cccgatcgaa 1140

gagtacatgg tccacgtgga ggaacatttt cagctgcttg cccgtaggat gcaggtcgac 1200

aagaagcgcg tctacctcgc cacggacgac ccctcgctgc tcaaagaggc aaagacgaag 1260

taccctaact atgagttcat cagcgataat tccatttctt ggtcagccgg cctccacaac 1320

cgatacaccg agaactccct gcgcggtgtt atccttgaca ttcacttttt gtcgcaggcg 1380

gacttcctcg tctgtacttt cagctcccag gtctgccggg tggcttacga gatcatgcaa 1440

acactgcatc cagatgccag cgccaacttt cactctctcg acgacatcta ctatttcggc 1500

ggccagaacg cccacaacca gattgctatc tacgcgcacc agcccagaac cgccgacgag 1560

atccccatgg aaccgggcga tatcattggt gtcgcaggca atcattggga cggatactcg 1620

aaggggggtga accgcaagct cggccgtacg ggcctgtacc cttcctataa ggtccgagag 1680

aagatcgaga ctgttaagta cccgacctac cccgaggccg agaagtaa 1728

<210> 144
<211> 575
<212> PRT
<213> Bos taurus

<400> 144

Met Arg Pro Trp Thr Gly Ser Trp Arg Trp Ile Met Leu Ile Leu Phe
1 5 10 15

Ala Trp Gly Thr Leu Leu Phe Tyr Ile Gly Gly His Leu Val Arg Asp
20 25 30

Asn Asp His Pro Asp His Ser Ser Arg Glu Leu Ser Lys Ile Leu Ala
35 40 45

Lys Leu Glu Arg Leu Lys Gln Gln Asn Glu Asp Leu Arg Arg Met Ala
50 55 60

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

Gly Arg Ile Arg Ala Leu Glu Glu Gln Leu Val Lys Ala Lys Glu Gln
85 90 95

Ile Glu Asn Tyr Lys Lys Gln Thr Arg Asn Gly Leu Gly Lys Asp His

```
            100                 105                 110

Glu Ile Leu Arg Arg Arg Ile Glu Asn Gly Ala Lys Glu Leu Trp Phe
        115                 120                 125

Phe Leu Gln Ser Glu Leu Lys Lys Leu Lys Asn Leu Glu Gly Asn Glu
    130                 135                 140

Leu Gln Arg His Ala Asp Glu Phe Leu Ser Asp Leu Gly His His Glu
145                 150                 155                 160

Arg Ser Ile Met Thr Asp Leu Tyr Tyr Leu Ser Gln Thr Asp Gly Ala
                165                 170                 175

Gly Asp Trp Arg Glu Lys Glu Ala Lys Asp Leu Thr Glu Leu Val Gln
            180                 185                 190

Arg Arg Ile Thr Tyr Leu Gln Asn Pro Lys Asp Cys Ser Lys Ala Lys
        195                 200                 205

Lys Leu Val Cys Asn Ile Asn Lys Gly Cys Gly Tyr Gly Cys Gln Leu
    210                 215                 220

His His Val Val Tyr Cys Phe Met Ile Ala Tyr Gly Thr Gln Arg Thr
225                 230                 235                 240

Leu Ile Leu Glu Ser His Asn Trp Arg Tyr Ala Thr Gly Gly Trp Glu
                245                 250                 255

Thr Val Phe Arg Pro Val Ser Glu Thr Cys Thr Asp Arg Ser Gly Val
            260                 265                 270

Ser Thr Gly His Trp Ser Gly Glu Ile Lys Asp Lys Asn Val Gln Val
        275                 280                 285

Val Glu Leu Pro Ile Val Asp Ser Leu His Pro Arg Pro Pro Tyr Leu
```

```
    290                 295                 300

Pro Leu Ala Val Pro Glu Asp Leu Ala Asp Arg Leu Val Arg Val His
305                 310                 315                 320

Gly Asp Pro Ala Val Trp Trp Val Ser Gln Phe Val Lys Tyr Leu Ile
                325                 330                 335

Arg Pro Gln Pro Trp Leu Glu Lys Glu Ile Glu Glu Ala Thr Lys Lys
            340                 345                 350

Leu Gly Phe Lys His Pro Val Ile Gly Val His Val Arg Arg Thr Asp
        355                 360                 365

Lys Val Gly Thr Glu Ala Ala Phe His Pro Ile Glu Glu Tyr Met Val
    370                 375                 380

His Val Glu Glu His Phe Gln Leu Leu Ala Arg Arg Met Gln Val Asp
385                 390                 395                 400

Lys Lys Arg Val Tyr Leu Ala Thr Asp Asp Pro Ser Leu Leu Lys Glu
                405                 410                 415

Ala Lys Thr Lys Tyr Pro His Tyr Glu Phe Ile Ser Asp Asn Ser Ile
            420                 425                 430

Ser Trp Ser Ala Gly Leu His Asn Arg Tyr Thr Glu Asn Ser Leu Arg
        435                 440                 445

Gly Val Ile Leu Asp Ile His Phe Leu Ser Gln Ala Asp Phe Leu Val
    450                 455                 460

Cys Thr Phe Ser Ser Gln Val Cys Arg Val Ala Tyr Glu Ile Met Gln
465                 470                 475                 480

Thr Leu His Pro Asp Ala Ser Ala Asn Phe His Ser Leu Asp Asp Ile
```

485 490 495

Tyr Tyr Phe Gly Gly Gln Asn Ala His Asn Gln Ile Ala Ile Tyr Pro
500 505 510

His Glu Pro Arg Thr Ala Asp Glu Ile Pro Met Glu Pro Gly Asp Ile
515 520 525

Ile Gly Val Ala Gly Asn His Trp Asp Gly Tyr Ser Lys Gly Val Asn
530 535 540

Arg Lys Leu Gly Arg Thr Gly Leu Tyr Pro Ser Tyr Lys Val Arg Glu
545 550 555 560

Lys Ile Glu Thr Val Lys Tyr Pro Thr Tyr Pro Glu Ala Glu Lys
565 570 575

<210> 145
<211> 575
<212> PRT
<213> Canis lupus

<400> 145

Met Arg Pro Trp Thr Gly Ser Trp Arg Trp Ile Met Leu Ile Leu Phe
1 5 10 15

Ala Trp Gly Thr Leu Leu Phe Tyr Ile Gly Gly His Leu Val Arg Asp
20 25 30

Asn Asp His Pro Asp His Ser Ser Arg Glu Leu Ser Lys Ile Leu Ala
35 40 45

Lys Leu Glu Arg Leu Lys Gln Gln Asn Glu Asp Leu Arg Arg Met Ala
50 55 60

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

```
Gly Arg Val Arg Ala Leu Glu Glu Gln Leu Leu Lys Ala Lys Glu Gln
                85                  90                  95

Ile Glu Asn Tyr Lys Lys Gln Thr Arg Asn Gly Leu Gly Lys Asp His
            100                 105                 110

Glu Ile Leu Arg Arg Arg Ile Glu Asn Gly Ala Lys Glu Leu Trp Phe
        115                 120                 125

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

Leu Gln Arg His Ala Asp Glu Phe Leu Ser Asp Leu Gly His His Glu
145                 150                 155                 160

Arg Ser Ile Met Thr Asp Leu Tyr Tyr Leu Ser Gln Thr Asp Gly Ala
                165                 170                 175

Gly Asp Trp Arg Glu Lys Glu Ala Lys Asp Leu Thr Glu Leu Val Gln
            180                 185                 190

Arg Arg Ile Thr Tyr Leu Gln Asn Pro Lys Asp Cys Ser Lys Ala Lys
        195                 200                 205

Lys Leu Val Cys Asn Ile Asn Lys Gly Cys Gly Tyr Gly Cys Gln Leu
    210                 215                 220

His His Val Val Tyr Cys Phe Met Ile Ala Tyr Gly Thr Gln Arg Thr
225                 230                 235                 240

Leu Ile Leu Glu Ser Gln Asn Trp Arg Tyr Ala Thr Gly Gly Trp Glu
                245                 250                 255

Thr Val Phe Arg Pro Val Asn Glu Thr Cys Thr Asp Arg Ser Gly Thr
            260                 265                 270
```

```
Ser Thr Gly His Trp Ser Gly Glu Val Lys Asp Lys Asn Val Gln Val
        275                 280                 285

Val Glu Leu Pro Ile Val Asp Ser Leu His Pro Arg Pro Pro Tyr Leu
    290                 295                 300

Pro Leu Ala Val Pro Glu Asp Leu Ala Asp Arg Leu Val Arg Val His
305                 310                 315                 320

Gly Asp Pro Ala Val Trp Trp Val Ser Gln Phe Val Lys Tyr Leu Ile
                325                 330                 335

Arg Pro Gln Pro Trp Leu Glu Lys Glu Ile Glu Glu Ala Thr Lys Lys
            340                 345                 350

Leu Gly Phe Asn Ile Pro Val Ile Gly Val His Val Arg Arg Thr Asp
        355                 360                 365

Lys Val Gly Thr Glu Ala Ala Phe His Pro Ile Glu Glu Tyr Met Val
    370                 375                 380

His Val Glu Glu His Phe Gln Leu Leu Ala Arg Arg Met Gln Val Asp
385                 390                 395                 400

Lys Arg Arg Val Tyr Leu Ala Thr Asp Asp Pro Ser Leu Leu Lys Glu
                405                 410                 415

Ala Lys Thr Lys Tyr Pro Thr Tyr Glu Phe Ile Ser Asp Asn Ser Ile
            420                 425                 430

Ser Trp Ser Ala Gly Leu His Asn Arg Tyr Thr Glu Asn Ser Leu Arg
        435                 440                 445

Gly Val Ile Leu Asp Ile His Phe Leu Ser Gln Ala Asp Phe Leu Val
    450                 455                 460
```

```
Cys Thr Phe Ser Ser Gln Val Cys Arg Val Ala Tyr Glu Ile Met Gln
465                 470                 475                 480


Thr Leu His Pro Asp Ala Ser Ala Asn Phe His Ser Leu Asp Asp Ile
                485                 490                 495


Tyr Tyr Phe Gly Gly Gln Asn Ala His Asn Gln Ile Ala Ile Tyr Pro
            500                 505                 510


His Gln Pro Arg Thr Ala Asp Glu Ile Pro Met Glu Pro Gly Asp Ile
        515                 520                 525


Ile Gly Val Ala Gly Asn His Trp Asp Gly Tyr Ser Lys Gly Val Asn
    530                 535                 540


Arg Lys Leu Gly Arg Thr Gly Leu Tyr Pro Ser Tyr Lys Val Arg Glu
545                 550                 555                 560


Lys Ile Glu Thr Val Lys Tyr Pro Thr Tyr Pro Glu Ala Glu Lys
                565                 570                 575


<210>  146
<211>  599
<212>  PRT
<213>  Mus musculus

<400>  146

Leu Glu Pro Glu Tyr Asn Val Ser Ser Ser Leu Ser Ser Arg Lys Ile
1               5                   10                  15


Glu Asp Arg Val Glu Thr Leu Lys Met Arg Ala Trp Thr Gly Ser Trp
            20                  25                  30


Arg Trp Ile Met Leu Ile Leu Phe Ala Trp Gly Thr Leu Leu Phe Tyr
        35                  40                  45
```

```
Ile Gly Gly His Leu Val Arg Asp Asn Asp His Pro Asp His Ser Ser
    50                  55                  60

Arg Glu Leu Ser Lys Ile Leu Ala Lys Leu Glu Arg Leu Lys Gln Gln
65                  70                  75                  80

Asn Glu Asp Leu Arg Arg Met Ala Glu Ser Leu Arg Ile Pro Glu Gly
                85                  90                  95

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

Gln Leu Val Lys Ala Lys Glu Gln Ile Glu Asn Tyr Lys Lys Gln Ala
        115                 120                 125

Arg Asn Gly Leu Gly Lys Asp His Glu Ile Leu Arg Arg Arg Ile Glu
    130                 135                 140

Asn Gly Ala Lys Glu Leu Trp Phe Phe Leu Gln Ser Glu Leu Lys Lys
145                 150                 155                 160

Leu Lys His Leu Glu Gly Asn Glu Leu Gln Arg His Ala Asp Glu Ile
                165                 170                 175

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

Tyr Leu Ser Gln Thr Asp Gly Ala Gly Asp Trp Arg Glu Lys Glu Ala
        195                 200                 205

Lys Asp Leu Thr Glu Leu Val Gln Arg Arg Ile Thr Tyr Leu Gln Asn
    210                 215                 220

Pro Lys Asp Cys Ser Lys Ala Arg Lys Leu Val Cys Asn Ile Asn Lys
225                 230                 235                 240
```

```
Gly Cys Gly Tyr Gly Cys Gln Leu His His Val Val Tyr Cys Phe Met
                245                 250                 255

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

Arg Tyr Ala Thr Gly Gly Trp Glu Thr Val Phe Arg Pro Val Ser Glu
        275                 280                 285

Thr Cys Thr Asp Arg Ser Gly Leu Ser Thr Gly His Trp Ser Gly Glu
    290                 295                 300

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

Leu His Pro Arg Pro Pro Tyr Leu Pro Leu Ala Val Pro Glu Asp Leu
                325                 330                 335

Ala Asp Arg Leu Leu Arg Val His Gly Asp Pro Ala Val Trp Trp Val
            340                 345                 350

Ser Gln Phe Val Lys Tyr Leu Ile Arg Pro Gln Pro Trp Leu Glu Lys
        355                 360                 365

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

Gly Val His Val Arg Arg Thr Asp Lys Val Gly Thr Glu Ala Ala Phe
385                 390                 395                 400

His Pro Ile Glu Glu Tyr Met Val His Val Glu Glu His Phe Gln Leu
                405                 410                 415

Leu Ala Arg Arg Met Gln Val Asp Lys Lys Arg Val Tyr Leu Ala Thr
            420                 425                 430
```

```
Asp Asp Pro Thr Leu Leu Lys Glu Ala Lys Thr Lys Tyr Ser Asn Tyr
        435                 440                 445

Glu Phe Ile Ser Asp Asn Ser Ile Ser Trp Ser Ala Gly Leu His Asn
    450                 455                 460

Arg Tyr Thr Glu Asn Ser Leu Arg Gly Val Ile Leu Asp Ile His Phe
465                 470                 475                 480

Leu Ser Gln Ala Asp Phe Leu Val Cys Thr Phe Ser Ser Gln Val Cys
                485                 490                 495

Arg Val Ala Tyr Glu Ile Met Gln Thr Leu His Pro Asp Ala Ser Ala
            500                 505                 510

Asn Phe His Ser Leu Asp Asp Ile Tyr Tyr Phe Gly Gly Gln Asn Ala
        515                 520                 525

His Asn Gln Ile Ala Val Tyr Pro His Lys Pro Arg Thr Glu Glu Glu
    530                 535                 540

Ile Pro Met Glu Pro Gly Asp Ile Ile Gly Val Ala Gly Asn His Trp
545                 550                 555                 560

Asp Gly Tyr Ser Lys Gly Ile Asn Arg Lys Leu Gly Lys Thr Gly Leu
                565                 570                 575

Tyr Pro Ser Tyr Lys Val Arg Glu Lys Ile Glu Thr Val Lys Tyr Pro
            580                 585                 590

Thr Tyr Pro Glu Ala Glu Lys
        595
```

<210> 147
<211> 575
<212> PRT

<213> Rattus norvegicus

<400> 147

```
Met Arg Ala Trp Thr Gly Ser Trp Arg Trp Ile Met Leu Ile Leu Phe
1               5                   10                  15


Ala Trp Gly Thr Leu Leu Phe Tyr Ile Gly Gly His Leu Val Arg Asp
            20                  25                  30


Asn Asp His Pro Asp His Ser Ser Arg Glu Leu Ser Lys Ile Leu Ala
        35                  40                  45


Lys Leu Glu Arg Leu Lys Gln Gln Asn Glu Asp Leu Arg Arg Met Ala
    50                  55                  60


Glu Ser Leu Arg Ile Pro Glu Gly Pro Ile Asp Gln Gly Thr Ala Thr
65                  70                  75                  80


Gly Arg Val Arg Val Leu Glu Glu Gln Leu Val Lys Ala Lys Glu Gln
                85                  90                  95


Ile Glu Asn Tyr Lys Lys Gln Ala Arg Asn Gly Leu Gly Lys Asp His
            100                 105                 110


Glu Ile Leu Arg Arg Arg Ile Glu Asn Gly Ala Lys Glu Leu Trp Phe
        115                 120                 125


Phe Leu Gln Ser Glu Leu Lys Lys Leu Lys His Leu Glu Gly Asn Glu
    130                 135                 140


Leu Gln Arg His Ala Asp Glu Ile Leu Leu Asp Leu Gly His His Glu
145                 150                 155                 160


Arg Ser Ile Met Thr Asp Leu Tyr Tyr Leu Ser Gln Thr Asp Gly Ala
                165                 170                 175
```

```
Gly Asp Trp Arg Glu Lys Glu Ala Lys Asp Leu Thr Glu Leu Val Gln
            180                 185                 190

Arg Arg Ile Thr Tyr Leu Gln Asn Pro Lys Asp Cys Ser Lys Ala Arg
        195                 200                 205

Lys Leu Val Cys Asn Ile Asn Lys Gly Cys Gly Tyr Gly Cys Gln Leu
    210                 215                 220

His His Val Val Tyr Cys Phe Met Ile Ala Tyr Gly Thr Gln Arg Thr
225                 230                 235                 240

Leu Ile Leu Glu Ser Gln Asn Trp Arg Tyr Ala Thr Gly Gly Trp Glu
                245                 250                 255

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

Ser Thr Gly His Trp Ser Gly Glu Val Asn Asp Lys Asn Ile Gln Val
        275                 280                 285

Val Glu Leu Pro Ile Val Asp Ser Leu His Pro Arg Pro Pro Tyr Leu
    290                 295                 300

Pro Leu Ala Val Pro Glu Asp Leu Ala Asp Arg Leu Val Arg Val His
305                 310                 315                 320

Gly Asp Pro Ala Val Trp Trp Val Ser Gln Phe Val Lys Tyr Leu Ile
                325                 330                 335

Arg Pro Gln Pro Trp Leu Glu Lys Glu Ile Glu Glu Ala Thr Lys Lys
            340                 345                 350

Leu Gly Phe Lys His Pro Val Ile Gly Val His Val Arg Arg Thr Asp
        355                 360                 365
```

```
Lys Val Gly Thr Glu Ala Ala Phe His Pro Ile Glu Glu Tyr Met Val
    370                 375                 380

His Val Glu Glu His Phe Gln Leu Leu Ala Arg Arg Met Gln Val Asp
385                 390                 395                 400

Lys Lys Arg Val Tyr Leu Ala Thr Asp Asp Pro Ala Leu Leu Lys Glu
                405                 410                 415

Ala Lys Thr Lys Tyr Ser Asn Tyr Glu Phe Ile Ser Asp Asn Ser Ile
            420                 425                 430

Ser Trp Ser Ala Gly Leu His Asn Arg Tyr Thr Glu Asn Ser Leu Arg
        435                 440                 445

Gly Val Ile Leu Asp Ile His Phe Leu Ser Gln Ala Asp Phe Leu Val
    450                 455                 460

Cys Thr Phe Ser Ser Gln Val Cys Arg Val Ala Tyr Glu Ile Met Gln
465                 470                 475                 480

Thr Leu His Pro Asp Ala Ser Ala Asn Phe His Ser Leu Asp Asp Ile
                485                 490                 495

Tyr Tyr Phe Gly Gly Gln Asn Ala His Asn Gln Ile Ala Val Tyr Pro
            500                 505                 510

His Lys Pro Arg Thr Asp Glu Glu Ile Pro Met Glu Pro Gly Asp Ile
        515                 520                 525

Ile Gly Val Ala Gly Asn His Trp Asp Gly Tyr Ser Lys Gly Val Asn
    530                 535                 540

Arg Lys Leu Gly Lys Thr Gly Leu Tyr Pro Ser Tyr Lys Val Arg Glu
545                 550                 555                 560
```

```
Lys Ile Glu Thr Val Lys Tyr Pro Thr Tyr Pro Glu Ala Glu Lys
                565                 570                 575


<210>  148
<211>  575
<212>  PRT
<213>  Cricetulus griseus

<400>  148

Met Arg Ala Trp Thr Gly Ser Trp Arg Trp Ile Met Leu Ile Leu Phe
1               5                   10                  15


Ala Trp Gly Thr Leu Leu Phe Tyr Ile Gly Gly His Leu Val Arg Asp
            20                  25                  30


Asn Asp His Pro Asp His Ser Ser Arg Glu Leu Ser Lys Ile Leu Ala
        35                  40                  45


Lys Leu Glu Arg Leu Lys Gln Gln Asn Glu Asp Leu Arg Arg Met Ala
    50                  55                  60


Glu Ser Leu Arg Ile Pro Glu Gly Pro Ile Asp Gln Gly Thr Ala Thr
65                  70                  75                  80


Gly Arg Val Arg Val Leu Glu Glu Gln Leu Val Lys Ala Lys Glu Gln
                85                  90                  95


Ile Glu Asn Tyr Lys Lys Gln Ala Arg Asn Asp Leu Gly Lys Asp His
            100                 105                 110


Glu Ile Leu Arg Arg Arg Ile Glu Asn Gly Ala Lys Glu Leu Trp Phe
        115                 120                 125


Phe Leu Gln Ser Glu Leu Lys Lys Leu Lys Lys Leu Glu Gly Asn Glu
    130                 135                 140


Leu Gln Arg His Ala Asp Glu Ile Leu Leu Asp Leu Gly His His Glu
```

```
145                 150                 155                 160

Arg Ser Ile Met Thr Asp Leu Tyr Tyr Leu Ser Gln Thr Asp Gly Ala
                165                 170                 175

Gly Glu Trp Arg Glu Lys Glu Ala Lys Asp Leu Thr Glu Leu Val Gln
            180                 185                 190

Arg Arg Ile Thr Tyr Leu Gln Asn Pro Lys Asp Cys Ser Lys Ala Arg
        195                 200                 205

Lys Leu Val Cys Asn Ile Asn Lys Gly Cys Gly Tyr Gly Cys Gln Leu
    210                 215                 220

His His Val Val Tyr Cys Phe Met Ile Ala Tyr Gly Thr Gln Arg Thr
225                 230                 235                 240

Leu Ile Leu Glu Ser Gln Asn Trp Arg Tyr Ala Thr Gly Gly Trp Glu
                245                 250                 255

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

Ser Thr Gly His Trp Ser Gly Glu Val Lys Asp Lys Asn Val Gln Val
        275                 280                 285

Val Glu Leu Pro Ile Val Asp Ser Leu His Pro Arg Pro Pro Tyr Leu
    290                 295                 300

Pro Leu Ala Val Pro Glu Asp Leu Ala Asp Arg Leu Leu Arg Val His
305                 310                 315                 320

Gly Asp Pro Ala Val Trp Trp Val Ser Gln Phe Val Lys Tyr Leu Ile
                325                 330                 335

Arg Pro Gln Pro Trp Leu Glu Arg Glu Ile Glu Glu Thr Thr Lys Lys
```

```
            340                 345                 350

Leu Gly Phe Lys His Pro Val Ile Gly Val His Val Arg Arg Thr Asp
        355                 360                 365

Lys Val Gly Thr Glu Ala Ala Phe His Pro Ile Glu Glu Tyr Met Val
    370                 375                 380

His Val Glu Glu His Phe Gln Leu Leu Glu Arg Arg Met Lys Val Asp
385                 390                 395                 400

Lys Lys Arg Val Tyr Leu Ala Thr Asp Asp Pro Ser Leu Leu Lys Glu
                405                 410                 415

Ala Lys Thr Lys Tyr Ser Asn Tyr Glu Phe Ile Ser Asp Asn Ser Ile
            420                 425                 430

Ser Trp Ser Ala Gly Leu His Asn Arg Tyr Thr Glu Asn Ser Leu Arg
        435                 440                 445

Gly Val Ile Leu Asp Ile His Phe Leu Ser Gln Ala Asp Phe Leu Val
    450                 455                 460

Cys Thr Phe Ser Ser Gln Val Cys Arg Val Ala Tyr Glu Ile Met Gln
465                 470                 475                 480

Thr Leu His Pro Asp Ala Ser Ala Asn Phe His Ser Leu Asp Asp Ile
                485                 490                 495

Tyr Tyr Phe Gly Gly Gln Asn Ala His Asn Gln Ile Ala Val Tyr Pro
            500                 505                 510

His Gln Pro Arg Thr Lys Glu Glu Ile Pro Met Glu Pro Gly Asp Ile
        515                 520                 525

Ile Gly Val Ala Gly Asn His Trp Asn Gly Tyr Ser Lys Gly Val Asn
```

530 535 540

Arg Lys Leu Gly Lys Thr Gly Leu Tyr Pro Ser Tyr Lys Val Arg Glu
545 550 555 560

Lys Ile Glu Thr Val Lys Tyr Pro Thr Tyr Pro Glu Ala Glu Lys
565 570 575

<210> 149
<211> 575
<212> PRT
<213> Gallus gallus

<400> 149

Met Arg Pro Trp Thr Gly Ser Trp Arg Trp Ile Met Leu Ile Leu Phe
1 5 10 15

Ala Trp Gly Thr Leu Leu Phe Tyr Ile Gly Gly His Leu Val Arg Asp
20 25 30

Ser Glu His Pro Asp His Ser Ser Arg Glu Leu Ser Lys Ile Leu Ala
35 40 45

Lys Leu Glu Arg Leu Lys Gln Gln Asn Glu Asp Leu Arg Arg Met Ala
50 55 60

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

Gly Lys Val His Ala Leu Glu Glu Gln Leu Leu Lys Ala Lys Glu Gln
85 90 95

Ile Glu Asn Tyr Lys Lys Gln Thr Gly Asp Gly Leu Gly Lys Asp His
100 105 110

Glu Ile Leu Arg Arg Arg Ile Glu Asn Gly Ala Lys Glu Leu Trp Phe
115 120 125

```
Phe Leu Gln Ser Glu Leu Lys Lys Leu Lys Asn Leu Glu Gly Ser Glu
    130                 135                 140

Leu Gln Arg Arg Ile Asp Glu Phe Leu Ser Asp Leu Gly His Gln Glu
145                 150                 155                 160

Arg Ser Ile Met Thr Asp Leu Tyr Tyr Leu Ser Gln Thr Asp Gly Ala
                165                 170                 175

Gly Asp Trp Arg Glu Lys Glu Ala Lys Asp Leu Thr Asp Leu Val Gln
            180                 185                 190

Arg Arg Ile Thr Tyr Leu Gln Asn Pro Lys Asp Cys Ser Lys Ala Lys
        195                 200                 205

Lys Leu Val Cys Asn Ile Asn Lys Gly Cys Gly Tyr Gly Cys Gln Leu
    210                 215                 220

His His Val Val Tyr Cys Phe Met Ile Ala Tyr Gly Thr Gln Arg Thr
225                 230                 235                 240

Leu Ile Leu Glu Ser Gln Asn Trp Arg Tyr Ala Thr Gly Gly Trp Glu
                245                 250                 255

Thr Val Phe Arg Pro Val Ser Glu Thr Cys Thr Asp Arg Ser Gly Thr
            260                 265                 270

Thr Thr Gly His Trp Ser Gly Glu Thr Asn Asp Lys Asp Val Gln Val
        275                 280                 285

Val Glu Leu Pro Ile Val Asp Ser Leu His Pro Arg Pro Pro Tyr Leu
    290                 295                 300

Pro Leu Ala Val Pro Glu Asp Leu Ala Asp Arg Leu Ile Arg Val His
305                 310                 315                 320
```

```
Gly Asp Pro Ala Val Trp Trp Val Ser Gln Phe Val Lys Tyr Leu Ile
                325                 330                 335

Arg Pro Gln Pro Trp Leu Glu Lys Glu Ile Glu Glu Ala Thr Arg Lys
            340                 345                 350

Leu Gly Phe Lys His Pro Val Ile Gly Val His Val Arg Arg Thr Asp
        355                 360                 365

Lys Val Gly Thr Glu Ala Ala Phe His Pro Ile Glu Glu Tyr Met Val
    370                 375                 380

His Val Glu Glu Arg Phe Glu Leu Leu Ala Arg Arg Met His Val Asp
385                 390                 395                 400

Lys Lys Arg Val Tyr Leu Ala Thr Asp Asp Pro Ser Leu Leu Gln Glu
                405                 410                 415

Ala Lys Ser Lys Tyr Pro Asn Tyr Glu Phe Ile Ser Asp Asn Ser Ile
            420                 425                 430

Ser Trp Ser Ala Gly Leu His Asn Arg Tyr Thr Glu Asn Ser Leu Arg
        435                 440                 445

Gly Val Ile Leu Asp Ile His Phe Leu Ser Gln Ala Asp Phe Leu Val
    450                 455                 460

Cys Thr Phe Ser Ser Gln Val Cys Arg Val Pro Tyr Glu Ile Met Gln
465                 470                 475                 480

Thr Leu His Pro Asp Ala Ser Ala Tyr Phe His Ser Leu Asp Asp Ile
                485                 490                 495

Tyr Tyr Phe Gly Gly Gln Asn Ala His Asn Gln Ile Ala Val Tyr Ala
            500                 505                 510
```

```
His His Pro Arg Thr Ala Asp Glu Ile Pro Met Glu Pro Gly Asp Ile
        515                 520                 525

Ile Gly Val Ala Gly Asn His Trp Asp Gly Tyr Ser Lys Gly Ile Asn
    530                 535                 540

Arg Lys Leu Gly Lys Thr Gly Leu Tyr Pro Ser Tyr Lys Val Lys Glu
545                 550                 555                 560

Lys Ile Glu Thr Val Lys Tyr Pro Thr Tyr Pro Glu Ala Glu Lys
                565                 570                 575
```

<210> 150
<211> 578
<212> PRT
<213> Xenodermus tropicalis

<400> 150

```
Met Arg Pro Trp Thr Gly Ser Trp Arg Trp Ile Met Leu Ile Leu Phe
1               5                   10                  15

Ala Trp Gly Thr Leu Leu Phe Tyr Ile Gly Gly His Leu Val Arg Asp
            20                  25                  30

Asn Glu Asn Pro Asp His Ser Ser Arg Glu Leu Ser Lys Ile Leu Ala
        35                  40                  45

Lys Leu Glu Arg Leu Lys Gln Gln Asn Glu Asp Leu Arg Arg Met Ala
    50                  55                  60

Glu Ser Leu Arg Ile Pro Glu Gly Pro Ile Glu Gln Gly Ala Ala Ala
65                  70                  75                  80

Gly Arg Ile Arg Ala Leu Glu Glu Gln Leu Leu Lys Ala Lys Glu Gln
                85                  90                  95
```

```
Ile Glu Met Tyr Lys Gln Gln Ser Ser Asn Ala Val Ser Gly Leu Gly
            100                 105                 110

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

Phe Trp Tyr Phe Val Gln Ser Glu Val Lys Lys Leu Lys His Leu Asp
    130                 135                 140

Arg Asn Glu Leu Gln Arg His Val Asp Glu Ile Ile Ile Asp Met Gly
145                 150                 155                 160

His Gln Gln Arg Ser Val Met Thr Asp Leu Tyr Tyr Leu Ser Gln Thr
                165                 170                 175

Asp Gly Ala Gly Asp Trp Arg Glu Arg Glu Ala Lys Asp Leu Thr Asp
            180                 185                 190

Leu Val Gln Arg Arg Ile Thr Tyr Leu Gln Asn Pro Lys Asp Cys Ser
        195                 200                 205

Lys Ala Lys Lys Leu Val Cys Asn Ile Asn Lys Gly Cys Gly Tyr Gly
    210                 215                 220

Cys Gln Leu His His Val Val Tyr Cys Phe Met Ile Ala Tyr Gly Thr
225                 230                 235                 240

Gln Arg Thr Leu Ile Leu Glu Ser Gln Ser Trp Arg Tyr Ala Thr Gly
                245                 250                 255

Gly Trp Glu Thr Val Phe Lys Pro Val Ser Glu Thr Cys Thr Asp Arg
            260                 265                 270

Ser Gly Ser Ser Thr Gly His Trp Ser Gly Glu Ala Asn Asp Lys Asn
        275                 280                 285
```

```
Val Gln Val Val Glu Leu Pro Ile Val Asp Ser Leu His Pro Arg Pro
    290                 295                 300

Pro Tyr Leu Pro Leu Gly Val Pro Glu Asp Leu Ala Asp Arg Leu Ile
305                 310                 315                 320

Arg Leu His Gly Asp Pro Ala Val Trp Trp Val Ser Gln Phe Val Lys
                325                 330                 335

Tyr Leu Ile Arg Pro Gln Pro Trp Leu Glu Lys Glu Ile Glu Glu Ser
            340                 345                 350

Thr Lys Lys Leu Gly Phe Lys His Pro Val Ile Gly Val His Val Arg
        355                 360                 365

Arg Thr Asp Lys Val Gly Thr Glu Ala Ala Phe His Pro Ile Glu Glu
    370                 375                 380

Tyr Met Val His Val Glu Glu His Phe Gln Leu Leu Ala Arg Arg Met
385                 390                 395                 400

Gln Ile Asp Lys Lys Arg Val Tyr Leu Ala Thr Asp Asp Pro Thr Leu
                405                 410                 415

Leu Gln Glu Ala Lys Ala Lys Tyr Pro Gln Tyr Glu Phe Ile Ser Asp
            420                 425                 430

Asn Ser Ile Ser Trp Ser Ala Gly Leu His Asn Arg Tyr Thr Glu Asn
        435                 440                 445

Ser Leu Arg Gly Val Ile Leu Asp Ile His Phe Leu Ser Gln Ala Asp
    450                 455                 460

Phe Leu Val Cys Thr Phe Ser Ser Gln Val Cys Arg Val Ala Tyr Glu
465                 470                 475                 480
```

```
Ile Met Gln Thr Leu His Pro Asp Ala Ser Ala His Phe His Ser Leu
                485                 490                 495


Asp Asp Ile Tyr Tyr Phe Gly Gly Gln Asn Ala His Asn Gln Leu Ala
            500                 505                 510


Ile Tyr Pro His Gln Pro Arg Asn Ala Glu Glu Ile Pro Leu Glu Pro
        515                 520                 525


Gly Asp Ile Ile Gly Val Ala Gly Asn His Trp Asp Gly Tyr Ser Lys
    530                 535                 540


Gly Ile Asn Arg Lys Leu Gly Arg Thr Gly Leu Tyr Pro Ser Tyr Lys
545                 550                 555                 560


Val Lys Glu Lys Ile Glu Thr Val Lys Tyr Pro Thr Tyr Gln Glu Ala
                565                 570                 575


Glu Lys
```

<210> 151
<211> 580
<212> PRT
<213> Danio rerio

<400> 151

```
Met Arg Pro Trp Thr Gly Ser Trp Arg Trp Ile Ala Leu Val Leu Leu
1               5                   10                  15


Ala Trp Gly Thr Leu Leu Phe Tyr Ile Gly Gly His Leu Val Lys Asp
            20                  25                  30


Ser Glu His Ala Pro Arg Ser Ser Arg Glu Leu Ala Lys Ile Leu Thr
        35                  40                  45
```

```
Lys Leu Glu Arg Leu Lys Gln Gln Asn Glu Asp Leu Arg Arg Met Ala
    50                  55                  60

Gln Ser Leu Arg Ile Pro Glu Gly Gln Ser Asp Gly Pro Ile Ser Ser
65                  70                  75                  80

Gly Arg Leu Arg Ser Leu Glu Glu Gln Leu Ser Arg Ala Lys Gln Lys
                85                  90                  95

Ile Gln Ser Phe Gln Arg Leu Ser Gly Glu Gly Pro Gly Lys Asp His
            100                 105                 110

Glu Glu Leu Arg Arg Lys Val Glu Asn Gly Val Arg Glu Leu Trp Tyr
        115                 120                 125

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

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

Arg Ser Val Met Thr Asp Leu Tyr His Leu Ser Gln Ala Asp Gly Ala
                165                 170                 175

Gly Asp Trp Arg Glu Lys Glu Ala Asn Glu Leu Ser Asp Leu Val Gln
            180                 185                 190

Asn Arg Ile Met Tyr Leu Gln Asn Pro Gln Asp Cys Ser Lys Ala Arg
        195                 200                 205

Lys Leu Val Cys Asn Ile Asn Lys Gly Cys Gly Tyr Gly Cys Gln Leu
    210                 215                 220

His His Val Val Tyr Cys Phe Met Ile Ala Tyr Gly Thr Gln Arg Thr
225                 230                 235                 240
```

```
Leu Ile Leu Glu Ser Gln Asn Trp Arg Tyr Ala Thr Gly Gly Trp Glu
                245                 250                 255

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

Ser Thr Gly His Trp Ser Gly Glu Ala His Asp Arg Asp Val Gln Val
        275                 280                 285

Val Glu Leu Pro Ile Val Asp Ser Leu His Pro Arg Pro Pro Tyr Leu
    290                 295                 300

Pro Leu Ala Val Pro Glu Asp Leu Ala Pro Arg Leu Gln Arg Leu His
305                 310                 315                 320

Gly Asp Pro Ser Val Trp Trp Val Ser Gln Phe Val Lys Phe Leu Val
                325                 330                 335

Arg Pro Gln Ala Trp Leu Glu Lys Glu Ile Gln Glu Thr Cys Leu Lys
            340                 345                 350

Leu Gly Phe Lys His Pro Ile Ile Gly Val His Val Arg Arg Thr Asp
        355                 360                 365

Lys Val Gly Thr Glu Ala Ala Phe His Pro Ile Glu Glu Tyr Met Val
    370                 375                 380

His Val Glu Asp His Tyr Gln Ser Leu Ala Gln Arg Met His Val Asp
385                 390                 395                 400

Lys Lys Arg Val Tyr Leu Ala Thr Asp Asp Pro Ser Leu Leu Gln Glu
                405                 410                 415

Ala Lys Thr Lys Tyr Pro Asp Tyr Glu Phe Ile Ser Asp Asn Ser Ile
            420                 425                 430
```

```
Ser Trp Ser Ala Gly Leu His Asn Arg Tyr Thr Glu Asn Ser Leu Arg
        435                 440                 445

Gly Val Ile Leu Asp Ile His Phe Leu Ser Arg Thr Asn Tyr Leu Val
    450                 455                 460

Cys Thr Phe Ser Ser Gln Val Cys Arg Val Ala Tyr Glu Ile Met Gln
465                 470                 475                 480

Thr Leu His Pro Asp Ala Ser Ser Tyr Phe Tyr Ser Leu Asp Asp Ile
                485                 490                 495

Tyr Tyr Phe Gly Gly Gln Asn Ala His Asn Gln Ile Ala Ile Tyr Pro
            500                 505                 510

His Gln Pro Arg Asn Ser Asp Asp Ile Pro Leu Glu Pro Gly Asp Val
        515                 520                 525

Ile Gly Val Ala Gly Asn His Trp Asp Gly Tyr Ser Lys Gly Ile Asn
    530                 535                 540

Arg Lys Thr Gly Arg Thr Gly Leu Tyr Pro Ser Tyr Lys Val Lys Glu
545                 550                 555                 560

Lys Ile Glu Thr Val Lys Tyr Pro Thr Tyr Pro Glu Ala Asp Lys Leu
                565                 570                 575

Leu Lys Lys Pro
            580
```

<210> 152
<211> 575
<212> PRT
<213> Homo sapiens

<400> 152

```
Met Arg Pro Trp Thr Gly Ser Trp Arg Trp Ile Met Leu Ile Leu Phe
```

```
1               5                   10                  15

Ala Trp Gly Thr Leu Leu Phe Tyr Ile Gly Gly His Leu Val Arg Asp
            20                  25                  30

Asn Asp His Pro Asp His Ser Ser Arg Glu Leu Ser Lys Ile Leu Ala
        35                  40                  45

Lys Leu Glu Arg Leu Lys Gln Gln Asn Glu Asp Leu Arg Arg Met Ala
    50                  55                  60

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

Gly Arg Val Arg Val Leu Glu Glu Gln Leu Val Lys Ala Lys Glu Gln
                85                  90                  95

Ile Glu Asn Tyr Lys Lys Gln Thr Arg Asn Gly Leu Gly Lys Asp His
            100                 105                 110

Glu Ile Leu Arg Arg Arg Ile Glu Asn Gly Ala Lys Glu Leu Trp Phe
        115                 120                 125

Phe Leu Gln Ser Glu Leu Lys Lys Leu Lys Asn Leu Glu Gly Asn Glu
    130                 135                 140

Leu Gln Arg His Ala Asp Glu Phe Leu Leu Asp Leu Gly His His Glu
145                 150                 155                 160

Arg Ser Ile Met Thr Asp Leu Tyr Tyr Leu Ser Gln Thr Asp Gly Ala
                165                 170                 175

Gly Asp Trp Arg Glu Lys Glu Ala Lys Asp Leu Thr Glu Leu Val Gln
            180                 185                 190

Arg Arg Ile Thr Tyr Leu Gln Asn Pro Lys Asp Cys Ser Lys Ala Lys
```

```
        195                 200                 205

Lys Leu Val Cys Asn Ile Asn Lys Gly Cys Gly Tyr Gly Cys Gln Leu
    210                 215                 220

His His Val Val Tyr Cys Phe Met Ile Ala Tyr Gly Thr Gln Arg Thr
225                 230                 235                 240

Leu Ile Leu Glu Ser Gln Asn Trp Arg Tyr Ala Thr Gly Gly Trp Glu
                245                 250                 255

Thr Val Phe Arg Pro Val Ser Glu Thr Cys Thr Asp Arg Ser Gly Ile
            260                 265                 270

Ser Thr Gly His Trp Ser Gly Glu Val Lys Asp Lys Asn Val Gln Val
        275                 280                 285

Val Glu Leu Pro Ile Val Asp Ser Leu His Pro Arg Pro Pro Tyr Leu
    290                 295                 300

Pro Leu Ala Val Pro Glu Asp Leu Ala Asp Arg Leu Val Arg Val His
305                 310                 315                 320

Gly Asp Pro Ala Val Trp Trp Val Ser Gln Phe Val Lys Tyr Leu Ile
                325                 330                 335

Arg Pro Gln Pro Trp Leu Glu Lys Glu Ile Glu Glu Ala Thr Lys Lys
            340                 345                 350

Leu Gly Phe Lys His Pro Val Ile Gly Val His Val Arg Arg Thr Asp
        355                 360                 365

Lys Val Gly Thr Glu Ala Ala Phe His Pro Ile Glu Glu Tyr Met Val
    370                 375                 380

His Val Glu Glu His Phe Gln Leu Leu Ala Arg Arg Met Gln Val Asp
```

385 390 395 400

Lys Lys Arg Val Tyr Leu Ala Thr Asp Asp Pro Ser Leu Leu Lys Glu
405 410 415

Ala Lys Thr Lys Tyr Pro Asn Tyr Glu Phe Ile Ser Asp Asn Ser Ile
420 425 430

Ser Trp Ser Ala Gly Leu His Asn Arg Tyr Thr Glu Asn Ser Leu Arg
435 440 445

Gly Val Ile Leu Asp Ile His Phe Leu Ser Gln Ala Asp Phe Leu Val
450 455 460

Cys Thr Phe Ser Ser Gln Val Cys Arg Val Ala Tyr Glu Ile Met Gln
465 470 475 480

Thr Leu His Pro Asp Ala Ser Ala Asn Phe His Ser Leu Asp Asp Ile
485 490 495

Tyr Tyr Phe Gly Gly Gln Asn Ala His Asn Gln Ile Ala Ile Tyr Ala
500 505 510

His Gln Pro Arg Thr Ala Asp Glu Ile Pro Met Glu Pro Gly Asp Ile
515 520 525

Ile Gly Val Ala Gly Asn His Trp Asp Gly Tyr Ser Lys Gly Val Asn
530 535 540

Arg Lys Leu Gly Arg Thr Gly Leu Tyr Pro Ser Tyr Lys Val Arg Glu
545 550 555 560

Lys Ile Glu Thr Val Lys Tyr Pro Thr Tyr Pro Glu Ala Glu Lys
565 570 575

<210> 153

<211> 1200
<212> DNA
<213> Caenorhabditis elegans

<400> 153
atgccaaccg gcaagtctga atcttctgat atttctgaag ttgttggtaa catggaaata 60

tctaaagttg agggtcttga agcgtgtatc ggaatgagcc acgaagtgtc cactactcca 120

gctgctgagt tggctgcttt cagagcacgc aaggttgctc tgattactgg aatttctgga 180

caagacggtt catatcttgc tgagcttctt ctttcaaaag gatacaaagt tcacggaatc 240

atccgtcgtt catcttcatt caataccgca agaatcgaac atctgtacag taatccaatt 300

actcatcacg gtgattcttc attctctctt cactatggag atatgactga ttcatcttgt 360

ctcatcaagc tcatttcaac tatcgagcca accgaagtgt atcatttggc tgctcaatct 420

cacgtcaaag tgtcttttga tttgccagaa tacactgctg aagtagacgc tgttggaact 480

cttcgccttc tcgatgcaat ccatgcttgt cgtttgactg aaaaagttcg attctatcaa 540

gcatccacat ccgaattgta tggaaaagtt caagagattc cacaaagtga gaagactcca 600

ttctatccaa gatctccata tgctgttgcc aagatgtacg ggtactggat tgttgttaac 660

tatcgtgaag cctacaatat gtttgcttgc aatggaattt tgttcaacca tgagagtcca 720

agaagaggag agacattcgt gactcgtaag atcactcgtt cagtcgctaa aatcagtttg 780

gggcaacagg aaagcattga gctcggaaat ctgagtgctc ttcgtgattg gggacacgcc 840

agagagtatg ttgaagcaat gtggagaatt cttcaacacg actcaccaga tgattttgtg 900

attgcaactg gaaaacaatt cagtgtcaga gagttttgta atcttgcatt tgctgaaatt 960

ggagaagtat tgcaatggga aggagaaggt gttgaggaag ttggaaagaa taaagatgga 1020

gttattcgag ttaaagttag tccaaagtac tacagaccaa ctgaagtgga gactttattg 1080

ggaaatgctg aaaaagcaaa gaagactctt ggatgggaag caaaggttac ggttccggaa 1140

ctcgtcaaag agatggttgc aagcgacatt atccttatga agtccaatcc aatggcttaa 1200

<210> 154
<211> 1146

<212> DNA
<213> Helicobacter pylori

<400> 154
atgaaagaga agatcgccct cattaccggc gtcacgggcc aggacggtag ctacctggct 60

gagtacctcc tgaaccttgg atatgaagtg cacggcttga agcgccgatc ctcgagcatc 120

aacacttctc ggatcgatca cctctacgag gacctccatt ccgagcacaa gcgccgtttc 180

tttctgcact acggcgacat gaccgactcg tcaaatctga tccacctcat tgccaccacg 240

aagcccacag agatctacaa ccttgccgcg cagagccatg tcaaggttag tttcgaaacc 300

cctgagtata cggccaacgc agatggcatt gggactctca ggatcttgga ggctatgcgc 360

atcctgggcc tcgagaagaa aaccagattc taccaagcct ccacgtctga gctgtacggt 420

gaggtcctgg aaaccccgca gaacgagaac acacccttta acccccgcag cccatacgcc 480

gtcgcgaaga tgtacgcttt ctatattacg aagaattacc gagaggccta caacctcttt 540

gcagtgaacg gaatcctttt caaccacgag tcgcgcgtcc ggggcgaaac cttcgttacc 600

cgtaagatta ctagggccgc ctccgctatc gcgtacaacc tcacggactg cctgtatctg 660

ggcaatttgg acgccaagcg cgattggggc cacgccaagg actacgtcaa gatgatgcac 720

ctcatgctcc aggcacctac cccgcaggac tacgtgatcg ccaccggtaa gactacaagc 780

gtccgagact tcgtcaagat gtccttcgag tttatcggca ttgatcttga gtttcagaac 840

acgggaatca aagagattgg cctgatcaag tcggttgacg agaagcgcgc gaacgcgctc 900

caactcaacc tgtctcatct caagaccggg aagatcgtcg tgcggattga cgaacactat 960

ttccgcccca ctgaggtcga cctgttgctg ggcgatccca cgggtgccga gaaagagctt 1020

ggctgggtcc gagagtacga cctcaaagaa ctggtgaagg acatgctcga gtacgatctg 1080

aaagagtgcc agaagaacct ctacttgcag gacggcggat ataccccttcg gaatttctac 1140

gagtaa 1146

<210> 155
<211> 380
<212> PRT

<213> Loa loa

<400> 155

```
Met Asn Thr Glu Ala Leu Glu Asp Cys Leu Gly Asn Arg His Ser Met
1               5                  10                  15

Lys Pro Ile Ser Glu Val Glu Lys Cys Lys Phe Arg Thr Pro Lys Ile
            20                  25                  30

Ala Leu Ile Thr Gly Ile Ser Gly Gln Asp Gly Ser Tyr Leu Ala Glu
        35                  40                  45

Leu Leu Leu Ser Lys Gly Tyr Glu Val His Gly Ile Ile Arg Arg Ser
    50                  55                  60

Ser Ser Phe Asn Thr Ser Arg Ile Glu His Leu Tyr Ser Asn Pro Val
65                  70                  75                  80

Thr His His Ala Asp Ser Ser Phe Thr Leu His Tyr Gly Asp Met Thr
                85                  90                  95

Asp Ser Ser Cys Leu Ile Lys Leu Val Ser Gln Ile Gln Pro Thr Glu
            100                 105                 110

Val Tyr His Leu Ala Ala Gln Ser His Val Lys Val Ser Phe Asp Leu
        115                 120                 125

Pro Glu Tyr Thr Ala Glu Val Asp Ala Val Gly Thr Leu Arg Leu Leu
    130                 135                 140

Asp Ser Ile His Ala Cys Gly Leu Thr Asn Lys Val Arg Phe Tyr Gln
145                 150                 155                 160

Ala Ser Thr Ser Glu Leu Tyr Gly Lys Val Gln Glu Val Pro Gln Lys
                165                 170                 175
```

```
Glu Thr Thr Pro Phe Tyr Pro Arg Ser Pro Tyr Ala Ala Ala Lys Leu
            180                 185                 190

Tyr Ser Tyr Trp Ile Val Val Asn Tyr Arg Glu Ala Tyr Asn Met Phe
        195                 200                 205

Ala Cys Asn Gly Ile Leu Phe Asn His Glu Ser Pro Arg Arg Gly Glu
    210                 215                 220

Thr Phe Val Thr Arg Lys Ile Thr Arg Ala Val Ala Lys Ile Ala Leu
225                 230                 235                 240

Gly Gln Gln Glu Ile Leu Glu Leu Gly Asn Leu Ser Ser Ser Arg Asp
                245                 250                 255

Trp Gly His Ala Lys Glu Tyr Val Glu Ala Met Trp Lys Ile Leu Gln
            260                 265                 270

Tyr Asp Gln Pro Asp Asp Phe Val Ile Ala Thr Gly Lys Ser Tyr Thr
        275                 280                 285

Val Arg Arg Phe Ala Glu Leu Ala Phe Glu Glu Ile Gly Lys Thr Ile
    290                 295                 300

Ile Trp Glu Gly Glu Gly Val His Glu Val Gly Lys Glu Lys Asp Thr
305                 310                 315                 320

Gly Ile Ile Arg Val Arg Val Ser Pro Lys Tyr Tyr Arg Pro Thr Glu
                325                 330                 335

Val Asp Leu Leu Ile Gly Asp Pro Thr Lys Ala Lys Gln Lys Leu Asn
            340                 345                 350

Trp Glu Ala Lys Ile Thr Leu Glu Glu Leu Val Lys Glu Met Val Ala
        355                 360                 365
```

Ser Asp Leu Gln Leu Met Lys Ser Asn Pro Met Ala
370 375 380

<210> 156
<211> 387
<212> PRT
<213> Brugia malayi

<400> 156

Met Thr Ile Asn Ala Thr Lys Met Asn Thr Glu Thr Gln Glu Asn Cys
1 5 10 15

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

Lys Cys Arg Ala Arg Lys Ile Ala Leu Ile Thr Gly Ile Ser Gly Gln
35 40 45

Asp Gly Ser Tyr Leu Ala Glu Leu Leu Leu Ser Lys Gly Tyr Glu Val
50 55 60

His Gly Ile Ile Arg Arg Ser Ser Ser Phe Asn Thr Ala Arg Ile Glu
65 70 75 80

His Leu Tyr Ser Asn Pro Ile Thr His His Ala Asp Ser Ser Phe Thr
85 90 95

Leu His Tyr Gly Asp Met Thr Asp Ser Ser Cys Leu Ile Lys Ile Val
100 105 110

Ser Gln Ile Gln Pro Thr Glu Val Tyr His Leu Ala Ala Gln Ser His
115 120 125

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

Val Gly Thr Leu Arg Leu Leu Asp Ser Ile His Ala Cys Gly Leu Thr

```
145                 150                 155                 160

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

Val Gln Glu Val Pro Gln Lys Glu Thr Thr Pro Phe Tyr Pro Arg Ser
            180                 185                 190

Pro Tyr Ala Ala Ala Lys Leu Tyr Ser Tyr Trp Ile Val Val Asn Tyr
        195                 200                 205

Arg Glu Ala Tyr Ser Met Phe Ala Cys Asn Gly Ile Leu Phe Asn His
    210                 215                 220

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

Ala Val Ala Lys Ile Ala Leu Gly Gln Gln Glu Val Leu Glu Leu Gly
                245                 250                 255

Asn Leu Ser Ser Ser Arg Asp Trp Gly His Ala Lys Glu Tyr Val Glu
            260                 265                 270

Ala Met Trp Arg Ile Leu Gln Tyr Asp Lys Pro Asp Asp Phe Val Ile
        275                 280                 285

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

Glu Glu Ile Gly Lys Lys Ile Ile Trp Glu Gly Glu Gly Val His Glu
305                 310                 315                 320

Val Gly Lys Glu Glu Asp Thr Gly Ile Val Arg Val Arg Val Ser Ser
                325                 330                 335

Lys Tyr Tyr Arg Pro Thr Glu Val Asp Leu Leu Ile Gly Asp Ser Thr
```

340 345 350

Lys Ala Lys Gln Lys Leu Asn Trp Glu Ala Lys Thr Thr Leu Glu Glu
355 360 365

Leu Val Lys Glu Met Val Ala Ser Asp Leu Gln Leu Met Lys Ser Asn
370 375 380

Pro Met Ala
385

<210> 157
<211> 362
<212> PRT
<213> Anopheles gambiae

<400> 157

Met Glu Gly Glu Ala Ala Val Thr Asn Pro Val Asp Arg Lys Val Ala
1 5 10 15

Leu Ile Thr Gly Ile Thr Gly Gln Asp Gly Ser Tyr Leu Ala Glu Phe
20 25 30

Leu Leu Asp Lys Gly Tyr Glu Val His Gly Ile Ile Arg Arg Ala Ser
35 40 45

Thr Phe Asn Thr Ser Arg Ile Glu His Leu Tyr Ala Asp Pro Arg Thr
50 55 60

His Arg Glu Gly Lys Met Lys Leu His Tyr Gly Asp Met Thr Asp Ser
65 70 75 80

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

Asn Leu Ala Ala Gln Ser His Val Lys Ile Ser Phe Asp Leu Ser Glu
100 105 110

```
Tyr Thr Ala Glu Val Asp Ala Val Gly Thr Leu Arg Leu Leu Asp Ala
        115                 120                 125

Ile Arg Thr Val Gly Gln Glu Arg Thr Val Arg Phe Tyr Gln Ala Ser
    130                 135                 140

Thr Ser Glu Leu Tyr Gly Lys Val Ala Glu Thr Pro Gln Asn Glu Lys
145                 150                 155                 160

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

Tyr Trp Ile Val Ile Asn Tyr Arg Glu Ala Tyr Asp Met Phe Ala Cys
            180                 185                 190

Asn Gly Ile Leu Phe Asn His Glu Ser Pro Arg Arg Gly Glu Asn Phe
        195                 200                 205

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

Gln Glu Tyr Leu Glu Leu Gly Asn Leu Asp Ser Lys Arg Asp Trp Gly
225                 230                 235                 240

His Ala Lys Asp Tyr Val Glu Ala Met Trp Leu Met Met Gln Gln Glu
                245                 250                 255

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

Glu Phe Val Glu Gln Ala Phe Arg Tyr Ile Gly Arg Glu Ile Glu Trp
        275                 280                 285

Arg Gly Thr Gly Val Asp Glu Val Gly Val Glu Lys Gly Thr Asp Thr
    290                 295                 300
```

```
Val Arg Val Arg Ile Asn Pro Lys Phe Phe Arg Pro Thr Glu Val Asp
305                 310                 315                 320


Leu Leu Leu Gly Asp Ala Ser Lys Ala Lys Ala Gln Leu Gly Trp Ser
                325                 330                 335


Pro Lys Val Thr Phe Leu Glu Leu Ile Ala Asp Met Met Ala Ala Asp
            340                 345                 350


Ile Gln Leu Met Lys Asn Asn Pro Ser Ala
        355                 360


<210>  158
<211>  382
<212>  PRT
<213>  Aedes aegypti

<400>  158

Met Ser Leu Glu Asn Gly Ser Asn Lys Lys Arg Arg Leu Ser Leu Glu
1               5                   10                  15


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


Arg Arg Val Ala Leu Ile Thr Gly Ile Thr Gly Gln Asp Gly Ser Tyr
        35                  40                  45


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


Arg Arg Ala Ser Thr Phe Asn Thr Ser Arg Ile Glu His Leu Tyr Ala
65                  70                  75                  80


Asp Pro His Ser His Lys Gln Gly Lys Met Lys Leu His Tyr Gly Asp
                85                  90                  95
```

```
Met Thr Asp Ser Ser Cys Leu Val Lys Ile Ile Ser Ser Val Arg Pro
            100                 105                 110

Ser Glu Ile Tyr Asn Leu Ala Ala Gln Ser His Val Lys Val Ser Phe
        115                 120                 125

Asp Leu Ser Glu Tyr Thr Ala Glu Val Asp Ala Val Gly Thr Leu Arg
    130                 135                 140

Leu Leu Asp Ala Ile Arg Thr Cys Gly Leu Glu Lys Ser Val Arg Phe
145                 150                 155                 160

Tyr Gln Ala Ser Thr Ser Glu Leu Tyr Gly Lys Val Val Glu Thr Pro
                165                 170                 175

Gln Asn Glu Lys Thr Pro Phe Tyr Pro Arg Ser Pro Tyr Ala Cys Ala
            180                 185                 190

Lys Met Tyr Gly Tyr Trp Ile Val Ile Asn Tyr Arg Glu Ala Tyr Asn
        195                 200                 205

Met Phe Ala Cys Asn Gly Ile Leu Phe Asn His Glu Ser Pro Arg Arg
    210                 215                 220

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

Ser Leu Asn Gln Met Asp Cys Leu Glu Leu Gly Asn Leu Asp Ser Lys
                245                 250                 255

Arg Asp Trp Gly His Ala Gln Asp Tyr Val Glu Ala Met Trp Met Met
            260                 265                 270

Leu Gln Gln Pro Gln Pro Gln Asp Tyr Val Ile Ala Thr Gly Glu Cys
        275                 280                 285
```

```
His Ser Val Arg Glu Phe Val Glu His Ser Phe Arg His Ile Gly Arg
    290                 295                 300

Glu Ile Glu Trp Arg Gly Glu Gly Leu Asn Glu Val Gly Val Glu Lys
305                 310                 315                 320

Gly Thr Asp Thr Val Arg Val Arg Ile Asn Pro Lys Phe Phe Arg Pro
                325                 330                 335

Thr Glu Val Asp Leu Leu Leu Gly Asp Ala Ser Lys Ala Lys Arg Glu
            340                 345                 350

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

Met Val Ala Asp Ile Glu Leu Met Lys Lys Asn Pro Asn Ala
    370                 375                 380
```

<210> 159
<211> 370
<212> PRT
<213> Danio rerio

<400> 159

```
Met Ala Gln Cys Thr Ala Thr Thr Thr Gly Gly Gly Met Asn Gly Asp
1               5                   10                  15

Ser Lys Arg Lys Arg Lys Val Ala Ile Ile Thr Gly Ile Thr Gly Gln
            20                  25                  30

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

His Gly Ile Leu Arg Arg Ser Ser Ser Phe Asn Thr Gly Arg Ile Glu
    50                  55                  60
```

```
His Leu Tyr His Asn Pro Gln Thr His Thr Glu Gly Asn Met Lys Leu
65                  70                  75                  80

His Tyr Gly Asp Leu Thr Asp Ser Thr Cys Leu Val Lys Ile Ile Asn
                85                  90                  95

Glu Val Lys Pro Thr Glu Ile Tyr Asn Leu Gly Ala Gln Ser His Val
            100                 105                 110

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

Gly Thr Leu Arg Leu Leu Asp Ala Val Lys Thr Cys Gly Leu Thr Asp
    130                 135                 140

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

Gln Glu Ile Pro Gln Lys Glu Thr Thr Pro Phe Tyr Pro Arg Ser Pro
                165                 170                 175

Tyr Gly Ala Ala Lys Leu Tyr Ala Tyr Trp Ile Val Ile Asn Phe Arg
            180                 185                 190

Glu Ala Tyr Asn Leu Phe Ala Val Asn Gly Ile Leu Phe Asn His Glu
        195                 200                 205

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

Val Ala Lys Ile His Leu Gly Gln Leu Glu Cys Phe Ser Leu Gly Asn
225                 230                 235                 240

Leu Asp Ser Met Arg Asp Trp Gly His Ala Lys Asp Tyr Val Glu Ala
                245                 250                 255
```

```
Met Trp Leu Met Leu Gln Gln Glu Glu Pro Val Asp Phe Val Ile Ala
            260                 265                 270

Thr Gly Glu Val His Ser Val Arg Glu Phe Val Glu Arg Ala Phe Lys
        275                 280                 285

His Val Gly Lys Thr Ile Val Trp Glu Gly Lys Asp Glu Lys Glu Val
    290                 295                 300

Gly Arg Cys Gln Glu Thr Gly Val Ile His Val Arg Val Asp Pro Lys
305                 310                 315                 320

Tyr Tyr Arg Pro Thr Glu Val Asp Tyr Leu Gln Gly Asp Ser Ser Lys
                325                 330                 335

Ala Phe Lys Val Leu Gly Trp Lys Pro Arg Val Thr Phe Glu Glu Leu
            340                 345                 350

Val Lys Glu Met Val Asp Ala Asp Ile Lys Leu Met Gln Asn Asn Pro
        355                 360                 365

Asn Ala
    370
```

<210> 160
<211> 370
<212> PRT
<213> Salmo salar

<400> 160

```
Met Ala Gln Cys Thr Glu Pro Ser Thr Ser Thr Gly Ala Asn Gly Glu
1               5                   10                  15

Leu Lys Lys Pro Arg Lys Val Ala Val Ile Thr Gly Ile Thr Gly Gln
            20                  25                  30

Asp Gly Ser Tyr Leu Ala Glu Phe Leu Leu Glu Lys Gly Tyr Glu Val
```

```
        35                  40                  45

His Gly Ile Leu Arg Arg Ser Ser Ser Phe Asn Thr Gly Arg Ile Glu
    50                  55                  60

His Leu Tyr Gln Asn Pro Gln Thr His Thr Glu Gly Asn Met Lys Leu
65                  70                  75                  80

His Tyr Gly Asp Leu Thr Asp Ser Thr Cys Leu Val Lys Ile Ile Asn
                85                  90                  95

Gln Val Lys Pro Thr Glu Ile Tyr Asn Leu Gly Ala Gln Ser His Val
            100                 105                 110

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

Gly Thr Leu Arg Leu Leu Asp Ala Ile Lys Thr Cys Gly Leu Thr Asn
    130                 135                 140

Ser Val Lys Phe Tyr Gln Ala Ser Thr Ser Glu Leu Tyr Gly Lys Val
145                 150                 155                 160

Gln Glu Ile Pro Gln Lys Glu Thr Thr Pro Phe Tyr Pro Arg Ser Pro
                165                 170                 175

Tyr Gly Ala Ala Lys Leu Tyr Ala Tyr Trp Ile Val Val Asn Phe Arg
            180                 185                 190

Glu Ala Tyr Asn Leu Phe Ala Val Asn Gly Ile Leu Phe Asn His Glu
        195                 200                 205

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

Val Ala Lys Ile His Leu Gly Gln Leu Glu Ser Phe Ser Leu Gly Asn
```

225 230 235 240

Leu Asp Ser Lys Arg Asp Trp Gly His Ala Lys Asp Tyr Val Glu Ala
245 250 255

Met Trp Leu Met Leu Gln Gln Glu Glu Pro Glu Asp Leu Val Ile Ala
260 265 270

Thr Gly Glu Val His Ser Val Arg Glu Phe Val Glu Lys Ser Phe Lys
275 280 285

His Val Gly Lys Thr Ile Val Trp Glu Gly Lys Asp Glu Asn Glu Val
290 295 300

Gly Arg Cys Gln Glu Thr Gly Val Ile His Val Lys Val Asp Ser Lys
305 310 315 320

Tyr Tyr Arg Pro Thr Glu Val Glu Tyr Leu Gln Gly Asp Ser Thr Lys
325 330 335

Ala Leu Thr Lys Leu Gly Trp Lys Ala Lys Ile Thr Phe Glu Glu Leu
340 345 350

Val Lys Glu Met Val Asp Ala Asp Ile His Leu Met Lys Asn Asn Pro
355 360 365

Asn Ala
370

<210> 161
<211> 358
<212> PRT
<213> Apis mellifera

<400> 161

Met Lys Met Ala Thr Asp Ser Arg Arg Arg Val Ala Leu Ile Thr Gly
1 5 10 15

```
Ile Thr Gly Gln Asp Gly Ser Tyr Leu Ala Glu Phe Leu Leu Glu Lys
            20                  25                  30

Gly Tyr Asp Val His Gly Ile Ile Arg Arg Ala Ser Ser Phe Asn Thr
        35                  40                  45

Ala Arg Ile Gln His Leu Tyr Glu Asp Pro Lys Cys His Arg Gln Gly
    50                  55                  60

Lys Met Lys Leu His Tyr Gly Asp Met Thr Asp Ser Ser Ser Leu Ile
65                  70                  75                  80

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

Gln Ser His Val Met Val Ser Phe Glu Val Ser Glu Tyr Thr Ala Glu
            100                 105                 110

Val Asp Ala Val Gly Thr Val Arg Leu Leu Asp Ala Ile Arg Thr Cys
        115                 120                 125

Gly Leu Glu Lys Ser Val Lys Phe Tyr His Ala Ser Thr Ser Glu Leu
    130                 135                 140

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

Pro Arg Ser Pro Tyr Ala Cys Ala Lys Leu Tyr Ser Phe Trp Ile Val
                165                 170                 175

Ile Asn Tyr Arg Glu Ala Tyr Asn Met Phe Ala Cys Asn Gly Ile Leu
            180                 185                 190

Phe Asn His Glu Ser Pro Arg Arg Gly Glu Asn Phe Val Thr Arg Lys
        195                 200                 205
```

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

Glu Leu Gly Asn Leu Asp Ala Lys Arg Asp Trp Gly His Ala Lys Asp
225                 230                 235                 240

Tyr Val Glu Ala Met Trp Leu Met Leu Gln Gln Pro Thr Ala Asp Asp
                245                 250                 255

Tyr Val Ile Ala Thr Gly Glu Thr His Ser Val Arg Glu Phe Val Glu
            260                 265                 270

Ala Ala Phe Gln Tyr Val Gly Arg Thr Ile Lys Trp Glu Gly Glu Gly
        275                 280                 285

Ile Asn Glu Ile Gly Gln Asp Val Gln Thr Gly Gln Val Leu Val Lys
    290                 295                 300

Val Asn Pro Lys Tyr Phe Arg Pro Thr Glu Val Asp Val Leu Leu Gly
305                 310                 315                 320

Asp Ala Thr Lys Ala Lys Glu Lys Ile Gly Trp Lys Pro Thr Ile Thr
                325                 330                 335

Phe Glu Asn Leu Val Lys Asp Met Met Asp Ser Asp Leu Glu Leu Met
            340                 345                 350

Ser Lys Asn Pro Asn Ala
        355
```

<210> 162
<211> 395
<212> PRT
<213> Drosophila melanogaster

<400> 162

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

Glu Thr Lys Lys Gln Arg Pro Glu Ser Ser Ser Asn Gly Ser Lys Asp
            20                  25                  30

Gln Asn Gly Thr Glu Ala Gly Ala Glu Gly Asp Ser Arg Asp Lys Val
        35                  40                  45

Ala Leu Ile Thr Gly Ile Thr Gly Gln Asp Gly Ser Tyr Leu Ala Glu
    50                  55                  60

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

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

Ala His Lys Gly Gly Arg Met Lys Leu His Tyr Gly Asp Met Thr Asp
            100                 105                 110

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

Tyr Asn Leu Ala Ala Gln Ser His Val Lys Val Ser Phe Asp Leu Ser
    130                 135                 140

Glu Tyr Thr Ala Glu Val Asp Ala Val Gly Thr Leu Arg Ile Leu Asp
145                 150                 155                 160

Ala Ile Arg Thr Cys Gly Met Glu Lys Asn Val Arg Phe Tyr Gln Ala
                165                 170                 175

Ser Thr Ser Glu Leu Tyr Gly Lys Val Val Glu Thr Pro Gln Asn Glu
            180                 185                 190
```

```
Gln Thr Pro Phe Tyr Pro Arg Ser Pro Tyr Ala Cys Ala Lys Met Tyr
        195                 200                 205

Gly Phe Trp Ile Val Ile Asn Tyr Arg Glu Ala Tyr Asn Met Tyr Ala
    210                 215                 220

Cys Asn Gly Ile Leu Phe Asn His Glu Ser Pro Arg Arg Gly Glu Asn
225                 230                 235                 240

Phe Val Thr Arg Lys Ile Thr Arg Ser Val Ala Lys Ile Tyr His Lys
                245                 250                 255

Gln Met Glu Tyr Phe Glu Leu Gly Asn Leu Asp Ser Lys Arg Asp Trp
            260                 265                 270

Gly His Ala Ser Asp Tyr Val Glu Ala Met Trp Met Met Leu Gln Arg
        275                 280                 285

Glu Ser Pro Ser Asp Tyr Val Ile Ala Thr Gly Glu Thr His Ser Val
    290                 295                 300

Arg Glu Phe Val Glu Ala Ala Phe Lys His Ile Asp Arg Glu Ile Thr
305                 310                 315                 320

Trp Lys Gly Lys Gly Val Asp Glu Val Gly Val Glu Asn Gly Thr Gly
                325                 330                 335

Ile Val Arg Val Arg Ile Asn Pro Lys Tyr Phe Arg Pro Thr Glu Val
            340                 345                 350

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

Thr Pro Lys Val Thr Phe Val Glu Leu Val Ser Asp Met Met Lys Ala
    370                 375                 380
```

```
Asp Ile Glu Leu Met Arg Lys Asn Pro Ile Ala
385                 390                 395


<210>  163
<211>  369
<212>  PRT
<213>  Xenopus laevis

<400>  163

Met Ala Gln Asn Gln Gly Asn Cys Ser Cys Ser Pro Ser Asn Ser Ser
1               5                   10                  15


Gly Lys Pro Arg Lys Val Ala Leu Ile Thr Gly Ile Thr Gly Gln Asp
            20                  25                  30


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


Gly Ile Val Arg Arg Ser Ser Ser Phe Asn Thr Gly Arg Ile Glu His
    50                  55                  60


Leu Tyr Lys Asn Pro His Ala His Thr Glu Gly Asn Met Lys Leu His
65                  70                  75                  80


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


Val Lys Pro Thr Glu Ile Tyr Asn Leu Gly Ala Gln Ser His Val Lys
            100                 105                 110


Ile Ser Phe Asp Leu Ala Glu Tyr Thr Ala Asp Val Asp Gly Leu Gly
        115                 120                 125


Thr Leu Arg Leu Leu Asp Ala Thr Lys Thr Cys Gly Leu Ile Asn Thr
    130                 135                 140
```

```
Val Lys Phe Tyr Gln Ala Ser Thr Ser Glu Leu Tyr Gly Lys Val Gln
145                 150                 155                 160


Glu Ile Pro Gln Lys Glu Thr Thr Pro Phe Tyr Pro Arg Ser Pro Tyr
                165                 170                 175


Gly Ala Ala Lys Leu Tyr Ala Tyr Trp Ile Val Val Asn Phe Arg Glu
            180                 185                 190


Ala Tyr Asn Leu Phe Ala Val Asn Gly Ile Leu Phe Asn His Glu Ser
        195                 200                 205


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


Ala Lys Ile His Leu Gly Gln Met Glu Ser Phe Ser Leu Gly Asn Leu
225                 230                 235                 240


Asp Ala Lys Arg Asp Trp Gly His Ala Lys Asp Tyr Val Glu Ala Met
                245                 250                 255


Trp Leu Met Leu Gln Thr Asp Glu Pro Glu Asp Phe Val Ile Ser Thr
            260                 265                 270


Gly Glu Val His Ser Val Arg Glu Phe Val Glu Lys Ala Phe Lys His
        275                 280                 285


Ile Gly Lys Thr Ile Val Trp Glu Gly Lys Asn Glu Asn Glu Val Gly
    290                 295                 300


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


Tyr Arg Pro Thr Glu Val Asp Phe Leu Gln Gly Asp Cys Ser Gln Ala
                325                 330                 335
```

Lys Asn Lys Leu Gly Trp Thr Pro Lys Val Ser Phe Asp Glu Leu Val
340 345 350

Lys Glu Met Val Glu Ser Asp Val Lys Leu Met Ala Thr Asn Pro Asn
355 360 365

Ala

<210> 164
<211> 372
<212> PRT
<213> Bos taurus

<400> 164

Met Ala Gln Ala Ala Ala His Tyr Pro Gly Ala Cys Gly Ala Gly Asp
1 5 10 15

Ala Glu Thr Gly Lys Pro Arg Lys Val Ala Leu Ile Thr Gly Ile Thr
20 25 30

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

Glu Val His Gly Ile Val Arg Arg Ser Ser Ser Phe Asn Thr Gly Arg
50 55 60

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

Lys Leu His Tyr Gly Asp Leu Thr Asp Ser Thr Cys Leu Val Lys Ile
85 90 95

Ile Asn Glu Val Lys Pro Thr Glu Ile Tyr Asn Leu Gly Ala Gln Ser
100 105 110

His Val Lys Ile Ser Phe Asp Leu Ala Glu Tyr Thr Ala Asp Val Asp

```
        115                 120                 125

Gly Val Gly Thr Leu Arg Leu Leu Asp Ala Val Lys Thr Cys Gly Leu
    130                 135                 140

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

Lys Val Gln Glu Ile Pro Gln Lys Glu Thr Thr Pro Phe Tyr Pro Arg
                165                 170                 175

Ser Pro Tyr Gly Ala Ala Lys Leu Tyr Ala Tyr Trp Ile Val Val Asn
            180                 185                 190

Phe Arg Glu Ala Tyr Asn Leu Phe Ala Val Asn Gly Ile Leu Phe Asn
        195                 200                 205

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

Arg Ser Val Ala Lys Ile His Leu Gly Gln Leu Glu Cys Phe Ser Leu
225                 230                 235                 240

Gly Asn Leu Asp Ala Lys Arg Asp Trp Gly His Ala Lys Asp Tyr Val
                245                 250                 255

Glu Ala Met Trp Leu Met Leu Gln Lys Asp Glu Pro Glu Asp Phe Val
            260                 265                 270

Ile Ala Thr Gly Glu Val His Ser Val Arg Glu Phe Val Glu Lys Ser
        275                 280                 285

Phe Leu His Ile Gly Lys Thr Ile Val Trp Glu Gly Lys Asn Glu Asn
    290                 295                 300

Glu Val Gly Arg Cys Lys Glu Thr Gly Lys Ile His Val Thr Val Asp
```

305 310 315 320

Leu Lys Tyr Tyr Arg Pro Thr Glu Val Asp Phe Leu Gln Gly Asp Cys
325 330 335

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

Glu Leu Val Arg Glu Met Val Glu Ala Asp Val Glu Leu Met Arg Thr
355 360 365

Asn Pro His Ala
370

<210> 165
<211> 372
<212> PRT
<213> Cricetulus griseus

<400> 165

Met Ala His Ala Pro Ala Ser Cys Pro Ser Ser Arg Asn Ser Gly Asp
1 5 10 15

Gly Asp Lys Gly Lys Pro Arg Lys Val Ala Leu Ile Thr Gly Ile Thr
20 25 30

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

Glu Val His Gly Ile Val Arg Arg Ser Ser Ser Phe Asn Thr Gly Arg
50 55 60

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

Lys Leu His Tyr Gly Asp Leu Thr Asp Ser Thr Cys Leu Val Lys Ile
85 90 95

```
Ile Asn Glu Val Lys Pro Thr Glu Ile Tyr Asn Leu Gly Ala Gln Ser
            100                 105                 110

His Val Lys Ile Ser Phe Asp Leu Ala Glu Tyr Thr Ala Asp Val Asp
        115                 120                 125

Gly Val Gly Thr Leu Arg Leu Leu Asp Ala Ile Lys Thr Cys Gly Leu
    130                 135                 140

Ile Asn Ser Val Lys Phe Tyr Gln Ala Ser Thr Ser Glu Leu Tyr Gly
145                 150                 155                 160

Lys Val Gln Glu Ile Pro Gln Lys Glu Thr Thr Pro Phe Tyr Pro Arg
                165                 170                 175

Ser Pro Tyr Gly Ala Ala Lys Leu Tyr Ala Tyr Trp Ile Val Val Asn
            180                 185                 190

Phe Arg Glu Ala Tyr Asn Leu Phe Ala Val Asn Gly Ile Leu Phe Asn
        195                 200                 205

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

Arg Ser Val Ala Lys Ile Tyr Leu Gly Gln Leu Glu Cys Phe Ser Leu
225                 230                 235                 240

Gly Asn Leu Asp Ala Lys Arg Asp Trp Gly His Ala Lys Asp Tyr Val
                245                 250                 255

Glu Ala Met Trp Leu Met Leu Gln Asn Asp Glu Pro Glu Asp Phe Val
            260                 265                 270

Ile Ala Thr Gly Glu Val His Ser Val Arg Glu Phe Val Glu Lys Ser
        275                 280                 285
```

```
Phe Met His Ile Gly Lys Thr Ile Val Trp Glu Gly Lys Asn Glu Asn
    290                 295                 300

Glu Val Gly Arg Cys Lys Glu Thr Gly Lys Ile His Val Thr Val Asp
305                 310                 315                 320

Leu Lys Tyr Tyr Arg Pro Thr Glu Val Asp Phe Leu Gln Gly Asp Cys
                325                 330                 335

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

Glu Leu Val Arg Glu Met Val Gln Ala Asp Val Glu Leu Met Arg Thr
        355                 360                 365

Asn Pro Asn Ala
    370
```

<210> 166
<211> 372
<212> PRT
<213> Mus musculus

<400> 166

```
Met Ala Gln Ala Pro Ala Lys Cys Pro Ser Tyr Pro Gly Ser Gly Asp
1               5                   10                  15

Gly Glu Met Gly Lys Leu Arg Lys Val Ala Leu Ile Thr Gly Ile Thr
            20                  25                  30

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

Glu Val His Gly Ile Val Arg Arg Ser Ser Ser Phe Asn Thr Gly Arg
    50                  55                  60
```

```
Ile Glu His Leu Tyr Lys Asn Pro Gln Ala His Ile Glu Gly Asn Met
65                  70                  75                  80

Lys Leu His Tyr Gly Asp Leu Thr Asp Ser Thr Cys Leu Val Lys Ile
                85                  90                  95

Ile Asn Glu Val Lys Pro Thr Glu Ile Tyr Asn Leu Gly Ala Gln Ser
            100                 105                 110

His Val Lys Ile Ser Phe Asp Leu Ala Glu Tyr Thr Ala Asp Val Asp
        115                 120                 125

Gly Val Gly Thr Leu Arg Leu Leu Asp Ala Ile Lys Thr Cys Gly Leu
    130                 135                 140

Ile Asn Ser Val Lys Phe Tyr Gln Ala Ser Thr Ser Glu Leu Tyr Gly
145                 150                 155                 160

Lys Val Gln Glu Ile Pro Gln Lys Glu Thr Thr Pro Phe Tyr Pro Arg
                165                 170                 175

Ser Pro Tyr Gly Ala Ala Lys Leu Tyr Ala Tyr Trp Ile Val Val Asn
            180                 185                 190

Phe Arg Glu Ala Tyr Asn Leu Phe Ala Val Asn Gly Ile Leu Phe Asn
        195                 200                 205

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

Arg Ser Val Ala Lys Ile Tyr Leu Gly Gln Leu Glu Cys Phe Ser Leu
225                 230                 235                 240

Gly Asn Leu Asp Ala Lys Arg Asp Trp Gly His Ala Lys Asp Tyr Val
                245                 250                 255
```

```
Glu Ala Met Trp Leu Met Leu Gln Asn Asp Glu Pro Glu Asp Phe Val
            260                 265                 270


Ile Ala Thr Gly Glu Val His Ser Val Arg Glu Phe Val Glu Lys Ser
        275                 280                 285


Phe Met His Ile Gly Lys Thr Ile Val Trp Glu Gly Lys Asn Glu Asn
    290                 295                 300


Glu Val Gly Arg Cys Lys Glu Thr Gly Lys Val His Val Thr Val Asp
305                 310                 315                 320


Leu Lys Tyr Tyr Arg Pro Thr Glu Val Asp Phe Leu Gln Gly Asp Cys
                325                 330                 335


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


Glu Leu Val Arg Glu Met Val Gln Ala Asp Val Glu Leu Met Arg Thr
        355                 360                 365


Asn Pro Asn Ala
    370


<210>  167
<211>  372
<212>  PRT
<213>  Rattus norvegicus

<400>  167

Met Ala His Ala Pro Ala Ser Cys Arg Arg Tyr Pro Gly Ser Gly Asp
1               5                   10                  15


Gly Glu Met Gly Lys Leu Arg Lys Val Ala Leu Ile Thr Gly Ile Thr
            20                  25                  30
```

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

Glu Val His Gly Ile Val Arg Arg Ser Ser Ser Phe Asn Thr Gly Arg
    50                  55                  60

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

Lys Leu His Tyr Gly Asp Leu Thr Asp Ser Thr Cys Leu Val Lys Ile
                85                  90                  95

Ile Asn Glu Val Lys Pro Thr Glu Ile Tyr Asn Leu Gly Ala Gln Ser
            100                 105                 110

His Val Lys Ile Ser Phe Asp Leu Ala Glu Tyr Thr Ala Asp Val Asp
        115                 120                 125

Gly Val Gly Thr Leu Arg Leu Leu Asp Ala Ile Lys Thr Cys Gly Leu
    130                 135                 140

Ile Asn Ser Val Lys Phe Tyr Gln Ala Ser Thr Ser Glu Leu Tyr Gly
145                 150                 155                 160

Lys Val Gln Glu Ile Pro Gln Lys Glu Thr Thr Pro Phe Tyr Pro Arg
                165                 170                 175

Ser Pro Tyr Gly Ala Ala Lys Leu Tyr Ala Tyr Trp Ile Val Val Asn
            180                 185                 190

Phe Arg Glu Ala Tyr Asn Leu Phe Ala Val Asn Gly Ile Leu Phe Asn
        195                 200                 205

His Glu Ser Pro Arg Arg Gly Ala Asn Phe Val Thr Arg Lys Ile Ser
    210                 215                 220
```

```
Arg Ser Val Ala Lys Ile Tyr Leu Gly Gln Leu Glu Cys Phe Ser Leu
225                 230                 235                 240


Gly Asn Leu Asp Ala Lys Arg Asp Trp Gly His Ala Lys Asp Tyr Val
                245                 250                 255


Glu Ala Met Trp Leu Met Leu Gln Asn Asp Glu Pro Glu Asp Phe Val
            260                 265                 270


Ile Ala Thr Gly Glu Val His Ser Val Arg Glu Phe Val Glu Lys Ser
        275                 280                 285


Phe Met His Ile Gly Lys Thr Ile Val Trp Glu Gly Lys Asn Glu Asn
    290                 295                 300


Glu Val Gly Arg Cys Lys Glu Thr Gly Lys Ile His Val Thr Val Asp
305                 310                 315                 320


Leu Lys Tyr Tyr Arg Pro Thr Glu Val Asp Phe Leu Gln Gly Asp Cys
                325                 330                 335


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


Glu Leu Val Arg Glu Met Val Gln Ala Asp Val Glu Leu Met Arg Thr
        355                 360                 365


Asn Pro Asn Ala
    370
```

<210> 168
<211> 372
<212> PRT
<213> Homo sapiens

<400> 168

```
Met Ala His Ala Pro Ala Arg Cys Pro Ser Ala Arg Gly Ser Gly Asp
```

```
1               5                   10                  15

Gly Glu Met Gly Lys Pro Arg Asn Val Ala Leu Ile Thr Gly Ile Thr
            20                  25                  30

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

Glu Val His Gly Ile Val Arg Arg Ser Ser Ser Phe Asn Thr Gly Arg
    50                  55                  60

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

Lys Leu His Tyr Gly Asp Leu Thr Asp Ser Thr Cys Leu Val Lys Ile
                85                  90                  95

Ile Asn Glu Val Lys Pro Thr Glu Ile Tyr Asn Leu Gly Ala Gln Ser
            100                 105                 110

His Val Lys Ile Ser Phe Asp Leu Ala Glu Tyr Thr Ala Asp Val Asp
        115                 120                 125

Gly Val Gly Thr Leu Arg Leu Leu Asp Ala Val Lys Thr Cys Gly Leu
    130                 135                 140

Ile Asn Ser Val Lys Phe Tyr Gln Ala Ser Thr Ser Glu Leu Tyr Gly
145                 150                 155                 160

Lys Val Gln Glu Ile Pro Gln Lys Glu Thr Thr Pro Phe Tyr Pro Arg
                165                 170                 175

Ser Pro Tyr Gly Ala Ala Lys Leu Tyr Ala Tyr Trp Ile Val Val Asn
            180                 185                 190

Phe Arg Glu Ala Tyr Asn Leu Phe Ala Val Asn Gly Ile Leu Phe Asn
```

195 200 205

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

Arg Ser Val Ala Lys Ile Tyr Leu Gly Gln Leu Glu Cys Phe Ser Leu
225 230 235 240

Gly Asn Leu Asp Ala Lys Arg Asp Trp Gly His Ala Lys Asp Tyr Val
245 250 255

Glu Ala Met Trp Leu Met Leu Gln Asn Asp Glu Pro Glu Asp Phe Val
260 265 270

Ile Ala Thr Gly Glu Val His Ser Val Arg Glu Phe Val Glu Lys Ser
275 280 285

Phe Leu His Ile Gly Lys Thr Ile Val Trp Glu Gly Lys Asn Glu Asn
290 295 300

Glu Val Gly Arg Cys Lys Glu Thr Gly Lys Val His Val Thr Val Asp
305 310 315 320

Leu Lys Tyr Tyr Arg Pro Thr Glu Val Asp Phe Leu Gln Gly Asp Cys
325 330 335

Thr Lys Ala Lys Gln Lys Leu Asn Trp Lys Pro Arg Val Ala Phe Asp
340 345 350

Glu Leu Val Arg Glu Met Val His Ala Asp Val Glu Leu Met Arg Thr
355 360 365

Asn Pro Asn Ala
370

<210> 169

<211> 373
<212> PRT
<213> Ciona intestinalis

<400> 169

```
Met Ala Asp Ser Ser Cys Asn Gly Lys Arg Lys Asn Gly Asp Ser Cys
1               5                   10                  15


Asp Thr Glu Thr Lys Lys Gln Lys Lys Thr Ala Leu Val Thr Gly Ile
            20                  25                  30


Thr Gly Gln Asp Gly Ser Tyr Leu Ala Glu Leu Leu Ile Glu Lys Gly
        35                  40                  45


Tyr Glu Val His Gly Ile Ile Arg Arg Ala Ser Gln Pro Asn Thr Ala
    50                  55                  60


Arg Ile Glu His Leu Tyr Ala Asp Arg Ala Thr His Lys Glu Gly Ser
65                  70                  75                  80


Met Lys Leu His Tyr Gly Asp Leu Thr Asp Ser Ser Cys Leu Val Lys
                85                  90                  95


Ile Ile Asn Gln Val Lys Pro Asn Glu Ile Tyr Asn Leu Gly Ala Met
            100                 105                 110


Ser His Val Lys Val Ser Phe Asp Leu Ala Glu Tyr Thr Ala Asp Val
        115                 120                 125


Asp Gly Val Gly Thr Leu Arg Leu Leu Asp Ala Ile Arg Thr Cys Gly
    130                 135                 140


Met Ser Asp Ser Val Arg Phe Tyr Gln Ala Ser Thr Ser Glu Met Phe
145                 150                 155                 160


Gly Lys Val Gln Glu Ile Pro Gln Lys Glu Thr Thr Pro Phe Tyr Pro
                165                 170                 175
```

```
Arg Ser Pro Tyr Ala Ala Ala Lys Val Tyr Ala Tyr Trp Ile Val Val
            180                 185                 190

Asn Tyr Arg Glu Ala Tyr Gly Met His Ala Ser Asn Gly Ile Leu Phe
        195                 200                 205

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

Thr Arg Ser Val Ala Lys Ile His Leu Gly Leu Gln Glu Leu Ile Thr
225                 230                 235                 240

Leu Gly Asn Leu Asp Ser Lys Arg Asp Trp Gly His Ala Arg Asp Tyr
                245                 250                 255

Val Lys Gly Met Trp Met Met Met Gln His Asp Glu Pro Gly Asp Tyr
            260                 265                 270

Val Leu Ser Thr Asn Glu Thr His Ser Val Arg Glu Phe Val Glu Lys
        275                 280                 285

Ser Phe Lys His Ile Gly Val Glu Leu Glu Trp Gln Gly Glu Gly Val
    290                 295                 300

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

Ser Glu Arg Tyr Tyr Arg Pro Thr Glu Val Glu Phe Leu Leu Gly Asp
                325                 330                 335

Tyr Ser Lys Ala Lys Lys Val Leu Gly Trp Ser Pro Asp Ile Lys Phe
            340                 345                 350

Asn Glu Leu Val Lys Glu Met Val Glu Ala Asp Ile Asn Leu Met Lys
        355                 360                 365
```

Lys Thr Pro Asn Ala
370

<210> 170
<211> 379
<212> PRT
<213> Francisella philomiragia

<400> 170

Met Lys Lys Val Ala Leu Ile Thr Gly Ile Thr Gly Gln Asp Gly Ser
1 5 10 15

Tyr Leu Ala Glu Phe Leu Leu Lys Lys Gly Tyr Ile Val His Gly Ile
20 25 30

Lys Arg Arg Ser Ser Leu Phe Asn Thr Asp Arg Ile Asp His Leu Tyr
35 40 45

Gln Asp Pro His Val Glu Asn Arg Asn Leu Ile Leu His Tyr Gly Asp
50 55 60

Met Thr Asp Ser Met Asn Leu Thr Arg Val Ile Ala Asp Thr Gln Pro
65 70 75 80

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

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

Ile Leu Glu Ala Val Arg Leu Leu Gly Leu Glu Lys Lys Thr Lys Ile
115 120 125

Tyr Gln Ala Ser Thr Ser Glu Leu Tyr Gly Lys Val Gln Ala Ile Pro
130 135 140

```
Gln Ser Glu Thr Thr Pro Phe Tyr Pro Arg Ser Pro Tyr Ala Val Ala
145                 150                 155                 160

Lys Met Tyr Ala Phe Trp Ile Thr Val Asn Tyr Arg Glu Ala Tyr Asp
                165                 170                 175

Met Phe Ala Cys Asn Gly Ile Leu Phe Asn His Glu Ser Pro Val Arg
            180                 185                 190

Gly Glu Thr Phe Val Thr Arg Lys Ile Thr Arg Ala Ala Ser Lys Ile
        195                 200                 205

Ala Leu Asn Leu Gln Asp Lys Leu Tyr Leu Gly Asn Leu Asp Ala Lys
    210                 215                 220

Arg Asp Trp Gly His Ala Lys Asp Tyr Val Arg Met Met Trp Met Ile
225                 230                 235                 240

Leu Gln Ala Asp Gln Pro Glu Asp Trp Val Ile Ala Thr Gly Gln Thr
                245                 250                 255

Thr Thr Val Arg Asp Phe Val Lys Leu Ser Phe Ala Tyr Ala Gly Ile
            260                 265                 270

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

Ser Val Asp Ser Ala Arg Ala Glu Arg Ala Gly Val Asp Leu Ser His
    290                 295                 300

Ile Ser Glu Gly Gln Val Val Val Cys Val Asp Pro Arg Tyr Phe Arg
305                 310                 315                 320

Pro Thr Glu Val Asp Leu Leu Leu Gly Asp Pro Thr Lys Ala Glu Gln
                325                 330                 335
```

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


Met Met Glu Ser Asp Leu Lys Leu Met Thr Lys Asp Val Tyr Leu Lys
        355                 360                 365


Asp Gly Gly Tyr Lys Ile Met Ser Tyr Phe Glu
    370                 375


<210>  171
<211>  379
<212>  PRT
<213>  Campylobacter coli

<400>  171

Met Lys Lys Val Ala Leu Ile Thr Gly Val Thr Gly Gln Asp Gly Ala
1               5                   10                  15


Tyr Leu Ser Glu Phe Leu Leu Asn Lys Gly Tyr Glu Val His Gly Ile
            20                  25                  30


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


Glu Gly His His Asn Lys Lys Asn Asp Phe Tyr Leu His Tyr Gly Asp
    50                  55                  60


Met Thr Asp Ser Met Asn Leu Thr Arg Ile Ile Ala Glu Ile Lys Pro
65                  70                  75                  80


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


Glu Thr Pro Glu Tyr Thr Ala Asn Ala Asp Gly Ile Gly Thr Leu Arg
            100                 105                 110
```

```
Ile Leu Asp Ala Val Arg Phe Leu Asn Leu Thr Gln Lys Thr Lys Ile
        115                 120                 125

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

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

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

Met Phe Ala Cys Asn Gly Ile Leu Phe Asn His Glu Ser Pro Val Arg
            180                 185                 190

Gly Glu Thr Phe Val Thr Arg Lys Ile Thr Arg Ala Thr Ala Lys Ile
        195                 200                 205

Ala Leu Asn Leu Asp Asp Met Leu Tyr Leu Gly Asn Leu Asp Ala Lys
    210                 215                 220

Arg Asp Trp Gly His Ala Lys Asp Tyr Val Arg Met Met Trp Met Ile
225                 230                 235                 240

Leu Gln His Glu Lys Ala Asp Asp Trp Val Ile Ala Thr Gly Lys Thr
                245                 250                 255

Thr Thr Val Arg Asp Phe Val Lys Leu Ala Phe Glu Tyr Cys Gly Ile
            260                 265                 270

Lys Leu Asn Phe Lys Gly Val Gly Val Asp Glu Glu Gly Phe Ile Glu
        275                 280                 285

Asp Leu Asp Gln Gln Arg Ala Lys Glu Leu Ser Leu Ser Phe Asn His
    290                 295                 300
```

Leu Gln Lys Gly Gln Val Val Val Lys Val Asn Pro Arg Tyr Phe Arg
305 310 315 320

Pro Thr Glu Val Asp Leu Leu Leu Gly Asp Pro Ser Lys Ala Glu Lys
325 330 335

Glu Leu Gly Trp Asn Arg Glu Tyr Asp Leu Lys Asn Leu Val Asp Asp
340 345 350

Met Met Glu Asn Asp Leu Lys Leu Met Thr Lys Asp Val Tyr Leu Lys
355 360 365

Gln Gly Gly Tyr Lys Ile Met Arg Tyr Tyr Glu
370 375

<210> 172
<211> 373
<212> PRT
<213> Cellulophaga lytica

<400> 172

Met Ser Asp Lys Lys Val Ala Leu Ile Thr Gly Val Thr Gly Gln Asp
1 5 10 15

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

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

Leu Tyr Gln Asp Pro His Ile Glu Asn Arg Asn Phe Ile Leu His Tyr
50 55 60

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

Gln Pro Asp Glu Ile Tyr Asn Leu Ala Ala Met Ser His Val His Val

```
                85                  90                  95

Ser Phe Glu Val Pro Glu Tyr Thr Ala Asn Ala Asp Gly Ile Gly Thr
            100                 105                 110

Leu Arg Ile Leu Asp Ala Val Arg Met Leu Gly Leu Ser Asn Lys Thr
        115                 120                 125

Arg Ile Tyr Gln Ala Ser Thr Ser Glu Leu Tyr Gly Lys Val Gln Glu
    130                 135                 140

Val Pro Gln Ser Glu Thr Thr Pro Phe Tyr Pro Arg Ser Pro Tyr Ala
145                 150                 155                 160

Val Ala Lys Met Tyr Ala Tyr Trp Ile Thr Val Asn Tyr Arg Glu Ala
                165                 170                 175

Tyr Asn Met Tyr Ala Cys Asn Gly Ile Leu Phe Asn His Glu Ser Pro
            180                 185                 190

Ile Arg Gly Glu Thr Phe Val Thr Arg Lys Ile Thr Arg Ala Thr Ala
        195                 200                 205

Lys Ile Ala Leu Gly Leu Gln Asp Lys Phe Tyr Leu Gly Asn Leu Asp
    210                 215                 220

Ala Glu Arg Asp Trp Gly His Ala Lys Asp Tyr Val Arg Met Met Trp
225                 230                 235                 240

Met Ile Leu Gln Ala Asp Glu Pro Glu Asp Trp Val Ile Ala Thr Gly
                245                 250                 255

Lys Thr Thr Lys Val Arg Glu Phe Val Lys Met Ser Phe Ala Glu Ala
            260                 265                 270

Gly Ile Glu Leu Glu Phe Lys Gly Ser Gly Val Glu Glu Lys Ala Tyr
```

275 280 285

Val Val Lys Cys Ser Asn Pro Asp Tyr Gln Leu Glu Ile Gly Lys Glu
290 295 300

Val Leu Ser Val Asp Pro Lys Tyr Phe Arg Pro Thr Glu Val Glu Leu
305 310 315 320

Leu Ile Gly Asp Pro Thr Lys Ala Lys Thr Lys Leu Gly Trp Thr Val
325 330 335

Glu Tyr Glu Leu Ala Asp Leu Val Lys Asp Met Val Gln Ser Asp Leu
340 345 350

Lys Leu Met Gln Lys Glu Gln Tyr Leu Lys Asp Gly Gly Tyr Arg Ile
355 360 365

Leu Asn Tyr Phe Glu
370

<210> 173
<211> 399
<212> PRT
<213> caenorhabditis elegans

<400> 173

Met Pro Thr Gly Lys Ser Glu Ser Ser Asp Ile Ser Glu Val Val Gly
1 5 10 15

Asn Met Glu Ile Ser Lys Val Glu Gly Leu Glu Ala Cys Ile Gly Met
20 25 30

Ser His Glu Val Ser Thr Thr Pro Ala Ala Glu Leu Ala Ala Phe Arg
35 40 45

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

```
Tyr Leu Ala Glu Leu Leu Leu Ser Lys Gly Tyr Lys Val His Gly Ile
65                  70                  75                  80

Ile Arg Arg Ser Ser Ser Phe Asn Thr Ala Arg Ile Glu His Leu Tyr
                85                  90                  95

Ser Asn Pro Ile Thr His His Gly Asp Ser Ser Phe Ser Leu His Tyr
            100                 105                 110

Gly Asp Met Thr Asp Ser Ser Cys Leu Ile Lys Leu Ile Ser Thr Ile
        115                 120                 125

Glu Pro Thr Glu Val Tyr His Leu Ala Ala Gln Ser His Val Lys Val
    130                 135                 140

Ser Phe Asp Leu Pro Glu Tyr Thr Ala Glu Val Asp Ala Val Gly Thr
145                 150                 155                 160

Leu Arg Leu Leu Asp Ala Ile His Ala Cys Arg Leu Thr Glu Lys Val
                165                 170                 175

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

Ile Pro Gln Ser Glu Lys Thr Pro Phe Tyr Pro Arg Ser Pro Tyr Ala
        195                 200                 205

Val Ala Lys Met Tyr Gly Tyr Trp Ile Val Val Asn Tyr Arg Glu Ala
    210                 215                 220

Tyr Asn Met Phe Ala Cys Asn Gly Ile Leu Phe Asn His Glu Ser Pro
225                 230                 235                 240

Arg Arg Gly Glu Thr Phe Val Thr Arg Lys Ile Thr Arg Ser Val Ala
                245                 250                 255
```

```
Lys Ile Ser Leu Gly Gln Gln Glu Ser Ile Glu Leu Gly Asn Leu Ser
            260                 265                 270

Ala Leu Arg Asp Trp Gly His Ala Arg Glu Tyr Val Glu Ala Met Trp
        275                 280                 285

Arg Ile Leu Gln His Asp Ser Pro Asp Asp Phe Val Ile Ala Thr Gly
    290                 295                 300

Lys Gln Phe Ser Val Arg Glu Phe Cys Asn Leu Ala Phe Ala Glu Ile
305                 310                 315                 320

Gly Glu Val Leu Gln Trp Glu Gly Glu Gly Val Glu Glu Val Gly Lys
                325                 330                 335

Asn Lys Asp Gly Val Ile Arg Val Lys Val Ser Pro Lys Tyr Tyr Arg
            340                 345                 350

Pro Thr Glu Val Glu Thr Leu Leu Gly Asn Ala Glu Lys Ala Lys Lys
        355                 360                 365

Thr Leu Gly Trp Glu Ala Lys Val Thr Val Pro Glu Leu Val Lys Glu
    370                 375                 380

Met Val Ala Ser Asp Ile Ile Leu Met Lys Ser Asn Pro Met Ala
385                 390                 395


<210>  174
<211>  381
<212>  PRT
<213>  helicobacter pylori

<400>  174

Met Lys Glu Lys Ile Ala Leu Ile Thr Gly Val Thr Gly Gln Asp Gly
1               5                   10                  15
```

```
Ser Tyr Leu Ala Glu Tyr Leu Leu Asn Leu Gly Tyr Glu Val His Gly
            20                  25                  30

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

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

Gly Asp Met Thr Asp Ser Ser Asn Leu Ile His Leu Ile Ala Thr Thr
65                  70                  75                  80

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

Ser Phe Glu Thr Pro Glu Tyr Thr Ala Asn Ala Asp Gly Ile Gly Thr
            100                 105                 110

Leu Arg Ile Leu Glu Ala Met Arg Ile Leu Gly Leu Glu Lys Lys Thr
        115                 120                 125

Arg Phe Tyr Gln Ala Ser Thr Ser Glu Leu Tyr Gly Glu Val Leu Glu
    130                 135                 140

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

Val Ala Lys Met Tyr Ala Phe Tyr Ile Thr Lys Asn Tyr Arg Glu Ala
                165                 170                 175

Tyr Asn Leu Phe Ala Val Asn Gly Ile Leu Phe Asn His Glu Ser Arg
            180                 185                 190

Val Arg Gly Glu Thr Phe Val Thr Arg Lys Ile Thr Arg Ala Ala Ser
        195                 200                 205
```

```
Ala Ile Ala Tyr Asn Leu Thr Asp Cys Leu Tyr Leu Gly Asn Leu Asp
    210                 215                 220


Ala Lys Arg Asp Trp Gly His Ala Lys Asp Tyr Val Lys Met Met His
225                 230                 235                 240


Leu Met Leu Gln Ala Pro Thr Pro Gln Asp Tyr Val Ile Ala Thr Gly
                245                 250                 255


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


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


Ile Lys Ser Val Asp Glu Lys Arg Ala Asn Ala Leu Gln Leu Asn Leu
    290                 295                 300


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


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


Glu Lys Glu Leu Gly Trp Val Arg Glu Tyr Asp Leu Lys Glu Leu Val
            340                 345                 350


Lys Asp Met Leu Glu Tyr Asp Leu Lys Glu Cys Gln Lys Asn Leu Tyr
        355                 360                 365


Leu Gln Asp Gly Gly Tyr Thr Leu Arg Asn Phe Tyr Glu
    370                 375                 380


<210>  175
<211>  948
<212>  DNA
```

<213> Caenorhabditis elegans

<400> 175
atgaaaacca tcctcgtcac gggcggcact ggtctggtgg gaagcgccat taagaaggtc 60

gttgagacaa ccgagaagcg cgacgatgaa aagtgggtct ttatcggctc caaggactgc 120

gacctcgaga accttgagga aacgcgagag ctgttcgagt cggtcaagcc cacccacgtg 180

atccatttgg ccgctatggt cgggggcctc ttccacaacc tcgcgcacaa tctgcagttc 240

tttcggaaga acatggccat caacgacaac gttctcgcac tgtgccacga gttcgatgtc 300

atcaagtgcg tgagctgcct ttctacctgt atcttccctg acaagacgtc ctacccgatt 360

gacgagacta tggtccacct cggcccaccc catgactcaa actttggcta ctcgtatgcc 420

aagcgcatga tcgatgtcct gaacaagggt tacgctcaag agcacggacg taagtacacc 480

agcgtggttc cctgcaatgt ctttggccct cacgacaact acaacttgca gtccggccat 540

gtcctcccgg ccctgatcca caaggcctat gtcgcgcaga gggacggcac gccccttcag 600

gtgtacggca gtggtacacc cctgcgccag ttcatctact ctattgatct cgctcgcctg 660

ttcattcgag tcgttagaga atacgaggac gtcgagccta tcatcctcag cgtgaacgag 720

tccgacgaag tctcgattcg cgacgccgtc agcgccgtgg ttaaggcaat cgacttcacc 780

ggggacgtcg agtatgatac ttccaaagcg gatggacagt tcaagaaaac cgcctcgaac 840

gagaagctcc tgaagttgtt tccggacttc caattcacgc cctttgagca ggctatccaa 900

gagtcagtcc agtggttcgt tgacaactac gaaaccgccc ggaagtaa 948

<210> 176
<211> 933
<212> DNA
<213> Helicobacter pylori

<400> 176
atgaacgaga tcatcctcat taccggcgcc tacggcatgg tcggtcagaa cacggctctg 60

tacttcaaga agaacaagcc cgacgttacc ctccttactc ctaagaaaag cgagctgtgc 120

ctcttggaca aggataatgt ccaggcctac ctgaaagaat ataagccgac aggaatcatt 180

cactgcgcag gccgcgtcgg cgggatcgtg gcgaacatga acgacctctc cacgtacatg 240

gtcgagaacc ttctcatggg cctgtacctg ttttcgagcg ccctcgactc tggtgtgaag 300

aaggccatca acttggcctc atcctgtgct tatcccaagt tcgcgcccaa tccactgaaa 360

gagtcggatc tgctcaacgg cagcctcgag cctaccaacg agggatacgc ccttgctaag 420

ctgtccgtca tgaagtactg cgaatacgtt agtgccgaga agggcgtgtt ctataagacc 480

ctcgtcccgt gcaacttgta cggcgagttc gacaagtttg aagaaaagat cgcacacatg 540

atccccggcc tcattgcccg aatgcatacg gcgaagctga agaacgagaa agaatttgcc 600

atgtggggcg acggtactgc tcgccgggag tacctcaacg ccaaggatct ggcccgtttc 660

atttctcttg catacgagaa tatcgctagc attccctctg tcatgaacgt gggatcgggc 720

gttgactata gcatcgagga atactacgag aaggtcgcgc aagtgctcga ctacaagggg 780

gtgttcgtca aggacctgtc caagcctgtc ggtatgcagc aaaagctcat ggatatctcg 840

aagcagaggg ctctgaagtg ggagttggag attccgctcg agcagggcat caaagaggcc 900

tacgagtact atctgaagct gcttgaggtg taa 933

<210> 177
<211> 320
<212> PRT
<213> Ascaris suum

<400> 177

Met Ala Ser Glu Lys Gln Met Ile Val Leu Val Thr Gly Gly Thr Gly
1 5 10 15

Leu Val Gly Lys Ala Ile Glu Lys Ile Val Lys Thr Glu Glu Ser Arg
20 25 30

Pro Asn Glu Arg Trp Ile Phe Ile Gly Ser Lys Asp Cys Asp Leu Ser
35 40 45

Asp Leu Glu Ala Thr Arg Lys Leu Phe Ala Lys His Lys Pro Thr His
50 55 60

```
Val Ile His Leu Ala Ala Met Val Gly Gly Leu Phe His Asn Leu Gln
65                  70                  75                  80

His Asn Leu Gln Phe Phe Arg Lys Asn Met Gln Ile Asn Asp Asn Val
                85                  90                  95

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

Ser Thr Cys Ile Phe Pro Asp Lys Thr Thr Tyr Pro Ile Asp Glu Thr
        115                 120                 125

Met Val His Asn Gly Pro Pro His Asp Ser Asn Phe Gly Tyr Ser Tyr
    130                 135                 140

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

Gly Arg Lys Tyr Thr Ser Val Val Pro Cys Asn Val Phe Gly Pro Tyr
                165                 170                 175

Asp Asn Tyr Asn Leu Glu Tyr Gly His Val Ile Pro Ala Leu Ile His
            180                 185                 190

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

Ser Gly Ala Pro Leu Arg Gln Phe Ile Tyr Ser Leu Asp Leu Ala Arg
    210                 215                 220

Leu Phe Val Trp Val Leu Arg Asn Tyr Glu Glu Ile Glu Pro Ile Ile
225                 230                 235                 240

Leu Ser Val Gly Glu Glu Asp Glu Val Ser Ile Met Asp Ala Val Asn
                245                 250                 255
```

```
Ala Ile Val Lys Ala Phe Asp Phe Lys Gly Gly Ile Val Gln Asp Lys
            260                 265                 270


Ser Lys Ala Asp Gly Gln Tyr Lys Lys Thr Ala Ser Asn Ala Lys Leu
        275                 280                 285


Arg Lys Tyr Leu Pro Asp Phe Lys Phe Thr Pro Phe Asp Val Ala Ile
    290                 295                 300


Lys Glu Ser Val Asp Trp Phe Val Ala Asn Tyr Glu Asp Ala Arg Lys
305                 310                 315                 320


<210>  178
<211>  483
<212>  PRT
<213>  Brugia malayi

<400>  178

Met Ala Ser Ser Ser Arg Arg Leu Lys Lys Glu Leu Thr Asp Ile Gln
1               5                   10                  15


Ser Ser Asp Ser Arg Thr Phe Cys Cys Val Glu Phe Asp Glu Asn Asn
            20                  25                  30


Leu Leu His Trp Thr Gly Leu Leu Val Pro Asp Lys Glu Pro Tyr Asn
        35                  40                  45


Lys Gly Ala Phe Lys Val Ala Ile Asp Phe Pro Val Glu Tyr Pro Phe
    50                  55                  60


Lys Pro Pro Lys Ile Thr Phe Leu Thr Lys Ile Tyr His Pro Asn Val
65                  70                  75                  80


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

```
Lys Pro Ala Thr Lys Thr Glu Gln Val Met Asn Ala Leu Leu Gly Leu
            100                 105                 110


Ile Thr Glu Pro Glu Pro Asp His Pro Leu Arg Ala Asp Leu Ala Glu
        115                 120                 125


Glu Phe Thr Lys Asp Arg Lys Lys Phe Asn Lys Thr Ala Glu Asp Tyr
    130                 135                 140


Thr Lys Lys Tyr Ala Val Lys Arg Pro Asp Gly Trp Phe Glu Thr Arg
145                 150                 155                 160


His Lys Ile Met Asp Arg Glu Gln Ser Met Thr Val Leu Val Thr Gly
                165                 170                 175


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


Glu Ala Arg Pro Asn Glu Thr Trp Ile Phe Val Gly Arg Asn Asp Cys
        195                 200                 205


Asp Leu Thr Asp Ile Glu Ala Thr Arg Lys Leu Phe Met Lys Cys Arg
    210                 215                 220


Pro Ser His Val Ile His Leu Ala Ala Met Val Gly Gly Leu Phe His
225                 230                 235                 240


Asn Leu His Cys Asn Leu Gln Phe Phe Arg Lys Asn Met Gln Ile Asn
                245                 250                 255


Asp Asn Val Leu Met Ala Cys Asn Glu Phe Asp Val Val Lys Cys Ile
            260                 265                 270


Ser Cys Leu Ser Thr Cys Val Phe Pro Asp Lys Thr Thr Tyr Pro Ile
        275                 280                 285
```

```
Asp Glu Thr Met Val His Asn Gly Pro Pro His Ser Ser Asn Phe Gly
    290                 295                 300

Tyr Ser Tyr Ala Lys Arg Met Ile Asp Val Leu Asn Arg Gly Tyr Ala
305                 310                 315                 320

Gln Glu Phe Gly Arg Lys Tyr Thr Ser Val Ile Pro Cys Asn Val Phe
                325                 330                 335

Gly Pro His Asp Asn Tyr Asn Leu Lys Asp Gly His Val Ile Pro Ala
            340                 345                 350

Leu Ile His Lys Thr Tyr Ile Ala Lys His Glu Gly Thr Pro Leu Glu
        355                 360                 365

Val Phe Gly Ser Gly Thr Pro Leu Arg Gln Phe Ile Tyr Ser Leu Asp
    370                 375                 380

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

Pro Ile Ile Leu Ser Val Gly Glu Glu Asp Glu Val Ser Ile Met Asp
                405                 410                 415

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

His Asp Lys Thr Lys Ala Asp Gly Gln Tyr Lys Lys Thr Ala Ser Asn
        435                 440                 445

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

Ile Ala Ile Lys Glu Ser Val Asp Trp Phe Ile Asp Asn Tyr Asp Asn
465                 470                 475                 480
```

Ala Arg Lys

<210> 179
<211> 323
<212> PRT
<213> Gallus gallus

<400> 179

```
Met Thr Glu Ala Leu Gly Ala Lys Pro Lys Arg Ile Leu Val Thr Gly
1               5                  10                  15


Gly Thr Gly Leu Val Gly Arg Ala Ile Gln Glu Val Val Ala Asn Gly
            20                  25                  30


Glu Gly Arg Pro Asp Glu Glu Trp Val Phe Val Ser Ser Arg Asp Ala
        35                  40                  45


Asp Leu Thr Ser Ala Val Glu Thr Lys Ala Leu Phe Glu Lys His Lys
    50                  55                  60


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


Asn Ile Arg Cys Asn Leu Asp Phe Trp Arg Arg Asn Ile His Ile Asn
                85                  90                  95


Asp Asn Val Leu His Ser Ala Tyr Glu Cys Gly Val Gln Lys Val Val
            100                 105                 110


Ser Cys Leu Ser Thr Cys Ile Phe Pro Asp Lys Thr Thr Tyr Pro Ile
        115                 120                 125


Asp Glu Thr Met Ile His Asn Gly Pro Pro His Ser Ser Asn Phe Gly
    130                 135                 140
```

```
Tyr Ser Tyr Ala Lys Arg Met Ile Asp Val Gln Asn Arg Gly Tyr Phe
145                 150                 155                 160

Glu Gln His Gly Cys Arg Phe Thr Ala Val Ile Pro Thr Asn Val Phe
                165                 170                 175

Gly Pro His Asp Asn Phe Asn Ile Glu Asp Gly His Val Leu Pro Gly
            180                 185                 190

Leu Ile His Lys Val Tyr Leu Ala Lys Gln Asn Gly Ser Ala Leu Thr
        195                 200                 205

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

Leu Ala Arg Leu Phe Val Trp Val Leu Arg Glu Tyr Glu Glu Val Glu
225                 230                 235                 240

Pro Ile Ile Leu Ser Val Gly Glu Glu Asp Glu Val Ser Ile Arg Glu
                245                 250                 255

Ala Ala Glu Ala Ile Val Glu Ala Met Asp Phe Arg Gly Glu Leu Ile
            260                 265                 270

Phe Asp Thr Thr Lys Ala Asp Gly Gln Phe Lys Lys Thr Ala Ser Asn
        275                 280                 285

Ala Lys Leu Arg His Tyr Leu Pro Asn Phe Gln Phe Thr Pro Phe Arg
    290                 295                 300

Gln Ala Val Lys Glu Thr Cys Thr Trp Phe Ser Thr Asn Tyr Ala Ser
305                 310                 315                 320

Ala Arg Lys
```

<210> 180
<211> 320
<212> PRT
<213> Danio rerio

<400> 180

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


Gly Leu Val Gly Arg Ala Ile Glu Arg Val Val Lys Asp Glu Gly Arg
            20                  25                  30


Glu Gly Glu Glu Trp Thr Phe Leu Ser Ser Lys Asp Ala Asn Leu Leu
        35                  40                  45


Ser Ala Glu Glu Thr Arg Ala Ile Phe Gln Lys Tyr Arg Pro Thr His
    50                  55                  60


Val Ile His Leu Ala Ala Met Val Gly Gly Leu Phe Arg Asn Met Arg
65                  70                  75                  80


Gln Asn Leu Asp Phe Trp Arg Asn Asn Val Phe Ile Asn Asp Asn Val
                85                  90                  95


Leu Gln Thr Ala Asn Glu Phe Gly Val Val Lys Val Val Ser Cys Leu
            100                 105                 110


Ser Thr Cys Ile Phe Pro Asp Lys Thr Thr Tyr Pro Ile Asp Glu Thr
        115                 120                 125


Met Ile His Asn Gly Pro Pro His Asp Ser Asn Phe Gly Tyr Ala Phe
    130                 135                 140


Ala Lys Arg Met Ile Asp Val Gln Asn Arg Thr Cys Phe Lys Gln Tyr
145                 150                 155                 160


Gly Arg Arg Tyr Thr Ser Val Ile Pro Thr Asn Val Phe Gly Ala His
```

```
                165                 170                 175

Asp Asn Phe Asn Ile Asp Asp Gly His Val Leu Pro Gly Leu Ile His
            180                 185                 190

Lys Thr Tyr Leu Ala Lys Lys Glu Gly Lys Pro Leu Gln Val Trp Gly
        195                 200                 205

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

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

Leu Ser Val Gly Glu Glu Asp Glu Leu Ser Ile Lys Asp Cys Ala Asp
                245                 250                 255

Ala Val Val Asp Ala Leu Gly Phe Lys Gly Asp Val Ile Tyr Asp Thr
            260                 265                 270

Ser Lys Ala Asp Gly Gln Phe Lys Lys Thr Ala Ser Asn Ala Lys Leu
        275                 280                 285

Arg Gln Tyr Leu Pro Asp Phe Gln Phe Thr Pro Phe Arg Glu Ala Ile
    290                 295                 300

Lys Glu Thr Cys Asp Trp Phe Val Ala Asn Tyr Asp Ile Ala Arg Lys
305                 310                 315                 320
```

<210> 181
<211> 317
<212> PRT
<213> Xenopus laevis

<400> 181

```
Met Glu Gly Lys Arg Ile Leu Val Thr Gly Gly Ser Gly Leu Val Gly
1               5                   10                  15
```

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

Gln Trp Ile Phe Ile Ser Ser Lys Asp Ala Asp Leu Thr Asn Ala Ala
        35                  40                  45

Asp Thr Lys Cys Leu Phe Glu Lys His Lys Pro Thr His Val Ile His
    50                  55                  60

Leu Ala Ala Met Val Gly Gly Leu Phe Arg Asn Met Lys Tyr Asn Leu
65                  70                  75                  80

Asp Phe Leu Arg Asn Asn Leu His Ile Asn Asp Asn Val Leu His Ser
                85                  90                  95

Ala Tyr Glu Met Gly Val Gln Lys Val Val Ser Cys Leu Ser Thr Cys
            100                 105                 110

Ile Phe Pro Asp Lys Thr Thr Tyr Pro Ile Asp Glu Thr Met Ile His
        115                 120                 125

Asn Gly Pro Pro His Thr Ser Asn Phe Gly Tyr Ser Tyr Ala Lys Arg
    130                 135                 140

Met Ile Asp Val Gln Asn Arg Ala Tyr Tyr Glu Gln His Gly Cys Lys
145                 150                 155                 160

Phe Thr Ser Val Ile Pro Thr Asn Val Phe Gly Pro His Asp Asn Phe
                165                 170                 175

Asn Ile Asp Asp Gly His Val Leu Pro Gly Leu Ile His Lys Val Tyr
            180                 185                 190

Ser Ala Lys Gln Asn Gly Thr Ala Leu Ser Ile Trp Gly Thr Gly Gln
        195                 200                 205
```

```
Pro Arg Arg Gln Phe Ile Tyr Ser Leu Asp Leu Ala Arg Leu Phe Ile
    210                 215                 220

Trp Val Leu Arg Glu Tyr Asn Glu Val Asp Pro Ile Ile Leu Ser Val
225                 230                 235                 240

Gly Glu Glu Asp Glu Val Ser Ile Lys Glu Ala Ala Glu Ser Ile Val
                245                 250                 255

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

Asp Gly Gln Phe Lys Lys Thr Ala Ser Asn His Lys Leu Arg Lys Tyr
        275                 280                 285

Leu Pro Asp Phe Gln Phe Thr Pro Phe Asn Lys Ala Val Gln Glu Thr
    290                 295                 300

Cys Asn Trp Phe Asn Ser Asn Tyr Ala Gln Ala Arg Lys
305                 310                 315


<210>  182
<211>  321
<212>  PRT
<213>  Bos taurus

<400>  182

Met Gly Asp Pro Arg Gly Thr Arg Arg Ile Leu Val Thr Gly Gly Ser
1               5                   10                  15

Gly Leu Val Gly Arg Ala Ile Gln Lys Val Val Glu Asp Gly Ala Arg
            20                  25                  30

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

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

His Val Ile His Leu Ala Ala Met Val Gly Gly Leu Phe Arg Asn Ile
65                  70                  75                  80

Lys Tyr Asn Leu Asp Phe Trp Arg Lys Asn Ile His Ile Asn Asp Asn
                85                  90                  95

Val Leu His Ser Ala Phe Glu Val Gly Val Arg Lys Val Val Ser Cys
            100                 105                 110

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

Thr Met Ile His Asn Gly Pro Pro His Ser Ser Asn Phe Gly Tyr Ser
    130                 135                 140

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

His Gly Cys Thr Phe Thr Ala Val Ile Pro Thr Asn Val Phe Gly Pro
                165                 170                 175

His Asp Asn Phe Ser Ile Glu Asp Gly His Val Leu Pro Gly Leu Ile
            180                 185                 190

His Lys Val His Leu Ala Lys Ser Ser Gly Ser Ala Leu Thr Val Trp
        195                 200                 205

Gly Thr Gly Arg Pro Arg Arg Gln Phe Ile Tyr Ser Leu Asp Leu Ala
    210                 215                 220

Arg Leu Phe Ile Trp Ala Leu Arg Glu Tyr Asp Glu Val Glu Pro Ile
225                 230                 235                 240
```

```
Ile Leu Ser Val Gly Glu Glu Asp Glu Val Ser Val Gln Glu Ala Ala
                245                 250                 255


Glu Ala Val Val Glu Ala Met Asp Phe His Gly Glu Val Thr Phe Asp
            260                 265                 270


Thr Thr Lys Ser Asp Gly Gln Phe Lys Lys Thr Ala Ser Asn Ala Lys
        275                 280                 285


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


Val Lys Glu Thr Cys Ala Trp Phe Thr Asp Asn Tyr Glu Gln Ala Arg
305                 310                 315                 320


Lys
```

<210> 183
<211> 321
<212> PRT
<213> Equus caballus

<400> 183

```
Met Gly Glu Pro Gln Gly Ser Met Arg Ile Leu Val Thr Gly Ser Ser
1               5                   10                  15


Gly Leu Val Gly Arg Ala Ile Gln Lys Val Val Ala Asp Gly Ala Arg
            20                  25                  30


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


Thr Asp Ala Ala Gln Thr Arg Ala Leu Phe Glu Lys Val Arg Pro Thr
    50                  55                  60
```

```
His Val Ile His Leu Ala Ala Met Val Gly Gly Leu Phe Arg Asn Ile
65                  70                  75                  80

Lys Tyr Asn Leu Asp Phe Trp Arg Lys Asn Val His Ile Asn Asp Asn
                85                  90                  95

Val Leu His Ser Ala Phe Glu Val Gly Ala Arg Lys Val Val Ser Cys
            100                 105                 110

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

Thr Met Ile His Asn Gly Pro Pro His Ser Ser Asn Phe Gly Tyr Ser
    130                 135                 140

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

His Gly Cys Thr Phe Thr Ala Val Ile Pro Thr Asn Val Phe Gly Pro
                165                 170                 175

His Asp Asn Phe Asn Ile Glu Asp Gly His Val Leu Pro Gly Leu Ile
            180                 185                 190

His Lys Val His Leu Ala Lys Ser Ser Gly Ser Ala Leu Thr Val Trp
        195                 200                 205

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

Arg Leu Phe Ile Trp Val Leu Arg Glu Tyr Asn Glu Val Glu Pro Ile
225                 230                 235                 240

Ile Leu Ser Val Gly Glu Glu Asp Glu Val Ser Ile Gln Glu Ala Ala
                245                 250                 255
```

Glu Ala Val Val Glu Ala Met Asp Phe His Gly Asp Val Thr Phe Asp
260 265 270

Thr Thr Lys Ser Asp Gly Gln Phe Lys Lys Thr Ala Ser Asn Gly Lys
275 280 285

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

Val Lys Glu Thr Cys Ala Trp Phe Thr Asp Asn Tyr Glu Gln Ala Arg
305 310 315 320

Lys

<210> 184
<211> 321
<212> PRT
<213> Canis lupus

<400> 184

Met Ser Glu Pro Gly Gly Ser Val Arg Ile Leu Val Thr Gly Gly Ser
1 5 10 15

Gly Leu Val Gly Arg Ala Ile Gln Lys Val Val Ala Asp Gly Ala Gly
20 25 30

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

Thr Asp Ala Ala Gln Thr Arg Ala Leu Phe Glu Lys Val Arg Pro Thr
50 55 60

His Val Ile His Leu Ala Ala Met Val Gly Gly Leu Phe Arg Asn Ile
65 70 75 80

Lys Tyr Asn Leu Asp Phe Trp Arg Lys Asn Val His Ile Asn Asp Asn

```
                85                  90                  95

Val Leu His Ser Ala Phe Glu Val Gly Val Arg Lys Val Val Ser Cys
            100                 105                 110

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

Thr Met Ile His Asn Gly Pro Pro His Asn Ser Asn Phe Gly Tyr Ser
    130                 135                 140

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

His Gly Cys Thr Phe Thr Ala Val Ile Pro Thr Asn Val Phe Gly Pro
                165                 170                 175

His Asp Asn Phe Asn Ile Glu Asp Gly His Val Leu Pro Gly Leu Ile
            180                 185                 190

His Lys Val His Leu Ala Lys Ser Ser Gly Ser Ala Leu Thr Val Trp
        195                 200                 205

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

Arg Leu Phe Ile Trp Val Leu Arg Glu Tyr Asn Glu Val Glu Pro Ile
225                 230                 235                 240

Ile Leu Ser Val Gly Glu Glu Asp Glu Val Ser Ile Gln Glu Ala Ala
                245                 250                 255

Glu Ala Val Val Glu Ala Met Asp Phe His Gly Glu Val Thr Phe Asp
            260                 265                 270

Thr Thr Lys Ser Asp Gly Gln Phe Lys Lys Thr Ala Ser Asn Gly Lys
```

275 280 285

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

Val Lys Glu Thr Cys Ala Trp Phe Thr His Asn Tyr Glu Gln Ala Arg
305 310 315 320

Lys

<210> 185
<211> 321
<212> PRT
<213> Homo sapiens

<400> 185

Met Gly Glu Pro Gln Gly Ser Met Arg Ile Leu Val Thr Gly Gly Ser
1 5 10 15

Gly Leu Val Gly Lys Ala Ile Gln Lys Val Val Ala Asp Gly Ala Gly
20 25 30

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

Thr Asp Thr Ala Gln Thr Arg Ala Leu Phe Glu Lys Val Gln Pro Thr
50 55 60

His Val Ile His Leu Ala Ala Met Val Gly Gly Leu Phe Arg Asn Ile
65 70 75 80

Lys Tyr Asn Leu Asp Phe Trp Arg Lys Asn Val His Met Asn Asp Asn
85 90 95

Val Leu His Ser Ala Phe Glu Val Gly Ala Arg Lys Val Val Ser Cys
100 105 110

```
Leu Ser Thr Cys Ile Phe Pro Asp Lys Thr Thr Tyr Pro Ile Asp Glu
        115                 120                 125

Thr Met Ile His Asn Gly Pro Pro His Asn Ser Asn Phe Gly Tyr Ser
    130                 135                 140

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

Tyr Gly Cys Thr Phe Thr Ala Val Ile Pro Thr Asn Val Phe Gly Pro
                165                 170                 175

His Asp Asn Phe Asn Ile Glu Asp Gly His Val Leu Pro Gly Leu Ile
            180                 185                 190

His Lys Val His Leu Ala Lys Ser Ser Gly Ser Ala Leu Thr Val Trp
        195                 200                 205

Gly Thr Gly Asn Pro Arg Arg Gln Phe Ile Tyr Ser Leu Asp Leu Ala
    210                 215                 220

Gln Leu Phe Ile Trp Val Leu Arg Glu Tyr Asn Glu Val Glu Pro Ile
225                 230                 235                 240

Ile Leu Ser Val Gly Glu Glu Asp Glu Val Ser Ile Lys Glu Ala Ala
                245                 250                 255

Glu Ala Val Val Glu Ala Met Asp Phe His Gly Glu Val Thr Phe Asp
            260                 265                 270

Thr Thr Lys Ser Asp Gly Gln Phe Lys Lys Thr Ala Ser Asn Ser Lys
        275                 280                 285

Leu Arg Thr Tyr Leu Pro Asp Phe Arg Phe Thr Pro Phe Lys Gln Ala
    290                 295                 300
```

```
Val Lys Glu Thr Cys Ala Trp Phe Thr Asp Asn Tyr Glu Gln Ala Arg
305                 310                 315                 320


Lys
```

<210> 186
<211> 321
<212> PRT
<213> Cricetulus griseus

<400> 186

```
Met Gly Glu Pro Gln Gly Ser Arg Arg Ile Leu Val Thr Gly Gly Ser
1               5                   10                  15


Gly Leu Val Gly Arg Ala Ile Gln Lys Val Val Ala Asp Gly Ala Gly
            20                  25                  30


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


Thr Asp Ala Ala Gln Thr Gln Ala Leu Phe Gln Lys Val Gln Pro Thr
    50                  55                  60


His Val Ile His Leu Ala Ala Met Val Gly Gly Leu Phe Arg Asn Ile
65                  70                  75                  80


Lys Tyr Asn Leu Asp Phe Trp Arg Lys Asn Val His Ile Asn Asp Asn
                85                  90                  95


Val Leu His Ser Ala Phe Glu Val Gly Thr Arg Lys Val Val Ser Cys
            100                 105                 110


Leu Ser Thr Cys Ile Phe Pro Asp Lys Thr Thr Tyr Pro Ile Asp Glu
        115                 120                 125
```

```
Thr Met Ile His Asn Gly Pro Pro His Ser Ser Asn Phe Gly Tyr Ser
    130                 135                 140

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

His Gly Cys Thr Phe Thr Ala Val Ile Pro Thr Asn Val Phe Gly Pro
                165                 170                 175

His Asp Asn Phe Asn Ile Glu Asp Gly His Val Leu Pro Gly Leu Ile
            180                 185                 190

His Lys Val His Leu Ala Lys Ser Asn Gly Ser Ala Leu Thr Val Trp
        195                 200                 205

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

Arg Leu Phe Ile Trp Val Leu Arg Glu Tyr Asn Glu Val Glu Pro Ile
225                 230                 235                 240

Ile Leu Ser Val Gly Glu Glu Asp Glu Val Ser Ile Lys Glu Ala Ala
                245                 250                 255

Glu Ala Val Val Glu Ala Met Asp Phe Cys Gly Glu Val Thr Phe Asp
            260                 265                 270

Ser Thr Lys Ser Asp Gly Gln Tyr Lys Lys Thr Ala Ser Asn Gly Lys
        275                 280                 285

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

Val Lys Glu Thr Cys Ala Trp Phe Thr Asp Asn Tyr Glu Gln Ala Arg
305                 310                 315                 320
```

Lys

<210> 187
<211> 321
<212> PRT
<213> Rattus norvegicus

<400> 187

```
Met Gly Glu Pro His Gly Ser Met Arg Ile Leu Val Thr Gly Gly Ser
1               5                   10                  15


Gly Leu Val Gly Arg Ala Ile Gln Lys Val Val Ala Asp Gly Ala Gly
            20                  25                  30


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


Thr Asp Ala Ala Gln Thr Gln Ala Leu Phe Gln Lys Val Gln Pro Thr
    50                  55                  60


His Val Ile His Leu Ala Ala Met Val Gly Gly Leu Phe Arg Asn Ile
65                  70                  75                  80


Lys Tyr Asn Leu Asp Phe Trp Arg Lys Asn Val His Ile Asn Asp Asn
                85                  90                  95


Val Leu His Ser Ala Phe Glu Val Gly Thr Arg Lys Val Val Ser Cys
            100                 105                 110


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


Thr Met Ile His Asn Gly Pro Pro His Ser Ser Asn Phe Gly Tyr Ser
    130                 135                 140
```

```
Tyr Ala Lys Arg Met Ile Asp Val Gln Asn Arg Ala Tyr Phe Gln Gln
145                 150                 155                 160


His Gly Cys Thr Phe Thr Ser Val Ile Pro Thr Asn Val Phe Gly Pro
                165                 170                 175


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


His Lys Val His Leu Ala Lys Ser Ser Gly Ser Ala Leu Thr Val Trp
        195                 200                 205


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


Arg Leu Phe Ile Trp Val Leu Arg Glu Tyr Asn Glu Val Glu Pro Ile
225                 230                 235                 240


Ile Leu Ser Val Gly Glu Glu Asp Glu Val Ser Ile Lys Glu Ala Ala
                245                 250                 255


Glu Ala Val Val Glu Ala Met Asp Phe Ser Gly Glu Val Thr Phe Asp
            260                 265                 270


Ser Thr Lys Ser Asp Gly Gln Tyr Lys Lys Thr Ala Ser Asn Gly Lys
        275                 280                 285


Leu Arg Ser Tyr Leu Pro Asp Phe Cys Phe Thr Pro Phe Lys Gln Ala
    290                 295                 300


Val Lys Glu Thr Cys Ala Trp Phe Thr Glu Asn Tyr Glu Gln Ala Arg
305                 310                 315                 320


Lys
```

<210> 188
<211> 321
<212> PRT
<213> Mus musculus

<400> 188

```
Met Gly Glu Pro His Gly Ser Met Arg Ile Leu Val Thr Gly Gly Ser
1               5                   10                  15


Gly Leu Val Gly Arg Ala Ile Gln Lys Val Val Ala Asp Gly Ala Gly
            20                  25                  30


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


Thr Asp Ala Ala Gln Thr Gln Ala Leu Phe Gln Lys Val Gln Pro Thr
    50                  55                  60


His Val Ile His Leu Ala Ala Met Val Gly Gly Leu Phe Arg Asn Ile
65                  70                  75                  80


Lys Tyr Asn Leu Asp Phe Trp Arg Lys Asn Val His Ile Asn Asp Asn
                85                  90                  95


Val Leu His Ser Ala Phe Glu Val Gly Ala Arg Lys Val Val Ser Cys
            100                 105                 110


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


Thr Met Ile His Asn Gly Pro Pro His Ser Ser Asn Phe Gly Tyr Ser
    130                 135                 140


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


His Gly Cys Thr Phe Thr Ala Val Ile Pro Thr Asn Val Phe Gly Pro
```

```
                165                 170                 175

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

His Lys Val His Leu Ala Lys Ser Ser Asp Ser Ala Leu Thr Val Trp
        195                 200                 205

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

Arg Leu Phe Ile Trp Val Leu Arg Glu Tyr Ser Glu Val Glu Pro Ile
225                 230                 235                 240

Ile Leu Ser Val Gly Glu Glu Asp Glu Val Ser Ile Lys Glu Ala Ala
                245                 250                 255

Glu Ala Val Val Glu Ala Met Asp Phe Asn Gly Glu Val Thr Phe Asp
            260                 265                 270

Ser Thr Lys Ser Asp Gly Gln Tyr Lys Lys Thr Ala Ser Asn Gly Lys
        275                 280                 285

Leu Arg Ser Tyr Leu Pro Asp Phe Arg Phe Thr Pro Phe Lys Gln Ala
    290                 295                 300

Val Lys Glu Thr Cys Thr Trp Phe Thr Asp Asn Tyr Glu Gln Ala Arg
305                 310                 315                 320

Lys
```

<210> 189
<211> 315
<212> PRT
<213> Caenorhabditis elegans

<400> 189

Met Lys Thr Ile Leu Val Thr Gly Gly Thr Gly Leu Val Gly Ser Ala
1 5 10 15

Ile Lys Lys Val Val Glu Thr Thr Glu Lys Arg Asp Asp Glu Lys Trp
20 25 30

Val Phe Ile Gly Ser Lys Asp Cys Asp Leu Glu Asn Leu Glu Glu Thr
35 40 45

Arg Glu Leu Phe Glu Ser Val Lys Pro Thr His Val Ile His Leu Ala
50 55 60

Ala Met Val Gly Gly Leu Phe His Asn Leu Ala His Asn Leu Gln Phe
65 70 75 80

Phe Arg Lys Asn Met Ala Ile Asn Asp Asn Val Leu Ala Leu Cys His
85 90 95

Glu Phe Asp Val Ile Lys Cys Val Ser Cys Leu Ser Thr Cys Ile Phe
100 105 110

Pro Asp Lys Thr Ser Tyr Pro Ile Asp Glu Thr Met Val His Leu Gly
115 120 125

Pro Pro His Asp Ser Asn Phe Gly Tyr Ser Tyr Ala Lys Arg Met Ile
130 135 140

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

Ser Val Val Pro Cys Asn Val Phe Gly Pro His Asp Asn Tyr Asn Leu
165 170 175

Gln Ser Gly His Val Leu Pro Ala Leu Ile His Lys Ala Tyr Val Ala
180 185 190

```
Gln Arg Asp Gly Thr Pro Leu Gln Val Tyr Gly Ser Gly Thr Pro Leu
        195                 200                 205

Arg Gln Phe Ile Tyr Ser Ile Asp Leu Ala Arg Leu Phe Ile Arg Val
    210                 215                 220

Val Arg Glu Tyr Glu Asp Val Glu Pro Ile Ile Leu Ser Val Asn Glu
225                 230                 235                 240

Ser Asp Glu Val Ser Ile Arg Asp Ala Val Ser Ala Val Val Lys Ala
                245                 250                 255

Ile Asp Phe Thr Gly Asp Val Glu Tyr Asp Thr Ser Lys Ala Asp Gly
            260                 265                 270

Gln Phe Lys Lys Thr Ala Ser Asn Glu Lys Leu Leu Lys Leu Phe Pro
        275                 280                 285

Asp Phe Gln Phe Thr Pro Phe Glu Gln Ala Ile Gln Glu Ser Val Gln
    290                 295                 300

Trp Phe Val Asp Asn Tyr Glu Thr Ala Arg Lys
305                 310                 315
```

<210> 190
<211> 310
<212> PRT
<213> Helicobacter pylori

<400> 190

```
Met Asn Glu Ile Ile Leu Ile Thr Gly Ala Tyr Gly Met Val Gly Gln
1               5                   10                  15

Asn Thr Ala Leu Tyr Phe Lys Lys Asn Lys Pro Asp Val Thr Leu Leu
            20                  25                  30
```

```
Thr Pro Lys Lys Ser Glu Leu Cys Leu Leu Asp Lys Asp Asn Val Gln
        35                  40                  45

Ala Tyr Leu Lys Glu Tyr Lys Pro Thr Gly Ile Ile His Cys Ala Gly
    50                  55                  60

Arg Val Gly Gly Ile Val Ala Asn Met Asn Asp Leu Ser Thr Tyr Met
65                  70                  75                  80

Val Glu Asn Leu Leu Met Gly Leu Tyr Leu Phe Ser Ser Ala Leu Asp
                85                  90                  95

Ser Gly Val Lys Lys Ala Ile Asn Leu Ala Ser Ser Cys Ala Tyr Pro
            100                 105                 110

Lys Phe Ala Pro Asn Pro Leu Lys Glu Ser Asp Leu Leu Asn Gly Ser
        115                 120                 125

Leu Glu Pro Thr Asn Glu Gly Tyr Ala Leu Ala Lys Leu Ser Val Met
    130                 135                 140

Lys Tyr Cys Glu Tyr Val Ser Ala Glu Lys Gly Val Phe Tyr Lys Thr
145                 150                 155                 160

Leu Val Pro Cys Asn Leu Tyr Gly Glu Phe Asp Lys Phe Glu Glu Lys
                165                 170                 175

Ile Ala His Met Ile Pro Gly Leu Ile Ala Arg Met His Thr Ala Lys
            180                 185                 190

Leu Lys Asn Glu Lys Glu Phe Ala Met Trp Gly Asp Gly Thr Ala Arg
        195                 200                 205

Arg Glu Tyr Leu Asn Ala Lys Asp Leu Ala Arg Phe Ile Ser Leu Ala
    210                 215                 220
```

```
Tyr Glu Asn Ile Ala Ser Ile Pro Ser Val Met Asn Val Gly Ser Gly
225                 230                 235                 240


Val Asp Tyr Ser Ile Glu Glu Tyr Tyr Glu Lys Val Ala Gln Val Leu
                245                 250                 255


Asp Tyr Lys Gly Val Phe Val Lys Asp Leu Ser Lys Pro Val Gly Met
            260                 265                 270


Gln Gln Lys Leu Met Asp Ile Ser Lys Gln Arg Ala Leu Lys Trp Glu
        275                 280                 285


Leu Glu Ile Pro Leu Glu Gln Gly Ile Lys Glu Ala Tyr Glu Tyr Tyr
    290                 295                 300


Leu Lys Leu Leu Glu Val
305                 310


<210>  191
<211>  1092
<212>  DNA
<213>  Caenorhabditis elegans

<400>  191
atgaagctcc acgaggaaaa caacaaggcc ctgttcgagg ctatgcgcaa ccgagagaat       60

cccaccaagt gggagagcta caagcaggtc atcacggccg tgtccgcgta ctgggtcttt      120

tcgattggcc tcgttttcct gaacaagtat cttttgtcta gcgtccagct cgacgcccct      180

ctgttcatca cttggtatca atgcctcgtc accgtgttcc tctgcctgtt tctttcaaag      240

acatccaagg catacggtct gttcaaattt ccctcgatgc cgatcgatgc caagattagc      300

cgtgaggtcc tcccattgtc cgtcgtgttc gttgctatga tcagtttcaa caacctctgt      360

ctgaagtacg tcggcgtttc tttttactac gtcggacgca gcctgaccac ggtgttcaac      420

gtcgtctgca cctacctcat ccttggccag aaaacgtcgg gccaggccat tgggtgctgc      480

gcgctgatca tcttcggctt tctcttgggt gtggaccagg aaggcgtcac cggaacgctg      540
```

tcctacactg gcgtcatttt cggcgttctc gccagcctct ccgtcgccct gaatgctatc 600

tatacccgta aggtcctttc gtcagtgggc gactgtctgt ggaggctcac aatgtacaac 660

aacctcaacg cactcgttct gtttctgccc cttatgttgt tcaacggcga gttcggtgcc 720

gtcttttact tcgacaagct ctttgatacc actttctgga ttctcatgac gctgggcgga 780

gtgttcggct tcatgatggg ctacgtcacc gggtggcaga tccaagcgac cagccctctc 840

acgcacaata tctctggtac tgccaaggcc gctgcccaga cagtcatggc agtcgtttgg 900

tattccgagc ttaagaccct gttgtggtgg acgtcgaact tcgtcgtgct gtttggcagc 960

ggaatgtaca cctacgtgca aaagcgcgtc atggacaaga agaactccgg cgccagcccg 1020

gcttcggagg cgaagtctga caaggtcaag ctcctgggca gagatggtaa cgccgccgag 1080

gaatccgttt aa 1092

<210> 192
<211> 385
<212> PRT
<213> Ascaris suum

<400> 192

Met His His Asp Ser Lys Ile Thr Pro Val Ala Thr Ile His Leu Leu
1 5 10 15

Pro Lys Gly Leu Gly Arg Gly Leu Leu Leu Gln Gln Phe Ala Met Lys
20 25 30

Asn Gly Arg Gln His Glu Thr Leu Ala Gln Lys Ser Ile Lys Ile Val
35 40 45

Leu Ala Val Ser Ala Tyr Trp Ile Cys Ser Ile Gly Leu Val Phe Leu
50 55 60

Asn Lys Tyr Leu Leu Ser Ser Glu Asn Leu Lys Leu Asn Ala Pro Leu
65 70 75 80

```
Phe Ile Thr Trp Tyr Gln Cys Leu Val Thr Val Val Leu Cys Tyr Thr
                85                  90                  95

Cys Ser Tyr Leu Ser Arg Ile Phe Pro Ser Arg Phe Ser Phe Pro Ser
            100                 105                 110

Ile Ala Phe Asp His Arg Ile Ser Arg Glu Val Leu Pro Leu Ser Phe
        115                 120                 125

Val Phe Val Ala Met Ile Thr Thr Asn Asn Leu Cys Leu Lys Tyr Val
    130                 135                 140

Gly Val Ser Phe Tyr Tyr Val Gly Arg Ser Leu Thr Thr Val Phe Asn
145                 150                 155                 160

Val Val Cys Ser Tyr Leu Ile Leu Gly Gln Gly Thr Ser Trp Arg Ala
                165                 170                 175

Leu Leu Cys Cys Ala Val Ile Ile Gly Gly Phe Phe Leu Gly Val Asp
            180                 185                 190

Gln Glu Asp Ala Ala Gly Ser Leu Ser Val Leu Gly Val Val Tyr Gly
        195                 200                 205

Val Ala Ala Ser Leu Cys Val Ala Leu Asn Ala Ile Tyr Thr Gln Arg
    210                 215                 220

Thr Leu Pro Ala Val Gly Asp Ser Val Ala Arg Leu Thr Met Tyr Asn
225                 230                 235                 240

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

Glu Phe Gly Glu Ile Ile Tyr Phe Pro Tyr Leu Leu Ser Thr His Phe
            260                 265                 270
```

```
Trp Ala Leu Met Thr Ile Ser Gly Val Phe Gly Phe Leu Met Gly Tyr
        275                 280                 285


Val Thr Gly Trp Gln Ile Gln Val Thr Ser Pro Leu Thr His Asn Ile
    290                 295                 300


Ser Gly Thr Ala Lys Ala Ala Ala Gln Thr Val Ile Ala Val Ala Trp
305                 310                 315                 320


Trp Gln Glu Val Lys Ser Val Leu Trp Trp Val Ser Asn Val Val Val
                325                 330                 335


Leu Gly Gly Ser Ala Ala Tyr Thr Ala Val Lys Arg Lys Glu Met Ile
            340                 345                 350


Ala Asn His Glu Ser Asn Ala Lys Pro Arg Gly Ser Val Ser Pro Asp
        355                 360                 365


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


Val
385


<210>  193
<211>  331
<212>  PRT
<213>  Loa loa

<400>  193

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


Ala Pro Leu Phe Val Thr Trp Tyr Gln Cys Phe Val Thr Val Leu Leu
            20                  25                  30
```

```
Cys Cys Val Phe Cys Trp Val Ser Lys Gln Tyr Pro Ser Leu Val Thr
        35                  40                  45

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

Leu Ser Phe Val Phe Val Ala Met Ile Ala Thr Asn Asn Leu Cys Leu
65                  70                  75                  80

Lys Tyr Val Gly Val Ser Phe Tyr Tyr Ile Gly Arg Ser Leu Thr Thr
                85                  90                  95

Val Phe Asn Val Ile Cys Ser Tyr Ile Ile Leu Gly Gln Leu Thr Ser
            100                 105                 110

Leu Lys Thr Ile Leu Cys Cys Ala Leu Ile Ile Gly Gly Phe Val Leu
        115                 120                 125

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

Phe Leu Gly Thr Leu Ser Val Thr Gly Val Ile Phe Gly Val Ala Ala
145                 150                 155                 160

Ser Met Phe Val Ala Leu Asn Ala Ile Tyr Thr Gln Arg Thr Leu Pro
                165                 170                 175

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

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

Glu Val Phe Tyr Phe Arg Tyr Ser Ser Ser Leu Arg Phe Trp Thr Leu
    210                 215                 220
```

```
Met Thr Leu Ser Gly Ile Phe Gly Phe Leu Met Ser Tyr Val Thr Gly
225                 230                 235                 240


Trp Gln Ile Gln Val Thr Ser Ser Leu Thr His Asn Ile Ser Gly Thr
                245                 250                 255


Ala Lys Ala Ala Ala Gln Thr Val Ile Ala Val Val Trp Trp Gln Glu
            260                 265                 270


Met Lys Ser Leu Leu Trp Trp Ile Ser Asn Val Ile Val Leu Gly Gly
        275                 280                 285


Ser Ala Ile Tyr Thr Met Ile Lys Arg Lys Glu Met Val Asp Lys Tyr
    290                 295                 300


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


Leu Phe Gly Leu Ser Asp Glu Asp Glu Thr Val
                325                 330
```

<210> 194
<211> 363
<212> PRT
<213> Rattus norvegicus

<400> 194

```
Met Asn Arg Val Pro Leu Lys Arg Ser Arg Ile Leu Arg Met Ala Leu
1               5                   10                  15


Thr Gly Ala Ser Ala Val Ser Glu Glu Ala Asp Ser Glu Asn Lys Pro
            20                  25                  30


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


Val Thr Ser Ile Ser Met Val Phe Leu Asn Lys Tyr Leu Leu Asp Ser
```

```
    50                  55                  60

Pro Ser Leu Gln Leu Asp Thr Pro Ile Phe Val Thr Phe Tyr Gln Cys
65                  70                  75                  80

Leu Val Thr Ser Leu Leu Cys Lys Gly Leu Ser Thr Leu Ala Thr Cys
                85                  90                  95

Cys Pro Gly Met Val Asp Phe Pro Thr Leu Asn Leu Asp Leu Lys Val
            100                 105                 110

Ala Arg Ser Val Leu Pro Leu Ser Val Val Phe Ile Gly Met Ile Thr
        115                 120                 125

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

Gly Arg Ser Leu Thr Thr Val Phe Asn Val Leu Leu Ser Tyr Leu Leu
145                 150                 155                 160

Leu Lys Gln Thr Thr Ser Phe Tyr Ala Leu Leu Thr Cys Ala Ile Ile
                165                 170                 175

Ile Gly Gly Phe Trp Leu Gly Ile Asp Gln Glu Gly Ala Glu Gly Thr
            180                 185                 190

Leu Ser Leu Thr Gly Thr Ile Phe Gly Val Leu Ala Ser Leu Cys Val
        195                 200                 205

Ser Leu Asn Ala Ile Tyr Thr Lys Lys Val Leu Pro Ala Val Asp His
    210                 215                 220

Ser Ile Trp Arg Leu Thr Phe Tyr Asn Asn Val Asn Ala Cys Val Leu
225                 230                 235                 240

Phe Leu Pro Leu Met Val Val Leu Gly Glu Leu His Ala Leu Leu Ala
```

245 250 255

Phe Ala His Leu Asn Ser Ala His Phe Trp Val Met Met Thr Leu Gly
260 265 270

Gly Leu Phe Gly Phe Ala Ile Gly Tyr Val Thr Gly Leu Gln Ile Lys
275 280 285

Phe Thr Ser Pro Leu Thr His Asn Val Ser Gly Thr Ala Lys Ala Cys
290 295 300

Ala Gln Thr Val Leu Ala Val Leu Tyr Tyr Glu Glu Ile Lys Ser Phe
305 310 315 320

Leu Trp Trp Thr Ser Asn Leu Met Val Leu Gly Gly Ser Ser Ala Tyr
325 330 335

Thr Trp Val Arg Gly Trp Glu Met Gln Lys Thr Gln Glu Asp Pro Ser
340 345 350

Ser Lys Glu Gly Glu Lys Ser Ala Ile Gly Val
355 360

<210> 195
<211> 365
<212> PRT
<213> Cricetulus griseus

<400> 195

Met Asn Arg Ala Pro Leu Lys Arg Ser Arg Ile Leu Arg Met Ala Leu
1 5 10 15

Thr Gly Gly Ser Thr Ala Ser Glu Glu Ala Asp Glu Asp Ser Arg Asn
20 25 30

Lys Pro Phe Leu Leu Arg Ala Leu Gln Ile Ala Leu Val Val Ser Leu
35 40 45

```
Tyr Trp Val Thr Ser Ile Ser Met Val Phe Leu Asn Lys Tyr Leu Leu
    50                  55                  60

Asp Ser Pro Ser Leu Gln Leu Asp Thr Pro Ile Phe Val Thr Phe Tyr
65                  70                  75                  80

Gln Cys Leu Val Thr Ser Leu Leu Cys Lys Gly Leu Ser Thr Leu Ala
                85                  90                  95

Thr Cys Cys Pro Gly Thr Val Asp Phe Pro Thr Leu Asn Leu Asp Leu
            100                 105                 110

Lys Val Ala Arg Ser Val Leu Pro Leu Ser Val Val Phe Ile Gly Met
        115                 120                 125

Ile Ser Phe Asn Asn Leu Cys Leu Lys Tyr Val Gly Val Ala Phe Tyr
    130                 135                 140

Asn Val Gly Arg Ser Leu Thr Thr Val Phe Asn Val Leu Leu Ser Tyr
145                 150                 155                 160

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

Ile Ile Ile Gly Gly Phe Trp Leu Gly Ile Asp Gln Glu Gly Ala Glu
            180                 185                 190

Gly Thr Leu Ser Leu Ile Gly Thr Ile Phe Gly Val Leu Ala Ser Leu
        195                 200                 205

Cys Val Ser Leu Asn Ala Ile Tyr Thr Lys Lys Val Leu Pro Ala Val
    210                 215                 220

Asp Asn Ser Ile Trp Arg Leu Thr Phe Tyr Asn Asn Val Asn Ala Cys
225                 230                 235                 240
```

```
Val Leu Phe Leu Pro Leu Met Val Leu Leu Gly Glu Leu Arg Ala Leu
                245                 250                 255


Leu Asp Phe Ala His Leu Tyr Ser Ala His Phe Trp Leu Met Met Thr
            260                 265                 270


Leu Gly Gly Leu Phe Gly Phe Ala Ile Gly Tyr Val Thr Gly Leu Gln
        275                 280                 285


Ile Lys Phe Thr Ser Pro Leu Thr His Asn Val Ser Gly Thr Ala Lys
    290                 295                 300


Ala Cys Ala Gln Thr Val Leu Ala Val Leu Tyr Tyr Glu Glu Thr Lys
305                 310                 315                 320


Ser Phe Leu Trp Trp Thr Ser Asn Leu Met Val Leu Gly Gly Ser Ser
                325                 330                 335


Ala Tyr Thr Trp Val Arg Gly Trp Glu Met Gln Lys Thr Gln Glu Asp
            340                 345                 350


Pro Ser Ser Lys Glu Gly Glu Lys Ser Ala Ile Arg Val
        355                 360                 365


<210>  196
<211>  363
<212>  PRT
<213>  Mus musculus

<400>  196

Met Asn Arg Ala Pro Leu Lys Arg Ser Arg Ile Leu Arg Met Ala Leu
1               5                   10                  15


Thr Gly Val Ser Ala Val Ser Glu Glu Ser Glu Ser Gly Asn Lys Pro
            20                  25                  30
```

```
Phe Leu Leu Arg Ala Leu Gln Ile Ala Leu Val Val Ser Leu Tyr Trp
        35                  40                  45

Val Thr Ser Ile Ser Met Val Phe Leu Asn Lys Tyr Leu Leu Asp Ser
    50                  55                  60

Pro Ser Leu Gln Leu Asp Thr Pro Ile Phe Val Thr Phe Tyr Gln Cys
65                  70                  75                  80

Leu Val Thr Ser Leu Leu Cys Lys Gly Leu Ser Thr Leu Ala Thr Cys
                85                  90                  95

Cys Pro Gly Met Val Asp Phe Pro Thr Leu Asn Leu Asp Val Lys Val
            100                 105                 110

Ala Arg Ser Val Leu Pro Leu Ser Val Val Phe Ile Gly Met Ile Thr
        115                 120                 125

Phe Asn Asn Leu Cys Leu Lys Tyr Val Gly Val Pro Phe Tyr Asn Val
    130                 135                 140

Gly Arg Ser Leu Thr Thr Val Phe Asn Val Leu Leu Ser Tyr Leu Leu
145                 150                 155                 160

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

Ile Gly Gly Phe Trp Leu Gly Ile Asp Gln Glu Gly Ala Glu Gly Thr
            180                 185                 190

Leu Ser Leu Thr Gly Thr Ile Phe Gly Val Leu Ala Ser Leu Cys Val
        195                 200                 205

Ser Leu Asn Ala Ile Tyr Thr Lys Lys Val Leu Pro Ala Val Asp His
    210                 215                 220
```

```
Ser Ile Trp Arg Leu Thr Phe Tyr Asn Asn Val Asn Ala Cys Val Leu
225                 230                 235                 240


Phe Leu Pro Leu Met Ile Val Leu Gly Glu Leu Arg Ala Leu Leu Ala
                245                 250                 255


Phe Thr His Leu Ser Ser Ala His Phe Trp Leu Met Met Thr Leu Gly
            260                 265                 270


Gly Leu Phe Gly Phe Ala Ile Gly Tyr Val Thr Gly Leu Gln Ile Lys
        275                 280                 285


Phe Thr Ser Pro Leu Thr His Asn Val Ser Gly Thr Ala Lys Ala Cys
    290                 295                 300


Ala Gln Thr Val Leu Ala Val Leu Tyr Tyr Glu Glu Ile Lys Ser Phe
305                 310                 315                 320


Leu Trp Trp Thr Ser Asn Leu Met Val Leu Gly Gly Ser Ser Ala Tyr
                325                 330                 335


Thr Trp Val Arg Gly Trp Glu Met Gln Lys Thr Gln Glu Asp Pro Ser
            340                 345                 350


Ser Lys Asp Gly Glu Lys Ser Ala Ile Arg Val
        355                 360


<210>  197
<211>  350
<212>  PRT
<213>  Mus musculus

<400>  197

Met Ala Leu Thr Gly Val Ser Ala Val Ser Glu Glu Ser Glu Ser Gly
1               5                   10                  15
```

```
Asn Lys Pro Phe Leu Leu Arg Ala Leu Gln Ile Ala Leu Val Val Ser
            20                  25                  30

Leu Tyr Trp Val Thr Ser Ile Ser Met Val Phe Leu Asn Lys Tyr Leu
        35                  40                  45

Leu Asp Ser Pro Ser Leu Gln Leu Asp Thr Pro Ile Phe Val Thr Phe
    50                  55                  60

Tyr Gln Cys Leu Val Thr Ser Leu Leu Cys Lys Gly Leu Ser Thr Leu
65                  70                  75                  80

Ala Thr Cys Cys Pro Gly Met Val Asp Phe Pro Thr Leu Asn Leu Asp
                85                  90                  95

Leu Lys Val Ala Arg Ser Val Leu Pro Leu Ser Val Val Phe Ile Gly
            100                 105                 110

Met Ile Thr Phe Asn Asn Leu Cys Leu Lys Tyr Val Gly Val Pro Phe
        115                 120                 125

Tyr Asn Val Gly Arg Ser Leu Thr Thr Val Phe Asn Val Leu Leu Ser
    130                 135                 140

Tyr Leu Leu Leu Lys Gln Thr Thr Ser Phe Tyr Ala Leu Leu Thr Cys
145                 150                 155                 160

Gly Val Ile Ile Gly Gly Phe Trp Leu Gly Ile Asp Gln Glu Gly Ala
                165                 170                 175

Glu Gly Thr Leu Ser Leu Thr Gly Thr Ile Phe Gly Val Leu Ala Ser
            180                 185                 190

Leu Cys Val Ser Leu Asn Ala Ile Tyr Thr Lys Lys Val Leu Pro Ala
        195                 200                 205
```

```
Val Asp His Ser Ile Trp Arg Leu Thr Phe Tyr Asn Asn Val Asn Ala
    210                 215                 220

Cys Val Leu Phe Leu Pro Leu Met Ile Val Leu Gly Glu Leu Arg Ala
225                 230                 235                 240

Leu Leu Ala Phe Thr His Leu Ser Ser Ala His Phe Trp Leu Met Met
                245                 250                 255

Thr Leu Gly Gly Leu Phe Gly Phe Ala Ile Gly Tyr Val Thr Gly Leu
            260                 265                 270

Gln Ile Lys Phe Thr Ser Pro Leu Thr His Asn Val Ser Gly Thr Ala
        275                 280                 285

Lys Ala Cys Ala Gln Thr Val Leu Ala Val Leu Tyr Tyr Glu Glu Ile
    290                 295                 300

Lys Ser Phe Leu Trp Trp Thr Ser Asn Leu Met Val Leu Gly Gly Ser
305                 310                 315                 320

Ser Ala Tyr Thr Trp Val Arg Gly Trp Glu Met Gln Lys Thr Gln Glu
                325                 330                 335

Asp Pro Ser Ser Lys Asp Gly Glu Lys Ser Ala Ile Arg Val
            340                 345                 350
```

<210> 198
<211> 365
<212> PRT
<213> Gallus gallus

<400> 198

```
Met Ser Arg Ser Gln Leu Thr Arg Thr Gly Ile Leu Arg Met Ala Leu
1               5                   10                  15

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

```
            20                  25                  30

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

Leu Tyr Trp Phe Val Ser Ile Thr Met Val Phe Leu Asn Lys Tyr Leu
    50                  55                  60

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

Phe Gln Cys Ala Val Thr Ala Ala Leu Cys Leu Gly Leu Ser Leu Gly
                85                  90                  95

Ala Ala Cys Gly Pro Cys Ala Ala Leu Pro Ala Leu Arg Leu Asp Leu
            100                 105                 110

Lys Val Ser Arg Ser Val Leu Pro Leu Ser Val Val Phe Ile Gly Met
        115                 120                 125

Val Thr Ser Asn Asn Leu Cys Leu Lys His Val Gly Val Ala Phe Tyr
    130                 135                 140

Asn Val Gly Arg Ser Leu Thr Thr Val Phe Asn Val Leu Leu Ser Tyr
145                 150                 155                 160

Leu Leu Leu Lys Gln Thr Thr Ser Leu Tyr Ala Leu Leu Ala Cys Gly
                165                 170                 175

Ile Ile Ile Gly Gly Phe Trp Leu Gly Val Asp Gln Glu Gly Ala Glu
            180                 185                 190

Gly Thr Leu Ser Trp Thr Gly Ile Ile Phe Gly Ile Leu Ala Ser Leu
        195                 200                 205

Cys Val Ser Leu Asn Ala Ile Tyr Thr Lys Lys Val Leu Pro Val Val
```

210 215 220

Asp Gly Ser Ile Trp His Leu Thr Phe Tyr Asn Asn Met Asn Ala Cys
225 230 235 240

Val Leu Phe Leu Pro Leu Met Met Ile Thr Gly Glu Phe His Thr Leu
245 250 255

Tyr His Phe Asp Lys Leu Gly Ser Pro Ser Phe Trp Gly Met Met Thr
260 265 270

Leu Gly Gly Val Phe Gly Phe Ala Ile Gly Tyr Val Thr Gly Leu Gln
275 280 285

Ile Lys Phe Thr Ser Pro Leu Thr His Asn Val Ser Gly Thr Ala Lys
290 295 300

Ala Cys Ala Gln Thr Val Leu Ala Val Val Tyr Phe Glu Glu Thr Lys
305 310 315 320

Ser Leu Leu Trp Trp Thr Ser Asn Leu Met Val Leu Gly Gly Ser Phe
325 330 335

Ala Tyr Thr Trp Val Lys Gly Leu Glu Met Arg Lys Ala Gln Glu Asp
340 345 350

Pro Asn Leu Lys Ser Ser Glu Lys Asn Glu Thr Gly Val
355 360 365

<210> 199
<211> 362
<212> PRT
<213> Xenopus tropicalis

<400> 199

Met Asn Phe Lys Arg Ser Ser Ile Leu Arg Met Ala Leu Met Gly Ala
1 5 10 15

```
Gly Glu Gly Asp Gln Glu Lys Val Ser Arg Glu Ser Phe Leu Val Arg
            20                  25                  30

Ala Val Lys Ile Ala Leu Val Val Thr Leu Tyr Trp Phe Ile Ser Ile
        35                  40                  45

Thr Met Val Phe Leu Asn Lys Tyr Leu Leu Asp Ser Pro Ser Leu Lys
    50                  55                  60

Leu Asp Ala Pro Leu Phe Val Thr Phe Tyr Gln Cys Val Val Thr Val
65                  70                  75                  80

Val Leu Cys Lys Gly Leu Ser Leu Leu Thr His Val Val Pro Ser His
                85                  90                  95

Ile Leu Glu Phe Pro Ser Leu Arg Phe Asp Leu Lys Val Leu Arg Thr
            100                 105                 110

Val Leu Pro Leu Ser Ile Val Phe Ile Gly Met Ile Thr Phe Asn Asn
        115                 120                 125

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

Leu Ser Thr Val Phe Asn Val Leu Leu Ser Tyr Ile Met Leu Lys Gln
145                 150                 155                 160

Thr Thr Ser Met Tyr Ala Leu Met Ser Cys Gly Val Ile Leu Gly Gly
                165                 170                 175

Phe Trp Leu Gly Ile Asp Gln Glu Gly Ala Glu Gly Thr Leu Ser Trp
            180                 185                 190

Ala Gly Ile Phe Phe Gly Val Leu Ala Ser Leu Cys Val Ser Leu Asn
        195                 200                 205
```

```
Ala Ile Tyr Thr Lys Lys Val Leu Pro Ala Val Asp Gly Ser Ile Trp
    210                 215                 220

Arg Leu Thr Phe Tyr Asn Asn Val Asn Ala Cys Phe Leu Phe Thr Pro
225                 230                 235                 240

Leu Leu Phe Ile Phe Gly Glu Val Gly Thr Leu Phe Thr Phe Asp Lys
                245                 250                 255

Leu Phe Ala Phe Ser Phe Trp Gly Met Met Thr Leu Gly Gly Ile Phe
            260                 265                 270

Gly Phe Ala Ile Gly Tyr Val Thr Gly Leu Gln Ile Gln Phe Thr Ser
        275                 280                 285

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

Val Leu Ala Val Met Tyr Tyr His Gln Ile Lys Ser Phe Leu Trp Trp
305                 310                 315                 320

Thr Ser Asn Leu Met Val Leu Gly Gly Ser Phe Ser Tyr Thr Trp Val
                325                 330                 335

Lys Gly Leu Glu Met Lys Lys Ser Gln Gly Glu Thr Asn Gln Ser Gln
            340                 345                 350

Ser Asn Gly Glu Lys Asn Ser Val Gly Val
        355                 360
```

<210> 200
<211> 348
<212> PRT
<213> Danio rerio

<400> 200

```
Met Ala Phe Thr Asp Ser Thr Arg Pro Gly Asp Lys Glu Glu Pro Phe
1               5                  10                  15

Phe Met Arg Ala Thr Lys Ile Ala Leu Val Val Thr Leu Tyr Trp Phe
            20                  25                  30

Ile Ser Ile Ser Met Val Phe Leu Asn Asn Tyr Leu Leu Asp Ser Lys
        35                  40                  45

Glu Leu Asp Ala Pro Val Phe Ile Thr Phe Phe Gln Cys Val Val Ser
    50                  55                  60

Val Gly Leu Cys Leu Leu Met Ser Phe Leu Ser Ser Leu Cys Pro Gly
65                  70                  75                  80

Ser Val Asp Phe Pro Ser Leu Lys Phe Asp Leu Arg Val Ser Arg Glu
                85                  90                  95

Ile Leu Pro Leu Thr Ile Val Phe Ile Ser Met Ile Thr Phe Asn Asn
            100                 105                 110

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

Leu Ser Thr Val Phe Asn Val Ile Leu Ser Tyr Val Val Leu Lys Gln
    130                 135                 140

Thr Thr Ser Leu Tyr Ala Val Leu Cys Cys Gly Val Ile Leu Gly Gly
145                 150                 155                 160

Phe Trp Leu Gly Val Asp Gln Glu Ala Val Ala Gly Ser Leu Ser Trp
                165                 170                 175

Ala Gly Val Val Phe Gly Val Ile Ala Ser Leu Cys Val Ser Leu Asn
            180                 185                 190
```

```
Ala Ile Phe Thr Lys Lys Val Leu Pro Val Val Asp Gly Asn Ile Trp
        195                 200                 205

Lys Leu Ser Tyr Tyr Asn Asn Leu Asn Ala Ile Val Leu Phe Leu Pro
    210                 215                 220

Leu Leu Ile Ile Leu Gly Glu Val Lys Ser Val Phe Glu Phe Ser Arg
225                 230                 235                 240

Leu Thr Asp Leu His Phe Trp Gly Met Met Thr Leu Gly Gly Val Phe
                245                 250                 255

Gly Phe Ala Ile Gly Tyr Val Thr Gly Leu Gln Ile Lys Phe Thr Ser
            260                 265                 270

Pro Leu Thr His Asn Val Ser Gly Thr Ala Lys Ser Cys Ala Gln Thr
        275                 280                 285

Val Leu Ala Val Val Tyr Trp Ala Ser Glu Lys Ser Thr Leu Trp Trp
    290                 295                 300

Thr Ser Asn Leu Met Val Leu Gly Gly Ser Phe Ala Tyr Thr Trp Val
305                 310                 315                 320

Lys Gly Met Glu Met Lys Lys Ala Pro Val Pro Thr Glu Thr Gln Ser
                325                 330                 335

Leu Asn Pro Gln Lys Asn Lys Glu Asp Leu Gly Val
            340                 345
```

<210> 201
<211> 364
<212> PRT
<213> Bos taurus

<400> 201

```
Met Asn Arg Ala Ser Leu Lys Arg Ser Lys Ile Leu His Met Ala Leu
1               5                  10                  15

Met Gly Thr Ser Asp Pro Ser Gly Glu Ala Glu Ala Ser Gln Glu Lys
            20                  25                  30

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

Trp Val Thr Ser Ile Ser Met Val Phe Leu Asn Lys Tyr Leu Leu Asp
    50                  55                  60

Ser Pro Ser Leu Arg Leu Asp Thr Pro Ile Phe Val Thr Phe Tyr Gln
65                  70                  75                  80

Cys Leu Val Thr Val Leu Leu Cys Lys Gly Leu Ser Ser Leu Ala Thr
                85                  90                  95

Cys Cys Pro Gly Thr Val Asp Phe Pro Ala Leu His Leu Asp Leu Lys
            100                 105                 110

Val Ala Arg Ser Val Leu Pro Leu Ser Val Val Phe Ile Gly Met Ile
        115                 120                 125

Thr Phe Asn Asn Leu Cys Leu Lys Tyr Val Gly Val Ala Phe Tyr Asn
    130                 135                 140

Val Gly Arg Ser Leu Thr Thr Val Phe Asn Val Leu Leu Ser Tyr Leu
145                 150                 155                 160

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

Ile Ile Gly Gly Phe Trp Leu Gly Val Asp Gln Glu Gly Ala Glu Gly
            180                 185                 190
```

```
Thr Leu Ser Trp Thr Gly Thr Leu Phe Gly Val Leu Ala Ser Leu Cys
        195                 200                 205

Val Ser Leu Asn Ala Ile Tyr Thr Lys Lys Val Leu Pro Ala Val Asp
    210                 215                 220

Gly Ser Ile Trp Arg Leu Thr Phe Tyr Asn Asn Ala Asn Ala Cys Val
225                 230                 235                 240

Leu Phe Leu Pro Leu Leu Leu Ala Leu Gly Glu Leu Arg Ala Leu Leu
                245                 250                 255

Ala Phe Pro Gln Leu Gly Ser Ala His Phe Trp Ala Met Met Thr Leu
            260                 265                 270

Gly Gly Leu Phe Gly Phe Ala Ile Gly Tyr Val Thr Gly Leu Gln Ile
        275                 280                 285

Lys Phe Thr Ser Pro Leu Thr His Asn Val Ser Gly Thr Ala Lys Ala
    290                 295                 300

Cys Ala Gln Thr Val Leu Ala Val Leu Tyr Tyr Glu Glu Ala Lys Ser
305                 310                 315                 320

Phe Leu Trp Trp Thr Ser Asn Met Met Val Leu Gly Gly Ser Ser Ala
                325                 330                 335

Tyr Thr Trp Val Arg Gly Arg Glu Met Lys Lys Thr Gln Glu Glu Pro
            340                 345                 350

His Pro Arg Glu Asn Glu Lys Ser Asn Met Glu Val
        355                 360
```

<210> 202
<211> 364
<212> PRT
<213> Canis lupus

<400> 202

```
Met Asn Arg Ala Pro Leu Lys Arg Ser Arg Ile Leu His Met Ala Leu
1               5                  10                  15


Met Gly Ala Ser Asp Pro Leu Gly Glu Ala Glu Ala Ile Lys Glu Lys
            20                  25                  30


Pro Phe Leu Leu Arg Ala Leu Gln Ile Thr Leu Val Val Ser Leu Tyr
        35                  40                  45


Trp Val Thr Ser Ile Ser Met Val Phe Leu Asn Lys Tyr Leu Leu Asp
    50                  55                  60


Ser Pro Ser Leu Gln Leu Asp Thr Pro Ile Phe Val Thr Phe Tyr Gln
65                  70                  75                  80


Cys Leu Val Thr Thr Leu Leu Cys Lys Ser Leu Ser Thr Leu Ala Ala
                85                  90                  95


Phe Cys Pro Gly Ala Met Asp Phe Pro Thr Leu Arg Leu Asp Leu Arg
            100                 105                 110


Val Ala Arg Ser Val Leu Pro Leu Ser Val Val Phe Ile Gly Met Ile
        115                 120                 125


Thr Phe Asn Asn Leu Cys Leu Lys Tyr Val Gly Val Ala Phe Tyr Asn
    130                 135                 140


Val Gly Arg Ser Leu Thr Thr Val Phe Asn Val Leu Leu Ser Tyr Leu
145                 150                 155                 160


Leu Leu Lys Gln Thr Thr Ser Phe Tyr Ala Leu Leu Thr Cys Gly Ile
                165                 170                 175


Ile Ile Gly Gly Phe Trp Leu Gly Val Asp Gln Glu Gly Ala Glu Gly
```

```
            180                 185                 190

Thr Leu Ser Trp Thr Gly Thr Leu Phe Gly Val Leu Ala Ser Leu Cys
        195                 200                 205

Val Ser Leu Asn Ala Ile Tyr Thr Lys Lys Val Leu Pro Ala Val Asp
    210                 215                 220

Gly Ser Ile Trp Arg Leu Thr Phe Tyr Asn Asn Val Asn Ala Cys Val
225                 230                 235                 240

Leu Phe Leu Pro Leu Leu Leu Leu Leu Gly Glu Leu Gln Thr Leu Leu
                245                 250                 255

Asn Phe Ser Gln Leu Gly Ser Ala His Phe Trp Gly Met Met Thr Leu
            260                 265                 270

Gly Gly Leu Phe Gly Phe Ala Ile Gly Tyr Val Thr Gly Leu Gln Ile
        275                 280                 285

Lys Phe Thr Ser Pro Leu Thr His Asn Val Ser Gly Thr Ala Lys Ala
    290                 295                 300

Cys Ala Gln Thr Val Leu Ala Val Leu Tyr Tyr Glu Glu Thr Lys Ser
305                 310                 315                 320

Phe Leu Trp Trp Thr Ser Asn Met Met Val Leu Gly Gly Ser Ser Ala
                325                 330                 335

Tyr Thr Trp Val Arg Gly Trp Glu Met Lys Lys Ile Gln Glu Asp Pro
            340                 345                 350

Ser Pro Lys Glu Asp Glu Lys Ser Ser Met Gly Val
        355                 360
```

<210> 203

<211> 364
<212> PRT
<213> Homo sapiens

<400> 203

```
Met Asn Arg Ala Pro Leu Lys Arg Ser Arg Ile Leu His Met Ala Leu
1               5                  10                  15

Thr Gly Ala Ser Asp Pro Ser Ala Glu Ala Glu Ala Asn Gly Glu Lys
            20                  25                  30

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

Trp Val Thr Ser Ile Ser Met Val Phe Leu Asn Lys Tyr Leu Leu Asp
    50                  55                  60

Ser Pro Ser Leu Arg Leu Asp Thr Pro Ile Phe Val Thr Phe Tyr Gln
65                  70                  75                  80

Cys Leu Val Thr Thr Leu Leu Cys Lys Gly Leu Ser Ala Leu Ala Ala
                85                  90                  95

Cys Cys Pro Gly Ala Val Asp Phe Pro Ser Leu Arg Leu Asp Leu Arg
            100                 105                 110

Val Ala Arg Ser Val Leu Pro Leu Ser Val Val Phe Ile Gly Met Ile
        115                 120                 125

Thr Phe Asn Asn Leu Cys Leu Lys Tyr Val Gly Val Ala Phe Tyr Asn
    130                 135                 140

Val Gly Arg Ser Leu Thr Thr Val Phe Asn Val Leu Leu Ser Tyr Leu
145                 150                 155                 160

Leu Leu Lys Gln Thr Thr Ser Phe Tyr Ala Leu Leu Thr Cys Gly Ile
                165                 170                 175
```

```
Ile Ile Gly Gly Phe Trp Leu Gly Val Asp Gln Glu Gly Ala Glu Gly
            180                 185                 190

Thr Leu Ser Trp Leu Gly Thr Val Phe Gly Val Leu Ala Ser Leu Cys
        195                 200                 205

Val Ser Leu Asn Ala Ile Tyr Thr Thr Lys Val Leu Pro Ala Val Asp
    210                 215                 220

Gly Ser Ile Trp Arg Leu Thr Phe Tyr Asn Asn Val Asn Ala Cys Ile
225                 230                 235                 240

Leu Phe Leu Pro Leu Leu Leu Leu Leu Gly Glu Leu Gln Ala Leu Arg
                245                 250                 255

Asp Phe Ala Gln Leu Gly Ser Ala His Phe Trp Gly Met Met Thr Leu
            260                 265                 270

Gly Gly Leu Phe Gly Phe Ala Ile Gly Tyr Val Thr Gly Leu Gln Ile
        275                 280                 285

Lys Phe Thr Ser Pro Leu Thr His Asn Val Ser Gly Thr Ala Lys Ala
    290                 295                 300

Cys Ala Gln Thr Val Leu Ala Val Leu Tyr Tyr Glu Glu Thr Lys Ser
305                 310                 315                 320

Phe Leu Trp Trp Thr Ser Asn Met Met Val Leu Gly Gly Ser Ser Ala
                325                 330                 335

Tyr Thr Trp Val Arg Gly Trp Glu Met Lys Lys Thr Pro Glu Glu Pro
            340                 345                 350

Ser Pro Lys Asp Ser Glu Lys Ser Ala Met Gly Val
        355                 360
```

<210> 204
<211> 351
<212> PRT
<213> Homo sapiens

<400> 204

```
Met Ala Leu Thr Gly Ala Ser Asp Pro Ser Ala Glu Ala Glu Ala Asn
1               5                   10                  15


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


Ser Leu Tyr Trp Val Thr Ser Ile Ser Met Val Phe Leu Asn Lys Tyr
        35                  40                  45


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


Phe Tyr Gln Cys Leu Val Thr Thr Leu Leu Cys Lys Gly Leu Ser Ala
65                  70                  75                  80


Leu Ala Ala Cys Cys Pro Gly Ala Val Asp Phe Pro Ser Leu Arg Leu
                85                  90                  95


Asp Leu Arg Val Ala Arg Ser Val Leu Pro Leu Ser Val Val Phe Ile
            100                 105                 110


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


Phe Tyr Asn Val Gly Arg Ser Leu Thr Thr Val Phe Asn Val Leu Leu
    130                 135                 140


Ser Tyr Leu Leu Leu Lys Gln Thr Thr Ser Phe Tyr Ala Leu Leu Thr
145                 150                 155                 160
```

```
Cys Gly Ile Ile Ile Gly Gly Phe Trp Leu Gly Val Asp Gln Glu Gly
                165                 170                 175

Ala Glu Gly Thr Leu Ser Trp Leu Gly Thr Val Phe Gly Val Leu Ala
            180                 185                 190

Ser Leu Cys Val Ser Leu Asn Ala Ile Tyr Thr Thr Lys Val Leu Pro
        195                 200                 205

Ala Val Asp Gly Ser Ile Trp Arg Leu Thr Phe Tyr Asn Asn Val Asn
    210                 215                 220

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

Ala Leu Arg Asp Phe Ala Gln Leu Gly Ser Ala His Phe Trp Gly Met
                245                 250                 255

Met Thr Leu Gly Gly Leu Phe Gly Phe Ala Ile Gly Tyr Val Thr Gly
            260                 265                 270

Leu Gln Ile Lys Phe Thr Ser Pro Leu Thr His Asn Val Ser Gly Thr
        275                 280                 285

Ala Lys Ala Cys Ala Gln Thr Val Leu Ala Val Leu Tyr Tyr Glu Glu
    290                 295                 300

Thr Lys Ser Phe Leu Trp Trp Thr Ser Asn Met Met Val Leu Gly Gly
305                 310                 315                 320

Ser Ser Ala Tyr Thr Trp Val Arg Gly Trp Glu Met Lys Lys Thr Pro
                325                 330                 335

Glu Glu Pro Ser Pro Lys Asp Ser Glu Lys Ser Ala Met Gly Val
            340                 345                 350
```

<210> 205
<211> 363
<212> PRT
<213> Caenorhabditis elegans

<400> 205

```
Met Lys Leu His Glu Glu Asn Asn Lys Ala Leu Phe Glu Ala Met Arg
1               5                  10                  15


Asn Arg Glu Asn Pro Thr Lys Trp Glu Ser Tyr Lys Gln Val Ile Thr
            20                  25                  30


Ala Val Ser Ala Tyr Trp Val Phe Ser Ile Gly Leu Val Phe Leu Asn
        35                  40                  45


Lys Tyr Leu Leu Ser Ser Val Gln Leu Asp Ala Pro Leu Phe Ile Thr
    50                  55                  60


Trp Tyr Gln Cys Leu Val Thr Val Phe Leu Cys Leu Phe Leu Ser Lys
65                  70                  75                  80


Thr Ser Lys Ala Tyr Gly Leu Phe Lys Phe Pro Ser Met Pro Ile Asp
                85                  90                  95


Ala Lys Ile Ser Arg Glu Val Leu Pro Leu Ser Val Val Phe Val Ala
            100                 105                 110


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


Tyr Tyr Val Gly Arg Ser Leu Thr Thr Val Phe Asn Val Val Cys Thr
    130                 135                 140


Tyr Leu Ile Leu Gly Gln Lys Thr Ser Gly Gln Ala Ile Gly Cys Cys
145                 150                 155                 160
```

```
Ala Leu Ile Ile Phe Gly Phe Leu Leu Gly Val Asp Gln Glu Gly Val
                165                 170                 175

Thr Gly Thr Leu Ser Tyr Thr Gly Val Ile Phe Gly Val Leu Ala Ser
            180                 185                 190

Leu Ser Val Ala Leu Asn Ala Ile Tyr Thr Arg Lys Val Leu Ser Ser
        195                 200                 205

Val Gly Asp Cys Leu Trp Arg Leu Thr Met Tyr Asn Asn Leu Asn Ala
    210                 215                 220

Leu Val Leu Phe Leu Pro Leu Met Leu Phe Asn Gly Glu Phe Gly Ala
225                 230                 235                 240

Val Phe Tyr Phe Asp Lys Leu Phe Asp Thr Thr Phe Trp Ile Leu Met
                245                 250                 255

Thr Leu Gly Gly Val Phe Gly Phe Met Met Gly Tyr Val Thr Gly Trp
            260                 265                 270

Gln Ile Gln Ala Thr Ser Pro Leu Thr His Asn Ile Ser Gly Thr Ala
        275                 280                 285

Lys Ala Ala Ala Gln Thr Val Met Ala Val Val Trp Tyr Ser Glu Leu
    290                 295                 300

Lys Thr Leu Leu Trp Trp Thr Ser Asn Phe Val Val Leu Phe Gly Ser
305                 310                 315                 320

Gly Met Tyr Thr Tyr Val Gln Lys Arg Val Met Asp Lys Lys Asn Ser
                325                 330                 335

Gly Ala Ser Pro Ala Ser Glu Ala Lys Ser Asp Lys Val Lys Leu Leu
            340                 345                 350
```

Gly Arg Asp Gly Asn Ala Ala Glu Glu Ser Val
        355   360

<210> 206
<211> 406
<212> PRT
<213> Trichoderma reesei

<400> 206

Met Ala Ser Thr Asn Ala Arg Tyr Val Arg Tyr Leu Leu Ile Ala Phe
1   5   10   15

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

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

Thr Pro Lys Pro Pro Ala Thr Gly Asp Ala Lys Asp Phe Pro Leu Ala
    50   55   60

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

Gly Pro Arg Met Asn Ala Thr Phe Val Thr Leu Ala Arg Asn Ser Asp
                85   90   95

Val Trp Asp Ile Ala Arg Ser Ile Arg Gln Val Glu Asp Arg Phe Asn
            100   105   110

Arg Arg Tyr Asn Tyr Asp Trp Val Phe Leu Asn Asp Lys Pro Phe Asp
        115   120   125

Asn Thr Phe Lys Lys Val Thr Thr Ser Leu Val Ser Gly Lys Thr His
    130   135   140

Tyr Gly Glu Ile Ala Pro Glu His Trp Ser Phe Pro Asp Trp Ile Asp

```
145                 150                 155                 160

Gln Asp Lys Ala Lys Lys Val Arg Glu Asp Met Ala Glu Arg Lys Ile
                165                 170                 175

Ile Tyr Gly Asp Ser Val Ser Tyr Arg His Met Cys Arg Phe Glu Ser
            180                 185                 190

Gly Phe Phe Phe Arg Gln Pro Leu Met Met Asn Tyr Glu Tyr Tyr Trp
        195                 200                 205

Arg Val Glu Pro Ser Ile Glu Leu Tyr Cys Asp Ile His Tyr Asp Pro
    210                 215                 220

Phe Arg Leu Met Val Glu Gln Gly Lys Lys Tyr Ser Phe Val Ile Ser
225                 230                 235                 240

Leu Tyr Glu Tyr Pro Ala Thr Ile Ala Thr Leu Trp Glu Ser Thr Lys
                245                 250                 255

Lys Phe Met Lys Asn His Pro Glu His Ile Ala Pro Asp Asn Ser Met
            260                 265                 270

Arg Phe Leu Ser Asp Asp Gly Gly Glu Thr Tyr Asn Asn Cys His Phe
        275                 280                 285

Trp Ser Asn Phe Glu Ile Gly Ser Leu Glu Trp Leu Arg Ser Lys Gln
    290                 295                 300

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

Glu Arg Trp Gly Asp Ala Pro Val His Ser Ile Ala Ala Gly Leu Met
                325                 330                 335

Leu Asn Arg Ser Glu Ile His Phe Phe Asn Asp Ile Ala Tyr Trp His
```

eolf-seql

340 345 350

Val Pro Phe Thr His Cys Pro Thr Gly Glu Lys Thr Arg Leu Asp Leu
355 360 365

Lys Cys His Cys Asp Pro Lys Glu Asn Phe Asp Trp Lys Gly Tyr Ser
370 375 380

Cys Thr Ser Arg Phe Phe Glu Met Asn Gly Met Asp Lys Pro Glu Gly
385 390 395 400

Trp Glu Asn Gln Gln Asp
405

<210> 207
<211> 1431
<212> DNA
<213> Trichoderma reesei

<400> 207
atggcgtcaa caaatgcgcg ctatgtgcgc tatctactaa tcgccttctt cgtacgtcac 60

cctacagact cgacacctct gtcccctatg cagttgttgc taacatagaa gaatagacaa 120

tcctcgtctt ctactttgtc tccaattcaa agtatgaggg cgtcgatctc aacaagggca 180

ccttcacagc tccggattcg accaagacga caccaaagcc gccagccact ggcgatgcca 240

aagactttcc tctggccctg acgccgaacg atccaggctt caacgacctc gtcggcatcg 300

ctcccggccc tcgaatgaac gccacctttg tcaccctcgc ccgaaacagc gacgtctggg 360

acattgcacg ctcgatccgc caggtcgagg atcgcttcaa ccgacggtac aactacgact 420

gggtgttcct caacgacaag ccgtttgaca acaccttcaa gaaggtcacg acgtccctgg 480

tgtcgggcaa gacgcactat ggcgagattg cgcccgagca ctggtcgttc cccgactgga 540

tcgaccagga caaggccaag aaggtgcgcg aggacatggc tgagcgcaaa atcatctacg 600

gcgactcggt cagctaccgc cacatgtgcc gcttcgagtc gggcttcttc ttccgccagc 660

cgctgatgat gaactacgaa tactactggc gcgtggagcc ctccatcgag ctctactgcg 720

acatccacta cgacccttc cgcctgatgg ttgagcaggg caaaaagtac agcttcgtca 780

tcagcctgta cgagtacccg gccacgattg ccacgctgtg ggagagcacc aagaagttta 840

tgaagaacca tccggagcac attgcccccg acaactcgat gcgcttcctg agcgatgacg 900

gcggcgagac gtacaacaac tgccacttcg taagcttccc tgcccgttga cttttctctc 960

tctctctttt gtctgccttc cacccggcaa catgatggct aacatgagga tagtggtcca 1020

actttgagat tggcagcctg gagtggctgc gcagcaagca gtacattgac tttttcgagt 1080

ccctggacaa ggacggcggc ttcttctacg agcgatgggg cgacgctccc gtccactcca 1140

ttgccgccgg cctgatgctc aacaggagcg agattcactt cttcaacgac attgcctact 1200

ggcatgtgcc ctttacccac tgccccacgg gcgagaagac gagactggat ctgaaatgcc 1260

actgcgaccc caaggagaac tttgattgga agggctactc ttgtaagcgc tctagatacc 1320

tttgtgccaa cagaaatctg tgactaacac gcctctgtca taggcacatc ccgattcttt 1380

gagatgaacg gcatggacaa gcccgaaggc tgggagaacc agcaagacta a 1431

<210> 208
<211> 85
<212> PRT
<213> Trichoderma reesei

<400> 208

Met Ala Ser Thr Asn Ala Arg Tyr Val Arg Tyr Leu Leu Ile Ala Phe
1 5 10 15

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

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

Thr Pro Lys Pro Pro Ala Thr Gly Asp Ala Lys Asp Phe Pro Leu Ala
50 55 60

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

Gly Pro Arg Met Asn
85

<210> 209
<211> 255
<212> DNA
<213> Trichoderma reesei

<400> 209
atggcgtcaa caaatgcgcg ctatgtgcgc tatctactaa tcgccttctt cacaatcctc 60

gtcttctact ttgtctccaa ttcaaagtat gagggcgtcg atctcaacaa gggcaccttc 120

acagctccgg attcgaccaa gacgacacca aagccgccag ccactggcga tgccaaagac 180

tttcctctgg ccctgacgcc gaacgatcca ggcttcaacg acctcgtcgg catcgctccc 240

ggccctcgaa tgaac 255

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

<220>
<223> targeting signal

<400> 210

Met Ala Ser Thr Asn Ala Arg Tyr Val Arg
1 5 10

<210> 211
<211> 17
<212> PRT
<213> Trichoderma reesei

<400> 211

Tyr Leu Leu Ile Ala Phe Phe Thr Ile Leu Val Phe Tyr Phe Val Ser

1 5 10 15

Asn

<210> 212
<211> 379
<212> PRT
<213> Trichoderma reesei

<400> 212

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

Asp Ser Thr Lys Thr Thr Pro Lys Pro Pro Ala Thr Gly Asp Ala Lys
20 25 30

Asp Phe Pro Leu Ala Leu Thr Pro Asn Asp Pro Gly Phe Asn Asp Leu
35 40 45

Val Gly Ile Ala Pro Gly Pro Arg Met Asn Ala Thr Phe Val Thr Leu
50 55 60

Ala Arg Asn Ser Asp Val Trp Asp Ile Ala Arg Ser Ile Arg Gln Val
65 70 75 80

Glu Asp Arg Phe Asn Arg Arg Tyr Asn Tyr Asp Trp Val Phe Leu Asn
85 90 95

Asp Lys Pro Phe Asp Asn Thr Phe Lys Lys Val Thr Thr Ser Leu Val
100 105 110

Ser Gly Lys Thr His Tyr Gly Glu Ile Ala Pro Glu His Trp Ser Phe
115 120 125

Pro Asp Trp Ile Asp Gln Asp Lys Ala Lys Lys Val Arg Glu Asp Met
130 135 140

```
Ala Glu Arg Lys Ile Ile Tyr Gly Asp Ser Val Ser Tyr Arg His Met
145                 150                 155                 160

Cys Arg Phe Glu Ser Gly Phe Phe Phe Arg Gln Pro Leu Met Met Asn
                165                 170                 175

Tyr Glu Tyr Tyr Trp Arg Val Glu Pro Ser Ile Glu Leu Tyr Cys Asp
            180                 185                 190

Ile His Tyr Asp Pro Phe Arg Leu Met Val Glu Gln Gly Lys Lys Tyr
        195                 200                 205

Ser Phe Val Ile Ser Leu Tyr Glu Tyr Pro Ala Thr Ile Ala Thr Leu
    210                 215                 220

Trp Glu Ser Thr Lys Lys Phe Met Lys Asn His Pro Glu His Ile Ala
225                 230                 235                 240

Pro Asp Asn Ser Met Arg Phe Leu Ser Asp Asp Gly Gly Glu Thr Tyr
                245                 250                 255

Asn Asn Cys His Phe Trp Ser Asn Phe Glu Ile Gly Ser Leu Glu Trp
            260                 265                 270

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

Gly Gly Phe Phe Tyr Glu Arg Trp Gly Asp Ala Pro Val His Ser Ile
    290                 295                 300

Ala Ala Gly Leu Met Leu Asn Arg Ser Glu Ile His Phe Phe Asn Asp
305                 310                 315                 320

Ile Ala Tyr Trp His Val Pro Phe Thr His Cys Pro Thr Gly Glu Lys
                325                 330                 335
```

```
Thr Arg Leu Asp Leu Lys Cys His Cys Asp Pro Lys Glu Asn Phe Asp
            340                 345                 350


Trp Lys Gly Tyr Ser Cys Thr Ser Arg Phe Phe Glu Met Asn Gly Met
        355                 360                 365


Asp Lys Pro Glu Gly Trp Glu Asn Gln Gln Asp
    370                 375


<210>  213
<211>  8
<212>  PRT
<213>  Trichoderma reesei

<400>  213

Met Ala Ile Ala Arg Pro Val Arg
1               5


<210>  214
<211>  15
<212>  PRT
<213>  Trichoderma reesei

<400>  214

Ala Leu Gly Gly Leu Ala Ala Ile Leu Trp Cys Phe Phe Leu Tyr
1               5                   10                  15


<210>  215
<211>  371
<212>  PRT
<213>  Trichoderma reesei

<400>  215

Gln Leu Leu Arg Pro Ser Ser Ser Tyr Asn Ser Pro Gly Asp Arg Tyr
1               5                   10                  15


Ile Asn Phe Glu Arg Asp Pro Asn Leu Asp Pro Thr Gly Glu Pro Glu
```

```
            20                  25                  30

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

Thr Asp Arg Ala Ser Ala Thr Leu Leu Ala Leu Val Arg Asn Glu Glu
    50                  55                  60

Val Asp Asp Met Val Ala Ser Met Val Asp Leu Glu Arg Thr Trp Asn
65                  70                  75                  80

Ser Lys Phe Asn Tyr Pro Trp Thr Phe Phe Asn Asp Lys Pro Phe Ser
                85                  90                  95

Glu Glu Phe Lys Lys Lys Thr Ser Ala Val Thr Asn Ala Thr Cys Asn
            100                 105                 110

Tyr Glu Leu Ile Pro Lys Glu His Trp Asp Ala Pro Ser Trp Ile Asp
        115                 120                 125

Pro Ala Ile Phe Glu Glu Ser Ala Ala Val Leu Lys Lys Asn Gly Val
    130                 135                 140

Gln Tyr Ala Asn Met Met Ser Tyr His Gln Met Cys Arg Trp Asn Ser
145                 150                 155                 160

Gly Met Phe Tyr Lys His Pro Ala Leu Lys Asp Val Arg Tyr Tyr Trp
                165                 170                 175

Arg Val Glu Pro Lys Val His Phe Phe Cys Asp Val Asp Tyr Asp Val
            180                 185                 190

Phe Arg Tyr Met Gln Asp Asn Asn Lys Thr Tyr Gly Phe Thr Ile Asn
        195                 200                 205

Leu Tyr Asp Asp Pro His Thr Leu Pro Thr Leu Trp Pro Gln Thr Ala
```

```
    210                 215                 220

Lys Phe Leu Ala Asp His Pro Asn Tyr Leu His Glu His Ser Ala Ile
225                 230                 235                 240

Lys Trp Val Ile Asp Asp Ala Arg Arg Pro Gln His Asn Arg Glu Ala
                245                 250                 255

Gln Gly Phe Ser Thr Cys His Phe Trp Ser Asn Phe Glu Val Ala Asp
            260                 265                 270

Met Glu Phe Trp Arg Ser Lys Val Tyr Glu Asp Tyr Phe Glu His Leu
        275                 280                 285

Asp Arg Ala Gly Gly Phe Phe Tyr Glu Arg Trp Gly Asp Ala Pro Val
    290                 295                 300

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

Phe Arg Asp Ile Gly Tyr Gln His Ile Pro Phe Phe Asn Cys Pro Asn
                325                 330                 335

Ser Pro Lys Cys Lys Gly Cys Val Thr Gly Arg Leu Thr Asp Gly Glu
            340                 345                 350

Pro Phe Leu His Arg Glu Asp Cys Arg Pro Asn Trp Phe Lys Tyr Ala
        355                 360                 365

Gly Met Gly
    370
```

<210> 216
<211> 6
<212> PRT
<213> Trichoderma reesei

<400> 216

Met Leu Asn Pro Arg Arg
1 5

<210> 217
<211> 15
<212> PRT
<213> Trichoderma reesei

<400> 217

Ala Leu Ile Ala Ala Ala Phe Ile Leu Thr Val Phe Phe Leu Ile
1 5 10 15

<210> 218
<211> 352
<212> PRT
<213> Trichoderma reesei

<400> 218

Ser Arg Ser His Asn Ser Glu Ser Ala Ser Thr Ser Glu Pro Lys Asp
1 5 10 15

Ala Glu Ala Glu Ala Leu Ser Ala Ala Asn Ala Gln Gln Arg Ala Ala
20 25 30

Pro Pro Pro Pro Pro Gln Lys Pro Met Ile Asp Met Ser Gly Met Ser
35 40 45

Thr Tyr Asp Lys Leu Ala Tyr Ala Tyr Glu Tyr Asp Ile Glu Ser Lys
50 55 60

Phe Pro Ala Tyr Ile Trp Gln Thr Trp Arg Lys Thr Pro Ser Glu Gly
65 70 75 80

Asp Phe Glu Phe Arg Glu Gln Glu Ala Ser Trp Ser Ile Glu His Pro
85 90 95

```
Gly Phe Ile His Glu Val Ile Thr Asp Ser Val Ala Asp Thr Leu Leu
            100                 105                 110

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

Leu Pro Leu Pro Val Leu Lys Ala Asp Leu Phe Arg Tyr Leu Ile Leu
    130                 135                 140

Tyr Ala Arg Gly Gly Ile Tyr Ser Asp Ile Asp Thr Tyr Ala Ile Arg
145                 150                 155                 160

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

Leu Val Ile Gly Ile Glu Ala Asp Pro Asp Arg Pro Asp Trp Ala Asp
            180                 185                 190

Trp Tyr Ser Arg Arg Ile Gln Phe Cys Gln Trp Thr Ile Gln Ser Lys
        195                 200                 205

Pro Gly His Pro Val Leu Arg Asp Ile Ile Ser Arg Ile Thr Asn Gln
    210                 215                 220

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

Arg Val Val Asp Leu Thr Gly Pro Ala Val Trp Thr Asp Thr Ile Met
                245                 250                 255

Asp Tyr Phe Asn Asp Glu Arg Tyr Phe Asp Met Glu Asn Ser Lys Gly
            260                 265                 270

Arg Ile Asp Tyr Arg Asn Phe Thr Gly Met Glu Thr Ser Lys Arg Val
        275                 280                 285
```

```
Gly Asp Val Val Val Leu Pro Ile Thr Ser Phe Ser Pro Gly Val Gly
    290                 295                 300

Gln Met Gly Ala Lys Asp Tyr Asp Asp Pro Met Ala Phe Val Lys His
305                 310                 315                 320

Asp Phe Glu Gly Thr Trp Lys Pro Glu Ser Glu Arg His Ile Gly Glu
                325                 330                 335

Ile Val Gln Glu Leu Gly Glu Gly Gln Gly Glu Ala Pro Lys Glu Gln
            340                 345                 350
```

<210> 219
<211> 22
<212> PRT
<213> Trichoderma reesei

<400> 219

```
Met Gly Met Gly Gln Cys Gln Trp Ser Pro Phe Arg Asn Lys Val Pro
1               5                   10                  15

Thr Gln Met Arg Arg Cys
            20
```

<210> 220
<211> 15
<212> PRT
<213> Trichoderma reesei

<400> 220

```
Leu Pro Leu Tyr Ile Thr Val Val Cys Val Phe Leu Val Ile Val
1               5                   10                  15
```

<210> 221
<211> 362
<212> PRT
<213> Trichoderma reesei

<400> 221

```
Asn Phe Asp Trp Ile Leu Ala Ile Pro Asn Pro Ala Ser Val Leu Arg
1               5                  10                  15

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

Ile Trp Gln Thr Trp Lys Val Asp Pro Leu Asn Phe Asp Glu Arg Asp
        35                  40                  45

Leu Val Thr Ala Arg Thr Trp Thr Thr Ile Asn Pro Gly Met Arg Tyr
    50                  55                  60

Glu Val Val Thr Asp Ala Asn Glu Met Ala Tyr Ile Glu Asp Arg Tyr
65                  70                  75                  80

Gly Pro Asn Gly Phe Asp Arg Pro Asp Ile Val Glu Phe Tyr Lys Met
                85                  90                  95

Ile Asn Leu Pro Ile Ile Lys Ala Asp Leu Leu Arg Tyr Met Ile Met
            100                 105                 110

Tyr Ala Glu Gly Gly Ile Tyr Ala Asp Ile Asp Val Glu Thr Met Lys
        115                 120                 125

Pro Phe His Arg Phe Ile Pro Asp Arg Tyr Asp Glu Lys Asp Ile Asp
    130                 135                 140

Ile Ile Ile Gly Val Glu Ile Asp Gln Pro Asp Phe Lys Asp His Pro
145                 150                 155                 160

Ile Leu Gly Lys Lys Ser Met Ser Phe Cys Gln Trp Thr Phe Val Ala
                165                 170                 175

Arg Pro Gln Gln Pro Val Met Met Arg Leu Ile Glu Asn Ile Met Lys
            180                 185                 190
```

```
Trp Phe Lys Thr Val Ala Arg Asp Gln Gly Val Pro Leu Gly Glu Val
        195                 200                 205

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

Thr Lys Ala Met Leu Glu Glu Met Asn Arg Lys Thr Lys Gly Pro Lys
225                 230                 235                 240

Val Thr Trp Asp Ala Phe His Asn Leu Asp Glu Ser Lys Leu Val Gly
                245                 250                 255

Gly Val Leu Val Leu Thr Val Glu Ala Phe Cys Ala Gly Gln Gly His
            260                 265                 270

Ser Asp Ser Gly Asn His Asn Ala Arg Asn Ala Leu Val Lys His His
        275                 280                 285

Phe His Ala Ser Asn Trp Pro Ser Arg His Pro Arg Tyr Lys His Pro
    290                 295                 300

Ala Tyr Gly Gln Val Glu Asp Cys Asn Trp Val Pro Glu Cys Val Arg
305                 310                 315                 320

Lys Trp Asp Glu Asp Thr Ser Asn Trp Asp Lys Tyr Ser Glu Asn Glu
                325                 330                 335

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

Arg Gln Gln Gln Ala Leu Ala Ala Leu Pro
        355                 360
```

<210> 222
<211> 17
<212> PRT

<213> Trichoderma reesei

<400> 222

Met Ala Arg Pro Met Gly Ser Val Arg Leu Lys Lys Ala Asn Pro Ser
1 5 10 15

Thr

<210> 223
<211> 16
<212> PRT
<213> Trichoderma reesei

<400> 223

Leu Ile Leu Gly Ala Val Leu Cys Ile Phe Ile Ile Ile Phe Leu Val
1 5 10 15

<210> 224
<211> 339
<212> PRT
<213> Trichoderma reesei

<400> 224

Ser Pro Ser Ser Pro Ala Ser Ala Ser Arg Leu Ser Ile Val Ser Ala
1 5 10 15

Gln His His Leu Ser Pro Pro Thr Ser Pro Tyr Gln Ser Pro Arg Ser
20 25 30

Gly Ala Val Gln Gly Pro Pro Pro Val Thr Arg Tyr Asn Leu Asn Lys
35 40 45

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

Leu Thr Pro Met Ala Arg Phe Tyr Gln Glu Tyr Trp Asp Asn Leu Leu
65 70 75 80

```
Arg Leu Asn Tyr Pro His Glu Leu Ile Thr Leu Gly Phe Ile Leu Pro
                85                  90                  95

Lys Thr Lys Glu Gly Asn Gln Ala Thr Ser Met Leu Gln Lys Gln Ile
            100                 105                 110

Gln Lys Thr Gln Asn Tyr Gly Pro Glu Lys Asp Arg Phe Lys Ser Ile
        115                 120                 125

Ile Ile Leu Arg Gln Asp Phe Asp Pro Ala Val Val Ser Gln Asp Glu
    130                 135                 140

Ser Glu Arg His Lys Leu Ala Asn Gln Lys Ala Arg Arg Glu Val Met
145                 150                 155                 160

Ala Lys Ala Arg Asn Ser Leu Leu Phe Thr Thr Leu Gly Pro Ser Thr
                165                 170                 175

Ser Trp Val Leu Trp Leu Asp Ala Asp Ile Thr Glu Thr Ala Pro Thr
            180                 185                 190

Leu Ile Gln Asp Leu Ala Ser His Asp Lys Pro Ile Ile Val Ala Asn
        195                 200                 205

Cys Phe Gln Lys Tyr Tyr Asp Pro Glu Ser Lys Lys Met Ala Glu Arg
    210                 215                 220

Pro Tyr Asp Phe Asn Ser Trp Gln Asp Ser Glu Thr Ala Leu Lys Met
225                 230                 235                 240

Ala Glu Gln Met Gly Pro Asp Asp Ile Leu Leu Glu Gly Tyr Ala Glu
                245                 250                 255

Met Ala Thr Tyr Arg Thr Leu Leu Ala Tyr Met Ser Thr Pro Gly Gly
            260                 265                 270
```

```
Ser Lys Asp Leu Val Val Pro Leu Asp Gly Val Gly Gly Thr Ala Leu
        275                 280                 285


Leu Val Lys Ala Asp Val His Arg Asp Gly Ala Met Phe Pro Pro Phe
    290                 295                 300


Ala Phe Tyr His Leu Ile Glu Ser Glu Gly Phe Ala Lys Met Ala Lys
305                 310                 315                 320


Arg Leu Gly Trp Gln Pro Tyr Gly Leu Pro Asn Tyr Lys Val Tyr His
                325                 330                 335


Tyr Asn Glu
```

<210> 225
<211> 31
<212> PRT
<213> Trichoderma reesei

<400> 225

```
Met Leu Leu Pro Lys Gly Gly Leu Asp Trp Arg Ser Ala Arg Ala Gln
1               5                   10                  15


Ile Pro Pro Thr Arg Ala Leu Trp Asn Ala Val Thr Arg Thr Arg
            20                  25                  30
```

<210> 226
<211> 15
<212> PRT
<213> Trichoderma reesei

<400> 226

```
Phe Ile Leu Leu Val Gly Ile Thr Gly Leu Ile Leu Leu Leu Trp
1               5                   10                  15
```

<210> 227
<211> 358
<212> PRT
<213> Trichoderma reesei

<400> 227

```
Arg Gly Val Ser Thr Ser Ala Ser Glu Met Gln Ser Phe Tyr Cys Trp
1               5                   10                  15


Gly Pro Ala Lys Pro Pro Met Glu Met Ser Pro Asn Glu His Asn Arg
            20                  25                  30


Trp Asn Gly His Leu Gln Thr Pro Val Ile Phe Asn His His Ala Pro
        35                  40                  45


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


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


Thr Pro Leu Lys Asp Ala Ala Pro Tyr Leu Ser Lys Tyr Phe Glu Leu
                85                  90                  95


Leu Ala Glu Leu Thr Tyr Pro His Arg Leu Ile Asp Leu Ala Phe Leu
            100                 105                 110


Val Ser Asp Ser Thr Asp Asp Thr Leu Ala Val Leu Ala Ser Glu Leu
        115                 120                 125


Asp Arg Ile Gln Lys Arg Pro Asp Gln Ile Pro Phe His Ser Ala Thr
    130                 135                 140


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


Arg His Ser Phe Glu Ala Gln Gly Pro Arg Arg Lys Ala Met Gly Arg
```

```
                165                 170                 175

Ala Arg Asn Tyr Leu Leu Tyr Thr Ala Leu Lys Pro Glu His Ser Trp
            180                 185                 190

Val Tyr Trp Arg Asp Val Asp Ile Val Asp Ser Pro Thr Gly Ile Leu
        195                 200                 205

Glu Asp Phe Ile Ala His Asp Arg Asp Ile Leu Val Pro Asn Ile Trp
    210                 215                 220

Phe His Arg Tyr Arg Asp Gly Val Asp Ile Glu Gly Arg Phe Asp Tyr
225                 230                 235                 240

Asn Ser Trp Val Glu Ser Asp Lys Gly Arg Lys Leu Ala Asn Ser Leu
                245                 250                 255

Asp Lys Asp Val Val Leu Ala Glu Gly Tyr Lys Gln Tyr Asp Thr Gly
            260                 265                 270

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

Glu Leu Glu Leu Asp Gly Ile Gly Gly Val Asn Ile Leu Val Lys Ala
    290                 295                 300

Asp Val His Arg Ser Gly Ile Asn Phe Pro Cys Tyr Ala Phe Glu Asn
305                 310                 315                 320

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

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

Glu Lys Gly Gly Asn Ala
```

355

<210> 228
<211> 45
<212> PRT
<213> Trichoderma reesei

<400> 228

Met Met Pro Arg His His Ser Ser Gly Phe Ser Asn Gly Tyr Pro Arg
1 5 10 15

Ala Asp Thr Phe Glu Ile Ser Pro His Arg Phe Gln Pro Arg Ala Thr
20 25 30

Leu Pro Pro His Arg Lys Arg Lys Arg Thr Ala Ile Arg
35 40 45

<210> 229
<211> 16
<212> PRT
<213> Trichoderma reesei

<400> 229

Val Gly Ile Ala Val Val Val Ile Leu Val Leu Val Leu Trp Phe Gly
1 5 10 15

<210> 230
<211> 407
<212> PRT
<213> Trichoderma reesei

<400> 230

Gln Pro Arg Ser Val Ala Ser Leu Ile Ser Leu Gly Ile Leu Ser Gly
1 5 10 15

Tyr Asp Asp Leu Lys Leu Glu Thr Val Arg Tyr Tyr Asp Leu Ser Asn
20 25 30

```
Val Gln Gly Thr Ala Arg Gly Trp Glu Arg Glu Glu Arg Ile Leu Leu
        35                  40                  45

Cys Val Pro Leu Arg Asp Ala Glu Gln His Leu Pro Met Phe Phe Ser
    50                  55                  60

His Leu Lys Asn Phe Thr Tyr Pro His Asn Leu Ile Asp Leu Ala Phe
65                  70                  75                  80

Leu Val Ser Asp Ser Lys Asp His Thr Leu Glu Ser Leu Thr Glu His
                85                  90                  95

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

Ile Ser Ile Ile Glu Lys Asp Phe Gly Gln Lys Val Asn Gln Asp Val
        115                 120                 125

Glu Ser Arg His Gly Phe Ala Ala Gln Ala Ser Arg Arg Lys Leu Met
    130                 135                 140

Ala Gln Ala Arg Asn Trp Leu Leu Ser Ala Ala Leu Arg Pro Tyr His
145                 150                 155                 160

Ser Trp Val Tyr Trp Arg Asp Val Asp Val Glu Thr Ala Pro Phe Thr
                165                 170                 175

Ile Leu Glu Asp Leu Met Arg His Asn Lys Asp Val Ile Val Pro Asn
            180                 185                 190

Val Trp Arg Pro Leu Pro Asp Trp Leu Gly Gly Glu Gln Pro Tyr Asp
        195                 200                 205

Leu Asn Ser Trp Gln Glu Ser Glu Thr Ala Leu Ala Leu Ala Asp Thr
    210                 215                 220
```

```
Leu Asp Glu Asp Ala Val Ile Val Glu Gly Tyr Ala Glu Tyr Ala Thr
225                 230                 235                 240


Trp Arg Pro His Leu Ala Tyr Leu Arg Asp Pro Tyr Gly Asp Pro Asp
                245                 250                 255


Met Glu Met Glu Ile Asp Gly Val Gly Gly Val Ser Ile Leu Ala Lys
            260                 265                 270


Ala Lys Val Phe Arg Ala Gly Val His Phe Pro Ala Phe Ser Phe Glu
        275                 280                 285


Lys His Ala Glu Thr Glu Gly Phe Gly Lys Met Ala Lys Arg Met His
    290                 295                 300


Phe Ser Val Val Gly Leu Pro His Tyr Thr Ile Trp His Leu Tyr Glu
305                 310                 315                 320


Pro Ser Val Asp Asp Ile Lys His Met Glu Glu Met Glu Arg Glu Arg
                325                 330                 335


Ile Ala Arg Glu Lys Glu Glu Glu Glu Arg Lys Lys Lys Glu Ala Gln
            340                 345                 350


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


Gln Gln Met Gln Asp Leu Lys Leu Gln Asp Arg Gly Gly Asp Lys Glu
    370                 375                 380


Ala Ala Ala Ala Gly Val Asn Gln Gly Ala Ala Ala Lys Ala Ala Gly
385                 390                 395                 400


Ala Met Glu Gly Gln Lys Asn
                405
```

<210> 231
<211> 119
<212> PRT
<213> Trichoderma reesei

<400> 231

```
Met Ser Leu Ser Arg Ser Pro Ser Pro Val Pro Gly Gly Gly Trp Ser
1               5                   10                  15


Ser Pro Gly Leu Asn Ile Asn Ser Gly Arg Ser Ser Pro Ser Asn Ala
            20                  25                  30


Ala Gly Ser Ser Val Ser Trp Glu Ser Ala Lys Met Arg Lys Gln Gly
        35                  40                  45


Ala Asn Gly Tyr Pro Ser Phe Ser Thr Gln Asn Gln Gly Phe Phe Thr
    50                  55                  60


Arg His Met Arg Arg Ile Ser Ser Ser Leu Pro Arg Phe Ala Ala Gly
65                  70                  75                  80


Pro Gly Asn Thr Tyr Ala Glu Arg Glu Lys Tyr Glu Arg Gly Gly His
                85                  90                  95


Ser Pro His Ala Gly Gly Gly Arg Leu Arg Ala Phe Leu Ala Arg Ile
            100                 105                 110


Gly Arg Arg Leu Lys Trp Arg
        115
```

<210> 232
<211> 15
<212> PRT
<213> Trichoderma reesei

<400> 232

```
Ile Leu Leu Pro Leu Ile Ile Ile Cys Thr Ile Val Ala Tyr Tyr
1               5                   10                  15
```

<210> 233
<211> 325
<212> PRT
<213> Trichoderma reesei

<400> 233

```
Gly Thr His Glu Ala Pro Gly Phe Val His Trp Trp Arg Arg Ile Ser
1               5                   10                  15


Met Gly Gly Gly Gly Glu Lys Phe Val Ile Ile Leu Gly Ala Asn Val
            20                  25                  30


Gly Gly Gly Val Met Glu Trp Lys Gly Ala Arg Glu Trp Ala Ile Glu
        35                  40                  45


Arg Asp Ser Val Arg Asn Lys Arg Lys Tyr Ala Thr Arg Trp Gly Tyr
    50                  55                  60


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


Trp Arg Glu Ser Trp Glu Lys Val Asp Phe Ile Arg Ala Ala Met Arg
                85                  90                  95


Lys Tyr Pro Lys Ala Glu Trp Phe Trp Trp Leu Asp Leu Asn Thr Tyr
            100                 105                 110


Val Met Glu Pro Ser Tyr Ser Leu Gln Arg His Leu Phe Asn His Leu
        115                 120                 125


Asp Arg His Val Tyr Arg Asp Ile Asn Val Phe Asn Pro Leu Asn Ile
    130                 135                 140


Thr His Pro Pro Thr Glu Glu Tyr Leu Asp Ala Glu Ala Arg Ser Pro
145                 150                 155                 160
```

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

Cys Ser Gly Phe Asn Leu Gly Ser Phe Phe Ile Arg Arg Ser Ala Trp
            180                 185                 190

Thr Glu Gln Leu Leu Asp Ile Trp Trp Asp Pro Val Leu Tyr Glu Gln
        195                 200                 205

Lys His Met Glu Trp Glu His Lys Glu Gln Asp Ala Leu Glu Gln Leu
    210                 215                 220

Tyr Arg Thr Gln Pro Trp Ile Arg Gln His Thr Gly Phe Leu Pro Gln
225                 230                 235                 240

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

Leu Asn Asn Thr Arg Ile His Tyr Asn Glu Lys Asp Arg Asp Phe Val
            260                 265                 270

Val Asn Met Ala Gly Cys Glu Trp Gly Arg Asp Cys Trp Gly Glu Met
        275                 280                 285

Tyr His Tyr Arg Glu Phe Ser Tyr Trp Leu Asn Arg Asn Pro Trp Glu
    290                 295                 300

Leu Phe Lys Glu Glu Ile Val Ala Val Ile Trp Tyr Lys Leu Thr Gly
305                 310                 315                 320

Gln Arg Val Lys Leu
                325
```

<210> 234
<211> 33
<212> PRT

<213> Trichoderma reesei

<400> 234

Met His Phe Ala Tyr Pro Ser Arg Lys Ser Ser Asn Pro Pro Pro Phe
1 5 10 15

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

Thr

<210> 235
<211> 15
<212> PRT
<213> Trichoderma reesei

<400> 235

Ile Gly Ile Val Leu Phe Leu Val Leu Ala Thr Leu Trp Phe Phe
1 5 10 15

<210> 236
<211> 262
<212> PRT
<213> Trichoderma reesei

<400> 236

Ser Asn Pro Arg Val Pro Arg Pro Asp Pro Glu Arg Val Pro Ser Gly
1 5 10 15

Arg Pro Pro Val Val Leu Val Thr Val Ile Asp Pro Thr Gln Tyr Pro
20 25 30

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

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

```
Gln Gly Ala Pro Gln Ser Trp Ser Lys Leu Met Ala Met Arg His Ala
65                  70                  75                  80

Leu Thr Lys Phe Pro Glu Cys Arg Phe Val Trp Tyr Leu Asp Gln Asp
                85                  90                  95

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

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

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

Asp Leu Ile Val Ser Gln Asp Ser Ser Gly Leu Val Ala Gly Ser Val
145                 150                 155                 160

Val Val Arg Asn Ser Gln Trp Ser Lys Phe Leu Leu Glu Thr Trp Met
                165                 170                 175

Asp Pro Leu Tyr Arg Ser Tyr Asn Phe Gln Lys Ala Glu Arg His Ala
            180                 185                 190

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

Leu Val Pro Gln Arg Thr Leu Gly Pro Tyr Thr Arg Thr Asp Gln Gly
    210                 215                 220

Asp Ala Tyr Gln Asp Gly Asp Phe Val Val Met Phe Thr Gly Cys Thr
225                 230                 235                 240

Lys Ser Gly Glu Gln Ser Cys Glu Thr Val Ser Ala Ser Tyr Tyr Gln
                245                 250                 255
```

```
Lys Trp Ser Ser Ser Leu
            260


<210>  237
<211>  90
<212>  PRT
<213>  Trichoderma reesei

<400>  237

Met Ile Arg Asp Pro Phe Gly Ile His Ser Lys Asn Ala Phe Lys Ala
1               5                   10                  15


Thr Ala Leu Arg Ala Ala Arg Asp Ile Lys Glu Ala Ala Thr Gln Ala
            20                  25                  30


Gly Ala Asn Ala Leu Glu Met Ser Phe Ser Leu Pro Lys His Val Pro
        35                  40                  45


Asp Phe Gly Asp Pro Ser Arg Ala Leu Glu Asp Arg Ala Trp Ala Ala
    50                  55                  60


Leu Leu Pro Met Tyr Lys Asp Lys Pro Tyr Ala Tyr Ala Pro Ser Met
65                  70                  75                  80


Arg Leu Arg Pro Trp Trp Arg Arg Arg Lys
                85                  90


<210>  238
<211>  19
<212>  PRT
<213>  Trichoderma reesei

<400>  238

Val Leu Gly Met Ile Ala Ala Ala Val Met Phe Val Leu Tyr Val Thr
1               5                   10                  15
```

Gly Phe Phe

<210> 239
<211> 565
<212> PRT
<213> Trichoderma reesei

<400> 239

```
Ser Ser Gly Gln Thr Glu Glu Ala Lys Lys Lys Ala Ser Gly Ser Ala
1               5                   10                  15


Phe Ser Trp Leu Gly Leu Ser Gln Glu Arg Gly Gly Val Asp Trp Asp
            20                  25                  30


Glu Arg Arg Lys Ser Val Val Glu Ala Phe Glu Val Trp Asp Ala Tyr
        35                  40                  45


Glu Arg Tyr Ala Trp Gly Lys Asp Glu Phe His Pro Ile Ser Lys Asn
    50                  55                  60


Gly Arg Asn Met Ala Pro Lys Gly Leu Gly Trp Ile Ile Ile Asp Ser
65                  70                  75                  80


Leu Asp Thr Met Met Leu Met Asn Gln Thr Thr Arg Leu Gln His Ala
                85                  90                  95


Arg Glu Trp Ile Ser Thr Ser Leu Thr Trp Asp Gln Asp Gln Asp Val
            100                 105                 110


Asn Thr Phe Glu Thr Thr Ile Arg Met Leu Gly Gly Leu Leu Ser Ala
        115                 120                 125


His Tyr Leu Ser Thr Glu Phe Pro Glu Leu Ala Pro Leu Thr Glu Asp
    130                 135                 140


Asp Glu Gly Ala Pro Gly Glu Asp Leu Tyr Leu Glu Lys Ala Lys Asp
```

```
145                 150                 155                 160

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

Tyr Ala Ser Val Asn Ile Gly Glu Tyr Lys Gly Pro Ser His Ser Asp
            180                 185                 190

Asn Gly Ala Ser Ser Thr Ala Glu Ala Thr Thr Leu Gln Leu Glu Phe
        195                 200                 205

Lys Tyr Leu Ala Lys Leu Thr Gly Glu Lys Asn Phe Trp Asp Lys Val
    210                 215                 220

Glu Lys Val Met Glu Val Val Asp Asp Asn Gln Pro Glu Asp Gly Leu
225                 230                 235                 240

Val Pro Ile Tyr Ile Tyr Ala Thr Thr Gly Glu Phe Arg Gly Gln Asn
                245                 250                 255

Ile Arg Leu Gly Ser Arg Gly Asp Ser Tyr Tyr Glu Tyr Leu Ile Lys
            260                 265                 270

Gln Tyr Leu Gln Thr Asn Lys Gln Glu Pro Ile Tyr Glu Glu Met Trp
        275                 280                 285

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

Pro Ser Glu Phe Thr Ile Ile Ala Glu Arg Pro Asp Gly Leu Glu His
305                 310                 315                 320

Pro Met Ser Pro Lys Met Asp His Leu Val Cys Phe Met Pro Gly Thr
                325                 330                 335

Ile Ala Leu Ala Ala Thr Gly Gly Leu Thr Glu Ala Glu Ala Arg Lys
```

```
            340                 345                 350

Leu Ser Thr Trp Asn Lys Lys Lys Asp Asp Asp Met Gln Leu Ala Arg
        355                 360                 365

Glu Leu Met His Thr Cys Trp Gly Met Tyr Lys Tyr Met Lys Thr Gly
    370                 375                 380

Leu Ala Pro Glu Ile Met Tyr Phe Asn Ile Pro Asn Pro Pro Pro Glu
385                 390                 395                 400

Ser Ser Ala Pro His Gln Ala Pro Ala Ala Phe Asp Glu Asp Pro His
                405                 410                 415

Ala Glu Trp Arg Lys Asp Phe Val Val His Ser Asn Asp Val His Asn
            420                 425                 430

Leu Gln Arg Pro Glu Thr Val Glu Ser Leu Phe Tyr Met Trp Arg Ile
        435                 440                 445

Thr Gly Asp Val Lys Tyr Arg Glu Trp Gly Trp Asp Met Phe Lys Ser
    450                 455                 460

Phe Val Asn Tyr Thr Ala Val Glu Asp Gln Gly Gly Phe Thr Ser Leu
465                 470                 475                 480

Leu Asp Ala Asn Ser Ile Pro Pro Thr Pro Lys Asp Asn Met Glu Ser
                485                 490                 495

Phe Trp Leu Ala Glu Thr Leu Lys Tyr Met Tyr Leu Leu Phe Ser Pro
            500                 505                 510

Asn Asp Val Leu Pro Leu His Lys Ile Val Leu Asn Thr Glu Ala His
        515                 520                 525

Pro Phe Pro Arg Phe Asp Met Gly Pro Leu Phe Ser Thr Gly Trp Lys
```

530 535 540

Arg Lys Pro Arg Asp Gly Ser Ala Lys Lys Lys Ala Thr Thr Ala Ala
545 550 555 560

Thr Thr Asp Ala Glu
565

<210> 240
<211> 7
<212> PRT
<213> Trichoderma reesei

<400> 240

Met Ala Arg Arg Arg Tyr Arg
1 5

<210> 241
<211> 15
<212> PRT
<213> Trichoderma reesei

<400> 241

Leu Phe Met Ile Cys Ala Ala Val Ile Leu Phe Leu Leu Tyr Arg
1 5 10 15

<210> 242
<211> 871
<212> PRT
<213> Trichoderma reesei

<400> 242

Val Ser Gln Asn Thr Trp Asp Asp Ser Ala His Tyr Ala Thr Leu Arg
1 5 10 15

His Pro Pro Ala Ser Asn Pro Pro Ala Ala Gly Gly Glu Ser Pro Leu
20 25 30

```
Lys Pro Ala Ala Lys Pro Glu His Glu His Glu His Glu Asn Gly Tyr
        35                  40                  45

Ala Pro Glu Ser Lys Pro Lys Pro Gln Ser Glu Pro Lys Pro Glu Ser
    50                  55                  60

Lys Pro Ala Pro Glu His Ala Ala Gly Gly Gln Lys Ser Gln Gly Lys
65                  70                  75                  80

Pro Ser Tyr Glu Asp Asp Glu Glu Thr Gly Lys Asn Pro Pro Lys Ser
                85                  90                  95

Ala Val Ile Pro Ser Asp Thr Arg Leu Pro Pro Asp Asn Lys Val His
            100                 105                 110

Trp Arg Pro Val Lys Glu His Phe Pro Val Pro Ser Glu Ser Val Ile
        115                 120                 125

Ser Leu Pro Thr Gly Lys Pro Leu Lys Val Pro Arg Val Gln His Glu
    130                 135                 140

Phe Gly Val Glu Ser Pro Glu Ala Lys Ser Arg Arg Val Ala Arg Gln
145                 150                 155                 160

Glu Arg Val Gly Lys Glu Ile Glu Arg Ala Trp Ser Gly Tyr Lys Lys
                165                 170                 175

Phe Ala Trp Met His Asp Glu Leu Ser Pro Val Ser Ala Lys His Arg
            180                 185                 190

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

Leu Trp Ile Ala Gly Leu Lys Glu Gln Phe Asp Glu Ala Ala Arg Ala
    210                 215                 220
```

```
Val Glu Gln Ile Asp Phe Thr Thr Thr Pro Arg Asn Asn Ile Pro Val
225                 230                 235                 240


Phe Glu Thr Thr Ile Arg Tyr Leu Gly Gly Leu Leu Gly Ala Phe Asp
                245                 250                 255


Val Ser Gly Gly His Asp Gly Gly Tyr Pro Met Leu Leu Thr Lys Ala
            260                 265                 270


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


Met Pro Ile Leu Tyr Tyr Gln Trp Gln Pro Glu Tyr Ala Ser Gln Pro
    290                 295                 300


His Arg Ala Gly Ser Val Gly Ile Ala Glu Leu Gly Thr Leu Ser Met
305                 310                 315                 320


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


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


Thr Ser Ile Pro Gly Leu Phe Pro Glu Asn Leu Asp Ala Ser Gly Cys
        355                 360                 365


Asn His Thr Ala Thr Ala Leu Arg Ser Ser Leu Ser Glu Ala Ala Gln
    370                 375                 380


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


Gly Lys Asn Ser Lys Ala Asp Pro Gln Thr Val Glu Lys Gln Pro Ala
                405                 410                 415
```

```
Lys Lys Gln Asn Glu Pro Val Glu Lys Ala Lys Gln Val Pro Thr Gln
            420                 425                 430

Gln Thr Ala Lys Arg Gly Lys Pro Pro Phe Gly Ala Asn Gly Phe Thr
        435                 440                 445

Ala Asn Trp Asp Cys Val Pro Gln Gly Leu Val Val Gly Gly Tyr Gly
    450                 455                 460

Phe Gln Gln Tyr His Met Gly Gly Gly Gln Asp Ser Ala Tyr Glu Tyr
465                 470                 475                 480

Phe Pro Lys Glu Tyr Leu Leu Leu Gly Gly Leu Glu Ser Lys Tyr Gln
                485                 490                 495

Lys Leu Tyr Val Asp Ala Val Glu Ala Ile Asn Glu Trp Leu Leu Tyr
            500                 505                 510

Arg Pro Met Thr Asp Gly Asp Trp Asp Ile Leu Phe Pro Ala Lys Val
        515                 520                 525

Ser Thr Ala Gly Asn Pro Ser Gln Asp Leu Val Ala Thr Phe Glu Val
    530                 535                 540

Thr His Leu Thr Cys Phe Ile Gly Gly Met Tyr Gly Leu Gly Gly Lys
545                 550                 555                 560

Ile Phe Gly Arg Glu Lys Asp Leu Glu Thr Ala Lys Arg Leu Thr Asp
                565                 570                 575

Gly Cys Val Trp Ala Tyr Gln Ser Thr Val Ser Gly Ile Met Pro Glu
            580                 585                 590

Gly Ser Gln Val Leu Ala Cys Pro Thr Leu Glu Lys Cys Asp Phe Asn
        595                 600                 605
```

```
Glu Thr Leu Trp Trp Glu Lys Leu Asp Pro Ala Lys Asp Trp Arg Asp
    610                 615                 620

Lys Gln Val Ala Asp Asp Lys Asp Lys Ala Thr Val Gly Glu Ala Leu
625                 630                 635                 640

Lys Glu Thr Ala Asn Ser His Asp Ala Ala Gly Gly Ser Lys Ala Val
                645                 650                 655

His Lys Arg Ala Ala Val Pro Leu Pro Lys Pro Gly Ala Asp Asp Asp
            660                 665                 670

Val Gly Ser Glu Leu Pro Gln Ser Leu Lys Asp Lys Ile Gly Phe Lys
        675                 680                 685

Asn Gly Glu Gln Lys Lys Pro Thr Gly Ser Ser Val Gly Ile Gln Arg
    690                 695                 700

Asp Pro Asp Ala Pro Val Asp Ser Val Leu Glu Ala His Arg Leu Pro
705                 710                 715                 720

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

Thr His Glu Glu Phe Val Lys Gln Arg Ile Ala Glu Met Gly Phe Ala
            740                 745                 750

Pro Gly Val Val His Ile Gln Ser Arg Gln Tyr Ile Leu Arg Pro Glu
        755                 760                 765

Ala Ile Glu Ser Val Trp Tyr Met Tyr Arg Ile Thr Gly Asp Pro Ile
    770                 775                 780

Trp Met Glu Lys Gly Trp Lys Met Phe Glu Ala Thr Ile Arg Ala Thr
785                 790                 795                 800
```

```
Arg Thr Glu Ile Ala Asn Ser Ala Ile Asp Asp Val Asn Ser Glu Glu
                805                 810                 815


Pro Gly Leu Lys Asp Glu Met Glu Ser Phe Trp Leu Ala Glu Thr Leu
            820                 825                 830


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


Glu Trp Val Leu Asn Thr Glu Ala His Pro Phe Lys Arg Pro Gly Gly
    850                 855                 860


Ser Val Ile Gly His Ser Ile
865                 870
```

<210> 243
<211> 13
<212> PRT
<213> Trichoderma reesei

<400> 243

```
Met Leu Asn Gln Leu Gln Gly Arg Val Pro Arg Arg Tyr
1               5                   10
```

<210> 244
<211> 15
<212> PRT
<213> Trichoderma reesei

<400> 244

```
Ile Ala Leu Val Ala Phe Ala Phe Phe Val Ala Phe Leu Leu Trp
1               5                   10                  15
```

<210> 245
<211> 542
<212> PRT
<213> Trichoderma reesei

<400> 245

```
Ser Gly Tyr Asp Phe Val Pro Arg Thr Ala Thr Val Gly Arg Phe Lys
1               5                   10                  15

Tyr Val Pro Ser Ser Tyr Asp Trp Ser Lys Ala Lys Val Tyr Tyr Pro
            20                  25                  30

Val Lys Asp Met Lys Thr Leu Pro Gln Gly Thr Pro Val Thr Phe Pro
        35                  40                  45

Arg Leu Gln Leu Arg Asn Gln Ser Glu Ala Gln Asp Asp Thr Thr Lys
    50                  55                  60

Ala Arg Lys Gln Ala Val Lys Asp Ala Phe Val Lys Ser Trp Glu Ala
65                  70                  75                  80

Tyr Lys Thr Tyr Ala Trp Thr Lys Asp Gln Leu Gln Pro Leu Ser Leu
                85                  90                  95

Ser Gly Lys Glu Thr Phe Ser Gly Trp Ser Ala Gln Leu Val Asp Ala
            100                 105                 110

Leu Asp Thr Leu Trp Ile Met Asp Leu Lys Asp Asp Phe Phe Leu Ala
        115                 120                 125

Val Lys Glu Val Ala Val Ile Asp Trp Ser Lys Thr Lys Asp Asn Lys
    130                 135                 140

Val Ile Asn Leu Phe Glu Val Thr Ile Arg Tyr Leu Gly Gly Leu Ile
145                 150                 155                 160

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

Glu Leu Gly Asp Thr Leu Tyr Ala Thr Phe Asp Thr Pro Asn Arg Leu
            180                 185                 190
```

```
Pro Ser His Trp Leu Asp Tyr Ser Lys Ala Lys Lys Gly Thr Gln Arg
        195                 200                 205

Ala Asp Asp Ser Met Ser Gly Ala Ala Gly Gly Thr Leu Cys Met Glu
    210                 215                 220

Phe Thr Arg Leu Ser Gln Ile Thr Gly Asp Pro Lys Tyr Tyr Asp Ala
225                 230                 235                 240

Thr Glu Arg Ile Lys Gln Phe Phe Tyr Arg Phe Gln Asn Glu Thr Thr
                245                 250                 255

Leu Pro Gly Met Trp Pro Val Met Met Asn Tyr Arg Glu Glu Thr Met
            260                 265                 270

Val Glu Ser Arg Tyr Ser Met Gly Gly Ser Ala Asp Ser Leu Tyr Glu
        275                 280                 285

Tyr Leu Val Lys Met Pro Ala Leu Leu Gly Gly Leu Asp Pro Gln Tyr
    290                 295                 300

Pro Glu Met Ala Ile Arg Ala Leu Asp Thr Ala Arg Asp Asn Leu Leu
305                 310                 315                 320

Phe Arg Pro Met Thr Glu Lys Gly Asp Asn Ile Leu Ala Leu Gly Asn
                325                 330                 335

Ala Leu Val Asp His Gly Asn Val Gln Arg Ile Thr Glu Met Gln His
            340                 345                 350

Leu Thr Cys Phe Ala Gly Gly Met Tyr Ala Met Ala Gly Lys Leu Phe
        355                 360                 365

Lys Arg Asp Asp Tyr Val Asp Leu Gly Ser Arg Ile Ser Ser Gly Cys
    370                 375                 380
```

```
Val Trp Ala Tyr Asp Ser Phe Pro Ser Gly Ile Met Pro Glu Ser Ala
385                 390                 395                 400


Asp Met Ala Ala Cys Ala Lys Leu Asp Gly Pro Cys Pro Tyr Asp Glu
                405                 410                 415


Val Lys Ala Pro Val Asp Pro Asp Gly Arg Arg Pro His Gly Phe Ile
            420                 425                 430


His Val Lys Ser Arg His Tyr Leu Leu Arg Pro Glu Ala Ile Glu Ser
        435                 440                 445


Val Phe Tyr Met Trp Arg Ile Thr Gly Asp Gln Val Trp Arg Asp Thr
    450                 455                 460


Ala Trp Arg Met Trp Glu Asn Ile Val Arg Glu Ala Glu Thr Glu His
465                 470                 475                 480


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


Asn Asn Tyr Leu Leu Gln Thr Phe Trp Leu Ala Glu Thr Leu Lys Tyr
            500                 505                 510


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


Val Phe Asn Thr Glu Ala His Pro Phe Lys Arg Pro Ala Val
    530                 535                 540


<210>  246
<211>  13
<212>  PRT
<213>  Trichoderma reesei

<400>  246
```

Met Leu Val Val Gly Arg Pro Arg Leu Val Arg Asn Ser
1 5 10

<210> 247
<211> 16
<212> PRT
<213> Trichoderma reesei

<400> 247

Ile Ile Leu Thr Leu Ala Ile Leu Ser Ile Trp His Leu Gly Leu Leu
1 5 10 15

<210> 248
<211> 576
<212> PRT
<213> Trichoderma reesei

<400> 248

Ser Arg Thr Pro Thr Ser Ala Ser Ala Leu Val Ser Ala Ser Val Ser
1 5 10 15

Ala Ser Ser Glu Trp Ser Arg Leu Glu Arg Leu Met Asn Arg Gly Ala
20 25 30

Pro Leu Thr Pro Tyr Pro Asp Ser Asn Ser Ser Phe Asp Trp Ser Ala
35 40 45

Ile Pro Phe Arg Tyr Pro Pro His Asn Thr Thr His Leu Pro Pro Arg
50 55 60

His Lys Gln Pro Pro Leu Pro Arg Ile Gln His Arg Phe Gly Pro Glu
65 70 75 80

Ser Pro Ala Ala Ala Lys Glu Arg Ile Lys Arg Leu Lys Ala Val Lys
85 90 95

Gln Val Phe Leu Arg Ala Trp Gln Ala Tyr Lys Gly Tyr Ala Trp Lys
100 105 110

```
Gln Asp Ala Leu Leu Pro Ile Ser Gly Gly Gly Arg Glu Gln Phe Ser
        115                 120                 125

Gly Trp Ala Ala Thr Leu Val Asp Ala Leu Asp Thr Leu Trp Ile Met
    130                 135                 140

Gly Leu Arg Glu Glu Phe Asp Glu Ala Val Ala Ala Val Ala Glu Ile
145                 150                 155                 160

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

Ile Arg Tyr Leu Gly Gly Leu Leu Ala Ala Tyr Asp Leu Ser Gly Arg
            180                 185                 190

Glu Val Leu Leu Lys Lys Ala Val Glu Leu Gly Asp Leu Ile Tyr Ala
        195                 200                 205

Gly Phe Asn Thr Glu Asn Gly Met Pro Val Asp Phe Leu Asn Phe Tyr
    210                 215                 220

Ser Ala Lys Ser Gly Glu Gly Leu Val Val Glu Ser Ser Val Val Ser
225                 230                 235                 240

Ala Ser Pro Gly Thr Leu Ser Leu Glu Leu Ala His Leu Ser Gln Val
                245                 250                 255

Thr Gly Asp Asp Lys Tyr Tyr Ser Ala Val Ser Gln Val Met Asp Val
            260                 265                 270

Phe Tyr Gln Gly Gln Asn Lys Thr Arg Leu Pro Gly Val Trp Pro Ile
        275                 280                 285

Asp Val Asn Met Arg Ala Lys Asp Val Val Ser Gly Ser Arg Phe Thr
    290                 295                 300
```

```
Leu Gly Gly Cys Ala Asp Ser Leu Tyr Glu Tyr Leu Pro Lys Met His
305                 310                 315                 320

Gln Leu Leu Gly Gly Gly Glu Pro Lys Tyr Glu Thr Met Ser Arg Thr
                325                 330                 335

Phe Leu Gln Ala Ala Asp Arg His Phe Val Phe Arg Pro Met Leu Pro
            340                 345                 350

Gly Ala Glu Glu Asp Val Leu Met Pro Gly Asn Val Asn Val Asp Glu
        355                 360                 365

Asp Ser Gly Glu Ala Val Leu Asp Pro Glu Thr Glu His Leu Ala Cys
    370                 375                 380

Phe Val Gly Gly Met Phe Gly Leu Ala Gly Arg Leu Phe Ser Arg Pro
385                 390                 395                 400

Asp Asp Val Glu Thr Gly Val Arg Leu Thr Asn Gly Cys Val Tyr Ala
                405                 410                 415

Tyr Arg Ala Phe Pro Thr Gly Met Met Pro Glu Arg Leu Asp Leu Ala
            420                 425                 430

Pro Cys Arg Asp Arg Ser Ser Arg Cys Pro Trp Asp Glu Glu His Trp
        435                 440                 445

Leu Glu Glu Arg Ala Lys Arg Pro Glu Trp Glu Pro His Leu Pro Arg
    450                 455                 460

Gly Phe Thr Ser Ala Lys Asp Pro Arg Tyr Leu Leu Arg Pro Glu Ala
465                 470                 475                 480

Ile Glu Ser Val Phe Tyr Ser Tyr Arg Ile Thr Gly Arg Gln Glu Phe
                485                 490                 495
```

```
Gln Thr Ala Ala Trp Asp Met Phe Thr Ala Val Glu Lys Gly Thr Arg
            500                 505                 510

Thr Gln Phe Ala Asn Ala Ala Val Leu Asp Val Thr Arg Ala Ala Asp
        515                 520                 525

Glu Leu Pro Gln Glu Asp Tyr Met Glu Ser Phe Trp Leu Ala Glu Thr
    530                 535                 540

Leu Lys Tyr Phe Tyr Leu Met Phe Thr Thr Pro Asp Ile Ile Ser Leu
545                 550                 555                 560

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

<210> 249
<211> 17
<212> PRT
<213> Trichoderma reesei

<400> 249

```
Met Val Met Leu Val Ala Ile Ala Leu Ala Trp Leu Gly Cys Ser Leu
1               5                   10                  15

Leu
```

<210> 250
<211> 1053
<212> PRT
<213> Trichoderma reesei

<400> 250

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

```
Glu Thr Val Asp Met Phe Tyr His Gly Tyr Ser Asn Tyr Met Glu His
            20                  25                  30

Ala Phe Pro Glu Asp Glu Leu Arg Pro Ile Ser Cys Thr Pro Leu Thr
        35                  40                  45

Arg Asp Arg Asp Asn Pro Gly Arg Ile Ser Leu Asn Asp Ala Leu Gly
    50                  55                  60

Asn Tyr Ser Leu Thr Leu Ile Asp Ser Leu Ser Thr Leu Ala Ile Leu
65                  70                  75                  80

Ala Gly Gly Pro Gln Asn Gly Pro Tyr Thr Gly Pro Gln Ala Leu Ser
                85                  90                  95

Asp Phe Gln Asp Gly Val Ala Glu Phe Val Arg His Tyr Gly Asp Gly
            100                 105                 110

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

Asp Ser Lys Val Gln Val Phe Glu Thr Val Ile Arg Gly Val Gly Gly
    130                 135                 140

Leu Leu Ser Ala His Leu Phe Ala Ile Gly Glu Leu Pro Ile Thr Gly
145                 150                 155                 160

Tyr Val Pro Arg Pro Glu Gly Val Ala Gly Asp Asp Pro Leu Glu Leu
                165                 170                 175

Ala Pro Ile Pro Trp Pro Asn Gly Phe Arg Tyr Asp Gly Gln Leu Leu
            180                 185                 190

Arg Leu Ala Leu Asp Leu Ser Glu Arg Leu Leu Pro Ala Phe Tyr Thr
        195                 200                 205
```

```
Pro Thr Gly Ile Pro Tyr Pro Arg Val Asn Leu Arg Ser Gly Ile Pro
    210                 215                 220

Phe Tyr Val Asn Ser Pro Leu His Gln Asn Leu Gly Glu Ala Val Glu
225                 230                 235                 240

Glu Gln Ser Gly Arg Pro Glu Ile Thr Glu Thr Cys Ser Ala Gly Ala
                245                 250                 255

Gly Ser Leu Val Leu Glu Phe Thr Val Leu Ser Arg Leu Thr Gly Asp
            260                 265                 270

Ala Arg Phe Glu Gln Ala Ala Lys Arg Ala Phe Trp Glu Val Trp His
        275                 280                 285

Arg Arg Ser Glu Ile Gly Leu Ile Gly Asn Gly Ile Asp Ala Glu Arg
    290                 295                 300

Gly Leu Trp Ile Gly Pro His Ala Gly Ile Gly Ala Gly Met Asp Ser
305                 310                 315                 320

Phe Phe Glu Tyr Ala Leu Lys Ser His Ile Leu Leu Ser Gly Leu Gly
                325                 330                 335

Met Pro Asn Ala Ser Thr Ser Arg Arg Gln Ser Thr Thr Ser Trp Leu
            340                 345                 350

Asp Pro Asn Ser Leu His Pro Pro Leu Pro Pro Glu Met His Thr Ser
        355                 360                 365

Asp Ala Phe Leu Gln Ala Trp His Gln Ala His Ala Ser Val Lys Arg
    370                 375                 380

Tyr Leu Tyr Thr Asp Arg Ser His Phe Pro Tyr Tyr Ser Asn Asn His
385                 390                 395                 400
```

```
Arg Ala Thr Gly Gln Pro Tyr Ala Met Trp Ile Asp Ser Leu Gly Ala
                405                 410                 415

Phe Tyr Pro Gly Leu Leu Ala Leu Ala Gly Glu Val Glu Glu Ala Ile
            420                 425                 430

Glu Ala Asn Leu Val Tyr Thr Ala Leu Trp Thr Arg Tyr Ser Ala Leu
        435                 440                 445

Pro Glu Arg Trp Ser Val Arg Glu Gly Asn Val Glu Ala Gly Ile Gly
    450                 455                 460

Trp Trp Pro Gly Arg Pro Glu Phe Ile Glu Ser Thr Tyr His Ile Tyr
465                 470                 475                 480

Arg Ala Thr Arg Asp Pro Trp Tyr Leu His Val Gly Glu Met Val Leu
                485                 490                 495

Arg Asp Ile Arg Arg Arg Cys Tyr Ala Glu Cys Gly Trp Ala Gly Leu
            500                 505                 510

Gln Asp Val Gln Thr Gly Glu Lys Gln Asp Arg Met Glu Ser Phe Phe
        515                 520                 525

Leu Gly Glu Thr Ala Lys Tyr Met Tyr Leu Leu Phe Asp Pro Asp His
    530                 535                 540

Pro Leu Asn Lys Leu Asp Ala Ala Tyr Val Phe Thr Thr Glu Gly His
545                 550                 555                 560

Pro Leu Ile Ile Pro Lys Ser Lys Arg Gly Ser Gly Ser His Asn Arg
                565                 570                 575

Gln Asp Arg Ala Arg Lys Ala Lys Lys Ser Arg Asp Val Ala Val Tyr
            580                 585                 590
```

```
Thr Tyr Tyr Asp Glu Ser Phe Thr Asn Ser Cys Pro Ala Pro Arg Pro
        595                 600                 605

Pro Ser Glu His His Leu Ile Gly Ser Ala Thr Ala Ala Arg Pro Asp
    610                 615                 620

Leu Phe Ser Val Ser Arg Phe Thr Asp Leu Tyr Arg Thr Pro Asn Val
625                 630                 635                 640

His Gly Pro Leu Glu Lys Val Glu Met Arg Asp Lys Lys Lys Gly Arg
                645                 650                 655

Val Val Arg Tyr Arg Ala Thr Ser Asn His Thr Ile Phe Pro Trp Thr
            660                 665                 670

Leu Pro Pro Ala Met Leu Pro Glu Asn Gly Thr Cys Ala Ala Pro Pro
        675                 680                 685

Glu Arg Ile Ile Ser Leu Ile Glu Phe Pro Ala Asn Asp Ile Thr Ser
    690                 695                 700

Gly Ile Thr Ser Arg Phe Gly Asn His Leu Ser Trp Gln Thr His Leu
705                 710                 715                 720

Gly Pro Thr Val Asn Ile Leu Glu Gly Leu Arg Leu Gln Leu Glu Gln
                725                 730                 735

Val Ser Asp Pro Ala Thr Gly Glu Asp Lys Trp Arg Ile Thr His Ile
            740                 745                 750

Gly Asn Thr Gln Leu Gly Arg His Glu Thr Val Phe Phe His Ala Glu
        755                 760                 765

His Val Arg His Leu Lys Asp Glu Val Phe Ser Cys Arg Arg Arg Arg
    770                 775                 780
```

```
Asp Ala Val Glu Ile Glu Leu Leu Val Asp Lys Pro Ser Asp Thr Asn
785                 790                 795                 800


Asn Asn Asn Thr Leu Ala Ser Ser Asp Asp Asp Val Val Val Asp Ala
                805                 810                 815


Lys Ala Glu Glu Gln Asp Gly Met Leu Ala Asp Asp Asp Gly Asp Thr
            820                 825                 830


Leu Asn Ala Glu Thr Leu Ser Ser Asn Ser Leu Phe Gln Ser Leu Leu
        835                 840                 845


Arg Ala Val Ser Ser Val Phe Glu Pro Val Tyr Thr Ala Ile Pro Glu
    850                 855                 860


Ser Asp Pro Ser Ala Gly Thr Ala Lys Val Tyr Ser Phe Asp Ala Tyr
865                 870                 875                 880


Thr Ser Thr Gly Pro Gly Ala Tyr Pro Met Pro Ser Ile Ser Asp Thr
                885                 890                 895


Pro Ile Pro Gly Asn Pro Phe Tyr Asn Phe Arg Asn Pro Ala Ser Asn
            900                 905                 910


Phe Pro Trp Ser Thr Val Phe Leu Ala Gly Gln Ala Cys Glu Gly Pro
        915                 920                 925


Leu Pro Ala Ser Ala Pro Arg Glu His Gln Val Ile Val Met Leu Arg
    930                 935                 940


Gly Gly Cys Ser Phe Ser Arg Lys Leu Asp Asn Ile Pro Ser Phe Ser
945                 950                 955                 960


Pro His Asp Arg Ala Leu Gln Leu Val Val Val Leu Asp Glu Pro Pro
                965                 970                 975
```

```
Pro Pro Pro Pro Pro Pro Pro Ala Asn Asp Arg Arg Asp Val Thr Arg
            980                 985                 990


Pro Leu Leu Asp Thr Glu Gln Thr  Thr Pro Lys Gly Met  Lys Arg Leu
        995                 1000                1005


His Gly  Ile Pro Met Val Leu  Val Arg Ala Ala Arg  Gly Asp Tyr
    1010                1015                1020


Glu Leu  Phe Gly His Ala Ile  Gly Val Gly Met Arg  Arg Lys Tyr
    1025                1030                1035


Arg Val  Glu Ser Gln Gly Leu  Val Val Glu Asn Ala  Val Val Leu
    1040                1045                1050


<210>  251
<211>  45
<212>  PRT
<213>  Trichoderma reesei

<400>  251

Met Met Pro Arg His His Ser Ser Gly Phe Ser Asn Gly Tyr Pro Arg
1               5                   10                  15


Ala Asp Thr Phe Glu Ile Ser Pro His Arg Phe Gln Pro Arg Ala Thr
            20                  25                  30


Leu Pro Pro His Arg Lys Arg Lys Arg Thr Ala Ile Arg
        35                  40                  45


<210>  252
<211>  16
<212>  PRT
<213>  Trichoderma reesei

<400>  252

Val Gly Ile Ala Val Val Val Ile Leu Val Leu Val Leu Trp Phe Gly
1               5                   10                  15
```

<210> 253
<211> 405
<212> PRT
<213> Trichoderma reesei

<400> 253

```
Gln Pro Arg Ser Val Ala Ser Leu Ile Ser Leu Gly Ile Leu Ser Gly
1               5                   10                  15


Tyr Asp Asp Leu Lys Leu Glu Thr Val Arg Tyr Tyr Asp Leu Ser Asn
            20                  25                  30


Val Gln Gly Thr Ala Arg Gly Trp Glu Arg Glu Glu Arg Ile Leu Leu
        35                  40                  45


Cys Val Pro Leu Arg Asp Ala Glu Gln His Leu Pro Met Phe Phe Ser
    50                  55                  60


His Leu Lys Asn Phe Thr Tyr Pro His Asn Leu Ile Asp Leu Ala Phe
65                  70                  75                  80


Leu Val Ser Asp Ser Lys Asp His Thr Leu Glu Ser Leu Thr Glu His
                85                  90                  95


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


Ile Ser Ile Ile Glu Lys Asp Phe Gly Gln Lys Val Asn Gln Asp Val
        115                 120                 125


Glu Ser Arg His Gly Phe Ala Ala Gln Ala Ser Arg Arg Lys Leu Met
    130                 135                 140


Ala Gln Ala Arg Asn Trp Leu Leu Ser Ala Ala Leu Arg Pro Tyr His
145                 150                 155                 160
```

```
Ser Trp Val Tyr Trp Arg Asp Val Asp Val Glu Thr Ala Pro Phe Thr
                165                 170                 175

Ile Leu Glu Asp Leu Met Arg His Asn Lys Asp Val Ile Val Pro Asn
            180                 185                 190

Val Trp Arg Pro Leu Pro Asp Trp Leu Gly Gly Glu Gln Pro Tyr Asp
        195                 200                 205

Leu Asn Ser Trp Gln Glu Ser Glu Thr Ala Leu Ala Leu Ala Asp Thr
    210                 215                 220

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

Trp Arg Pro His Leu Ala Tyr Leu Arg Asp Pro Tyr Gly Asp Pro Asp
                245                 250                 255

Met Glu Met Glu Ile Asp Gly Val Gly Gly Val Ser Ile Leu Ala Lys
            260                 265                 270

Ala Lys Val Phe Arg Ala Gly Val His Phe Pro Ala Phe Ser Phe Glu
        275                 280                 285

Lys His Ala Glu Thr Glu Gly Phe Gly Lys Met Ala Lys Arg Met His
    290                 295                 300

Phe Ser Val Val Gly Leu Pro His Tyr Thr Ile Trp His Leu Tyr Glu
305                 310                 315                 320

Pro Ser Val Asp Asp Ile Lys His Met Glu Glu Met Glu Arg Glu Arg
                325                 330                 335

Ile Ala Arg Glu Lys Glu Glu Glu Glu Arg Lys Lys Lys Glu Ala Gln
            340                 345                 350
```

```
Ile Lys Glu Glu Phe Gly Asp Ala Asn Ser Gln Trp Glu Gln Asp Lys
        355                 360                 365


Gln Gln Met Gln Asp Leu Lys Leu Gln Asp Arg Gly Gly Asp Lys Glu
    370                 375                 380


Ala Ala Ala Ala Gly Val Asn Gln Gly Ala Ala Ala Lys Ala Ala Gly
385                 390                 395                 400


Ala Met Glu Gly Gln
                405
```

<210> 254
<211> 31
<212> PRT
<213> Trichoderma reesei

<400> 254

```
Met Leu Leu Pro Lys Gly Gly Leu Asp Trp Arg Ser Ala Arg Ala Gln
1               5                   10                  15


Ile Pro Pro Thr Arg Ala Leu Trp Asn Ala Val Thr Arg Thr Arg
            20                  25                  30
```

<210> 255
<211> 15
<212> PRT
<213> Trichoderma reesei

<400> 255

```
Phe Ile Leu Leu Val Gly Ile Thr Gly Leu Ile Leu Leu Leu Trp
1               5                   10                  15
```

<210> 256
<211> 358
<212> PRT
<213> Trichoderma reesei

<400> 256

```
Arg Gly Val Ser Thr Ser Ala Ser Glu Met Gln Ser Phe Tyr Cys Trp
1               5                  10                  15

Gly Pro Ala Lys Pro Pro Met Glu Met Ser Pro Asn Glu His Asn Arg
            20                  25                  30

Trp Asn Gly His Leu Gln Thr Pro Val Ile Phe Asn His His Ala Pro
        35                  40                  45

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

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

Thr Pro Leu Lys Asp Ala Ala Pro Tyr Leu Ser Lys Tyr Phe Glu Leu
                85                  90                  95

Leu Ala Glu Leu Thr Tyr Pro His Arg Leu Ile Asp Leu Ala Phe Leu
            100                 105                 110

Val Ser Asp Ser Thr Asp Asp Thr Leu Ala Val Leu Ala Ser Glu Leu
        115                 120                 125

Asp Arg Ile Gln Lys Arg Pro Asp Gln Ile Pro Phe His Ser Ala Thr
    130                 135                 140

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

Arg His Ser Phe Glu Ala Gln Gly Pro Arg Arg Lys Ala Met Gly Arg
                165                 170                 175

Ala Arg Asn Tyr Leu Leu Tyr Thr Ala Leu Lys Pro Glu His Ser Trp
            180                 185                 190
```

```
Val Tyr Trp Arg Asp Val Asp Ile Val Asp Ser Pro Thr Gly Ile Leu
        195                 200                 205

Glu Asp Phe Ile Ala His Asp Arg Asp Ile Leu Val Pro Asn Ile Trp
    210                 215                 220

Phe His Arg Tyr Arg Asp Gly Val Asp Ile Glu Gly Arg Phe Asp Tyr
225                 230                 235                 240

Asn Ser Trp Val Glu Ser Asp Lys Gly Arg Lys Leu Ala Asn Ser Leu
                245                 250                 255

Asp Lys Asp Val Val Leu Ala Glu Gly Tyr Lys Gln Tyr Asp Thr Gly
            260                 265                 270

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

Glu Leu Glu Leu Asp Gly Ile Gly Gly Val Asn Ile Leu Val Lys Ala
    290                 295                 300

Asp Val His Arg Ser Gly Ile Asn Phe Pro Cys Tyr Ala Phe Glu Asn
305                 310                 315                 320

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

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

Glu Lys Gly Gly Asn Ala
        355
```

<210> 257
<211> 17

<212> PRT
<213> Trichoderma reesei

<400> 257

Met Ala Arg Pro Met Gly Ser Val Arg Leu Lys Lys Ala Asn Pro Ser
1 5 10 15

Thr

<210> 258
<211> 16
<212> PRT
<213> Trichoderma reesei

<400> 258

Leu Ile Leu Gly Ala Val Leu Cys Ile Phe Ile Ile Ile Phe Leu Val
1 5 10 15

<210> 259
<211> 339
<212> PRT
<213> Trichoderma reesei

<400> 259

Ser Pro Ser Ser Pro Ala Ser Ala Ser Arg Leu Ser Ile Val Ser Ala
1 5 10 15

Gln His His Leu Ser Pro Pro Thr Ser Pro Tyr Gln Ser Pro Arg Ser
20 25 30

Gly Ala Val Gln Gly Pro Pro Pro Val Thr Arg Tyr Asn Leu Asn Lys
35 40 45

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

Leu Thr Pro Met Ala Arg Phe Tyr Gln Glu Tyr Trp Asp Asn Leu Leu

```
65                  70                  75                  80

Arg Leu Asn Tyr Pro His Glu Leu Ile Thr Leu Gly Phe Ile Leu Pro
                85                  90                  95

Lys Thr Lys Glu Gly Asn Gln Ala Thr Ser Met Leu Gln Lys Gln Ile
            100                 105                 110

Gln Lys Thr Gln Asn Tyr Gly Pro Glu Lys Asp Arg Phe Lys Ser Ile
        115                 120                 125

Ile Ile Leu Arg Gln Asp Phe Asp Pro Ala Val Val Ser Gln Asp Glu
    130                 135                 140

Ser Glu Arg His Lys Leu Ala Asn Gln Lys Ala Arg Arg Glu Val Met
145                 150                 155                 160

Ala Lys Ala Arg Asn Ser Leu Leu Phe Thr Thr Leu Gly Pro Ser Thr
                165                 170                 175

Ser Trp Val Leu Trp Leu Asp Ala Asp Ile Thr Glu Thr Ala Pro Thr
            180                 185                 190

Leu Ile Gln Asp Leu Ala Ser His Asp Lys Pro Ile Ile Val Ala Asn
        195                 200                 205

Cys Phe Gln Lys Tyr Tyr Asp Pro Glu Ser Lys Lys Met Ala Glu Arg
    210                 215                 220

Pro Tyr Asp Phe Asn Ser Trp Gln Asp Ser Glu Thr Ala Leu Lys Met
225                 230                 235                 240

Ala Glu Gln Met Gly Pro Asp Asp Ile Leu Leu Glu Gly Tyr Ala Glu
                245                 250                 255

Met Ala Thr Tyr Arg Thr Leu Leu Ala Tyr Met Ser Thr Pro Gly Gly
```

260 265 270

Ser Lys Asp Leu Val Val Pro Leu Asp Gly Val Gly Gly Thr Ala Leu
275 280 285

Leu Val Lys Ala Asp Val His Arg Asp Gly Ala Met Phe Pro Pro Phe
290 295 300

Ala Phe Tyr His Leu Ile Glu Ser Glu Gly Phe Ala Lys Met Ala Lys
305 310 315 320

Arg Leu Gly Trp Gln Pro Tyr Gly Leu Pro Asn Tyr Lys Val Tyr His
325 330 335

Tyr Asn Glu

<210> 260
<211> 33
<212> PRT
<213> Trichoderma reesei

<400> 260

Met His Phe Ala Tyr Pro Ser Arg Lys Ser Ser Asn Pro Pro Pro Phe
1 5 10 15

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

Thr

<210> 261
<211> 15
<212> PRT
<213> Trichoderma reesei

<400> 261

```
Ile Gly Ile Val Leu Phe Leu Val Leu Ala Thr Leu Trp Phe Phe
1               5                   10                  15


<210>  262
<211>  262
<212>  PRT
<213>  Trichoderma reesei

<400>  262

Ser Asn Pro Arg Val Pro Arg Pro Asp Pro Glu Arg Val Pro Ser Gly
1               5                   10                  15


Arg Pro Pro Val Val Leu Val Thr Val Ile Asp Pro Thr Gln Tyr Pro
            20                  25                  30


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


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


Gln Gly Ala Pro Gln Ser Trp Ser Lys Leu Met Ala Met Arg His Ala
65                  70                  75                  80


Leu Thr Lys Phe Pro Glu Cys Arg Phe Val Trp Tyr Leu Asp Gln Asp
                85                  90                  95


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


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


Pro Asp Ser Ile Ile Lys Thr Phe Ser His Leu Arg Pro Asp Glu Val
    130                 135                 140
```

```
Asp Leu Ile Val Ser Gln Asp Ser Ser Gly Leu Val Ala Gly Ser Val
145                 150                 155                 160


Val Val Arg Asn Ser Gln Trp Ser Lys Phe Leu Leu Glu Thr Trp Met
                165                 170                 175


Asp Pro Leu Tyr Arg Ser Tyr Asn Phe Gln Lys Ala Glu Arg His Ala
            180                 185                 190


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


Leu Val Pro Gln Arg Thr Leu Gly Pro Tyr Thr Arg Thr Asp Gln Gly
    210                 215                 220


Asp Ala Tyr Gln Asp Gly Asp Phe Val Val Met Phe Thr Gly Cys Thr
225                 230                 235                 240


Lys Ser Gly Glu Gln Ser Cys Glu Thr Val Ser Ala Ser Tyr Tyr Gln
                245                 250                 255


Lys Trp Ser Ser Ser Leu
            260


<210>  263
<211>  119
<212>  PRT
<213>  Trichoderma reesei

<400>  263

Met Ser Leu Ser Arg Ser Pro Ser Pro Val Pro Gly Gly Gly Trp Ser
1               5                   10                  15


Ser Pro Gly Leu Asn Ile Asn Ser Gly Arg Ser Ser Pro Ser Asn Ala
            20                  25                  30


Ala Gly Ser Ser Val Ser Trp Glu Ser Ala Lys Met Arg Lys Gln Gly
```

35 40 45

Ala Asn Gly Tyr Pro Ser Phe Ser Thr Gln Asn Gln Gly Phe Phe Thr
50 55 60

Arg His Met Arg Arg Ile Ser Ser Ser Leu Pro Arg Phe Ala Ala Gly
65 70 75 80

Pro Gly Asn Thr Tyr Ala Glu Arg Glu Lys Tyr Glu Arg Gly Gly His
85 90 95

Ser Pro His Ala Gly Gly Gly Arg Leu Arg Ala Phe Leu Ala Arg Ile
100 105 110

Gly Arg Arg Leu Lys Trp Arg
115

<210> 264
<211> 16
<212> PRT
<213> Trichoderma reesei

<400> 264

Ile Leu Leu Pro Leu Ile Ile Ile Cys Thr Ile Val Ala Tyr Tyr Gly
1 5 10 15

<210> 265
<211> 324
<212> PRT
<213> Trichoderma reesei

<400> 265

Thr His Glu Ala Pro Gly Phe Val His Trp Trp Arg Arg Ile Ser Met
1 5 10 15

Gly Gly Gly Gly Glu Lys Phe Val Ile Ile Leu Gly Ala Asn Val Gly
20 25 30

```
Gly Gly Val Met Glu Trp Lys Gly Ala Arg Glu Trp Ala Ile Glu Arg
        35                  40                  45

Asp Ser Val Arg Asn Lys Arg Lys Tyr Ala Thr Arg Trp Gly Tyr Asp
    50                  55                  60

Leu Glu Ile Val Asp Met Lys Thr Lys Lys Arg Tyr Ala His Glu Trp
65                  70                  75                  80

Arg Glu Ser Trp Glu Lys Val Asp Phe Ile Arg Ala Ala Met Arg Lys
                85                  90                  95

Tyr Pro Lys Ala Glu Trp Phe Trp Trp Leu Asp Leu Asn Thr Tyr Val
            100                 105                 110

Met Glu Pro Ser Tyr Ser Leu Gln Arg His Leu Phe Asn His Leu Asp
        115                 120                 125

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

His Pro Pro Thr Glu Glu Tyr Leu Asp Ala Glu Ala Arg Ser Pro Val
145                 150                 155                 160

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

Ser Gly Phe Asn Leu Gly Ser Phe Phe Ile Arg Arg Ser Ala Trp Thr
            180                 185                 190

Glu Gln Leu Leu Asp Ile Trp Trp Asp Pro Val Leu Tyr Glu Gln Lys
        195                 200                 205

His Met Glu Trp Glu His Lys Glu Gln Asp Ala Leu Glu Gln Leu Tyr
    210                 215                 220
```

```
Arg Thr Gln Pro Trp Ile Arg Gln His Thr Gly Phe Leu Pro Gln Arg
225                 230                 235                 240

Leu Ile Asn Ser Phe Pro Pro Ala Ala Cys Ala Asp Glu Ser Gly Leu
                245                 250                 255

Asn Asn Thr Arg Ile His Tyr Asn Glu Lys Asp Arg Asp Phe Val Val
            260                 265                 270

Asn Met Ala Gly Cys Glu Trp Gly Arg Asp Cys Trp Gly Glu Met Tyr
        275                 280                 285

His Tyr Arg Glu Phe Ser Tyr Trp Leu Asn Arg Asn Pro Trp Glu Leu
    290                 295                 300

Phe Lys Glu Glu Ile Val Ala Val Ile Trp Tyr Lys Leu Thr Gly Gln
305                 310                 315                 320

Arg Val Lys Leu
```

<210> 266
<211> 40
<212> DNA
<213> Trichoderma reesei

<400> 266
agctccgtgg cgaaagcctg acgcaccggt agattcttgg 40

<210> 267
<211> 1000
<212> DNA
<213> Trichoderma reesei

<400> 267
gttgggctga ggccgtatcg gagggacggg gtgaggattg aggcggagga gatgaagggg 60

gatgatgggg agacggtggt tgttgtgcat aattatgggc atgcgggatg ggggtatcag 120

gggtcgtatg ggtgtgcgga gagggttgtc gagttggtgg aggggattgt gaggggatga 180

gcggatgttt ttgatgtttt gactgctcgc ctttgactcg attctgatac ggacactttt 240

cgacctttgt ttctccaaga tggccctgta cagtcagatt gatagaggag catgtataat 300

tcattgccgg ttgccgtccc gtttccaagc agaaagccac tgttgagaag caacgtgctt 360

tgacgaaagt cgtggctcac tactcaaatc tctccacact catacattgt gtttcagtca 420

aaacactttg gcaaccaaga cgtgggaggg agtatctgca tcttttctca tcggcaagct 480

atctgactcg attgagaaga tgcgtggttc atatcacctg gccgttggag gtttcttcct 540

aggcagtcgc tctgttctcc ttctataaag aactccatcg ttcttgaata cctctttggc 600

cttcaagctc gatagtattg aacccattct tcactcatgc tgctcatcat tccacctccc 660

tcaagttggg tgtcgttgag tacctagtgt acataagcgg gtctatgcat ttaaaggggt 720

atcttcacca ccagcaatat ccacacttct aggctccacg ttgcacataa cgaaaccaaa 780

acagctaaac cgacgggcca atttcacgcg catcttcatc gacgaagcga gcgacagcga 840

agccgatacg caaatcctct tcagacaagc tcaactcggc caagcctcat gttttgccaa 900

cggaaccctg cacaagtcgg ctggcattaa agaggaaagg agaacagaaa gagagtgagc 960

agatttcagt ctctcaccac tcacctgagt tgcctctctc 1000

<210> 268
<211> 1001
<212> DNA
<213> Trichoderma reesei

<400> 268
gggcagtatg ccggatggct ggcttataca ggcaaaaacc accttcttca ttcttcattc 60

ttcgtcttct tcttcttctt cctcctcatc gtcggtaggc ggcagctttc ccacattgga 120

gtcgctctcc tcgtcgctga gttcctcgac cgtcttttcg aattcctttg gcctggagtc 180

atcataatag tttaatacac gtttagagta tagagagaaa aaataagggg gaaaaagacg 240

caaatcatac cagtacggct gcttccgcca gagcttctcg tcgcgcacga ccttgataat 300

ctcgccaaag gccctgctgt cctgcgtgcc gacgggatat ccctcggcca ggacgtagcc 360

gccgcgcttg atccagacgg tgttgcgcag gcgctgggcg agctcgagga cgacgtgctt 420

cttgctgggc atctcgcagg tgtagaggtt gttgccctcg ggcttcagga cgcgcacaat 480

ggcctgcgtc ggctcgaggg catcgggagg cgtgagggcc tcttgtgtgg cggcaaggac 540

atttcgcttc ggcttaccca tggctgcgag tctttggggt cgattcggtg atactatctg 600

atcccaagaa aaaagagaca aaatttcatt gttgttgatt ggaaaataaa ctggggccgt 660

gatggagggg cagctttatc gataggacgg ggatttctcg aataggaaaa taaaacccct 720

ccgcccgtcc cgctctccgg cacggtgttg ccccattcgg cgaaaccgct tcagggacca 780

aactagaagt aaggtaccta tccataagct atcacgatga tatagaaggc atggatgtat 840

tgcaaaagcg aattgttaga cgccccaatg ggaggcttgg tggggttatc ggtttacgaa 900

atacttgaat caatgcatta ttaatctatc cattaggcat tttggcgttc accagaccgt 960

ttgactcacc gatatcgttc gtggtggtac tcggccagat g 1001

<210> 269
<211> 63
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 269
agatttcagt ctctcaccac tcacctgagt tgcctctctc ggtctgaagg acgtggaatg 60

atg 63

<210> 270
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 270
cagagccgct atcgccgagg aggttgccct tcttgcccat gttgagagaa gttgttggat 60

tgatca 66

<210> 271
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 271
agctccgtgg cgaaagcctg a 21

<210> 272
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 272
cagccgcagc ctcagcctct ctcagcctca tcagccgcgg ccgccaactt tgcgtccctt 60

gtgacg 66

<210> 273
<211> 76
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 273
gcaacgagag cagagcagca gtagtcgatg ctaggcggcc gcgggcagta tgccggatgg 60

ctggcttata caggca 76

<210> 274
<211> 76
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 274
tgcctgtata agccagccat ccggcatact gcccgcggcc gcctagcatc gactactgct 60

gctctgctct cgttgc 76

<210> 275
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 275
tgcgtcgccg tctcgctcct 20

<210> 276
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 276
ttaggcgacc tctttttcca 20

<210> 277
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 277
cgaggaagtc tcgtgaggat 20

<210> 278
<211> 19

<212> DNA
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cgctgcccat catccacgcg 20

<210> 427
<211> 20
<212> DNA
<213> Trichoderma reesei

<400> 427
tccacgtttg agctgcgtgt 20

<210> 428
<211> 20
<212> DNA
<213> Trichoderma reesei

<400> 428
atccccatcc accagaagcg 20

<210> 429
<211> 20
<212> DNA
<213> Trichoderma reesei

<400> 429
cgtcttcgac cgaatacaag 20

<210> 430
<211> 374

<212> PRT
<213> Trichoderma virens

<400> 430

```
Met Leu Asn Pro Arg Arg Ala Phe Ile Ala Ala Ala Phe Leu Leu Thr
1               5                  10                  15


Val Phe Phe Leu Ile Thr Arg Ser His Ser Ser Glu Pro Ser Pro Ala
            20                  25                  30


Thr Lys Thr Glu Ser Gln Asp Ala Gln Ala Glu Ala Gln Ala Ala Ala
        35                  40                  45


Asn Thr Gln Gln Arg Ile Leu Pro Pro Pro Pro Pro Gln Lys Pro Met
    50                  55                  60


Ile Asp Met Ser Gly Met Ser Thr Tyr Glu Lys Leu Ala Tyr Gln Tyr
65                  70                  75                  80


Glu Tyr Asp Ile Glu Ser Lys Phe Pro Ala Tyr Ile Trp Gln Thr Trp
                85                  90                  95


Lys His Thr Pro Gly Glu Gly Glu Phe Gln Phe Arg Glu Gln Glu Ala
            100                 105                 110


Ser Trp Ser Ile Glu His Pro Gly Phe Ile His Glu Val Ile Thr Asp
        115                 120                 125


Ser Val Ala Asp Thr Leu Leu Gln Leu Leu Tyr Gly Ser Ile Pro Glu
    130                 135                 140


Val Leu Glu Ala Tyr His Ala Leu Pro Leu Pro Val Leu Lys Ala Asp
145                 150                 155                 160


Leu Phe Arg Tyr Leu Ile Leu Tyr Ala Arg Gly Gly Ile Tyr Ser Asp
                165                 170                 175
```

```
Ile Asp Thr Tyr Ala Ile Arg Ser Ala Ile Glu Trp Ile Pro Ala Gln
            180                 185                 190

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

Asp Arg Pro Asp Trp Ala Asp Trp Tyr Ser Arg Arg Ile Gln Phe Cys
    210                 215                 220

Gln Trp Thr Ile Gln Ser Lys Pro Gly His Pro Val Leu Arg Asp Ile
225                 230                 235                 240

Ile Ser Arg Ile Thr Asn Ser Thr Leu Thr Met Lys Lys Glu Gly Lys
                245                 250                 255

Leu Ser Gln Phe Gln Gly Asn Arg Val Val Asp Leu Thr Gly Pro Ala
            260                 265                 270

Val Trp Thr Asp Thr Ile Met Asp Tyr Phe Asn Asp Glu Arg Tyr Phe
        275                 280                 285

Asp Met Ala Asn Ser Lys Gly Lys Ile Asp Tyr Arg Asn Phe Thr Gly
    290                 295                 300

Met Glu Thr Ser Lys Arg Val Gly Asp Val Val Val Leu Pro Ile Thr
305                 310                 315                 320

Ser Phe Ser Pro Gly Val Gly Gln Met Gly Ala Lys Asp Tyr Asp Asp
                325                 330                 335

Pro Met Ala Phe Val Lys His Asp Phe Glu Gly Thr Trp Lys Pro Glu
            340                 345                 350

Ser Glu Arg His Ile Gly Glu Val Gln Gln Glu Leu Gly Glu Gly Glu
        355                 360                 365
```

Glu Ala Pro Lys Gln Gln
    370

<210> 431
<211> 389
<212> PRT
<213> Trichoderma atroviride

<400> 431

Met Leu Asn Ser Arg Arg Ala Ile Val Ala Ala Val Phe Ile Leu Thr
1   5   10   15

Val Phe Phe Leu Leu Thr Arg Ser His Thr Thr Thr Pro Val Val Pro
            20   25   30

Ala Ala Lys Asn Ala Ala Thr Thr Ala Val Asp Thr Ser Lys Asn Asp
        35   40   45

Ala Pro Ala Ser Asn Gln Val Val Ser Pro Pro Pro Glu Glu Gln Lys
    50   55   60

Glu Met Glu Val Lys Glu Arg Arg Thr Arg Pro Arg Ile Asp Met Ser
65   70   75   80

Gly Met Ser Ile Gln Glu Lys Leu Glu Tyr Ala Tyr Pro Tyr Asp Val
                85   90   95

Ala Thr Lys Phe Pro Ala Tyr Ile Trp Gln Thr Trp Lys Gln Ser Pro
            100   105   110

Asp Gln Gly Asp Phe Gln Phe Lys Asp His His Ala Ser Trp Arg Glu
        115   120   125

Glu His Pro Gly Phe Val His Glu Val Ile Thr Asp Asp Val Ala Val
    130   135   140

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


Tyr Arg Ser Leu Pro Met Pro Val Leu Lys Ala Asp Phe Phe Arg Tyr
                165                 170                 175


Leu Ile Leu Phe Ala Arg Gly Gly Ile Tyr Ser Asp Ile Asp Thr Tyr
            180                 185                 190


Ala Ile Gln Ser Ser Val Lys Trp Leu Pro Glu Gln Ile Pro Arg Asp
        195                 200                 205


Thr Ile Gly Leu Val Ile Gly Ile Glu Ala Asp Pro Asp Arg Pro Asp
    210                 215                 220


Trp Ala Gln Trp Tyr Ser Arg Arg Ile Gln Phe Cys Gln Trp Thr Ile
225                 230                 235                 240


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


Thr Lys Lys Thr Leu Glu Leu Lys Asn Gln Gly Lys Leu Glu Lys Phe
            260                 265                 270


Ile Asp Arg Asn Val Val Glu Phe Thr Gly Pro Ala Val Trp Thr Asp
        275                 280                 285


Ala Ile Met Glu Tyr Phe Asn Asp Pro Arg Phe Phe Asp Met Ser Gln
    290                 295                 300


Ser Lys Gly Thr Ile Asp Tyr Lys Asn Phe Thr Gly Met Glu Thr Ser
305                 310                 315                 320


Lys Arg Val Gly Asp Val Val Val Leu Pro Ile Thr Ser Phe Ser Pro
                325                 330                 335
```

Gly Val Gly Gln Met Gly Ala Lys Glu Pro Asp Asp Pro Met Ala Phe
340 345 350

Val Lys His Asp Phe Glu Gly Thr Trp Lys Pro Glu Ser Glu Arg His
355 360 365

Met Gly Glu Gln Gln Gln Gln Glu Gly Gln Gln Ala Ala Gln Ala Pro
370 375 380

Gln Ala Pro Leu Gln
385

<210> 432
<211> 389
<212> PRT
<213> Fusarium oxysporum

<400> 432

Met Leu Asn Ser Arg Arg Ala Ile Val Ala Ala Val Phe Ile Leu Thr
1 5 10 15

Val Phe Phe Leu Leu Thr Arg Ser His Thr Thr Thr Pro Val Val Pro
20 25 30

Ala Ala Lys Asn Ala Ala Thr Thr Ala Val Asp Thr Ser Lys Asn Asp
35 40 45

Ala Pro Ala Ser Asn Gln Val Val Ser Pro Pro Pro Glu Glu Gln Lys
50 55 60

Glu Met Glu Val Lys Glu Arg Arg Thr Arg Pro Arg Ile Asp Met Ser
65 70 75 80

Gly Met Ser Ile Gln Glu Lys Leu Glu Tyr Ala Tyr Pro Tyr Asp Val
85 90 95

Ala Thr Lys Phe Pro Ala Tyr Ile Trp Gln Thr Trp Lys Gln Ser Pro

```
            100                 105                 110

Asp Gln Gly Asp Phe Gln Phe Lys Asp His His Ala Ser Trp Arg Glu
        115                 120                 125

Glu His Pro Gly Phe Val His Glu Val Ile Thr Asp Asp Val Ala Val
    130                 135                 140

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

Tyr Arg Ser Leu Pro Met Pro Val Leu Lys Ala Asp Phe Phe Arg Tyr
                165                 170                 175

Leu Ile Leu Phe Ala Arg Gly Gly Ile Tyr Ser Asp Ile Asp Thr Tyr
            180                 185                 190

Ala Ile Gln Ser Ser Val Lys Trp Leu Pro Glu Gln Ile Pro Arg Asp
        195                 200                 205

Thr Ile Gly Leu Val Ile Gly Ile Glu Ala Asp Pro Asp Arg Pro Asp
    210                 215                 220

Trp Ala Gln Trp Tyr Ser Arg Arg Ile Gln Phe Cys Gln Trp Thr Ile
225                 230                 235                 240

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

Thr Lys Lys Thr Leu Glu Leu Lys Asn Gln Gly Lys Leu Glu Lys Phe
            260                 265                 270

Ile Asp Arg Asn Val Val Glu Phe Thr Gly Pro Ala Val Trp Thr Asp
        275                 280                 285

Ala Ile Met Glu Tyr Phe Asn Asp Pro Arg Phe Phe Asp Met Ser Gln
```

290 295 300

Ser Lys Gly Thr Ile Asp Tyr Lys Asn Phe Thr Gly Met Glu Thr Ser
305 310 315 320

Lys Arg Val Gly Asp Val Val Val Leu Pro Ile Thr Ser Phe Ser Pro
325 330 335

Gly Val Gly Gln Met Gly Ala Lys Glu Pro Asp Asp Pro Met Ala Phe
340 345 350

Val Lys His Asp Phe Glu Gly Thr Trp Lys Pro Glu Ser Glu Arg His
355 360 365

Met Gly Glu Gln Gln Gln Gln Glu Gly Gln Gln Ala Ala Gln Ala Pro
370 375 380

Gln Ala Pro Leu Gln
385

<210> 433
<211> 414
<212> PRT
<213> Fusarium graminearum

<400> 433

Met Leu Asn Ser Arg Arg Ala Ile Val Ala Ala Val Phe Val Leu Thr
1 5 10 15

Val Phe Phe Leu Leu Thr Arg Ser His Ser Ser Thr Pro Val Val Pro
20 25 30

Ala Ala Gln Asn Ala Ala Ala Ala Ala Asp Thr Ser Lys Asn Asp Ala
35 40 45

Pro Ala Ser Asn Glu Ala Val Pro Pro Pro Pro Glu Lys Lys Glu Pro
50 55 60

```
Glu Met Glu Val Lys Glu Arg Arg Thr Arg Pro Arg Ile Asp Met Ser
65                  70                  75                  80

Gly Met Thr Thr Tyr Glu Lys Leu Glu Tyr Ala Tyr Pro Tyr Asp Val
                85                  90                  95

Thr Ser Lys Phe Pro Ala Tyr Ile Trp Gln Thr Trp Lys Gln Ser Pro
            100                 105                 110

Asp Gln Gly Asp Phe Gln Phe Lys Asp His His Gly Ser Trp Arg Glu
        115                 120                 125

Glu His Pro Gly Phe Val His Glu Val Val Thr Asp Asp Val Ala Val
    130                 135                 140

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

Tyr Arg Ser Leu Pro Met Pro Val Leu Lys Ala Asp Phe Phe Arg Tyr
                165                 170                 175

Leu Ile Leu Phe Ala Arg Gly Gly Ile Tyr Ser Asp Ile Asp Thr Tyr
            180                 185                 190

Ala Ile Gln Ser Ser Val Lys Trp Leu Pro Glu Gln Ile Ser Arg Asp
        195                 200                 205

Thr Ile Gly Leu Val Ile Gly Ile Glu Ala Asp Pro Asp Arg Pro Asp
    210                 215                 220

Trp Ala Gln Trp Tyr Ser Arg Arg Ile Gln Phe Cys Gln Trp Thr Ile
225                 230                 235                 240

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

```
Thr Lys Lys Thr Leu Asp Glu Lys Arg Lys Gly Thr Leu Glu Thr Phe
            260                 265                 270

Val Asp Arg Asn Val Val Glu Phe Thr Gly Pro Ala Val Trp Thr Asp
        275                 280                 285

Ala Ile Ile Asp Tyr Phe Asn Asp Gly Arg Phe Phe Asp Met Ser Gln
    290                 295                 300

Ser Lys Gly Thr Ile Asp Tyr Lys Asn Phe Thr Gly Met Glu Thr Ser
305                 310                 315                 320

Lys Arg Val Gly Asp Val Val Val Leu Pro Ile Thr Ser Phe Ser Pro
                325                 330                 335

Gly Val Gly Gln Met Gly Ser Lys Glu Pro Asp Asp Pro Met Ala Tyr
            340                 345                 350

Val Lys His Asp Phe Glu Gly Thr Trp Lys Pro Glu Ser Glu Arg His
        355                 360                 365

Met Gly Glu Gln Lys Gln Glu Glu Gly Gln Gln Ala Pro Leu Gln Gln
    370                 375                 380

Glu Gly Gln Pro Gln Gln Gly Gln Pro Gln Gln Gly Gln Pro Gln Gln
385                 390                 395                 400

Gly Gln Pro Gln Gln Gln Gln Gln Pro Pro Pro Ala Gln Gln
                405                 410
```

<210> 434
<211> 372
<212> PRT
<213> Neurospora crassa

<400> 434

```
Met Leu Thr Phe Arg Arg Ala Leu Val Ala Ala Ala Phe Phe Leu Thr
1               5                   10                  15

Ile Phe Tyr Leu Ile Ser Ser Ser Ser Ser Asn Pro Pro Ser Thr Thr
            20                  25                  30

Thr Pro Ala Val Pro Lys Thr Asp Ala Asp Val Glu Thr Ala Lys His
        35                  40                  45

Ala Ser Thr Thr Ala Val Thr Asp Lys Ser Ser Ser Gly Ala Asn Ala
    50                  55                  60

Ala Gln Gln Asn Pro Gln Gly Gln Arg Pro Ile Gln Asp Met Ser Arg
65                  70                  75                  80

Met Thr Leu Tyr Glu Lys Leu Ala Tyr Gln Phe Pro Tyr Asp Val Glu
                85                  90                  95

Ser Lys Phe Pro Ala Tyr Ile Trp Gln Thr Trp Lys Trp Thr Pro Ala
            100                 105                 110

His Gly Glu Phe Asn Phe Arg Asp Gln Glu Ala Thr Trp Thr Gln Gln
        115                 120                 125

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

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

Asn Ala Leu Pro Leu Pro Val Leu Lys Ala Asp Phe Phe Arg Tyr Leu
                165                 170                 175

Ile Leu Leu Ala Arg Gly Gly Ile Tyr Ser Asp Ile Asp Thr Tyr Ala
            180                 185                 190
```

```
Ile Arg Ser Ala Val Glu Trp Ile Pro Asp Ser Val Pro Lys Asp Ala
        195                 200                 205

Ile Gly Leu Val Ile Gly Ile Glu Ala Asp Pro Asp Arg Pro Asp Trp
    210                 215                 220

Lys Glu Trp Tyr Ser Arg Arg Ile Gln Phe Cys Gln Trp Thr Ile Gln
225                 230                 235                 240

Ser Lys Pro Gly His Pro Val Leu Arg Glu Val Val Ser Arg Ile Thr
                245                 250                 255

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

Asp Lys Asn Val Ile Glu Phe Thr Gly Pro Ala Leu Trp Thr Asp Val
        275                 280                 285

Ile Phe Glu Tyr Phe Asn Asp Gln Arg Tyr Phe Asp Met Thr His Ser
    290                 295                 300

Ala Gly Ser Ile Asp Trp Lys Asn Phe Thr Gly Met Glu Ala Ser Lys
305                 310                 315                 320

Arg Val Gly Asp Val Val Val Leu Pro Ile Thr Ser Phe Ser Pro Gly
                325                 330                 335

Val Gly Gln Met Gly Ala Lys Glu Tyr Asp Asp Pro Met Ala Phe Val
            340                 345                 350

Lys His Asp Phe Glu Gly Thr Trp Lys Pro Glu Ser Glu Arg His Ile
        355                 360                 365

Gly Glu Asn Lys
    370
```

<210> 435
<211> 474
<212> PRT
<213> Myceliophthora thermophila

<400> 435

```
Met Leu Ser Phe Arg Arg Ala Leu Val Ala Ala Ala Phe Phe Leu Thr
1               5                  10                  15


Ile Leu Phe Phe Thr Thr Arg Ser Thr Ser Pro Ala Ala Ser Ser Leu
            20                  25                  30


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


Ser Gln Ser Thr Thr Ser Thr Asp Thr Gly Asn Ala Val His Ala Gly
    50                  55                  60


Gly Asn Asp Arg Asp Arg Thr Pro Ser Asn Gly Gln Gln Pro Met His
65                  70                  75                  80


Asp Met Ser Lys Met Thr Leu His Glu Lys Leu Ala Tyr Gln Phe Pro
                85                  90                  95


Tyr Asp Val Glu Ser Lys Phe Pro Ala Tyr Ile Trp Gln Thr Trp Lys
            100                 105                 110


Trp Thr Pro Ala His Gly Glu Phe His Phe Arg Glu Gln Glu Ala Thr
        115                 120                 125


Trp Thr Glu Leu His Pro Gly Phe Ile His Glu Val Ile Thr Asp Gln
    130                 135                 140


Val Ala Val Tyr Leu Ile Arg Leu Leu Tyr Ala Ser Val Pro Glu Val
145                 150                 155                 160
```

```
Val Glu Ala Tyr Glu Ala Leu Pro Leu Ala Val Leu Lys Ala Asp Phe
                165                 170                 175

Phe Arg Tyr Leu Ile Leu Leu Ala Arg Gly Gly Ile Tyr Ser Asp Ile
            180                 185                 190

Asp Thr Tyr Ala Leu Arg Ser Ala Leu Glu Trp Ile Pro Asp Thr Val
        195                 200                 205

Pro Arg Asp Thr Val Gly Leu Val Ile Gly Ile Glu Ala Asp Pro Asp
    210                 215                 220

Arg Pro Asp Trp Asn Gln Trp Tyr Ser Arg Arg Ile Gln Phe Cys Gln
225                 230                 235                 240

Trp Thr Ile Gln Ala Lys Pro Gly His Pro Val Leu Arg Glu Val Val
                245                 250                 255

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

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

Trp Thr Asp Thr Ile Phe Glu Tyr Phe Asn Asp Pro Arg Tyr Phe Asp
    290                 295                 300

Leu Ser Gln Ser Pro Gly Pro Ile Asp Trp Arg Asn Phe Thr Gly Met
305                 310                 315                 320

Glu Asn Pro Arg Arg Val Gly Asp Ile Val Val Leu Pro Ile Thr Ser
                325                 330                 335

Phe Ser Pro Gly Val Gln Gln Met Gly Ala Lys Asp Tyr Asp Asp Pro
            340                 345                 350
```

Met Ala Phe Val Lys His Asp Phe Glu Gly Met Ser Pro Phe Pro Pro
        355   360   365

Leu Leu Ala Leu Phe Phe Leu Ala Pro Thr Cys Pro Ser Leu Thr Trp
    370   375   380

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

Ala Ser Ser Gly Thr Leu Pro Thr Leu Leu Ser Ile Phe Asp Asp Val
                405   410   415

Leu Ser Ala Ser Leu Gly Asp Asp Ala His Ser Leu Leu Ile Ser Phe
            420   425   430

Tyr Lys Pro Ala Trp Phe Gly Val Ile Met Val Val Lys His Cys Ile
        435   440   445

Ile Ser Gly Trp Leu Leu Glu Gly Arg Gly Arg Ile Glu Ser Val Gln
    450   455   460

Lys Thr Ala Val Cys Ser His Val Ser Leu
465   470

<210> 436
<211> 359
<212> PRT
<213> Aspergillus fumigatus

<400> 436

Met Leu Thr Phe Arg Lys Ser Leu Ile Val Ala Val Val Leu Ile Thr
1   5   10   15

Phe Val Val Leu Leu Arg Ser Ala His Ser Ser Pro Ser Ala Glu Pro
            20   25   30

Ala Val Leu Asn Thr Glu Thr Thr Ala His Asp Thr Ser Gln Ala Ala

```
        35                  40                  45

Asp Glu His Leu Thr Asp Gln Lys Gln Asp Ile Gln Gln Gln Pro Leu
    50                  55                  60

Lys Pro Pro Pro Thr Ala Pro Leu Arg Glu Arg Leu Arg Tyr Gln Phe
65                  70                  75                  80

Pro Tyr Asp Leu Glu Asn Arg Phe Pro Ala Tyr Ile Trp Gln Thr Trp
                85                  90                  95

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

Glu Ala Ser Trp Thr Glu Leu His Pro Gly Phe Val His Glu Val Ile
        115                 120                 125

Pro Asp Asp Thr Gln Arg His Leu Val Lys Tyr Leu Tyr Gly Ser Val
    130                 135                 140

Pro Glu Val Phe Glu Ala Tyr Asp Ser Met Pro Leu Pro Val Leu Lys
145                 150                 155                 160

Ala Asp Phe Phe Arg Tyr Leu Ile Leu Leu Ala Arg Gly Gly Ile Tyr
                165                 170                 175

Ser Asp Ile Asp Thr Tyr Ala Leu Lys Pro Ala Val Asp Trp Leu Pro
            180                 185                 190

Gly Glu Leu Asp Leu Ala Thr Val Gly Phe Val Ile Gly Ile Glu Ala
        195                 200                 205

Asp Pro Asp Arg Pro Asp Trp His Asp Trp Tyr Ser Arg Arg Ile Gln
    210                 215                 220

Phe Cys Gln Trp Thr Ile Gln Ala Lys Pro Gly His Pro Ile Leu Arg
```

225 230 235 240

Asp Ile Val Ala Tyr Ile Thr Glu Glu Ala Leu Arg Met Lys Lys Lys
245 250 255

Gly Ile Leu Lys Glu Gly Lys Met Asp Lys Thr Ile Val Glu Phe Thr
260 265 270

Gly Pro Ala Ala Trp Thr Asp Ala Val Phe Arg Tyr Phe Asn Asn Pro
275 280 285

Glu Tyr Phe Ser Ile Glu Pro Gly Ser Thr His Asn Val Thr Tyr Glu
290 295 300

Asp Phe Thr Asn Gln Arg Gly Tyr Lys Lys Val Gly Asp Val Val Val
305 310 315 320

Leu Pro Ile Thr Ser Phe Ser Pro Gly Val Gly Gln Met Gly Ala Gly
325 330 335

Asp Leu Asp Asp Pro Met Ala Phe Val Lys His Asp Phe Ser Gly Ser
340 345 350

Trp Lys Thr Asp Pro Ala Leu
355

<210> 437
<211> 362
<212> PRT
<213> Aspergillus niger

<400> 437

Met Leu Thr Phe Arg Lys Ser Leu Leu Ala Ala Ala Leu Leu Ile Thr
1 5 10 15

Phe Ile Val Tyr Leu Arg Ser Ser His Thr Ala Ser Ser Leu Pro Ser
20 25 30

```
Pro Asp Thr Ser Ser Ala Gly His Leu Tyr Asn Gln Asp Tyr Asp Gly
        35                  40                  45

His Ala Asp Asn Glu Arg Lys Gly Gly Thr Arg Asp Thr Val Gln Gln
    50                  55                  60

Leu Pro Leu Thr Pro Pro Pro Ser Ala Pro Leu Arg Asp Arg Leu Arg
65                  70                  75                  80

Tyr His Phe Pro Tyr Asp Leu Glu Ala Lys Phe Pro Ala Phe Ile Trp
                85                  90                  95

Gln Thr Trp Lys Tyr Ala Pro Ser Ser Met Phe Phe Ser Glu Ser Leu
            100                 105                 110

Arg Asp Pro Glu Ser Ser Trp Ser Glu Leu His Pro Gly Phe Val His
        115                 120                 125

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

Gly Ala Val Pro Asp Val Phe Glu Ala Tyr Asp Ala Met Pro Leu Pro
145                 150                 155                 160

Val Leu Lys Ala Asp Phe Phe Arg Tyr Leu Ile Leu Leu Ala Arg Gly
                165                 170                 175

Gly Ile Tyr Ser Asp Ile Asp Thr Thr Ala Leu Lys Pro Ala Ser Asp
            180                 185                 190

Trp Leu Pro Ala Glu Leu Asp Leu Ala Thr Val Gly Ala Val Val Gly
        195                 200                 205

Ile Glu Ala Asp Pro Asp Arg Pro Asp Trp His Asp Trp Tyr Ala Arg
    210                 215                 220
```

```
Arg Ile Gln Phe Cys Gln Trp Thr Ile Gln Ala Lys Pro Gly His Pro
225                 230                 235                 240


Ile Met Arg Asp Ile Val Ser Tyr Ile Thr Glu Glu Thr Leu Arg Met
                245                 250                 255


Lys Lys Ala Gly Ile Leu Lys Thr Gly Lys Met Asp Lys Thr Val Met
            260                 265                 270


Glu Tyr Thr Gly Pro Gly Ala Trp Thr Asp Ala Val Phe Arg Tyr Phe
        275                 280                 285


Asn Asp Pro Glu Tyr Phe Asn Ile Glu Pro Gly Ser Thr Leu Asn Ile
    290                 295                 300


Thr Tyr Glu Asp Phe Thr Gly Gln Glu Gly Tyr Lys Lys Val Gly Asp
305                 310                 315                 320


Val Val Val Leu Pro Ile Thr Ser Phe Ser Pro Gly Val His Gln Met
                325                 330                 335


Gly Ala Gly Asp Val Asp Asp Pro Met Ala Phe Val Lys His His Phe
            340                 345                 350


Glu Gly Thr Trp Lys Asp Asp Pro Ser Leu
        355                 360


<210>  438
<211>  363
<212>  PRT
<213>  Aspergillus oryzae

<400>  438

Met Leu Thr Tyr Arg Lys Ser Leu Ile Ala Ala Leu Phe Leu Ile Thr
1               5                   10                  15
```

```
Phe Val Val Leu Leu Arg Ser Ser His Ser Ala Ser Ser Pro Ser Pro
            20                  25                  30

Pro Ala Pro Ala His Leu Pro Asp Glu Val Ala Tyr Asn Thr Asn Glu
        35                  40                  45

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

Gln Gln Pro Leu Lys Pro Ser Pro Ser Ala Pro Leu Arg Glu Arg Leu
65                  70                  75                  80

Arg Tyr His Phe Pro Tyr Asp Leu Asp Lys Lys Phe Pro Ala Tyr Ile
                85                  90                  95

Trp Gln Thr Trp Lys Tyr Thr Pro Asp Ser Val Trp Phe Gly Gln Glu
            100                 105                 110

Leu Arg Gly Ala Glu Ala Ser Trp Thr Glu Leu His Pro Gly Phe Val
        115                 120                 125

His Gln Val Val Pro Asp Asp Thr Gln Gly Tyr Leu Ile Lys Tyr Leu
    130                 135                 140

Tyr Ser Ser Leu Pro Asp Val Phe Glu Ala Tyr Glu Ser Leu Pro Leu
145                 150                 155                 160

Pro Val Leu Lys Ala Asp Phe Phe Arg Tyr Leu Ile Leu Leu Ala Arg
                165                 170                 175

Gly Gly Ile Tyr Ser Asp Ile Asp Thr Ser Ala Leu Lys Pro Ala Ala
            180                 185                 190

Asp Trp Leu Pro Ser Thr Tyr Asp Leu Ser Thr Ile Gly Phe Val Val
        195                 200                 205
```

```
Gly Ile Glu Ala Asp Pro Asp Arg Pro Asp Trp His Glu Trp Tyr Ser
    210                 215                 220

Arg Arg Leu Gln Phe Cys Gln Trp Thr Ile Gln Ser Lys Pro Gly His
225                 230                 235                 240

Pro Ile Leu Arg Asp Ile Val Ala Tyr Ile Thr Glu Glu Thr Leu Arg
                245                 250                 255

Met Lys Lys Ala Gly Ile Leu Lys Val Gly Lys Met Asp Lys Thr Ile
            260                 265                 270

Val Glu Phe Thr Gly Pro Gly Ala Trp Thr Asp Ala Ile Phe Arg Tyr
        275                 280                 285

Phe Asn Asp Pro Asp Tyr Phe Asn Ile Glu Pro Asp Ser Asn His Asn
    290                 295                 300

Ile Thr Tyr Glu Asp Phe Ser Asn Gln Lys Asp Trp Arg Lys Val Gly
305                 310                 315                 320

Asp Val Val Val Leu Pro Ile Thr Ser Phe Ser Pro Gly Val Met Gln
                325                 330                 335

Met Gly Ala Gly Asp Tyr Asp Asp Pro Met Ala Phe Val Lys His Asp
            340                 345                 350

Phe Glu Gly Ser Trp Lys Thr Asp Pro Ser Leu
        355                 360
```

<210> 439
<211> 362
<212> PRT
<213> Aspergillus nidulans

<400> 439

```
Met Leu Thr Phe Arg Lys Ala Leu Ile Val Ala Ala Ile Phe Ile Thr
1               5                  10                  15

Leu Ile Leu Phe Leu Arg Ser Ser His Ser Gly Pro Glu Ser Ala Ala
            20                  25                  30

Ala Ala Ser Pro Glu Asp Ile Ala Tyr Glu Ile Ser Gln Glu Thr Lys
        35                  40                  45

Gly Lys Thr Ser Ser Glu Ser Ser Asp Ser Thr Gln Gln Gln Pro Leu
    50                  55                  60

Lys Gln Pro Pro Pro Pro Ala Thr Ala Pro Leu Arg Glu Arg Leu Arg
65                  70                  75                  80

Tyr His Phe Pro Tyr Asn Leu Glu Ala Lys Phe Pro Ala Tyr Ile Trp
                85                  90                  95

Gln Thr Trp Lys Tyr Thr Pro Ala Ser Val Trp Phe Ser Gln Asp Leu
            100                 105                 110

Arg Arg Pro Glu Ala Ser Trp Thr Glu Met Asn Pro Ser Phe Val His
        115                 120                 125

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

Gly Ser Ile Pro Glu Val Leu Glu Ala Phe Asn Ser Met Pro Ile Pro
145                 150                 155                 160

Val Met Lys Ala Asp Phe Phe Arg Tyr Leu Ile Leu Leu Ala Arg Gly
                165                 170                 175

Gly Val Tyr Ser Asp Ile Asp Thr Thr Ala Leu Lys Pro Val Val Asp
            180                 185                 190
```

```
Trp Leu Pro Asp Ser Leu Asp Leu Ser Thr Ile Gly Phe Val Val Gly
        195                 200                 205

Ile Glu Ala Asp Pro Asp Arg Pro Asp Trp His Asp Trp Tyr Ser Arg
    210                 215                 220

Arg Ile Gln Phe Cys Gln Trp Thr Ile Gln Ser Lys Pro Gly His Pro
225                 230                 235                 240

Ile Leu Leu Asp Ile Val Thr Tyr Ile Thr Gln Glu Ala Leu Arg Met
                245                 250                 255

Lys Lys Ala Gly Ile Leu Lys Lys Gly Lys Met Asp Lys Thr Ile Val
            260                 265                 270

Glu Phe Thr Gly Pro Ala Ala Trp Thr Asp Ala Val Phe Arg Tyr Phe
        275                 280                 285

Asn Asp Pro Glu Tyr Phe Tyr Val Glu Pro Gly Thr Thr Arg Asn Ile
    290                 295                 300

Thr Tyr Glu Asp Phe Thr Asn Gln Val Glu Tyr Gln Lys Val Gly Asp
305                 310                 315                 320

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

Gly Ala Gln Gly Ile Asp Asp Pro Met Ala Phe Val Lys His Asn Phe
            340                 345                 350

Gly Gly Thr Trp Lys Thr Asp Pro Ser Leu
        355                 360
```

<210> 440
<211> 360
<212> PRT
<213> Penicillium roqueforti

<400> 440

```
Met Ile Thr Pro Arg Lys Val Leu Leu Ala Leu Phe Cys Val Val Thr
1               5                  10                  15

Phe Val Leu Ile Leu Arg Ser Phe Arg Asp Pro Glu Val Pro Gly Ala
            20                  25                  30

Pro Gly Tyr Arg Pro Val Lys Lys Ile Ser Gln Glu Glu Asp Glu Ala
        35                  40                  45

Ile Ala Asn Leu Ala Arg Lys Ile Pro Pro Gln Gly Arg Ala Gln Leu
    50                  55                  60

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

Gln Phe Pro Tyr Glu Ile Glu Asn Arg Phe Pro Ala Tyr Ile Trp Gln
                85                  90                  95

Thr Trp Lys Tyr Ser Pro Gly Ser Phe Trp Phe Asp Glu Asp Leu Arg
            100                 105                 110

Gly Pro Glu Ala Ser Trp Thr Glu Met His Pro Gly Phe Thr His Glu
        115                 120                 125

Val Ile Pro Asp Asp Thr Gln Gln His Leu Ile Lys Tyr Leu Tyr Gly
    130                 135                 140

Ser Val Pro Glu Val Phe Glu Ala Tyr Asp Ser Leu Pro Leu Gly Val
145                 150                 155                 160

Met Lys Ala Asp Phe Phe Arg Tyr Leu Val Leu Leu Ala Arg Gly Gly
                165                 170                 175

Ile Tyr Ser Asp Ile Asp Thr Ser Ala Leu Lys Pro Ala His Thr Trp
```

```
            180                 185                 190

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

Glu Ala Asp Pro Asp Arg Asp Asp Trp His Asp Trp Tyr Ser Arg Arg
    210                 215                 220

Leu Gln Phe Cys Gln Trp Thr Phe Val Ser Lys Pro Gly His Pro Ile
225                 230                 235                 240

Leu Arg Asp Met Val Ala Tyr Ile Thr Glu His Ala Leu Arg Met Lys
                245                 250                 255

Lys Ala Gly Ile Leu Lys Val Gly Lys Met Asp Lys Thr Ile Met Glu
            260                 265                 270

Phe Thr Gly Pro Gly Ala Trp Thr Asp Ser Ile Phe Arg Tyr Phe Asn
        275                 280                 285

Asn Pro Ala Tyr Phe Asn Ile Gln Pro Gly Asp Lys Asn Ile Thr Tyr
    290                 295                 300

Glu Asp Phe Ser His Gln Thr Thr His Arg Lys Val Gly Asp Val Val
305                 310                 315                 320

Val Leu Pro Ile Thr Ser Phe Ser Pro Gly Val Gly Gln Met Gly Ala
                325                 330                 335

Gly Asp Thr Asp Asp Pro Met Ala Phe Val Lys His Asn Phe Gly Gly
            340                 345                 350

Thr Trp Lys Thr Asp Pro Ser Leu
        355                 360
```

<210> 441

<211> 360
<212> PRT
<213> Penicillium chrysogenum

<400> 441

```
Met Ile Thr Pro Arg Lys Val Leu Leu Ser Leu Leu Cys Val Val Thr
1               5                  10                  15


Phe Val Leu Ile Leu Arg Ser Phe Arg Asp Pro Glu Val Pro Gly Ala
            20                  25                  30


Pro Gly Tyr Arg Pro Val Lys Lys Ile Ser Gln Glu Glu Asp Glu Val
        35                  40                  45


Thr Ser Asn Leu Ala Arg Lys Thr Pro Pro Gln Gly Arg Ala Gln Leu
    50                  55                  60


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


Gln Phe Pro Tyr Gly Ile Glu Asn Lys Phe Pro Ala Tyr Ile Trp Gln
                85                  90                  95


Thr Trp Lys Tyr Asp Pro Gly Ser Phe Trp Phe Asp Glu Asp Leu Arg
            100                 105                 110


Gly Leu Glu Ala Ser Trp Thr Glu Met His Pro Gly Phe Thr His Glu
        115                 120                 125


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


Ser Val Pro Glu Val Phe Glu Ala Tyr Asp Ser Leu Pro Leu Ala Val
145                 150                 155                 160


Met Lys Ala Asp Phe Phe Arg Tyr Leu Val Leu Leu Ala Arg Gly Gly
                165                 170                 175
```

```
Ile Tyr Ser Asp Ile Asp Thr Leu Ala Leu Arg Pro Ala His Thr Trp
            180                 185                 190

Leu Pro Glu Glu Leu Asp Arg Ser Thr Ile Gly Leu Ile Val Gly Ile
        195                 200                 205

Glu Ala Asp Pro Asp Arg Asp Asp Trp His Asp Trp Tyr Ser Arg Arg
    210                 215                 220

Leu Gln Phe Cys Gln Trp Thr Leu Val Ser Lys Pro Gly His Pro Ile
225                 230                 235                 240

Leu Arg Asp Met Val Ala Tyr Val Thr Glu His Ala Leu Arg Met Lys
                245                 250                 255

Arg Ala Gly Ile Leu Lys Val Gly Lys Met Asp Lys Thr Ile Met Glu
            260                 265                 270

Phe Thr Gly Pro Gly Ala Trp Thr Asp Ser Val Phe Arg Tyr Phe Asn
        275                 280                 285

Asn Pro Ala Tyr Phe Asn Ile Gln Pro Gly Asp Lys Asn Ile Thr Tyr
    290                 295                 300

Glu Asp Phe Ser His Gln Thr Thr His Arg Lys Val Gly Asp Val Val
305                 310                 315                 320

Val Leu Pro Ile Thr Ser Phe Ser Pro Gly Val Gly Gln Met Gly Ala
                325                 330                 335

Gly Asp Pro Asp Asp Pro Met Ala Phe Val Lys His Asn Phe Gly Gly
            340                 345                 350

Thr Trp Lys Thr Asp Pro Ser Leu
        355                 360
```

<210> 442
<211> 347
<212> PRT
<213> Trichoderma virens

<400> 442

```
Met Leu Ala Thr Leu Ser Leu Ala Ser Pro Val Lys Asn Leu Arg Ala
1               5                   10                  15


Glu Pro Thr Asp Leu Pro Arg Leu Ile Val Tyr Phe Gln Thr Thr His
            20                  25                  30


Asp Gln Asn Asn Asn Pro Ile Ser Met Leu Pro Leu Ile Asn Glu Lys
        35                  40                  45


Gly Ile Ala Leu Thr His Leu Ile Val Cys Ser Phe His Ile Asn Gln
    50                  55                  60


Gly Gly Val Val His Leu Asn Asp Phe Pro Pro Asp Asp Pro His Phe
65                  70                  75                  80


Tyr Thr Leu Trp Asn Glu Thr Ile Thr Met Lys Gln Ala Gly Val Lys
                85                  90                  95


Val Met Gly Met Val Gly Gly Ala Ala Pro Gly Ser Phe Asn Ser Ala
            100                 105                 110


Thr Leu Asp Ser Thr Asn Ser Thr Thr Phe Glu His Tyr Tyr Gly Gln
        115                 120                 125


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


Val Glu Gln Pro Met Ser Gln Ala Gly Ile Thr Arg Leu Val Ala Arg
145                 150                 155                 160
```

```
Leu Arg Ala Asp Phe Gly Pro Asp Phe Leu Ile Thr Leu Ala Pro Val
                165                 170                 175

Ala Ser Ala Leu Glu Asn Ser Ser Asn Leu Ser Gly Phe Asn Tyr Asn
            180                 185                 190

Thr Leu Arg Thr Ala Gln Gly Ser Asn Ile Ala Trp Tyr Asn Thr Gln
        195                 200                 205

Phe Tyr Ser Gly Phe Gly Ser Met Gln Ser Thr Ser Asp Tyr Asp Arg
    210                 215                 220

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

Thr Thr Pro Glu Gly Ala Gly Trp Ile Pro Thr Ser Asn Leu Asn Thr
                245                 250                 255

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

Gly Trp Glu Tyr Phe Asn Ser Leu Pro Gly Gly Thr Ser Glu Pro Trp
        275                 280                 285

Glu Trp Ala Gln Ile Val Thr Glu Ile Leu Arg Pro Asn Leu Val Pro
    290                 295                 300

Asp Leu Arg Ile Thr Gln Glu Asp Ala Asp Arg Leu Gln Ser Ala Tyr
305                 310                 315                 320

Ala Ala Ser Val Lys Ala Thr Gly Lys Asp Lys Ser Phe Val Lys Lys
                325                 330                 335

Pro Ser Val Asp Tyr Asn Ala Met Val Asn Ala
            340                 345
```

<210> 443
<211> 362
<212> PRT
<213> Trichoderma atroviride

<400> 443

```
Met Lys Ser Ala Phe Val Phe Leu Ala Ser Met Leu Ala Thr Leu Ser
1               5                   10                  15


Leu Ala Ala Pro Val Gln Asp Val Ala Val Ala Arg Ser Glu Pro Thr
            20                  25                  30


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


Asn Asn Pro Ile Ser Met Leu Pro Leu Ile Asn Glu Lys Gly Ile Ala
    50                  55                  60


Leu Thr His Leu Ile Val Cys Ser Phe His Ile Asn Gln Gly Gly Val
65                  70                  75                  80


Ile His Leu Asn Asp Phe Pro Pro Asp Asp Pro His Phe Ala Thr Leu
                85                  90                  95


Trp Asn Glu Thr Val Ile Met Lys Gln Ala Gly Val Lys Ile Met Gly
            100                 105                 110


Met Val Gly Gly Ala Ala Ser Gly Ser Tyr Ser Thr Ser Thr Leu Asp
        115                 120                 125


Ser Ser Asn Ser Thr Thr Phe Glu His Tyr Tyr Gly Gln Leu His Asp
    130                 135                 140


Leu Ile Val Asn Phe Glu Leu Glu Gly Met Asp Leu Asp Val Glu Gln
145                 150                 155                 160
```

```
Pro Phe Ser Gln Ser Gly Val Asn Arg Leu Ile Ser Arg Leu Arg Ser
                165                 170                 175

Asp Phe Gly Pro Asp Phe Leu Ile Thr Leu Ala Pro Val Ala Thr Ala
            180                 185                 190

Leu Glu Asn Ser Ala Asn Leu Ser Gly Phe Asn Tyr Asn Gln Leu Gln
        195                 200                 205

Thr Asp Glu Gly Ser Ser Ile Asp Trp Tyr Asn Thr Gln Phe Tyr Ser
    210                 215                 220

Gly Phe Gly Thr Met Glu Ser Pro Asn Asp Phe Ile Asn Ile Val Asn
225                 230                 235                 240

Thr Gly Tyr Ser Pro Asp Ile Ile Val Ala Gly Gln Leu Thr Thr Pro
                245                 250                 255

Asn Asp Gly Gly Gly Trp Ile Pro Thr Ala Asp Leu Asn Asn Thr Ile
            260                 265                 270

Ile Thr Leu Asp Gln Thr Tyr Gly Gln Ile Gly Gly Val Met Gly Trp
        275                 280                 285

Glu Tyr Phe Asn Ser Leu Pro Gly Asp Thr Ser Ala Pro Trp Glu Trp
    290                 295                 300

Ala Gln Ile Val Thr Glu Ile Leu Arg Pro Gly Leu Thr Pro Glu Leu
305                 310                 315                 320

Lys Ile Thr Lys Gln Asp Ala Ala Arg Leu Gln Ala Ala Tyr Ala Thr
                325                 330                 335

Ser Val Ala Ala Asn Gly Gly Lys Asp Lys Ser Phe Ala Ala Lys Pro
            340                 345                 350
```

Ser Val Asn Tyr Ser Lys Trp Val Asn Ala
        355   360

<210> 444
<211> 406
<212> PRT
<213> Neurospora crassa

<400> 444

Met Arg Ser Thr Ile Phe Arg Ala Ala Thr Ala Leu Met Ala Ile Leu
1   5   10   15

Thr Pro Ile Ile Val Thr Ala Ala Asn Pro Leu Gln Ile Arg Thr His
            20   25   30

Ile Asn Gly His Thr Leu Ser Pro Arg Ala Thr Phe Ala Tyr Gly Gln
        35   40   45

Gly Asn Thr Thr Asp Val Ile Ile Arg Thr Glu Ile Pro Arg Leu Ile
    50   55   60

Ile Tyr Phe Gln Thr Thr His Asp Glu Ser Gly Lys Pro Ile Ser Met
65   70   75   80

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

Cys Ser Leu His Ile Gln Lys Asp Gly Asn Ile Thr Leu Asn Asp His
            100   105   110

Gln Pro Thr Asp Pro Arg Tyr Gly Thr Leu Trp Gln Glu Thr Gln Ile
        115   120   125

Leu Gly Tyr Ala Gly Val Lys Ile Met Gly Met Ile Gly Gly Ala Ala
    130   135   140

Ala Gly Ser Phe Thr Pro Asp Thr Leu Asp Ser Ala Asn Glu Thr Val

```
145                 150                 155                 160

Phe Asn Arg Tyr Tyr Gly Gln Leu His Glu Thr Ile Lys Arg Tyr Gly
                165                 170                 175

Leu Gln Gly Leu Asp Ile Asp Val Glu Gln Pro Met Ser Gln Gly Gly
            180                 185                 190

Ile Glu Arg Leu Ile Leu Arg Leu Arg Ala Asp Phe Gly Lys Asp Phe
        195                 200                 205

Ile Ile Thr Leu Ala Pro Val Ala Ser Ala Leu Thr Met Gly Gly Trp
    210                 215                 220

Asn Leu Ser Gly Phe Asp Tyr Arg Lys Leu Met Leu Ala Pro Ser Gly
225                 230                 235                 240

Ala Gly Lys Glu Val Ala Phe Tyr Asn Cys Gln Phe Tyr Ser Gly Phe
                245                 250                 255

Gly Asp Ala Gly Asn Pro Asn Gln Phe His Gln Ile Ile Thr Asp Asn
            260                 265                 270

Ala Gln Arg Asp Met Arg Gly Ala Leu Ser Pro Thr Lys Ile Val Ile
        275                 280                 285

Gly Gln Leu Thr Asn Pro Asn Asn Gly Gly Gly Phe Val Thr Ala Gly
    290                 295                 300

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

Gly Gly Val Ala Gly Trp Glu Tyr Phe Asn Gly Gln Pro Gly Gly Val
                325                 330                 335

Glu Glu Pro Trp Lys Trp Ala Gln Thr Met Thr Ala Ile Leu Arg Pro
```

340 345 350

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

Lys Asp Val Trp Lys Glu Ser Ala Ala Ala Gly Met Arg Gln Val Val
370 375 380

Gly Asn Val Lys Val Gln Leu Glu Gly Leu Glu Pro Thr Val Asp Tyr
385 390 395 400

Met Ala Met Val Asn Ala
405

<210> 445
<211> 346
<212> PRT
<213> Fusarium graminearum

<400> 445

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

Tyr Tyr Gln Thr His His Asp Ser Ser Gly Asn Leu Ile Ser Thr Leu
20 25 30

Pro Leu Ile Thr Gln Pro Gly Ile Ala Ile Thr His Val Ile Val Ala
35 40 45

Ala Ile His Ile Asn Glu Asp Pro Glu Lys Ile Ala Leu Asn Asp Tyr
50 55 60

His Pro Ser His Pro Ile Phe Gln Thr Met Trp Ala Glu Leu Arg Ile
65 70 75 80

Leu Gln Ala Ser Gly Val Lys Val Met Gly Met Leu Gly Gly Ala Cys
85 90 95

```
Lys Gly Ser Tyr Ala Arg Leu Asp Ala Asp Glu Asn Thr Phe Glu Arg
            100                 105                 110

Phe Tyr Cys Pro Val Arg Asp Met Ile Arg Glu Arg Ala Leu Asp Gly
        115                 120                 125

Leu Asp Leu Asp Val Glu Glu Val Met Ser Leu Gly Gly Ile Val Arg
    130                 135                 140

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

Leu Ala Pro Val Ala Met Ser Leu Ile Asp Phe Arg Arg Asn Leu Ser
                165                 170                 175

Gly Phe Asp Tyr Glu Ala Leu Glu Val Met Arg Gly Arg Asp Ile Ala
            180                 185                 190

Trp Tyr Asn Thr Gln Phe Tyr Cys Gly Trp Gly Asp Cys Ser Asn Pro
        195                 200                 205

Leu Met Tyr Asp Leu Met Val Gln Lys Gly Trp Pro Pro Glu Lys Ile
    210                 215                 220

Val Ile Gly Leu Leu Thr Asn Pro Glu Asn Gly His Gly Tyr Val Pro
225                 230                 235                 240

Phe Asn Pro Leu Gly Met Val Leu Thr Thr Leu Arg Gly Arg Tyr Gly
                245                 250                 255

Asn Phe Gly Gly Val Met Gly Trp Glu Tyr Phe Asn Gly Leu Pro Gly
            260                 265                 270

Gly Lys Glu Arg Pro Trp Glu Trp Ala Arg Glu Met Thr Glu Leu Leu
        275                 280                 285
```

```
Arg Gly His Ile Leu Ser Glu Pro Ala Gln Val Thr Gln Leu Thr Gln
    290                 295                 300

Gln Gln Gln Pro Val Pro Val Glu Ser Ala Pro Lys Lys Asn Glu Glu
305                 310                 315                 320

Val Asp Pro Asp Thr Pro Gly Gly Lys Asp Val Ala Leu Pro Lys Gln
                325                 330                 335

Phe Asp Tyr Tyr Thr Asp Gly Ser Asp Ala
            340                 345
```

<210> 446
<211> 358
<212> PRT
<213> Myceliophthora thermophila

<400> 446

```
Met Pro Pro Leu Pro Gln Pro Pro Ala Leu Pro Arg Val Ile Thr Tyr
1               5                   10                  15

Tyr Gln Thr His His Thr Pro Ser Gly Lys Pro Ile Ser Val Leu Pro
            20                  25                  30

Leu Leu Gln Gln Pro Gly Ile Gly Ile Thr His Val Ile Leu Ala Ala
        35                  40                  45

Ile His Ile Asn Glu Asp Pro Ala Gly Leu Thr Leu Asn Asp His Pro
    50                  55                  60

Pro Ser Asp Pro Arg Phe Thr Thr Leu Trp Ala Glu Met Arg Val Leu
65                  70                  75                  80

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

```
Gly Thr Tyr Ala Arg Leu Asp Leu Asn Gly Asn Gly Asn Gly Asn Gly
            100                 105                 110

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

Ala Glu Leu Ile Arg Glu Arg Gly Leu Asp Gly Leu Asp Leu Asp Val
    130                 135                 140

Glu Glu Pro Met Ser Leu Gly Gly Ile Val Arg Leu Ile Asp Arg Leu
145                 150                 155                 160

Arg Ala Asp Phe Gly Pro Asp Phe Leu Ile Thr Leu Ala Pro Val Ala
                165                 170                 175

Ser Ala Leu Leu Asp Pro Leu Arg Asn Leu Ser Gly Phe Asp Tyr Glu
            180                 185                 190

Ala Leu Glu Val Leu Arg Gly Arg Asp Ile Ala Trp Tyr Asn Ala Gln
        195                 200                 205

Phe Tyr Cys Gly Trp Gly Asp Cys Ser Asn Pro Val Met Tyr Glu Met
    210                 215                 220

Leu Leu Ala Lys Gly Trp Pro Pro Asp Lys Ile Val Val Gly Leu Leu
225                 230                 235                 240

Thr Asn Pro Asp Asn Gly Ser Gly Trp Val Pro Trp Asn Leu Leu Ser
                245                 250                 255

Gly Val Leu Pro Leu Leu Ala Gly Arg His Pro Arg Phe Gly Gly Val
            260                 265                 270

Met Gly Trp Glu Tyr Phe Asn Ser Leu Pro Gly Gly Lys Glu Arg Pro
        275                 280                 285
```

```
Trp Glu Trp Ala Gln Ala Met Thr Ala Leu Leu Lys Gly Arg Arg Ala
    290                 295                 300

Val Gln Ser Leu Glu Gly Leu Gln Gly Ser Glu Lys Pro Ala Glu Glu
305                 310                 315                 320

Lys Lys Thr Ser Glu Val Ser Pro Glu Ala Asp Pro Asp Glu Glu Gln
                325                 330                 335

Pro Gly Glu Ala Pro Pro Val Pro Ala Glu Phe Glu Tyr His Ser Asp
            340                 345                 350

Gly Gly Gly Glu Glu Glu
        355
```

<210> 447
<211> 305
<212> PRT
<213> Aspergillus nidulans

<400> 447

```
Met Pro Pro Ile Pro Pro Pro Ser Tyr Pro His Arg Ile Val Leu Tyr
1               5                   10                  15

His Gln Thr Leu His Pro Asp Arg Gly Pro Tyr Val Ser Met Leu Pro
            20                  25                  30

Leu Leu Asn Asn His Thr Gly Thr Thr His Val Ile Leu Ala Ala Phe
        35                  40                  45

His Leu Asn Ala Pro Asn Pro Asn His Ile Thr Leu Asn Asn Asp Pro
    50                  55                  60

Pro Asp Asn Pro Met Tyr Asp Arg Leu Trp Ala Glu Val Ser Ile Leu
65                  70                  75                  80
```

```
Gln Glu Ser Gly Ile Lys Val Met Gly Met Leu Gly Gly Ala Ala Pro
                85                  90                  95

Gly Thr Phe Thr Cys Leu Asp Gly Asp Glu Ala Gln Phe Glu Gln Tyr
            100                 105                 110

Tyr Gly Pro Leu Leu Asp Met Ile Arg Arg His Gly Leu Asp Gly Ile
        115                 120                 125

Asp Leu Asp Val Glu Glu Pro Met Ser Leu Ala Gly Ile Val Arg Leu
    130                 135                 140

Ile Asp Arg Leu Lys Ala Asp Leu Gly Glu Arg Phe Ile Ile Thr Leu
145                 150                 155                 160

Ala Pro Val Ala Ala Ala Leu Leu Gly Ile Gly Asn Leu Ser Gly Phe
                165                 170                 175

Asp Tyr Arg Leu Leu Glu Gln Gln Arg Ala Gly Ser Ile Ala Trp Tyr
            180                 185                 190

Asn Thr Gln Phe Tyr Asn Gly Trp Gly Pro Ala Asp Asp Pro Arg Met
        195                 200                 205

Tyr Ala Ala Ile Val Ala Gln Gly Trp Ser Pro Ala Arg Ile Val Tyr
    210                 215                 220

Gly Leu Leu Thr Asn Pro Gly Asn Gly Ser Gln Gly Tyr Val Pro Gln
225                 230                 235                 240

Glu Val Ile Gly Pro Val Leu Ala Thr Leu Val Glu Gln Phe Pro Asn
                245                 250                 255

Phe Gly Gly Val Met Gly Trp Glu Tyr Phe Asn Ser Met Pro Gly Arg
            260                 265                 270
```

Leu Glu Arg Pro Trp Glu Trp Ala Ala Gln Met Ser Leu Asn Met Gly
275 280 285

Leu Asn Lys Val Leu Arg Ile Ala Arg Glu Leu Leu Val Ser Arg Ser
290 295 300

Arg
305

<210> 448
<211> 322
<212> PRT
<213> Penicillium chrysogenum

<400> 448

Met Pro Pro Ile Arg Gly Gly Leu Gly Glu Arg Pro Arg Val Ile Leu
1 5 10 15

Tyr His Gln Thr Leu Ile Pro Gly Gly Gly Gln Tyr Val Ser Met Leu
20 25 30

Pro Leu Leu Glu Asn Asn Thr Gly Ile Thr His Leu Ile Leu Ala Ala
35 40 45

Phe His Leu Asn Gly Ala Pro Gly Asp Ile Thr Leu Asn Asp Asp Pro
50 55 60

Pro Asp Ser Ala Lys Phe Asp Pro Leu Trp Ala Glu Val Pro Val Met
65 70 75 80

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

Gly Ser Phe Thr Arg Leu Asp Gly Ser Arg Ala Glu Phe Glu Gln Phe
100 105 110

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

```
        115                 120                 125

Asp Leu Asp Val Glu Glu Ala Met Ser Leu Gln Gly Ile Ile Arg Leu
    130                 135                 140

Ile Asp Arg Leu Lys Ala Asp Met Gly Asp Ala Phe Ile Ile Thr Leu
145                 150                 155                 160

Ala Pro Val Ala Ala Ala Leu Leu Gly Ile Gly Asn Leu Ser Gly Phe
                165                 170                 175

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

Asn Ala Gln Phe Tyr Asn Gly Trp Gly Leu Ala Glu Asp Pro Arg Met
        195                 200                 205

Tyr Ala Ala Met Val Ser Gln Gly Trp Ser Pro Arg Arg Ile Val Tyr
    210                 215                 220

Gly Leu Leu Thr Asn Pro Gly Asn Gly Ser Gln Gly Tyr Val Ser Gln
225                 230                 235                 240

Glu Lys Ile Gly Pro Val Leu Ala Met Leu Val Glu Gln Phe Pro Asn
                245                 250                 255

Phe Gly Gly Val Met Gly Trp Glu Tyr Phe Asn Ala Leu Pro Gly Gly
            260                 265                 270

Thr Ala Lys Pro Trp Gln Trp Ala Ala Ala Met Ser Leu Ser Met Gly
        275                 280                 285

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

Met Ala Ser Thr Leu Asn Asn Leu Phe Gln Asp Met Leu Asn Gln Gly
```

305 310 315 320

His Gln

<210> 449
<211> 290
<212> PRT
<213> Apergillus fumigatus

<400> 449

Gly Pro Met Pro Pro Val Pro Gly Arg Pro Glu His Arg Arg Val Ile
1 5 10 15

Cys Tyr His Gln Thr Leu Cys Pro Asn Arg Gly Asp Tyr Val Ser Val
20 25 30

Leu Pro Leu Val Lys Asn Asn Thr Gly Val Thr His Ile Ile Ile Ala
35 40 45

Ala Phe His Leu Asn Glu Asp Pro Gly His Ile Thr Leu Asn Asp Asp
50 55 60

Pro Pro Asp His Glu Met Tyr Asn Pro Leu Trp Ala Glu Val Pro Val
65 70 75 80

Leu Lys Arg Ser Gly Val Lys Val Met Gly Met Leu Gly Gly Ala Ala
85 90 95

Gln Gly Ser Tyr Arg Cys Leu Asp Gly Asp Gln Glu Lys Phe Glu Arg
100 105 110

Tyr Tyr Gln Pro Leu Leu Ala Met Val Arg Arg His Gln Leu Asp Gly
115 120 125

Leu Asp Leu Asp Val Glu Glu Glu Met Ser Leu Pro Gly Ile Ile Arg
130 135 140

```
Leu Ile Asp Arg Leu Lys Leu Asp Leu Gly Asp Asp Phe Ile Ile Thr
145                 150                 155                 160

Leu Ala Pro Val Ala Ala Ala Leu Leu Gly Ile Gly Asn Leu Ser Gly
                165                 170                 175

Phe Asp Tyr Arg Gln Leu Glu Gln Gln Arg Gly Ser Lys Ile Ser Trp
            180                 185                 190

Tyr Asn Ala Gln Phe Tyr Asn Gly Trp Gly Leu Ala Glu Asp Pro Arg
        195                 200                 205

Met Tyr Ala Ala Ile Val Ala Gln Gly Trp Ser Pro Gln Arg Val Val
    210                 215                 220

Tyr Gly Leu Leu Thr Asn Pro Gly Asn Gly Ser Gln Gly Tyr Val Pro
225                 230                 235                 240

Arg Glu Arg Ile Gly Pro Val Leu Ala Val Leu Val Glu Gln Phe Pro
                245                 250                 255

Asn Phe Gly Gly Val Met Gly Trp Glu Tyr Phe Asn Ser Ile Pro Gly
            260                 265                 270

Glu Gln Gln Ser Pro Trp Gln Trp Ala Ala Glu Met Ser Leu Ser Met
        275                 280                 285

His Met
    290
```

<210> 450
<211> 339
<212> PRT
<213> Aspergillus oryzae

<400> 450

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

Glu Val Thr Asn Pro Ile Pro Asn Leu Arg Pro His Gln Ala Arg Lys
            20                  25                  30

Ile Val Ile Tyr Tyr Gln Thr Met Thr Val Ser Leu Lys Asp Leu Ala
        35                  40                  45

Val Ala Tyr Leu Ile Glu Ser Trp Leu Gln Met Glu Thr Leu Thr His
    50                  55                  60

Leu Ile Val Gly Cys Phe His Leu Gly Arg Asn Gly Tyr Leu His Leu
65                  70                  75                  80

Asn Asn His Thr Pro Asp His Glu Ser Phe Thr Glu Leu Trp Gln Asp
                85                  90                  95

Lys Gln Thr Leu Gln Gln Arg Gly Leu Lys Val Leu Ala Met Leu Gly
            100                 105                 110

Gly Ala Cys Pro Gly Ser Phe Ile Val Leu Asp Glu Asp Glu Ser Phe
        115                 120                 125

Gln Glu Cys Tyr Lys Thr Leu Tyr Asp Met Leu Val Lys Tyr Lys Phe
    130                 135                 140

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

Asn Arg Leu Val Asp Arg Leu Arg Ala Asp Phe Gly Pro Asn Phe Ile
                165                 170                 175

Ile Thr Leu Ala Pro Val Ala Thr Ala Leu Gln Gly Lys Ala His Leu
            180                 185                 190
```

```
Ser Gly Phe Asp Tyr Leu Arg Phe Glu Gly Glu Arg Gly Asp Lys Ile
        195                 200                 205

Asn Phe Tyr Asn Thr Gln Phe Tyr Asn Gly Trp Gly Ser Leu Glu Thr
    210                 215                 220

Thr Lys Asp Tyr Asp Ala Ile Met Ala Met Gly Phe Pro Pro Ser Arg
225                 230                 235                 240

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

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

Tyr Pro Tyr Leu Gly Gly Val Ala Gly Trp Glu Tyr Phe Asn Ser Asp
        275                 280                 285

Pro Gly Gly Gln Glu Met Pro Tyr Gln Trp Leu Ala Ile Val Ser Phe
    290                 295                 300

Ile Glu Thr Ser Val Tyr Leu Leu Gly Pro Asp His Arg Arg Leu Leu
305                 310                 315                 320

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

Leu Gly Gln
```

<210> 451
<211> 317
<212> PRT
<213> Aspergillus niger

<400> 451

```
Met Pro Pro Val Ser Pro Gln Pro Glu Arg Pro Arg Val Ile Leu Tyr
1               5                  10                  15

His Gln Thr Ile Cys Pro Asp Gly Gln Tyr Cys Ser Met Leu Pro Leu
            20                  25                  30

Leu Asp Asn Asn Thr Gly Val Thr His Ile Ile Leu Ala Ala Phe His
        35                  40                  45

Leu Asn Ala Asp Pro Gln His Ile Thr Leu Asn Asn Asp Pro Pro His
    50                  55                  60

Met Pro Leu Tyr Glu Pro Leu Trp Ala Glu Val Pro Ala Val Lys Gln
65                  70                  75                  80

Ser Gly Val Arg Val Met Gly Leu Leu Gly Gly Ala Ala Gln Gly Ser
                85                  90                  95

Phe Arg Cys Leu Asp Gly Asn Glu Glu Lys Phe Glu Leu Tyr Tyr Gln
            100                 105                 110

Pro Leu Arg Asp Met Val Arg Arg His Gln Leu Asp Gly Leu Asp Leu
        115                 120                 125

Asp Val Glu Glu Glu Met Ser Leu Ser Gly Ile Ile Arg Leu Ile Asp
    130                 135                 140

Arg Leu Lys Leu Asp Met Gly Asp Asp Phe Ile Ile Thr Leu Ala Pro
145                 150                 155                 160

Val Ala Ala Ala Met Leu Gly Met Gly Asn Leu Ser Gly Phe Asp Tyr
                165                 170                 175

Arg Glu Leu Glu Arg Gln Arg Ala Ser Lys Ile Ser Trp Tyr Asn Thr
            180                 185                 190
```

```
Gln Phe Tyr Asn Gly Trp Gly Asn Pro Glu Asp Pro Arg Met Tyr Ala
        195                 200                 205

Ala Met Val Ala Gln Gly Trp Ala Pro Asn Arg Val Val Tyr Gly Leu
    210                 215                 220

Leu Thr Asn Pro Gly Asn Gly Ser Gln Gly Tyr Val Pro Leu Glu Lys
225                 230                 235                 240

Ile Gly Pro Ile Leu Gly Leu Leu Val Glu Arg Phe Pro Asn Phe Gly
                245                 250                 255

Gly Val Met Gly Trp Glu Tyr Phe Asn Ser Lys Pro Gly Asp Arg Asp
            260                 265                 270

Ala Pro Trp Gln Trp Ala Ala Ala Met Ser Leu Ser Met His Met Lys
        275                 280                 285

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

Ser Leu Met Asn Leu Leu Arg Asp Met Met Gln Gln Arg
305                 310                 315
```

<210> 452
<211> 540
<212> PRT
<213> Rhizopus microsporus

<400> 452

```
Met Leu Ala Arg Thr Phe Leu Gly Met Ala Ile Ser Ala Phe Leu Ala
1               5                   10                  15

Ser Thr Gly Val Gln Ala Ala Trp Ser Ser Asn Gly Pro Asn Val Met
            20                  25                  30

Tyr Tyr Trp Gly Gln Asn Ser Ala Gly Gly Ser Asn Thr Gln Ala Ser
```

```
        35                  40                  45

Leu Gly Thr Tyr Cys Glu Ser Gly Gln Val Asp Ala Val Leu Leu Ser
    50                  55                  60

Phe Leu His Val Phe Asn Val Gly Gly Thr Pro Glu Ile Asn Leu Ser
65                  70                  75                  80

Ser Ala Cys Ala Gly Thr Tyr Phe Pro Asn Thr Gln Leu Leu Ser Cys
                85                  90                  95

Pro Ala Val Gly Ala Asp Ile Lys Lys Cys Gln Asp Lys Gly Val Lys
            100                 105                 110

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

Asp Ala Gln Gly Gln Gln Phe Ala Gln Thr Ile Trp Asn Leu Phe Gly
    130                 135                 140

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

Val Asp Leu Asp Ile Glu Gly Gly Ala Ser Thr Gly Tyr Ala Ala Phe
                165                 170                 175

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

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

Ser Ala Ser Phe Asp Tyr Val Asn Val Gln Phe Tyr Asn Asn Tyr Cys
    210                 215                 220

Ser Ala Thr Gly Ser Ser Phe Asn Phe Asp Thr Trp Asp Asn Trp Ala
```

```
225                 230                 235                 240

Lys Thr Thr Ser Pro Asn Lys Asn Val Lys Ile Met Phe Thr Ile Pro
                245                 250                 255

Gly Ser Pro Thr Ala Ala Gly Ser Gly Tyr Val Pro Met Ser Thr Leu
            260                 265                 270

Gln Thr Ile Val Pro Ser Leu Ala Ser Glu Tyr Ser Ser Tyr Gly Gly
        275                 280                 285

Val Ser Val Trp Asp Ala Ser Gln Ala Trp Asn Asn Gly Asp Phe Ser
    290                 295                 300

Ser Gln Leu Tyr Ser Leu Val His Ser Gly Gly Ser Thr Pro Pro Pro
305                 310                 315                 320

Ser Ser Ser Thr Ile Lys Thr Thr Thr Lys Ala Thr Thr Thr Ser Thr
                325                 330                 335

Lys Thr Thr Thr Thr Ala Ala Pro Thr Ala Thr Ser Ala Pro Gly Ser
            340                 345                 350

Cys Pro Val Ala Asn Gln Ser Cys Ser Thr Gln Asn Gln Tyr Ala Cys
        355                 360                 365

Thr Ala Asp Gly Lys Tyr Ala Val Cys Asp His Gly Lys Trp Val Val
    370                 375                 380

Ser Ser Cys Pro Ser Gly Thr Val Cys Ile Pro Thr Thr Asp Gly Thr
385                 390                 395                 400

Ser Ile Tyr Cys Gly Tyr Ala Thr Gly Ser Gly Ser Thr Cys Pro Ser
                405                 410                 415

Ala Ser Ala Leu Glu Ile Ala Ala Ala Ser Phe Gly Ser Lys Asn Gly
```

```
            420                 425                 430

Pro Val Pro Arg Pro Tyr Lys Ala Ser Lys Val Ala Ala Gln Leu Ala
        435                 440                 445

Val Thr Ser Thr Asp Lys Asn Ser Phe Glu Ala Val Ile Asn Ala Arg
    450                 455                 460

Arg Thr Thr Leu Thr Pro Phe Glu Lys Ser Val Thr Ile Glu Phe Thr
465                 470                 475                 480

Thr Pro Ser Asn Ile Lys Phe Thr Glu Ser Asp Met Gly Pro Val Arg
                485                 490                 495

Gln Val Gly Asn Lys Val Arg Ile Gln Ala Lys Asn Asp Tyr Asn Glu
            500                 505                 510

Ser Met Thr Leu Val Val Lys Val Lys Gly Ser Ile Asn Ser Gly Val
        515                 520                 525

Phe Val Ala Pro Ser Thr Ser Ala Trp Lys Phe Lys
    530                 535                 540


<210>  453
<211>  493
<212>  PRT
<213>  Rhizopus niveus

<400>  453

Met Ile Ser Cys Asn Ile Leu Gly Ile Thr Ile Ala Ala Phe Ile Thr
1               5                   10                  15

Ser Thr Leu Ala Ala Tyr Ser Ser Asn Gly Val Asn Val Met Tyr Tyr
            20                  25                  30

Trp Gly Gln Asn Ser Ala Gly Gly Ser Asn Thr Gln Gly Ser Leu Val
        35                  40                  45
```

```
Ser Tyr Cys Gln Ser Gly Gln Val Asp Val Ile Ile Leu Ser Phe Leu
    50                  55                  60

Asn Lys Phe Asn Met Gly Gly Leu Pro Glu Ile Asn Leu Ala Ser Ala
65                  70                  75                  80

Cys Glu Gln Thr Phe Phe Pro Asn Thr Asn Leu Leu His Cys Pro Thr
                85                  90                  95

Val Gly Ser Asp Ile Lys Thr Cys Gln Ser Asn Gly Val Lys Val Leu
            100                 105                 110

Leu Ser Leu Gly Gly Ala Ala Gly Ser Tyr Gly Phe Ser Ser Asp Ser
        115                 120                 125

Glu Gly Gln Thr Phe Ala Glu Thr Ile Trp Asn Leu Phe Gly Gly Gly
    130                 135                 140

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

Leu Asp Ile Glu Gly Gly Ser Ser Thr Gly Tyr Ala Ala Phe Val Thr
                165                 170                 175

Ala Leu Arg Ser Lys Gly His Phe Leu Ile Gly Ala Ala Pro Gln Cys
            180                 185                 190

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

Asp Phe Val Asn Val Gln Phe Tyr Asn Asn Val Cys Ser Val Ala Ser
    210                 215                 220

Gly Ser Ser Phe Asn Phe Asp Val Trp Asn Asp Trp Ala Lys Asn Lys
225                 230                 235                 240
```

```
Ser Pro Asn Lys Asn Ile Lys Val Met Leu Thr Val Pro Gly Ser Ser
                245                 250                 255

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

Val Ser Ser Val Ile Ser Gln Tyr Ser Ser Phe Gly Gly Val Ser Val
        275                 280                 285

Trp Asp Ala Ser Gln Ala Trp Asn Asn Asn Gly Phe His Ser Glu Leu
    290                 295                 300

Tyr Ser Ile Val His Gly Ser Ser Ala Ala Leu Gly Gln Ala Ala Arg
305                 310                 315                 320

Lys Thr Pro Phe Pro Asn Thr Ser Ser Ile Thr Thr Thr Ser Leu Ala
                325                 330                 335

Thr Ala Ser Ser Ala Leu Phe Pro Leu Leu Tyr Ala Gly Arg Ser Cys
            340                 345                 350

Ser Ser Gln Ser Lys Val Ser Cys Thr Ser Thr Gly Ser Tyr Thr Ile
        355                 360                 365

Cys Asn Tyr Gly Lys Trp Val Thr Ala Pro Cys Pro Pro Gly Val Ile
    370                 375                 380

Cys Leu Ser Ser Ala Gln Ser Asn Asn Thr Asp Leu Thr Val Ser Ala
385                 390                 395                 400

Gln Phe Phe Ile Thr Ser Phe Ala Gly Gly Ser Phe Lys Ala Ile Ile
                405                 410                 415

Asn Ala Arg Arg Thr Thr Leu Thr Pro Phe Glu Lys Met Lys Thr Ile
            420                 425                 430
```

```
Glu Phe Thr Val Pro Asp His Val Arg Leu Ser Gln Cys Asn Leu Gly
        435                 440                 445


Lys Ile Glu Gln Val Gly Arg Ser Val Arg Ile Arg Leu Lys Asp His
    450                 455                 460


Pro Asn Met Ala Phe Val Leu Asn Leu Ser Gly Asn Val Ser Ser Asp
465                 470                 475                 480


Ala Phe Val Ala Pro Asp Pro Ser Ser Trp Arg Phe Ser
                485                 490


<210>  454
<211>  549
<212>  PRT
<213>  Mucor circinelloides

<400>  454

Met Leu Leu Arg Phe Ile Gly Ile Thr Ala Ala Ala Leu Leu Ser Ser
1               5                   10                  15


Cys Gly Val Gln Ala Ala Phe Ser Ser Ser Ser Pro Asn Val Met Tyr
            20                  25                  30


Tyr Trp Gly Gln Asn Ser Ala Gly Gly Ser Ser Thr Gln Gly Ser Leu
        35                  40                  45


Ala Ser Tyr Cys Asn Ser Gly Gln Ala Asp Val Val Leu Leu Ser Phe
    50                  55                  60


Leu His Ile Phe Asn Val Gly Gly Leu Pro Gly Ile Asn Leu Ser Ser
65                  70                  75                  80


Ala Cys Glu Thr Thr Phe Pro Gly Thr Ser Leu Leu Thr Cys Pro Ala
                85                  90                  95
```

```
Ile Gly Asn Asp Ile Lys Thr Cys Gln Ser Lys Gly Val Lys Ile Ile
            100                 105                 110

Leu Ser Leu Gly Gly Ala Ala Gly Ser Tyr Gly Phe Thr Ser Asp Ala
        115                 120                 125

Gln Gly Gln Thr Phe Ala Gln Thr Ile Trp Asp Met Phe Gly Gly Gly
    130                 135                 140

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

Leu Asp Ile Glu Gly Gly Pro Ser Thr Gly Tyr Ile Ala Phe Val Asn
                165                 170                 175

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

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

Gly Leu Asp Phe Val Asn Val Gln Phe Tyr Asn Asn Tyr Cys Ser Ala
    210                 215                 220

Val Gly Asn Ser Phe Asn Tyr Asp Thr Trp Ala Asn Trp Ala Lys Thr
225                 230                 235                 240

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

Pro Thr Ala Ala Gly Ser Gly Tyr Ala Pro Ile Ser Thr Ile Gln Thr
            260                 265                 270

Ile Val Pro Gln Leu Ala Ser Gln Tyr Pro Gly Ile Phe Gly Gly Val
        275                 280                 285
```

```
Ser Val Trp Asp Ala Ser Gln Ala Trp Asn Asn Ala Gln Phe Ala Ser
    290                 295                 300

Gln Leu Tyr Ser Leu Val Lys Gly Ser Gly Gly Gly Gly Val Thr Thr
305                 310                 315                 320

Thr Lys Thr Thr Thr Thr Thr Thr Ala Thr Ser Thr Gln Ser Thr Pro
                325                 330                 335

Asn Ser Ser Ser Ser Ser Thr Lys Thr Ser Thr Ser Thr Ser Ser Ser
            340                 345                 350

Ala Thr Ala Thr Ala Thr Ser Thr Pro Gly Thr Cys Ala Ala Ala Gly
        355                 360                 365

Gln Ala Cys Ser Thr Glu Gly Lys Tyr Val Cys Thr Ser Gly Gly Ala
    370                 375                 380

Tyr Ala Val Cys Leu Tyr Gly Lys Trp Ser Val Thr Ser Cys Pro Ser
385                 390                 395                 400

Asn Thr Gln Cys Ile Pro Thr Thr Asp Gly Ala Ser Ile Tyr Cys Gly
                405                 410                 415

Tyr Ser Asn Gly Ser Thr Thr Cys Ser Ala Leu Ser Ala Arg Asp Ile
            420                 425                 430

Leu His Ala Thr Leu Asn Lys Gly Gly Ala Val Pro Lys Pro Tyr Lys
        435                 440                 445

Ala Ser Gln Val Gln Ala Gln Phe Val Val Ala Ser Ala Ser Ala Asp
    450                 455                 460

Ala Phe Lys Ala Val Ile Asn Ala His Arg Thr Asn Thr Lys Pro Phe
465                 470                 475                 480
```

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


Ser Ser Ala Asp Ala Gly Thr Val Arg Gln Val Gly Asn Ser Val Arg
            500                 505                 510


Ile Gln Ala Lys Ser Asp Phe Asp Lys Asn Met Ala Ile Val Val Ala
        515                 520                 525


Val Gln Gly Ser Val Lys Ser Gly Val Phe Val Ala Pro Asn Pro Ser
    530                 535                 540


Ser Leu Arg Ile Lys
545
```

<210> 455
<211> 2418
<212> DNA
<213> Trypanosoma congolense

<400> 455

```
atgtatcgga agttggccgt catctcggcc ttcttggcca cagctcgtgc taaggaaatc       60

ctcagcctga acagcggcca cttcctcgac gtcgtcgact acggcggcgg cattctccga      120

gccgccgtca agcctcgcaa ggactggttc tacgaggtcg acagcgtcgt cgtcaagaac      180

cccgtcgccg gcgagatcca gcccaagtgc gaaggcacca gctgcaccgt caccagcgag      240

aactgcgccc tcagcaccgt cgtggacgac cagaagatcc agctcagcta cgcctgcggc      300

ggcctccgac tcgcttctgt cgaggtccct caggaccgcc tcgaggaacc cagcctcacc      360

atgcgcttcc ccaaggccca ccgcctctac ggcatccccg agcacagcat ggacctgccc      420

ctcaaggaca acgccaccta cgagatgttc aacaccgacg ccttccagta caagatcaac      480

aaccccgagc ccctctacgg ctcgatcccg ttcctcctgg cccacagcaa ggaagtcagc      540

accggcatcc tgttcctcaa cagcgccggc atgaacgtca aggtcctcac cgagaacggc      600

ctcggctgcc agtgggatgc tgaggcgggc ctggtcgacc tgttcttctt ccctggcccc      660
```

```
acccctgccc tcgtccagca gcagcatgcc agcatcaccg gccctaccgc cctgcccccc      720

tacttcagcc tcggctttca ccagtgccgc tggaactacc gcagcaccga ggacagcctc      780

agcgtcgacc acggcttcga ccagcacaac ctgccctacg acaccctctg gctcgacatc      840

gagcacaccg acaacaagaa gtacttcacc tgggacaagg acaccttccc cgaccccaag      900

gtcctcgtca aggccctcgc cgcttctggc cgcaagctcg tcaccatcaa ggacccccac      960

gtcaaggtcg agagcggcta ctacgtctac gacgaggcca tgagcggcaa ccacttcgtc     1020

aagaacgccg acgacgagga accctacgtc ggccagtgct ggcctggccg atctagctgg     1080

cccgacttct acaacaagcg cacccgcgac tggtacgcca ccctcttcca ccacgaccgc     1140

tacgagggcg gcagccacga cgtccatacc tgggtcgaca tgaacgagcc cagcgtcttt     1200

gaggcccccg acaagaccct ccgacgcgac gcccgacata ccagcgacag cggcaacgtc     1260

gtcgaccaca agttcatcca caacatctac agcctctaca ccgtcatggc cgcccaccag     1320

ggccacatcg agagcagcaa gggcctcaac cacgtcaagc gccccttttat cctgacccgc     1380

agcttcttca gcggcagcca gcgctacgcc gccatgtgga ccggcgacaa catggcccga     1440

tgggaccacc tccagaacag cttccccgag ctgctcagcc tcagcatcag caactacgtc     1500

tttatcggcg ccgacgctgg cggcttcttc ttcgacccct ccgaagaact cttcgtccgc     1560

tggatccagg ccagcgtctt ttaccccttc atgcgcaccc actcccacat cgagacaaag     1620

cgccgcgagc cctgggtcta tggcgacgcc gccaccgacc gaattcgagc cgccctcgcc     1680

ctccgctaca gcctcatccc ctacatctac acccagatgt ttatcgccca ccgcaccggc     1740

agcaccatca tgcgcccccc gttctacgag ttcccccacg aggaacagtt ctacgacgag     1800

cagtacacct ttatgttcgg ccccagcctc ctcgtcagcc ccgtcgtcaa ggaaggcgag     1860

acagagaagc agatccccat ccccagcggc agcaagtggt acagctacac caccggcgag     1920

gtcgtccccc ctggcaacca ccacatgaag gtcgacatgg acaccatccc catgttcctc     1980

cgaggcggcc acatcatccc cgtcaagctc cgcatccgcc gagccaccct cgccatgaag     2040

cacgacccct acaccctcta cgtcgccctc aacgagaagg gcaactctgc cggcgagctg     2100
```

ttcatcgacg acggcgagag cttcgactac gagagcggcg cctacatcta ccgctacctc 2160

accttcagcg acggcaagct caccaaccgc gcccacccga acagcaccgc cagcagcctc 2220

ttcaccgcca agaacaaggt cgagcgcatc gtcatcttcg gctacgaggg caagcccagc 2280

gtcgccatgg tcgaggtcgt cacccagagc atcaaggtcg gcaaggaaat cgagtacgac 2340

gtcaagggcg gcgccctcgt cctgaagaac cccggcctcc acatcggcga ggactgggtc 2400

atcgtcctca agaagtga 2418

<210> 456
<211> 805
<212> PRT
<213> Trypanosoma congolense

<400> 456

Met Tyr Arg Lys Leu Ala Val Ile Ser Ala Phe Leu Ala Thr Ala Arg
1 5 10 15

Ala Lys Glu Ile Leu Ser Leu Asn Ser Gly His Phe Leu Asp Val Val
20 25 30

Asp Tyr Gly Gly Gly Ile Leu Arg Ala Ala Val Lys Pro Arg Lys Asp
35 40 45

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

Glu Ile Gln Pro Lys Cys Glu Gly Thr Ser Cys Thr Val Thr Ser Glu
65 70 75 80

Asn Cys Ala Leu Ser Thr Val Val Asp Asp Gln Lys Ile Gln Leu Ser
85 90 95

Tyr Ala Cys Gly Gly Leu Arg Leu Ala Ser Val Glu Val Pro Gln Asp
100 105 110

```
Arg Leu Glu Glu Pro Ser Leu Thr Met Arg Phe Pro Lys Ala His Arg
        115                 120                 125

Leu Tyr Gly Ile Pro Glu His Ser Met Asp Leu Pro Leu Lys Asp Asn
    130                 135                 140

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

Asn Pro Glu Pro Leu Tyr Gly Ser Ile Pro Phe Leu Leu Ala His Ser
                165                 170                 175

Lys Glu Val Ser Thr Gly Ile Leu Phe Leu Asn Ser Ala Gly Met Asn
            180                 185                 190

Val Lys Val Leu Thr Glu Asn Gly Leu Gly Cys Gln Trp Asp Ala Glu
        195                 200                 205

Ala Gly Leu Val Asp Leu Phe Phe Phe Pro Gly Pro Thr Pro Ala Leu
    210                 215                 220

Val Gln Gln Gln His Ala Ser Ile Thr Gly Pro Thr Ala Leu Pro Pro
225                 230                 235                 240

Tyr Phe Ser Leu Gly Phe His Gln Cys Arg Trp Asn Tyr Arg Ser Thr
                245                 250                 255

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

Tyr Asp Thr Leu Trp Leu Asp Ile Glu His Thr Asp Asn Lys Lys Tyr
        275                 280                 285

Phe Thr Trp Asp Lys Asp Thr Phe Pro Asp Pro Lys Val Leu Val Lys
    290                 295                 300
```

```
Ala Leu Ala Ala Ser Gly Arg Lys Leu Val Thr Ile Lys Asp Pro His
305                 310                 315                 320

Val Lys Val Glu Ser Gly Tyr Tyr Val Tyr Asp Glu Ala Met Ser Gly
                325                 330                 335

Asn His Phe Val Lys Asn Ala Asp Asp Glu Glu Pro Tyr Val Gly Gln
            340                 345                 350

Cys Trp Pro Gly Arg Ser Ser Trp Pro Asp Phe Tyr Asn Lys Arg Thr
        355                 360                 365

Arg Asp Trp Tyr Ala Thr Leu Phe His His Asp Arg Tyr Glu Gly Gly
    370                 375                 380

Ser His Asp Val His Thr Trp Val Asp Met Asn Glu Pro Ser Val Phe
385                 390                 395                 400

Glu Ala Pro Asp Lys Thr Leu Arg Arg Asp Ala Arg His Thr Ser Asp
                405                 410                 415

Ser Gly Asn Val Val Asp His Lys Phe Ile His Asn Ile Tyr Ser Leu
            420                 425                 430

Tyr Thr Val Met Ala Ala His Gln Gly His Ile Glu Ser Ser Lys Gly
        435                 440                 445

Leu Asn His Val Lys Arg Pro Phe Ile Leu Thr Arg Ser Phe Phe Ser
    450                 455                 460

Gly Ser Gln Arg Tyr Ala Ala Met Trp Thr Gly Asp Asn Met Ala Arg
465                 470                 475                 480

Trp Asp His Leu Gln Asn Ser Phe Pro Glu Leu Leu Ser Leu Ser Ile
                485                 490                 495
```

```
Ser Asn Tyr Val Phe Ile Gly Ala Asp Ala Gly Gly Phe Phe Phe Asp
            500                 505                 510

Pro Ser Glu Glu Leu Phe Val Arg Trp Ile Gln Ala Ser Val Phe Tyr
        515                 520                 525

Pro Phe Met Arg Thr His Ser His Ile Glu Thr Lys Arg Arg Glu Pro
    530                 535                 540

Trp Val Tyr Gly Asp Ala Ala Thr Asp Arg Ile Arg Ala Ala Leu Ala
545                 550                 555                 560

Leu Arg Tyr Ser Leu Ile Pro Tyr Ile Tyr Thr Gln Met Phe Ile Ala
                565                 570                 575

His Arg Thr Gly Ser Thr Ile Met Arg Pro Leu Phe Tyr Glu Phe Pro
            580                 585                 590

His Glu Glu Gln Phe Tyr Asp Glu Gln Tyr Thr Phe Met Phe Gly Pro
        595                 600                 605

Ser Leu Leu Val Ser Pro Val Val Lys Glu Gly Glu Thr Glu Lys Gln
    610                 615                 620

Ile Pro Ile Pro Ser Gly Ser Lys Trp Tyr Ser Tyr Thr Thr Gly Glu
625                 630                 635                 640

Val Val Pro Pro Gly Asn His His Met Lys Val Asp Met Asp Thr Ile
                645                 650                 655

Pro Met Phe Leu Arg Gly Gly His Ile Ile Pro Val Lys Leu Arg Ile
            660                 665                 670

Arg Arg Ala Thr Leu Ala Met Lys His Asp Pro Tyr Thr Leu Tyr Val
        675                 680                 685
```

```
Ala Leu Asn Glu Lys Gly Asn Ser Ala Gly Glu Leu Phe Ile Asp Asp
    690                 695                 700


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


Thr Phe Ser Asp Gly Lys Leu Thr Asn Arg Ala His Pro Asn Ser Thr
                725                 730                 735


Ala Ser Ser Leu Phe Thr Ala Lys Asn Lys Val Glu Arg Ile Val Ile
            740                 745                 750


Phe Gly Tyr Glu Gly Lys Pro Ser Val Ala Met Val Glu Val Val Thr
        755                 760                 765


Gln Ser Ile Lys Val Gly Lys Glu Ile Glu Tyr Asp Val Lys Gly Gly
    770                 775                 780


Ala Leu Val Leu Lys Asn Pro Gly Leu His Ile Gly Glu Asp Trp Val
785                 790                 795                 800


Ile Val Leu Lys Lys
                805
```

<210> 457
<211> 961
<212> PRT
<213> Aspergillus niger

<400> 457

```
Met Ser Asn Arg Trp Thr Leu Leu Leu Ser Leu Val Ile Leu Leu Gly
1               5                   10                  15


Cys Leu Val Ile Pro Gly Val Thr Val Lys His Glu Asn Phe Lys Thr
            20                  25                  30
```

```
Cys Ser Gln Ser Gly Phe Cys Lys Arg Asn Arg Ala Phe Ala Asp Asp
        35                  40                  45

Ala Ala Ala Gln Gly Ser Ser Trp Ala Ser Pro Tyr Glu Leu Asp Ser
    50                  55                  60

Ser Ser Ile Gln Phe Lys Asp Gly Gln Leu His Gly Thr Ile Leu Lys
65                  70                  75                  80

Ser Val Ser Pro Asn Glu Lys Val Lys Leu Pro Leu Val Val Ser Phe
                85                  90                  95

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

Asn Gly Asp Ile Gln Leu Arg His Asp Ser Lys Ala Arg Lys Glu Arg
        115                 120                 125

Tyr Asn Glu Ala Glu Lys Trp Val Leu Val Gly Gly Leu Glu Leu Ser
    130                 135                 140

Lys Thr Ala Thr Leu Arg Pro Glu Thr Glu Ser Gly Phe Thr Arg Val
145                 150                 155                 160

Leu Tyr Gly Pro Asp Asn Gln Phe Glu Ala Val Ile Arg His Ala Pro
                165                 170                 175

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

Asn Lys Gly Tyr Leu Asn Met Glu His Trp Arg Pro Lys Val Glu Val
        195                 200                 205

Glu Gly Glu Gly Glu Gln Gln Thr Gln Glu Asp Glu Ser Thr Trp Trp
    210                 215                 220
```

```
Asp Glu Ser Phe Gly Gly Asn Thr Asp Thr Lys Pro Arg Gly Pro Glu
225                 230                 235                 240


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


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


Glu Gly Asn His Glu Glu Pro Tyr Arg Met Tyr Asn Ala Asp Val Phe
        275                 280                 285


Glu Tyr Glu Leu Ser Ser Pro Met Thr Leu Tyr Gly Ala Ile Pro Phe
    290                 295                 300


Met Gln Ala His Arg Lys Asp Ser Thr Val Gly Val Phe Trp Leu Asn
305                 310                 315                 320


Ala Ala Glu Thr Trp Val Asp Ile Val Lys Ser Thr Ser Ser Pro Asn
                325                 330                 335


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


Phe Ser Glu Ser Gly Gln Leu Asp Val Phe Val Phe Leu Gly Pro Thr
        355                 360                 365


Pro Gln Glu Ile Ser Lys Thr Tyr Gly Glu Leu Thr Gly Tyr Thr Gln
    370                 375                 380


Leu Pro Gln His Phe Ala Ile Ala Tyr His Gln Cys Arg Trp Asn Tyr
385                 390                 395                 400


Ile Thr Asp Glu Asp Val Lys Glu Val Asp Arg Asn Phe Asp Lys Tyr
                405                 410                 415
```

```
Gln Ile Pro Tyr Asp Val Ile Trp Leu Asp Ile Glu Tyr Thr Asp Asp
            420                 425                 430

Arg Lys Tyr Phe Thr Trp Asp Pro Leu Ser Phe Pro Asp Pro Ile Ser
        435                 440                 445

Met Glu Glu Gln Leu Asp Glu Ser Glu Arg Lys Leu Val Val Ile Ile
    450                 455                 460

Asp Pro His Ile Lys Asn Gln Asp Lys Tyr Ser Ile Val Gln Glu Met
465                 470                 475                 480

Lys Ser Lys Asp Leu Ala Thr Lys Asn Lys Asp Gly Glu Ile Tyr Asp
                485                 490                 495

Gly Trp Cys Trp Pro Gly Ser Ser His Trp Ile Asp Thr Phe Asn Pro
            500                 505                 510

Ala Ala Ile Lys Trp Trp Val Ser Leu Phe Lys Phe Asp Lys Phe Lys
        515                 520                 525

Gly Thr Leu Ser Asn Val Phe Ile Trp Asn Asp Met Asn Glu Pro Ser
    530                 535                 540

Val Phe Asn Gly Pro Glu Thr Thr Met Pro Lys Asp Asn Leu His His
545                 550                 555                 560

Gly Asn Trp Glu His Arg Asp Ile His Asn Val His Gly Ile Thr Leu
                565                 570                 575

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

Arg Arg Pro Phe Ile Leu Thr Arg Ser Tyr Tyr Ala Gly Ala Gln Arg
        595                 600                 605
```

```
Met Ser Ala Met Trp Thr Gly Asp Asn Gln Ala Thr Trp Glu His Leu
    610                 615                 620

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

Phe Ala Gly Ala Asp Val Gly Gly Phe Phe Gln Asn Pro Ser Lys Glu
                645                 650                 655

Leu Leu Thr Arg Trp Tyr Gln Ala Gly Ile Trp Tyr Pro Phe Phe Arg
            660                 665                 670

Ala His Ala His Ile Asp Thr Arg Arg Arg Glu Pro Tyr Leu Ile Ala
        675                 680                 685

Glu Pro His Arg Ser Ile Ile Ser Gln Ala Ile Arg Leu Arg Tyr Gln
    690                 695                 700

Leu Leu Pro Ala Trp Tyr Thr Ala Phe His Glu Ala Ser Val Asn Gly
705                 710                 715                 720

Met Pro Ile Val Arg Pro Gln Tyr Tyr Ala His Pro Trp Asp Glu Ala
                725                 730                 735

Gly Phe Ala Ile Asp Asp Gln Leu Tyr Leu Gly Ser Thr Gly Leu Leu
            740                 745                 750

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

Ala Asp Asp Glu Lys Tyr Tyr Asp Tyr Phe Asp Tyr Thr Val Tyr Gln
    770                 775                 780

Gly Ala Gly Lys Arg His Thr Val Pro Ala Pro Met Glu Thr Val Pro
785                 790                 795                 800
```

Leu Leu Met Gln Gly Gly His Val Ile Pro Arg Lys Asp Arg Pro Arg
805 810 815

Arg Ser Ser Ala Leu Met Arg Trp Asp Pro Tyr Thr Leu Val Val Val
820 825 830

Leu Asp Lys Asn Gly Gln Ala Asp Gly Ser Leu Tyr Val Asp Asp Gly
835 840 845

Glu Thr Phe Asp Tyr Lys Arg Gly Ala Tyr Ile His Arg Arg Phe Arg
850 855 860

Phe Gln Glu Ser Ala Leu Val Ser Glu Asp Val Gly Thr Lys Gly Pro
865 870 875 880

Lys Thr Ala Glu Tyr Leu Lys Thr Met Ala Asn Val Arg Val Glu Arg
885 890 895

Val Val Val Val Asp Pro Pro Lys Glu Trp Gln Gly Lys Thr Ser Val
900 905 910

Thr Val Ile Glu Asp Gly Ala Ser Ala Ala Ser Thr Ala Ser Met Gln
915 920 925

Tyr His Ser Gln Pro Asp Gly Lys Ala Ala Tyr Ala Val Val Lys Asn
930 935 940

Pro Asn Val Gly Ile Gly Lys Thr Trp Arg Ile Glu Phe His Asp Glu
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Leu

<210> 458
<211> 3004
<212> DNA
<213> Aspergillus niger

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atgacgcata gtcaccgtga aacacgagaa cttcaagaca tgttctcaat cgggcttctg 180

taagcggaac agagcattcg ccgacgatgc tgccgcccaa ggttcctcct gggcctcccc 240

atacgaactc gactcatcct ccatccagtt caaggatggc caattgcacg gaaccattct 300

caagtccgtc tcccccaacg agaaagtcaa gctgcctctc gttgtctcct tcctcgagtc 360

cggcgccgcc cgagttgttg tcgatgagga aaagcgcatg aacggtgaca tccagcttcg 420

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tggcctggag ttgagcaaaa ccgcgacctt gagacctgaa accgagtctg gctttaccag 540

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cgacttcaag agggatggcc aaacccacgt tcaattgaac aacaagggct accttaacat 660

ggagcattgg cgccctaagg tagaggtcga aggcgagggc gagcagcaaa cccaggaaga 720

tgaaagcact tggtgggatg agagctttgg tggaaacacg gacaccaagc ccaggggtcc 780

cgagagtgtg ggattggata tcaccttccc tggctacaag catgtttttg gaattcctga 840

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tgcagagacc tgggtggaca ttgtcaagtc tacctcatct cctaaccctc ttgctctcgg 1140

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<213> Aspergillus niger

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ttatatacct acttaggctg aggcggtgct acacgcaacc attctatccc aacttgcatc 180

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<210> 460
<211> 1961
<212> DNA
<213> Trichoderma reesei

<400> 460
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agcccgctgc tcccaaggac tcgggtaagg acgagctgtg a 1961

<210> 461
<211> 1000
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 461
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aattcagatc gcagataaca aaatgctacc agcatctgtc tagttgtgga gatatgaagg 180

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<210> 463
<211> 857
<212> PRT
<213> Leishmania major

<400> 463

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            20                  25                  30


Thr Lys Thr Ala Ser Pro Pro Ala Lys Val Ile Leu Leu Pro Lys Thr
        35                  40                  45


Leu Thr Asp Glu Lys Asp Phe Ile Gly Ile Phe Pro Phe Pro Phe Trp
    50                  55                  60


Pro Val His Phe Val Leu Thr Val Val Ala Leu Phe Val Leu Ala Ala
65                  70                  75                  80


Ser Cys Phe Gln Ala Phe Thr Val Arg Met Ile Ser Val Gln Ile Tyr
                85                  90                  95


Gly Tyr Leu Ile His Glu Phe Asp Pro Trp Phe Asn Tyr Arg Ala Ala
            100                 105                 110


Glu Tyr Met Ser Thr His Gly Trp Ser Ala Phe Phe Ser Trp Phe Asp
        115                 120                 125


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


Pro Gly Leu Gln Leu Thr Ala Val Ala Ile His Arg Ala Leu Ala Ala
145                 150                 155                 160
```

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Ala Gly Met Pro Met Ser Leu Asn Asn Val Cys Val Leu Met Pro Ala
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Trp Phe Gly Ala Ile Ala Thr Ala Thr Leu Ala Phe Cys Thr Tyr Glu
            180                 185                 190

Ala Ser Gly Ser Thr Val Ala Ala Ala Ala Ala Ala Leu Ser Phe Ser
        195                 200                 205

Ile Ile Pro Ala His Leu Met Arg Ser Met Ala Gly Glu Phe Asp Asn
    210                 215                 220

Glu Cys Ile Ala Val Ala Ala Met Leu Leu Thr Phe Tyr Cys Trp Val
225                 230                 235                 240

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

Val Ala Tyr Gly Tyr Met Ala Ala Ala Trp Gly Gly Tyr Ile Phe Val
            260                 265                 270

Leu Asn Met Val Ala Met His Ala Gly Ile Ser Ser Met Val Asp Trp
        275                 280                 285

Ala Arg Asn Thr Tyr Asn Pro Ser Leu Leu Arg Ala Tyr Thr Leu Phe
    290                 295                 300

Tyr Val Val Gly Thr Ala Ile Ala Val Cys Val Pro Pro Val Gly Met
305                 310                 315                 320

Ser Pro Phe Lys Ser Leu Glu Gln Leu Gly Ala Leu Leu Val Leu Val
                325                 330                 335

Phe Leu Cys Gly Leu Gln Val Cys Glu Val Leu Arg Ala Arg Ala Gly
            340                 345                 350
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Val Glu Val Arg Ser Arg Ala Asn Phe Lys Ile Arg Val Arg Val Phe
        355                 360                 365

Ser Val Met Ala Gly Val Ala Ala Leu Ala Ile Ser Val Leu Ala Pro
    370                 375                 380

Thr Gly Tyr Phe Gly Pro Leu Ser Val Arg Val Arg Ala Leu Phe Val
385                 390                 395                 400

Glu His Thr Arg Thr Gly Asn Pro Leu Val Asp Ser Val Ala Glu His
                405                 410                 415

Gln Pro Ala Ser Pro Glu Ala Met Trp Ala Phe Leu His Val Cys Gly
            420                 425                 430

Val Thr Trp Gly Leu Gly Ser Ile Val Leu Ala Val Ser Thr Phe Val
        435                 440                 445

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

Tyr Tyr Phe Ser Thr Arg Met Ala Arg Leu Leu Leu Leu Ser Gly Pro
465                 470                 475                 480

Ala Ala Cys Leu Ser Thr Gly Ile Phe Val Gly Thr Ile Leu Glu Ala
                485                 490                 495

Ala Val Gln Leu Ser Phe Trp Asp Ser Asp Ala Thr Lys Ala Lys Lys
            500                 505                 510

Gln Gln Lys Gln Ala Gln Arg His Gln Arg Gly Ala Gly Lys Gly Ser
        515                 520                 525

Gly Arg Asp Asp Ala Lys Asn Ala Thr Thr Ala Arg Ala Phe Cys Asp
    530                 535                 540
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Val Phe Ala Gly Ser Ser Leu Ala Trp Gly His Arg Met Val Leu Ser
545                 550                 555                 560


Ile Ala Met Trp Ala Leu Val Thr Thr Thr Ala Val Ser Phe Phe Ser
                565                 570                 575


Ser Glu Phe Ala Ser His Ser Thr Lys Phe Ala Glu Gln Ser Ser Asn
            580                 585                 590


Pro Met Ile Val Phe Ala Ala Val Val Gln Asn Arg Ala Thr Gly Lys
        595                 600                 605


Pro Met Asn Leu Leu Val Asp Asp Tyr Leu Lys Ala Tyr Glu Trp Leu
    610                 615                 620


Arg Asp Ser Thr Pro Glu Asp Ala Arg Val Leu Ala Trp Trp Asp Tyr
625                 630                 635                 640


Gly Tyr Gln Ile Thr Gly Ile Gly Asn Arg Thr Ser Leu Ala Asp Gly
                645                 650                 655


Asn Thr Trp Asn His Glu His Ile Ala Thr Ile Gly Lys Met Leu Thr
            660                 665                 670


Ser Pro Val Val Glu Ala His Ser Leu Val Arg His Met Ala Asp Tyr
        675                 680                 685


Val Leu Ile Trp Ala Gly Gln Ser Gly Asp Leu Met Lys Ser Pro His
    690                 695                 700


Met Ala Arg Ile Gly Asn Ser Val Tyr His Asp Ile Cys Pro Asp Asp
705                 710                 715                 720


Pro Leu Cys Gln Gln Phe Gly Phe His Arg Asn Asp Tyr Ser Arg Pro
                725                 730                 735
```

```
Thr Pro Met Met Arg Ala Ser Leu Leu Tyr Asn Leu His Glu Ala Gly
            740                 745                 750

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

Ser Ser Lys Tyr Gly Leu Val Arg Ile Phe Lys Val Met Asn Val Ser
    770                 775                 780

Ala Glu Ser Lys Lys Trp Val Ala Asp Pro Ala Asn Arg Val Cys His
785                 790                 795                 800

Pro Pro Gly Ser Trp Ile Cys Pro Gly Gln Tyr Pro Pro Ala Lys Glu
                805                 810                 815

Ile Gln Glu Met Leu Ala His Arg Val Pro Phe Asp Gln Val Thr Asn
            820                 825                 830

Ala Asp Arg Lys Asn Asn Val Gly Ser Tyr Gln Glu Glu Tyr Met Arg
        835                 840                 845

Arg Met Arg Glu Ser Glu Asn Arg Arg
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<210> 464
<211> 2673
<212> DNA
<213> Leishmania major

<400> 464

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gcccaggccg aggacgccgc cagccagacc aagaccgcca gccccctgc caaggtcatc       180

ctcctgccca agaccctcac cgacgagaag gacttcatcg gcatcttccc gttcccgttc      240

tggcccgtcc acttcgtcct caccgtcgtc gccctcttcg tcctcgccgc cagctgcttc      300
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cgcgtccgcg tctttagcgt catggccggc gtggccgccc tcgccatctc tgtcctcgcc 1200

cccaccggct acttcggccc cctcagcgtc cgagtgcgcg ccctgttcgt cgagcacacc 1260

cgcaccggca acccccctcgt cgacagcgtc gccgagcacc agcccgccag ccccgaggcc 1320

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gtcagcacct tcgtccacta cagccccagc aaggtctttt ggctcctcaa ctctggcgcc 1440

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gacagcgacg ccaccaaggc caagaagcag cagaagcagg cccagcgcca ccagcgaggc 1620

gctggcaagg gctctggccg cgacgacgcc aagaacgcga cgaccgcccg agccttctgc 1680

gacgtctttg ccggcagcag cctcgcctgg ggccaccgca tggtcctctc gatcgccatg 1740

tgggcgctcg tcacgacaac ggccgtcagc ttcttcagca gcgagttcgc cagccacagc 1800

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ctccgcgaca gcacccctga ggacgcccgc gtcctggcct ggtgggacta cggctaccag 1980

atcaccggca tcggcaaccg caccagcctc gccgacggca acacctggaa ccacgagcac 2040

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agctggatct gccctggcca gtaccctccc gccaaggaaa tccaggagat gctcgcccac 2520

cgcgtcccgt tcgaccaggt caccaacgcc gaccgcaaga acaacgtcgg cagctaccaa 2580

gaggagtaca tgcgccgcat gcgcgagagc gagaaccgcc gctagttaat taagatccac 2640

ttaacgttac tgaaatcatc aaacagcttg acg 2673

<210> 465
<211> 1347
<212> DNA
<213> Xenopus laevis

<400> 465
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cacgtcatcc agctcgccga ggccgctgag gccgagcttg agaagcagaa gggcctcctc 180

cagcagatcc accactacag cggcctgctc aaccagcagc agcccagctc tcacgtccgc 240

ctcgcccccc tcatgcccat caagaacctc aacgtcagct cgcccttccc cagccccgtt 300

ggctctggcc ctctcccccc cgtcatcccc attctcgtcg tcgcctgcga ccgcccttct 360

gtccgacgat gcctcgacag cctcctcaag taccgcccca gcgccgagaa gttccccatc 420

atcgtcagcc aggactgcgg ccacgaggaa accggcaagg tcatcgacag ctacggcgac 480

gccgtcaccc acatcaagca gcccgacctc agcgaggtcg ccgtccctcc tgagcaccgc 540

aagttccagg gctactacaa gatcagccgc cactaccgct gggccctcaa ccagatcttc 600

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ttctacgagt acttccaggc caccctgccc ctgctccaaa aggaccgcat gctctggtgc 720

gtcagcgcct ggaacgacaa cggcaaggaa gccctcatcg accctggcgg caccagcctg 780

ctctaccgca gcgacttctt tcccggcctc ggctggctcc tcctgcgcga gctttgggag 840

gaactcgagc ccaagtggcc cagcgccttc tgggacgact gggtccgacg acctgagcag 900

cgactcgacc gagcctgcgt ccgacctgag ctgtctcgca cccgcacctt tggccgcaag 960

ggcgttagcc agggccagtt cttcgaccag cacctccgct tcatcaagct caaccaggac 1020

ctcgtccgct tcaccaagat ggacctcagc tacctcctca aggacaccta cgacccctgg 1080

ttcctcgagc aggtctacgg cgctcctaag gcccgagccg aggaagtcct tcacggccag 1140

gtccctggcg gccgaactgt ccgagtcgag tacaccacca aggacacctt caaggccatg 1200

gcccgagcct tcggcgtcat ggaagatctc aagagcggcg tcgcccgagc cgcctacaag 1260

ggcgtcgtca gctttagcca ccgcggacgc cgcgtctttc tcgcccctcc taaggactgg 1320

accggctacg acccccctctg gacctaa 1347

<210> 466
<211> 448
<212> PRT
<213> Xenopus laevis

<400> 466

Met Pro Arg Lys Val Ser Val Ala Ala Trp Gly Ala Ala Leu Phe Ile
1 5 10 15

```
Ser Trp Asn Ala Ile Leu Leu Leu Tyr Leu Met Ser Arg Ser Arg Gly
            20                  25                  30

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

Ala Glu Ala Glu Leu Glu Lys Gln Lys Gly Leu Leu Gln Gln Ile His
    50                  55                  60

His Tyr Ser Gly Leu Leu Asn Gln Gln Gln Pro Ser Ser His Val Arg
65                  70                  75                  80

Leu Ala Pro Leu Met Pro Ile Lys Asn Leu Asn Val Ser Ser Pro Phe
                85                  90                  95

Pro Ser Pro Val Gly Ser Gly Pro Leu Pro Leu Val Ile Pro Ile Leu
            100                 105                 110

Val Val Ala Cys Asp Arg Pro Ser Val Arg Arg Cys Leu Asp Ser Leu
        115                 120                 125

Leu Lys Tyr Arg Pro Ser Ala Glu Lys Phe Pro Ile Ile Val Ser Gln
    130                 135                 140

Asp Cys Gly His Glu Glu Thr Gly Lys Val Ile Asp Ser Tyr Gly Asp
145                 150                 155                 160

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

Pro Glu His Arg Lys Phe Gln Gly Tyr Tyr Lys Ile Ser Arg His Tyr
            180                 185                 190

Arg Trp Ala Leu Asn Gln Ile Phe Lys Ser Met Gly Tyr Lys Ala Ala
        195                 200                 205
```

```
Ile Val Val Glu Asp Asp Leu Glu Val Ala Pro Asp Phe Tyr Glu Tyr
    210                 215                 220

Phe Gln Ala Thr Leu Pro Leu Leu Gln Lys Asp Arg Met Leu Trp Cys
225                 230                 235                 240

Val Ser Ala Trp Asn Asp Asn Gly Lys Glu Ala Leu Ile Asp Pro Gly
                245                 250                 255

Gly Thr Ser Leu Leu Tyr Arg Ser Asp Phe Phe Pro Gly Leu Gly Trp
            260                 265                 270

Leu Leu Leu Arg Glu Leu Trp Glu Glu Leu Glu Pro Lys Trp Pro Ser
        275                 280                 285

Ala Phe Trp Asp Asp Trp Val Arg Arg Pro Glu Gln Arg Leu Asp Arg
    290                 295                 300

Ala Cys Val Arg Pro Glu Leu Ser Arg Thr Arg Thr Phe Gly Arg Lys
305                 310                 315                 320

Gly Val Ser Gln Gly Gln Phe Phe Asp Gln His Leu Arg Phe Ile Lys
                325                 330                 335

Leu Asn Gln Asp Leu Val Arg Phe Thr Lys Met Asp Leu Ser Tyr Leu
            340                 345                 350

Leu Lys Asp Thr Tyr Asp Pro Trp Phe Leu Glu Gln Val Tyr Gly Ala
        355                 360                 365

Pro Lys Ala Arg Ala Glu Glu Val Leu His Gly Gln Val Pro Gly Gly
    370                 375                 380

Arg Thr Val Arg Val Glu Tyr Thr Thr Lys Asp Thr Phe Lys Ala Met
385                 390                 395                 400
```

Ala Arg Ala Phe Gly Val Met Glu Asp Leu Lys Ser Gly Val Ala Arg
405 410 415

Ala Ala Tyr Lys Gly Val Val Ser Phe Ser His Arg Gly Arg Arg Val
420 425 430

Phe Leu Ala Pro Pro Lys Asp Trp Thr Gly Tyr Asp Pro Leu Trp Thr
435 440 445

<210> 467
<211> 1469
<212> DNA
<213> Xenopus laevis

<400> 467
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cctacagact cgacacctct gtcccctatg cagttgttgc taacatagaa gaatagacaa 120

tcctcgtctt ctactttgtc tccaattcaa agtatgaggg cgtcgatctc aacaagggca 180

ccttcacagc tccggattcg accaagacga caccaaagcc gccagccact ggcgatgcca 240

aagactttcc tctggccctg acgccgaacg atccaggctt caacgacctc gtcggcatcg 300

ctcccggccc tcgaatgaac agcggcctgc tcaaccagca gcagcccagc tctcacgtcc 360

gcctcgcccc cctcatgccc atcaagaacc tcaacgtcag ctcgcccttc cccagccccg 420

ttggctctgg ccctctcccc ctcgtcatcc ccattctcgt cgtcgcctgc gaccgccctt 480

ctgtccgacg atgcctcgac agcctcctca agtaccgccc cagcgccgag aagttcccca 540

tcatcgtcag ccaggactgc ggccacgagg aaaccggcaa ggtcatcgac agctacggcg 600

acgccgtcac ccacatcaag cagcccgacc tcagcgaggt cgccgtccct cctgagcacc 660

gcaagttcca gggctactac aagatcagcc gccactaccg ctgggccctc aaccagatct 720

tcaagagcat gggctacaag gccgccatcg tcgtcgagga cgacctcgag gttgcccccg 780

acttctacga gtacttccag gccaccctgc ccctgctcca aaaggaccgc atgctctggt 840

gcgtcagcgc ctggaacgac aacggcaagg aagccctcat cgaccctggc ggcaccagcc 900

tgctctaccg cagcgacttc tttcccggcc tcggctggct cctcctgcgc gagctttggg 960

aggaactcga gcccaagtgg cccagcgcct tctgggacga ctgggtccga cgacctgagc 1020

agcgactcga ccgagcctgc gtccgacctg agctgtctcg cacccgcacc tttggccgca 1080

agggcgttag ccagggccag ttcttcgacc agcacctccg cttcatcaag ctcaaccagg 1140

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ggttcctcga gcaggtctac ggcgctccta aggcccgagc cgaggaagtc cttcacggcc 1260

aggtccctgg cggccgaact gtccgagtcg agtacaccac caaggacacc ttcaaggcca 1320

tggcccgagc cttcggcgtc atggaagatc tcaagagcgg cgtcgcccga gccgcctaca 1380

agggcgtcgt cagctttagc caccgcggac gccgcgtctt tctcgcccct cctaaggact 1440

ggaccggcta cgacccctc tggacctaa 1469

<210> 468
<211> 467
<212> PRT
<213> Xenopus laevis

<400> 468

Met Ala Ser Thr Asn Ala Arg Tyr Val Arg Tyr Leu Leu Ile Ala Phe
1 5 10 15

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

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

Thr Pro Lys Pro Pro Ala Thr Gly Asp Ala Lys Asp Phe Pro Leu Ala
50 55 60

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

```
Gly Pro Arg Met Asn Ser Gly Leu Leu Asn Gln Gln Gln Pro Ser Ser
                85                  90                  95

His Val Arg Leu Ala Pro Leu Met Pro Ile Lys Asn Leu Asn Val Ser
            100                 105                 110

Ser Pro Phe Pro Ser Pro Val Gly Ser Gly Pro Leu Pro Leu Val Ile
        115                 120                 125

Pro Ile Leu Val Val Ala Cys Asp Arg Pro Ser Val Arg Arg Cys Leu
    130                 135                 140

Asp Ser Leu Leu Lys Tyr Arg Pro Ser Ala Glu Lys Phe Pro Ile Ile
145                 150                 155                 160

Val Ser Gln Asp Cys Gly His Glu Glu Thr Gly Lys Val Ile Asp Ser
                165                 170                 175

Tyr Gly Asp Ala Val Thr His Ile Lys Gln Pro Asp Leu Ser Glu Val
            180                 185                 190

Ala Val Pro Pro Glu His Arg Lys Phe Gln Gly Tyr Tyr Lys Ile Ser
        195                 200                 205

Arg His Tyr Arg Trp Ala Leu Asn Gln Ile Phe Lys Ser Met Gly Tyr
    210                 215                 220

Lys Ala Ala Ile Val Val Glu Asp Asp Leu Glu Val Ala Pro Asp Phe
225                 230                 235                 240

Tyr Glu Tyr Phe Gln Ala Thr Leu Pro Leu Leu Gln Lys Asp Arg Met
                245                 250                 255

Leu Trp Cys Val Ser Ala Trp Asn Asp Asn Gly Lys Glu Ala Leu Ile
            260                 265                 270
```

```
Asp Pro Gly Gly Thr Ser Leu Leu Tyr Arg Ser Asp Phe Phe Pro Gly
        275                 280                 285

Leu Gly Trp Leu Leu Leu Arg Glu Leu Trp Glu Glu Leu Glu Pro Lys
    290                 295                 300

Trp Pro Ser Ala Phe Trp Asp Asp Trp Val Arg Arg Pro Glu Gln Arg
305                 310                 315                 320

Leu Asp Arg Ala Cys Val Arg Pro Glu Leu Ser Arg Thr Arg Thr Phe
                325                 330                 335

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

Phe Ile Lys Leu Asn Gln Asp Leu Val Arg Phe Thr Lys Met Asp Leu
        355                 360                 365

Ser Tyr Leu Leu Lys Asp Thr Tyr Asp Pro Trp Phe Leu Glu Gln Val
    370                 375                 380

Tyr Gly Ala Pro Lys Ala Arg Ala Glu Glu Val Leu His Gly Gln Val
385                 390                 395                 400

Pro Gly Gly Arg Thr Val Arg Val Glu Tyr Thr Thr Lys Asp Thr Phe
                405                 410                 415

Lys Ala Met Ala Arg Ala Phe Gly Val Met Glu Asp Leu Lys Ser Gly
            420                 425                 430

Val Ala Arg Ala Ala Tyr Lys Gly Val Val Ser Phe Ser His Arg Gly
        435                 440                 445

Arg Arg Val Phe Leu Ala Pro Pro Lys Asp Trp Thr Gly Tyr Asp Pro
    450                 455                 460
```

Leu Trp Thr
465

<210> 469
<211> 1371
<212> DNA
<213> Drosophila melanogaster

<400> 469
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tactacctgc tcctccgcca gaccggcatc cacacctctc gccaccagag cctccaggcc 120

tacaagctca acagccaggc ccgcgacgcc aacatgcaga gccaccacct cgccaagaac 180

gtctttgagt tcgtcaagct caagtacctc gagaagcagc cccccagcgt cgccagcacc 240

ccccagatca gcatcattgc cgccgagatc agcgccgagc tgcccgagca gcacgtcgcc 300

aagtctgcca ccgcccgcat ccccaccaag acctacctcg ccaacggcga gcccgtcttt 360

cccgtcgtcg tctttgcctg caaccgcgtc agcgtcaaga agtgcatcga caacctcgtc 420

cagtaccgcc ccagcgtcga gcagttcccc atcatcgtca gccaggactg cggcgacgag 480

cccaccaagg aagccatcct cagctacggc aagcaggtca ccctcatcga gcagcccgac 540

ctcagcgaca tcatgcccaa ggaaaagaag ttcaagggct actacaagat cgcccgccac 600

tacggctggg ccctcaacac cactttcgcc gtcggcttcg agttcgtcat catcgtcgag 660

gacgacctca acgtcgcccc cgacttcttc gagtacttcc tcggcaccca caagctcctc 720

aagcaggacc ccagcctctg gtgcgtcagc gcctggaacg acaacggcaa ggccgccgtc 780

gtcgatgccg ctcagcctga gctgctctac cgcaccgact ttttccccgg cctcggctgg 840

atgctcacca aggacctctg ggccgagctg agcgtcaagt ggcccaagag cttctgggac 900

gactggatcc gccaccccgc ccagcgaaag gaccgcgtct gcatccgccc cgagattagc 960

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aagcacatca agctcagcga ggacttcgtc cagttcacca agatcaacat gagctacctg 1080

ctcaaggaca actacgacaa caccttcctc cgccgcgtct acacctaccc catcgtcacc 1140

tacgacgagc tgcgccgcaa cctcatccgc atcgagggcc ccgtccgcat ccagtacacc 1200

acccgcgagc agtacaagcg caccaccaag atgctcggcc tcatggacga cttcaagagc 1260

ggcgtccccc gcaccgccta ccacggcatc gtcagcttct actacaacaa gcgccgcgtc 1320

cacctcgccc ccaacgccaa ctggaagggc tacgagctga gctggtccta a 1371

<210> 470
<211> 456
<212> PRT
<213> Drosophila melanogaster

<400> 470

Met Arg Thr Arg Lys Val Leu Leu Val Ile Gly Phe Leu Val Thr Trp
1 5 10 15

Thr Tyr Ala Thr Tyr Tyr Leu Leu Leu Arg Gln Thr Gly Ile His Thr
20 25 30

Ser Arg His Gln Ser Leu Gln Ala Tyr Lys Leu Asn Ser Gln Ala Arg
35 40 45

Asp Ala Asn Met Gln Ser His His Leu Ala Lys Asn Val Phe Glu Phe
50 55 60

Val Lys Leu Lys Tyr Leu Glu Lys Gln Pro Pro Ser Val Ala Ser Thr
65 70 75 80

Pro Gln Ile Ser Ile Ile Ala Ala Glu Ile Ser Ala Glu Leu Pro Glu
85 90 95

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

Leu Ala Asn Gly Glu Pro Val Phe Pro Val Val Val Phe Ala Cys Asn
115 120 125

```
Arg Val Ser Val Lys Lys Cys Ile Asp Asn Leu Val Gln Tyr Arg Pro
    130                 135                 140

Ser Val Glu Gln Phe Pro Ile Ile Val Ser Gln Asp Cys Gly Asp Glu
145                 150                 155                 160

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

Glu Gln Pro Asp Leu Ser Asp Ile Met Pro Lys Glu Lys Lys Phe Lys
            180                 185                 190

Gly Tyr Tyr Lys Ile Ala Arg His Tyr Gly Trp Ala Leu Asn Thr Thr
        195                 200                 205

Phe Ala Val Gly Phe Glu Phe Val Ile Ile Val Glu Asp Asp Leu Asn
    210                 215                 220

Val Ala Pro Asp Phe Phe Glu Tyr Phe Leu Gly Thr His Lys Leu Leu
225                 230                 235                 240

Lys Gln Asp Pro Ser Leu Trp Cys Val Ser Ala Trp Asn Asp Asn Gly
                245                 250                 255

Lys Ala Ala Val Val Asp Ala Ala Gln Pro Glu Leu Leu Tyr Arg Thr
            260                 265                 270

Asp Phe Phe Pro Gly Leu Gly Trp Met Leu Thr Lys Asp Leu Trp Ala
        275                 280                 285

Glu Leu Ser Val Lys Trp Pro Lys Ser Phe Trp Asp Asp Trp Ile Arg
    290                 295                 300

His Pro Ala Gln Arg Lys Asp Arg Val Cys Ile Arg Pro Glu Ile Ser
305                 310                 315                 320
```

```
Arg Thr Arg Thr Phe Gly Lys Ile Gly Val Ser Asn Gly Leu Phe Phe
                325                 330                 335

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

Thr Lys Ile Asn Met Ser Tyr Leu Leu Lys Asp Asn Tyr Asp Asn Thr
        355                 360                 365

Phe Leu Arg Arg Val Tyr Thr Tyr Pro Ile Val Thr Tyr Asp Glu Leu
    370                 375                 380

Arg Arg Asn Leu Ile Arg Ile Glu Gly Pro Val Arg Ile Gln Tyr Thr
385                 390                 395                 400

Thr Arg Glu Gln Tyr Lys Arg Thr Thr Lys Met Leu Gly Leu Met Asp
                405                 410                 415

Asp Phe Lys Ser Gly Val Pro Arg Thr Ala Tyr His Gly Ile Val Ser
            420                 425                 430

Phe Tyr Tyr Asn Lys Arg Arg Val His Leu Ala Pro Asn Ala Asn Trp
        435                 440                 445

Lys Gly Tyr Glu Leu Ser Trp Ser
    450                 455
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<210> 471
<211> 1335
<212> DNA
<213> Arabidopsis thaliana

<400> 471
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tacatccaga tgcgcctctt ccagacccag agccagtacg ccgaccgcct cagcagcgcc 120

atcgagagcg agaaccactg caccagccag atgcgcggcc tcatcgacga ggtcagcatc 180

aagcagagcc gcatcgtcgc cctcgaggac atgaagaacc gccaggacga ggaactcgtc 240

cagctcaagg acctcatcca gaccttcgag aagaagggca ttgccaagct cacccagggc 300

ggccagatgc ctgtcgccgc tgtcgtcgtc atggcctgct ctcgcgccga ctacctcgag 360

cgcaccgtca agagcgtcct cacctaccag acccccgtcg ccagcaagta ccccctgttc 420

atcagccagg acggcagcga ccaggccgtc aagagcaaga gcctcagcta caaccagctc 480

acctacatgc agcacctcga cttcgagccc gtcgtcaccg agcgacctgg cgagctgacc 540

gcctactaca agatcgcccg ccactacaag tgggccctcg accagctgtt ctacaagcac 600

aagttcagcc gcgtcatcat cctcgaggac gacatggaaa tcgcccccga cttcttcgac 660

tacttcgagg ccgctgccag cctcatggac cgcgacaaga ccatcatggc cgccagcagc 720

tggaacgaca acggccagaa gcagttcgtc cacgacccct acgccctcta ccgcagcgac 780

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tggcccaagg cctactggga cgactggctc cgcctcaagg aaaaccacaa gggccgccag 900

ttcatccgcc ccgaggtctg ccgcacctac aacttcggcg agcacggcag cagcctcggc 960

cagttcttca gccagtacct cgagcccatc aagctcaacg acgtcaccgt cgactggaag 1020

gccaaggacc tcggctacct caccgagggc aactacacca agtacttcag cggcctcgtc 1080

cgccaggccc gacccattca gggctctgac ctcgtcctca aggcccagaa catcaaggac 1140

gacgtccgca tccgctacaa ggaccaggtc gagttcgagc gcattgccgg cgagttcggc 1200

atcttcgagg aatggaagga cggcgtcccc cgcaccgcct acaagggcgt cgtcgtcttt 1260

cgcatccaga ccacccgccg agtctttctc gtcggccccg acagcgtcat gcagctcggc 1320

atccgcaaca gctaa 1335

<210> 472
<211> 444
<212> PRT
<213> Arabidopsis thaliana

<400> 472

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Met Ala Arg Ile Ser Cys Asp Leu Arg Phe Leu Leu Ile Pro Ala Ala
1               5                   10                  15

Phe Met Phe Ile Tyr Ile Gln Met Arg Leu Phe Gln Thr Gln Ser Gln
            20                  25                  30

Tyr Ala Asp Arg Leu Ser Ser Ala Ile Glu Ser Glu Asn His Cys Thr
        35                  40                  45

Ser Gln Met Arg Gly Leu Ile Asp Glu Val Ser Ile Lys Gln Ser Arg
    50                  55                  60

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

Gln Leu Lys Asp Leu Ile Gln Thr Phe Glu Lys Lys Gly Ile Ala Lys
                85                  90                  95

Leu Thr Gln Gly Gly Gln Met Pro Val Ala Ala Val Val Val Met Ala
            100                 105                 110

Cys Ser Arg Ala Asp Tyr Leu Glu Arg Thr Val Lys Ser Val Leu Thr
        115                 120                 125

Tyr Gln Thr Pro Val Ala Ser Lys Tyr Pro Leu Phe Ile Ser Gln Asp
    130                 135                 140

Gly Ser Asp Gln Ala Val Lys Ser Lys Ser Leu Ser Tyr Asn Gln Leu
145                 150                 155                 160

Thr Tyr Met Gln His Leu Asp Phe Glu Pro Val Val Thr Glu Arg Pro
                165                 170                 175

Gly Glu Leu Thr Ala Tyr Tyr Lys Ile Ala Arg His Tyr Lys Trp Ala
            180                 185                 190
```

```
Leu Asp Gln Leu Phe Tyr Lys His Lys Phe Ser Arg Val Ile Ile Leu
        195                 200                 205

Glu Asp Asp Met Glu Ile Ala Pro Asp Phe Phe Asp Tyr Phe Glu Ala
    210                 215                 220

Ala Ala Ser Leu Met Asp Arg Asp Lys Thr Ile Met Ala Ala Ser Ser
225                 230                 235                 240

Trp Asn Asp Asn Gly Gln Lys Gln Phe Val His Asp Pro Tyr Ala Leu
                245                 250                 255

Tyr Arg Ser Asp Phe Phe Pro Gly Leu Gly Trp Met Leu Lys Arg Ser
            260                 265                 270

Thr Trp Asp Glu Leu Ser Pro Lys Trp Pro Lys Ala Tyr Trp Asp Asp
        275                 280                 285

Trp Leu Arg Leu Lys Glu Asn His Lys Gly Arg Gln Phe Ile Arg Pro
    290                 295                 300

Glu Val Cys Arg Thr Tyr Asn Phe Gly Glu His Gly Ser Ser Leu Gly
305                 310                 315                 320

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

Val Asp Trp Lys Ala Lys Asp Leu Gly Tyr Leu Thr Glu Gly Asn Tyr
            340                 345                 350

Thr Lys Tyr Phe Ser Gly Leu Val Arg Gln Ala Arg Pro Ile Gln Gly
        355                 360                 365

Ser Asp Leu Val Leu Lys Ala Gln Asn Ile Lys Asp Asp Val Arg Ile
    370                 375                 380
```

```
Arg Tyr Lys Asp Gln Val Glu Phe Glu Arg Ile Ala Gly Glu Phe Gly
385                 390                 395                 400


Ile Phe Glu Glu Trp Lys Asp Gly Val Pro Arg Thr Ala Tyr Lys Gly
                405                 410                 415


Val Val Val Phe Arg Ile Gln Thr Thr Arg Arg Val Phe Leu Val Gly
            420                 425                 430


Pro Asp Ser Val Met Gln Leu Gly Ile Arg Asn Ser
        435                 440


<210>  473
<211>  1404
<212>  DNA
<213>  Caenorhabditis elegans

<400>  473
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tgcatcctcg tcctctgcag cttcatcatc tacctcaaga gcgaggacca cgacctccag      120

aagaacaccg ccatccacgc ccctcgcagc aacagccgcg aggacgagga cgacatcctc      180

atccccgccg acaacaagga ccagcagttc gtcgccgccg tcctcgtctt ttgcgccacc      240

cgacctgacg ccctccgcaa ccacctcagc cagattctcg cccagcgccc cagccacttc      300

cagtaccaca tcatcgtcag ccaggacggc aacaagaccg ccgtcaccca ggtcgcccag      360

aagttcgtca aggactacaa gaacgtcagc cacatccagc acgaaaagac cgagatcaag      420

aagcgcaaca actaccccgc catcagcgcc cactacaagt gggccctcga caaggccttc      480

aagggcttcc gctacgacca cgtcattgtc accgaggacg acctcgacat cggcaacgac      540

tttttcagct acttccgctg gggcaagcag gtcctcaaca gcgacgacac catctggtgc      600

gtcagcgcct ggaacgacaa cggcggaggc cccctcatcg acagcactcg cggcgacctg      660

atctggcgca ccgacttttt tcccggcctc ggctggatgc tcaccaagaa gctctggaac      720

gagctgagcc ccggcttccc cgtcgcctac tgggacgact ggatgcgcaa gcccgaggtc      780
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cgcaagagcc gcagctgcat ccgccccgag attagccgca ccagccacaa catgaagctc 840

gccggcaagg gcagcagcgg cggcatgttc aaggactacc tcagcaagat cagcgccagc 900

agcgccaaca tcgacttcag cctgctcccc gtcaccctcg tccagaagtc catctacgac 960

aagcgcctca tcgagcagat cgagaacgcc cgacccatcg acctgcagaa caccaccggc 1020

atggaaaaga cctacaacta caagatcgtc tacaagaaca tccgcgactg gcaccgcctc 1080

gccgcccact tcaagctcat gaccgacatc cgaggcggca tgcagcgcac cgcctactac 1140

ggcgtcgtca ccctcatgtt ccagaactgc cgcgtctttc tcgtccccga gagcacctac 1200

cgcaacccca gccagctcac cagctacgtc tacgacagcg agtgggacaa gcagaaccgc 1260

ttcatcgagt tcgaggccta ctactgcaag accaagaagt acgccggcaa gtgcgacccc 1320

cacagccccg agatgatcgc cttcttcaag aagaagggct ggaagaagcg cctcgacgac 1380

tggggcgaga tgctcgtcgt ctaa 1404

<210> 474
<211> 467
<212> PRT
<213> Caenorhabditis elegans

<400> 474

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Phe Lys Ile Ile Cys Ile Leu Val Leu Cys Ser Phe Ile Ile Tyr Leu
20 25 30

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

Arg Ser Asn Ser Arg Glu Asp Glu Asp Asp Ile Leu Ile Pro Ala Asp
50 55 60

Asn Lys Asp Gln Gln Phe Val Ala Ala Val Leu Val Phe Cys Ala Thr

```
65                  70                  75                  80

Arg Pro Asp Ala Leu Arg Asn His Leu Ser Gln Ile Leu Ala Gln Arg
                85                  90                  95

Pro Ser His Phe Gln Tyr His Ile Ile Val Ser Gln Asp Gly Asn Lys
            100                 105                 110

Thr Ala Val Thr Gln Val Ala Gln Lys Phe Val Lys Asp Tyr Lys Asn
        115                 120                 125

Val Ser His Ile Gln His Glu Lys Thr Glu Ile Lys Lys Arg Asn Asn
    130                 135                 140

Tyr Pro Ala Ile Ser Ala His Tyr Lys Trp Ala Leu Asp Lys Ala Phe
145                 150                 155                 160

Lys Gly Phe Arg Tyr Asp His Val Ile Val Thr Glu Asp Asp Leu Asp
                165                 170                 175

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

Asn Ser Asp Asp Thr Ile Trp Cys Val Ser Ala Trp Asn Asp Asn Gly
        195                 200                 205

Gly Gly Pro Leu Ile Asp Ser Thr Arg Gly Asp Leu Ile Trp Arg Thr
    210                 215                 220

Asp Phe Phe Pro Gly Leu Gly Trp Met Leu Thr Lys Lys Leu Trp Asn
225                 230                 235                 240

Glu Leu Ser Pro Gly Phe Pro Val Ala Tyr Trp Asp Asp Trp Met Arg
                245                 250                 255

Lys Pro Glu Val Arg Lys Ser Arg Ser Cys Ile Arg Pro Glu Ile Ser
```

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            260                 265                 270

Arg Thr Ser His Asn Met Lys Leu Ala Gly Lys Gly Ser Ser Gly Gly
        275                 280                 285

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

Asp Phe Ser Leu Leu Pro Val Thr Leu Val Gln Lys Ser Ile Tyr Asp
305                 310                 315                 320

Lys Arg Leu Ile Glu Gln Ile Glu Asn Ala Arg Pro Ile Asp Leu Gln
                325                 330                 335

Asn Thr Thr Gly Met Glu Lys Thr Tyr Asn Tyr Lys Ile Val Tyr Lys
            340                 345                 350

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

Asp Ile Arg Gly Gly Met Gln Arg Thr Ala Tyr Tyr Gly Val Val Thr
    370                 375                 380

Leu Met Phe Gln Asn Cys Arg Val Phe Leu Val Pro Glu Ser Thr Tyr
385                 390                 395                 400

Arg Asn Pro Ser Gln Leu Thr Ser Tyr Val Tyr Asp Ser Glu Trp Asp
                405                 410                 415

Lys Gln Asn Arg Phe Ile Glu Phe Glu Ala Tyr Tyr Cys Lys Thr Lys
            420                 425                 430

Lys Tyr Ala Gly Lys Cys Asp Pro His Ser Pro Glu Met Ile Ala Phe
        435                 440                 445

Phe Lys Lys Lys Gly Trp Lys Lys Arg Leu Asp Asp Trp Gly Glu Met
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eolf-seql

450 455 460

Leu Val Val
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<210> 475
<211> 1332
<212> DNA
<213> Spodoptera frugiperda

<400> 475
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gtcgagatcg agaagaagat catcaagctc cagaagcagg tcgacgccca gatggccgag 180

agcaagagcc tcctcgccaa ggtcaagaag ctcaagaaga tcagcgaggg cgagaacgtc 240

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ctccccgtcc tcgtcattgc ctgcgaccgc gtcactgtcc agcgctgcct cgacaacctc 360

gtcaagttcc gccccagcaa ggaaaccttc cccatcatcg tcagccagga ctgcggccac 420

aacgccacct acgaggtcat caccagctac accgccagcg accccaccat cagcgtcgtc 480

cgacagcccg acctcagcga gattgtcctg ccccgcgtca aggtcaagtt tcgcggctac 540

tacaagatcg cccgccacta caagttcgcc ctcaaccacg tctttgagac tctcggccac 600

gaggccgtca tcatcgtcga ggacgacctc gacatcagcc ccgacttttt cgagtacttc 660

ctcggcacct acccccctgct cctcaaggac cccagcctct ggtgcatcag cgcctggaac 720

gacaacggca agatggaagt catcgatatg agccgccctg acctcctcca ccgcaccgac 780

ttttttcccg gcctcggctg ggtcctccgc cgcgagatgt ggcgaaagct cgcccccaag 840

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tgcatccgcc ccgagatcag ccgcacctac agcttcggca aggtcggcgt cagcaagggc 960

ctcttcttcg acctccacct ccgcaacatc cagctcaaca tggaatacgt cgagttcacc 1020

aagctcaacc tcacctacct gctcaaggaa cactacgacg acgccctcgt cagcaccgtc 1080

tacaacctcc ccgagatgag cgccagcgag gtcgtcgctg gctctgacct ctctgccgac 1140

cccgtccgcg tcatgtacag caacgccaag acctaccagc gagccgccaa gaagctcggc 1200

ctcatggacg acttccgcag cggcgtccct cgcactgcct accgcggcat cgtcacgtgc 1260

ttcatccgag gccgccgagt ctacctcgcc cccagcttcg agtggaacaa gtacgacccc 1320

acctggggct aa 1332

<210> 476
<211> 443
<212> PRT
<213> Spodoptera frugiperda

<400> 476

Met Arg Leu Asn Val Lys Lys Ala Leu Ile Phe Val Gly Cys Val Val
1 5 10 15

Phe Leu Trp Val Leu Leu Ser Tyr Ala Ser Val Ile Glu Val Pro Arg
20 25 30

Ala Val Pro Gln Lys Asp Pro Ala Val Glu Ile Glu Lys Lys Ile Ile
35 40 45

Lys Leu Gln Lys Gln Val Asp Ala Gln Met Ala Glu Ser Lys Ser Leu
50 55 60

Leu Ala Lys Val Lys Lys Leu Lys Lys Ile Ser Glu Gly Glu Asn Val
65 70 75 80

Gly Gly Glu Glu Asp Ser Leu Lys Asp Ser Glu Val Met Gln His Leu
85 90 95

Ser Gln Pro Ile Leu Pro Val Leu Val Ile Ala Cys Asp Arg Val Thr
100 105 110

Val Gln Arg Cys Leu Asp Asn Leu Val Lys Phe Arg Pro Ser Lys Glu

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        115                 120                 125

Thr Phe Pro Ile Ile Val Ser Gln Asp Cys Gly His Asn Ala Thr Tyr
    130                 135                 140

Glu Val Ile Thr Ser Tyr Thr Ala Ser Asp Pro Thr Ile Ser Val Val
145                 150                 155                 160

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

Phe Arg Gly Tyr Tyr Lys Ile Ala Arg His Tyr Lys Phe Ala Leu Asn
            180                 185                 190

His Val Phe Glu Thr Leu Gly His Glu Ala Val Ile Ile Val Glu Asp
        195                 200                 205

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

Pro Leu Leu Leu Lys Asp Pro Ser Leu Trp Cys Ile Ser Ala Trp Asn
225                 230                 235                 240

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

His Arg Thr Asp Phe Phe Pro Gly Leu Gly Trp Val Leu Arg Arg Glu
            260                 265                 270

Met Trp Arg Lys Leu Ala Pro Lys Trp Pro Thr Ala Phe Phe Asp Asp
        275                 280                 285

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

Glu Ile Ser Arg Thr Tyr Ser Phe Gly Lys Val Gly Val Ser Lys Gly
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305 310 315 320

Leu Phe Phe Asp Leu His Leu Arg Asn Ile Gln Leu Asn Met Glu Tyr
325 330 335

Val Glu Phe Thr Lys Leu Asn Leu Thr Tyr Leu Leu Lys Glu His Tyr
340 345 350

Asp Asp Ala Leu Val Ser Thr Val Tyr Asn Leu Pro Glu Met Ser Ala
355 360 365

Ser Glu Val Val Ala Gly Ser Asp Leu Ser Ala Asp Pro Val Arg Val
370 375 380

Met Tyr Ser Asn Ala Lys Thr Tyr Gln Arg Ala Ala Lys Lys Leu Gly
385 390 395 400

Leu Met Asp Asp Phe Arg Ser Gly Val Pro Arg Thr Ala Tyr Arg Gly
405 410 415

Ile Val Thr Cys Phe Ile Arg Gly Arg Arg Val Tyr Leu Ala Pro Ser
420 425 430

Phe Glu Trp Asn Lys Tyr Asp Pro Thr Trp Gly
435 440

<210> 477
<211> 1335
<212> DNA
<213> Phaeodactylum tricornutum

<400> 477
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ggccgagagg aacgcctcgc tattggcctc ctcctcaccc tcgctgtcgt ctggggcact 120

gtcctcgtcg gcaccctcgt cgctctggtc gccagcccta ccaagagcgt ccccaccttt 180

cccaccgtcc ccaccgactc tcgacccagc gccgcctttg tcgtcagcga cgctcctggc 240

gcctacgaga gccccctcct cgtctttacc tgccgacgcg accagtacct ccgcgagact 300

ctccgcgaca tctggaacta catccccacg gactgcagcg tcggctgccc cctcgtcatt 360

agccaggacg gcaacgaccc tgccgtccgc cgagtcgtcc gcgagttcac cgacgagttc 420

gccaccaaga acgtccccgt catccactgg acccacacct ctgccctccg cggcagcacc 480

aacggctacc aggccctcgc catccactac ggctgggccc tccgccgagt ctttgacggc 540

cagactctca gcggcagcgt ccacggcgct aagcacggca ctccccagcg cgtcatcatc 600

ctcgaagagg acctccacgt cgcccccgac tttttcgact acttcgccgc caccgccccc 660

ctgctcgacc acgattctag cctgctcgcc gtcagcgcct tccacgacaa cggcttcgcc 720

cacaacgtcc gcaacgccag ccgaatcctc cgcagcgact tcttccctgg cctcggctgg 780

atgatgaacc gccgcctctg ggtcgacgag ctgcagagca agtggcctgg cggctactgg 840

gacgactggc tccgagagcc tgcccagcga caggaccgcg ccattctccg ccctgagatc 900

agccgcacct accacttcgg caccgagggc ggcaccagca gcaaccagtt tggcagccac 960

ctcagcaaga tcctgctcaa ccgcgagact gtcgactggt ccaaggccgc cgatctcgag 1020

gcccagctcc gacccgaggt ctacgaccct gcctactggg ccatggtcca ggccagcacc 1080

ctcacctaca ccatccccga cgccctcgag caggccaaga agtccaacgc ccgcctccag 1140

tacaccacca tcgagcagtt caagtacctc gcccacaagc tcaagctcat ggccgacgag 1200

aaggccaacg tcccccgcac cgcctacaag ggcatcgtcg agactcgacc ccacggcgcc 1260

gactactttc tcttcctgac gccccctctg gccgagctgc agaaggaatt cgacatcccc 1320

agccccaagc gctaa 1335

<210> 478
<211> 320
<212> DNA
<213> Trichoderma reesei

<400> 478
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cctacagact cgacacctct gtcccctatg cagttgttgc taacatagaa gaatagacaa 120

tcctcgtctt ctactttgtc tccaattcaa agtatgaggg cgtcgatctc aacaagggca 180

ccttcacagc tccggattcg accaagacga caccaaagcc gccagccact ggcgatgcca 240

aagactttcc tctggccctg acgccgaacg atccaggctt caacgacctc gtcggcatcg 300

ctcccggccc tcgaatgaac 320

<210> 479
<211> 85
<212> PRT
<213> Trichoderma reesei

<400> 479

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

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

Thr Pro Lys Pro Pro Ala Thr Gly Asp Ala Lys Asp Phe Pro Leu Ala
50 55 60

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

Gly Pro Arg Met Asn
85

<210> 480
<211> 407
<212> PRT
<213> Homo sapiens

<400> 480

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Ile Arg Leu Ala Gln Asp Ala Glu Val Glu Leu Glu Arg Gln Arg Gly
            20                  25                  30

Leu Leu Gln Gln Ile Gly Asp Ala Leu Ser Ser Gln Arg Gly Arg Val
        35                  40                  45

Pro Thr Ala Ala Pro Pro Ala Gln Pro Arg Val Pro Val Thr Pro Ala
    50                  55                  60

Pro Ala Val Ile Pro Ile Leu Val Ile Ala Cys Asp Arg Ser Thr Val
65                  70                  75                  80

Arg Arg Cys Leu Asp Lys Leu Leu His Tyr Arg Pro Ser Ala Glu Leu
                85                  90                  95

Phe Pro Ile Ile Val Ser Gln Asp Cys Gly His Glu Glu Thr Ala Gln
            100                 105                 110

Ala Ile Ala Ser Tyr Gly Ser Ala Val Thr His Ile Arg Gln Pro Asp
        115                 120                 125

Leu Ser Ser Ile Ala Val Pro Pro Asp His Arg Lys Phe Gln Gly Tyr
    130                 135                 140

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

Gln Phe Arg Phe Pro Ala Ala Val Val Val Glu Asp Asp Leu Glu Val
                165                 170                 175

Ala Pro Asp Phe Phe Glu Tyr Phe Arg Ala Thr Tyr Pro Leu Leu Lys
            180                 185                 190
```

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Ala Asp Pro Ser Leu Trp Cys Val Ser Ala Trp Asn Asp Asn Gly Lys
        195                 200                 205


Glu Gln Met Val Asp Ala Ser Arg Pro Glu Leu Leu Tyr Arg Thr Asp
    210                 215                 220


Phe Phe Pro Gly Leu Gly Trp Leu Leu Leu Ala Glu Leu Trp Ala Glu
225                 230                 235                 240


Leu Glu Pro Lys Trp Pro Lys Ala Phe Trp Asp Asp Trp Met Arg Arg
                245                 250                 255


Pro Glu Gln Arg Gln Gly Arg Ala Cys Ile Arg Pro Glu Ile Ser Arg
            260                 265                 270


Thr Met Thr Phe Gly Arg Lys Gly Val Ser His Gly Gln Phe Phe Asp
        275                 280                 285


Gln His Leu Lys Phe Ile Lys Leu Asn Gln Gln Phe Val His Phe Thr
    290                 295                 300


Gln Leu Asp Leu Ser Tyr Leu Gln Arg Glu Ala Tyr Asp Arg Asp Phe
305                 310                 315                 320


Leu Ala Arg Val Tyr Gly Ala Pro Gln Leu Gln Val Glu Lys Val Arg
                325                 330                 335


Thr Asn Asp Arg Lys Glu Leu Gly Glu Val Arg Val Gln Tyr Thr Gly
            340                 345                 350


Arg Asp Ser Phe Lys Ala Phe Ala Lys Ala Leu Gly Val Met Asp Asp
        355                 360                 365


Leu Lys Ser Gly Val Pro Arg Ala Gly Tyr Arg Gly Ile Val Thr Phe
    370                 375                 380
```

Gln Phe Arg Gly Arg Arg Val His Leu Ala Pro Pro Pro Thr Trp Glu
385 390 395 400

Gly Tyr Asp Pro Ser Trp Asn
405

<210> 481
<211> 1224
<212> DNA
<213> Homo sapiens

<400> 481
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caagacgccg aggtggagct ggagcggcag cgtgggctgc tgcagcagat cggggatgcc 120

ctgtcgagcc agcgggggag ggtgcccacc gccgcccctc ccgcccagcc gcgtgtgcct 180

gtgacccccg cgccggcggt gattcccatc ctggtcatcg cctgtgaccg cagcactgtt 240

cggcgctgcc tggacaagct gctgcattat cggccctcgg ctgagctctt ccccatcatc 300

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ttccagggct actacaagat cgcgcgccac taccgctggg cgctgggcca ggtcttccgg 480

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ctcgcccgcg tctacggtgc tccccagctg caggtggaga aagtgaggac caatgaccgg 1020

aaggagctgg gggaggtgcg ggtgcagtac acgggcaggg acagcttcaa ggctttcgcc 1080

aaggctctgg gtgtcatgga tgacctcaag tcgggggttc cgagagctgg ctaccggggc 1140

attgtcacct tccagttccg gggccgccgt gtccacctgg cgcccccacc gacgtgggag 1200

ggctatgatc ccagctggaa ttag 1224

<210> 482
<211> 58
<212> PRT
<213> Homo sapiens

<400> 482

Met Arg Phe Arg Ile Tyr Lys Arg Lys Val Leu Ile Leu Thr Leu Val
1 5 10 15

Val Ala Ala Cys Gly Phe Val Leu Trp Ser Ser Asn Gly Arg Gln Arg
20 25 30

Lys Asn Glu Ala Leu Ala Pro Pro Leu Leu Asp Ala Glu Pro Ala Arg
35 40 45

Gly Ala Gly Gly Arg Gly Gly Asp His Pro
50 55

<210> 483
<211> 174
<212> DNA
<213> Homo sapiens

<400> 483
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ggctttgttc tctggtccag caacggtcgc cagcgtaaga acgaggccct ggcgcctccc 120

ctcttggacg ccgaaccggc cagaggcgca ggtggcaggg gaggggatca cccc 174

<210> 484
<211> 1344

<212> DNA
<213> Homo sapiens

<400> 484
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aatcagctca ttgcgggtgt caacttttgc cccgtcttgc aagttttctt ccctttctct 540

atccaactct accccaacga gttcccgggc agtgaccccc gcgactgtcc tcgggatctg 600

ccaaaaaacg ccgctctcaa gctgggctgc atcaacgccg aataccccga cagctttggc 660

cactatcgcg aggccaagtt ctcgcagacg aagcaccact ggtggtggaa gctccatttt 720

gtctgggagc gagtgaagat ccttcgtgat tacgcaggac tcattctgtt cttggaagag 780

gaccactacc tggccccgga cttctaccac gtctttaaga agatgtggaa gctcaagcag 840

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ttttggaagg tccttgttcc ccagatcccg agaattttcc atgctggcga ctgcgggatg 1140

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aacaacaagc agtacatgtt ccccgagaca ctgaccatta gcgagaagtt tacggtcgtg 1260

gcgatctccc cgcctcgaaa gaatggcggc tggggtgaca tccgcgatca cgagctgtgc 1320

aagtcttacc gccggctcca gtaa 1344

<210> 485
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 485
cctggaaagc actgttggag 20

<210> 486
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 486
gattgtcatg gtgtacgtga 20

<210> 487
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 487
catcctcaag gcctcagac 19

<210> 488
<211> 57
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 488

gtaacgccag ggttttccca gtcacgacgg tttaaacgtt gggctgaggc cgtatcg 57

<210> 489
<211> 68
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 489
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tcaggtga 68

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<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 490
ccttgtatct ctacacacag gctc 24

<210> 491
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<220>
<223> PRIMER

<400> 491
ctgatgtctg ctcaagcggg 20

<210> 492
<211> 68
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<400> 492
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actgaatc 68

<210> 493
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<212> DNA
<213> Artificial Sequence

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<223> PRIMER

<400> 493
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acagcatgca a 71

<210> 494
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 494
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<210> 495
<211> 84
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agatttcagt ctctcaccac tcacctgagt tgcctctctc gcgatcgctc tagagtcgac 60

cattctcacg gtgaatgtag gccttttg 88

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tcaggtgagt ggtgagagac tgaaatct 88

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aggaccttaa ttaatcatat atgcagatcc tgcactgcag gcgatcgcgc ggccgcctag 60

catcgact 68

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catcgact 68

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acacacaggc tcaaatcaat aagaagaa 88

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tcaggtgagt ggtgagagac tgaaatct 88

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ttaggcgacc tctttttcca 20

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gcgtcactca tcaaaactgc 20

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<210> 630
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ttaggcgacc tctttttcca 20

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cggtgatg 68

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gtctgcct 68

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<400> 636
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<400> 637
gttgagagaa gttgttggat tg 22

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<400> 638
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<210> 641
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ggtggccgcc ccgtc 75

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<210> 643
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ggccgagtgg agatgtggag tggg 84

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aaggcaca 68

<210> 645
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<400> 645
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cactcaat 68

<210> 646
<211> 24
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<220>
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<400> 646
taacttgtac gctctcagtt cgag 24

<210> 647
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<400> 647
catcctcaag gcctcagac 19

<210> 648
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<400> 648
ccacgccagc ctttccgtct 20

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tggaggaaga cgccgagcga 20

<210> 650
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gaccacgcgg ttgccctgaa 20

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ggatgc 66

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<400> 653
ctagcatcga ctactgctgc 20

<210> 654
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aaggggaccg gccgctagtc tcaccgttat catgcaaaga tacacatcaa 50

<210> 655
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caacgacctc gtcggcatcg ctcccggccc tcgaatgaac agcggcctgc tcaaccagca 60

<210> 656
<211> 60
<212> DNA
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ccaagaatct accggtgcgt caggctttcg ccacggagct ttaggtccag agggggtcgt 60

<210> 657
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caacgacctc gtcggcatcg ctcccggccc tcgaatgaac gccgccgaga tcagcgccga 60

<210> 658
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<220>
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ccaagaatct accggtgcgt caggctttcg ccacggagct ttaggaccag ctcagctcgt 60

<210> 659
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<220>
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caacgacctc gtcggcatcg ctcccggccc tcgaatgaac gacgaggaac tcgtccagct 60

<210> 660
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ccaagaatct accggtgcgt caggctttcg ccacggagct ttagctgttg cggatgccga 60

<210> 661
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<220>
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caacgacctc gtcggcatcg ctcccggccc tcgaatgaac aacaccgcca tccacgcccc 60

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<210> 663
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<210> 664
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<210> 666
<211> 60
<212> DNA
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<220>
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ccaagaatct accggtgcgt caggctttcg ccacggagct ttagcgcttg gggctgggga 60

<210> 667
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actaacagct accccgcttg agcagacatc atggcgtcaa caaatgcgcg 50

<210> 668
<211> 20
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<213> Artificial Sequence

<220>
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<400> 668
gttcattcga gggccgggag 20

<210> 669
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<220>
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<400> 669
gctcgagacg tacgattcac 20

<210> 670
<211> 20
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<220>
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gagcaggctc gacgtatttc 20

<210> 671
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<400> 671
ggcgaaataa gctcactcag 20

<210> 672
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<400> 672
cgttgttgac tggaaaaagg 20

<210> 673
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ccaatagccc ggtgatagtc 20

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aacaagtccg tggctccatt 20

<210> 675
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ccaacttttc agccagcaac 20

<210> 676
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<210> 677
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<220>
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<400> 677
ctcgactgag atgcgtactt 20

<210> 678
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<220>
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actaacagct accccgcttg agcagacatc ttaattaaat gaccaagagc gtccccacct 60

t 61

<210> 679
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<220>
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<400> 680
gccagcggcg cagaccggga 20

<210> 681
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<220>
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<400> 681
gatgtctgct caagcggggt 20

<210> 682
<211> 22
<212> DNA
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<220>
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<400> 682
cagtatattc atcttcccat cc 22

<210> 683
<211> 49
<212> DNA
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<220>
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<400> 683
taacagctac cccgcttgag cagacatcat gcgcttccga atctacaag 49

<210> 684
<211> 49
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 684
gacggtggga aaggtgggga cgctcttggt ggggtgatcc cctcccctg 49

<210> 685
<211> 48
<212> DNA
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<220>
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<400> 685
taacagctac cccgcttgag cagacatcat gatgccacgg catcactc 48

<210> 686
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<212> DNA
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<220>
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gacggtggga aaggtgggga cgctcttggt ttcgagcttc aggtcatcgt 50

<210> 687
<211> 48
<212> DNA
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<220>
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<400> 687
taacagctac cccgcttgag cagacatcat ggcctcttct tcaaagac 48

<210> 688
<211> 50
<212> DNA
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<220>
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gacggtggga aaggtgggga cgctcttggt gaggtattcc ttgttgaatg 50

<210> 689
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<220>
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<400> 689
aggccaggga agaagtcg 18

<210> 690
<211> 102
<212> PRT
<213> Trichoderma reesei

<400> 690

Met Ala Ser Thr Asn Ala Arg Tyr Val Arg Tyr Leu Leu Ile Ala Phe
1 5 10 15

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

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

```
Thr Pro Lys Pro Pro Ala Thr Gly Asp Ala Lys Asp Phe Pro Leu Ala
    50                  55                  60

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

Gly Pro Arg Met Asn Met Ala Ser Thr Asn Ala Arg Tyr Val Arg Tyr
                85                  90                  95

Leu Leu Ile Ala Phe Phe
            100
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<210> 691
<211> 391
<212> PRT
<213> Phaedactylum Tricornutum

<400> 691

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Thr Lys Ser Val Pro Thr Phe Pro Thr Val Pro Thr Asp Ser Arg Pro
1               5                   10                  15

Ser Ala Ala Phe Val Val Ser Asp Ala Pro Gly Ala Tyr Glu Ser Pro
            20                  25                  30

Leu Leu Val Phe Thr Cys Arg Arg Asp Gln Tyr Leu Arg Glu Thr Leu
        35                  40                  45

Arg Asp Ile Trp Asn Tyr Ile Pro Thr Asp Cys Ser Val Gly Cys Pro
    50                  55                  60

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

Arg Glu Phe Thr Asp Glu Phe Ala Thr Lys Asn Val Pro Val Ile His
                85                  90                  95
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```
Trp Thr His Thr Ser Ala Leu Arg Gly Ser Thr Asn Gly Tyr Gln Ala
            100                 105                 110

Leu Ala Ile His Tyr Gly Trp Ala Leu Arg Arg Val Phe Asp Gly Gln
        115                 120                 125

Thr Leu Ser Gly Ser Val His Gly Ala Lys His Gly Thr Pro Gln Arg
    130                 135                 140

Val Ile Ile Leu Glu Glu Asp Leu His Val Ala Pro Asp Phe Phe Asp
145                 150                 155                 160

Tyr Phe Ala Ala Thr Ala Pro Leu Leu Asp His Asp Ser Ser Leu Leu
                165                 170                 175

Ala Val Ser Ala Phe His Asp Asn Gly Phe Ala His Asn Val Arg Asn
            180                 185                 190

Ala Ser Arg Ile Leu Arg Ser Asp Phe Phe Pro Gly Leu Gly Trp Met
        195                 200                 205

Met Asn Arg Arg Leu Trp Val Asp Glu Leu Gln Ser Lys Trp Pro Gly
    210                 215                 220

Gly Tyr Trp Asp Asp Trp Leu Arg Glu Pro Ala Gln Arg Gln Asp Arg
225                 230                 235                 240

Ala Ile Leu Arg Pro Glu Ile Ser Arg Thr Tyr His Phe Gly Thr Glu
                245                 250                 255

Gly Gly Thr Ser Ser Asn Gln Phe Gly Ser His Leu Ser Lys Ile Leu
            260                 265                 270

Leu Asn Arg Glu Thr Val Asp Trp Ser Lys Ala Ala Asp Leu Glu Ala
        275                 280                 285
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```
Gln Leu Arg Pro Glu Val Tyr Asp Pro Ala Tyr Trp Ala Met Val Gln
    290                 295                 300

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

Lys Ser Asn Ala Arg Leu Gln Tyr Thr Thr Ile Glu Gln Phe Lys Tyr
                325                 330                 335

Leu Ala His Lys Leu Lys Leu Met Ala Asp Glu Lys Ala Asn Val Pro
            340                 345                 350

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

Tyr Phe Leu Phe Leu Thr Pro Pro Leu Ala Glu Leu Gln Lys Glu Phe
    370                 375                 380

Asp Ile Pro Ser Pro Lys Arg
385                 390
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<210> 692
<211> 58
<212> PRT
<213> Homo sapiens

<400> 692

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Met Arg Phe Arg Ile Tyr Lys Arg Lys Val Leu Ile Leu Thr Leu Val
1               5                   10                  15

Val Ala Ala Cys Gly Phe Val Leu Trp Ser Ser Asn Gly Arg Gln Arg
            20                  25                  30

Lys Asn Glu Ala Leu Ala Pro Pro Leu Leu Asp Ala Glu Pro Ala Arg
        35                  40                  45
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Gly Ala Gly Gly Arg Gly Gly Asp His Pro
    50   55

<210> 693
<211> 407
<212> PRT
<213> Phaedactylum tricornutum

<400> 693

Ser Val Ser Ala Leu Asp Gly Asp Pro Ala Ser Leu Thr Arg Glu Val
1   5   10   15

Ile Arg Leu Ala Gln Asp Ala Glu Val Glu Leu Glu Arg Gln Arg Gly
            20   25   30

Leu Leu Gln Gln Ile Gly Asp Ala Leu Ser Ser Gln Arg Gly Arg Val
        35   40   45

Pro Thr Ala Ala Pro Pro Ala Gln Pro Arg Val Pro Val Thr Pro Ala
    50   55   60

Pro Ala Val Ile Pro Ile Leu Val Ile Ala Cys Asp Arg Ser Thr Val
65   70   75   80

Arg Arg Cys Leu Asp Lys Leu Leu His Tyr Arg Pro Ser Ala Glu Leu
                85   90   95

Phe Pro Ile Ile Val Ser Gln Asp Cys Gly His Glu Glu Thr Ala Gln
            100   105   110

Ala Ile Ala Ser Tyr Gly Ser Ala Val Thr His Ile Arg Gln Pro Asp
        115   120   125

Leu Ser Ser Ile Ala Val Pro Pro Asp His Arg Lys Phe Gln Gly Tyr
    130   135   140

Tyr Lys Ile Ala Arg His Tyr Arg Trp Ala Leu Gly Gln Val Phe Arg

```
145                 150                 155                 160

Gln Phe Arg Phe Pro Ala Ala Val Val Val Glu Asp Asp Leu Glu Val
                165                 170                 175

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

Ala Asp Pro Ser Leu Trp Cys Val Ser Ala Trp Asn Asp Asn Gly Lys
        195                 200                 205

Glu Gln Met Val Asp Ala Ser Arg Pro Glu Leu Leu Tyr Arg Thr Asp
    210                 215                 220

Phe Phe Pro Gly Leu Gly Trp Leu Leu Leu Ala Glu Leu Trp Ala Glu
225                 230                 235                 240

Leu Glu Pro Lys Trp Pro Lys Ala Phe Trp Asp Asp Trp Met Arg Arg
                245                 250                 255

Pro Glu Gln Arg Gln Gly Arg Ala Cys Ile Arg Pro Glu Ile Ser Arg
            260                 265                 270

Thr Met Thr Phe Gly Arg Lys Gly Val Ser His Gly Gln Phe Phe Asp
        275                 280                 285

Gln His Leu Lys Phe Ile Lys Leu Asn Gln Gln Phe Val His Phe Thr
    290                 295                 300

Gln Leu Asp Leu Ser Tyr Leu Gln Arg Glu Ala Tyr Asp Arg Asp Phe
305                 310                 315                 320

Leu Ala Arg Val Tyr Gly Ala Pro Gln Leu Gln Val Glu Lys Val Arg
                325                 330                 335

Thr Asn Asp Arg Lys Glu Leu Gly Glu Val Arg Val Gln Tyr Thr Gly
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340 345 350

Arg Asp Ser Phe Lys Ala Phe Ala Lys Ala Leu Gly Val Met Asp Asp
355 360 365

Leu Lys Ser Gly Val Pro Arg Ala Gly Tyr Arg Gly Ile Val Thr Phe
370 375 380

Gln Phe Arg Gly Arg Arg Val His Leu Ala Pro Pro Pro Thr Trp Glu
385 390 395 400

Gly Tyr Asp Pro Ser Trp Asn
405

<210> 694
<211> 392
<212> PRT
<213> Phaedactylum tricornutum

<400> 694

Met Thr Lys Ser Val Pro Thr Phe Pro Thr Val Pro Thr Asp Ser Arg
1 5 10 15

Pro Ser Ala Ala Phe Val Val Ser Asp Ala Pro Gly Ala Tyr Glu Ser
20 25 30

Pro Leu Leu Val Phe Thr Cys Arg Arg Asp Gln Tyr Leu Arg Glu Thr
35 40 45

Leu Arg Asp Ile Trp Asn Tyr Ile Pro Thr Asp Cys Ser Val Gly Cys
50 55 60

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

Val Arg Glu Phe Thr Asp Glu Phe Ala Thr Lys Asn Val Pro Val Ile
85 90 95

```
His Trp Thr His Thr Ser Ala Leu Arg Gly Ser Thr Asn Gly Tyr Gln
            100                 105                 110

Ala Leu Ala Ile His Tyr Gly Trp Ala Leu Arg Arg Val Phe Asp Gly
        115                 120                 125

Gln Thr Leu Ser Gly Ser Val His Gly Ala Lys His Gly Thr Pro Gln
    130                 135                 140

Arg Val Ile Ile Leu Glu Glu Asp Leu His Val Ala Pro Asp Phe Phe
145                 150                 155                 160

Asp Tyr Phe Ala Ala Thr Ala Pro Leu Leu Asp His Asp Ser Ser Leu
                165                 170                 175

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

Asn Ala Ser Arg Ile Leu Arg Ser Asp Phe Phe Pro Gly Leu Gly Trp
        195                 200                 205

Met Met Asn Arg Arg Leu Trp Val Asp Glu Leu Gln Ser Lys Trp Pro
    210                 215                 220

Gly Gly Tyr Trp Asp Asp Trp Leu Arg Glu Pro Ala Gln Arg Gln Asp
225                 230                 235                 240

Arg Ala Ile Leu Arg Pro Glu Ile Ser Arg Thr Tyr His Phe Gly Thr
                245                 250                 255

Glu Gly Gly Thr Ser Ser Asn Gln Phe Gly Ser His Leu Ser Lys Ile
            260                 265                 270

Leu Leu Asn Arg Glu Thr Val Asp Trp Ser Lys Ala Ala Asp Leu Glu
        275                 280                 285
```

```
Ala Gln Leu Arg Pro Glu Val Tyr Asp Pro Ala Tyr Trp Ala Met Val
    290                 295                 300

Gln Ala Ser Thr Leu Thr Tyr Thr Ile Pro Asp Ala Leu Glu Gln Ala
305                 310                 315                 320

Lys Lys Ser Asn Ala Arg Leu Gln Tyr Thr Thr Ile Glu Gln Phe Lys
                325                 330                 335

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

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

Asp Tyr Phe Leu Phe Leu Thr Pro Pro Leu Ala Glu Leu Gln Lys Glu
    370                 375                 380

Phe Asp Ile Pro Ser Pro Lys Arg
385                 390
```

<210> 695
<211> 58
<212> PRT
<213> Homo sapiens

<400> 695

```
Met Arg Phe Arg Ile Tyr Lys Arg Lys Val Leu Ile Leu Thr Leu Val
1               5                   10                  15

Val Ala Ala Cys Gly Phe Val Leu Trp Ser Ser Asn Gly Arg Gln Arg
            20                  25                  30

Lys Asn Glu Ala Leu Ala Pro Pro Leu Leu Asp Ala Glu Pro Ala Arg
        35                  40                  45
```

Gly Ala Gly Gly Arg Gly Gly Asp His Pro
50 55

<210> 696
<211> 391
<212> PRT
<213> Phaedactylum Tricornutum

<400> 696

Thr Lys Ser Val Pro Thr Phe Pro Thr Val Pro Thr Asp Ser Arg Pro
1 5 10 15

Ser Ala Ala Phe Val Val Ser Asp Ala Pro Gly Ala Tyr Glu Ser Pro
20 25 30

Leu Leu Val Phe Thr Cys Arg Arg Asp Gln Tyr Leu Arg Glu Thr Leu
35 40 45

Arg Asp Ile Trp Asn Tyr Ile Pro Thr Asp Cys Ser Val Gly Cys Pro
50 55 60

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

Arg Glu Phe Thr Asp Glu Phe Ala Thr Lys Asn Val Pro Val Ile His
85 90 95

Trp Thr His Thr Ser Ala Leu Arg Gly Ser Thr Asn Gly Tyr Gln Ala
100 105 110

Leu Ala Ile His Tyr Gly Trp Ala Leu Arg Arg Val Phe Asp Gly Gln
115 120 125

Thr Leu Ser Gly Ser Val His Gly Ala Lys His Gly Thr Pro Gln Arg
130 135 140

```
Val Ile Ile Leu Glu Glu Asp Leu His Val Ala Pro Asp Phe Phe Asp
145                 150                 155                 160


Tyr Phe Ala Ala Thr Ala Pro Leu Leu Asp His Asp Ser Ser Leu Leu
                165                 170                 175


Ala Val Ser Ala Phe His Asp Asn Gly Phe Ala His Asn Val Arg Asn
            180                 185                 190


Ala Ser Arg Ile Leu Arg Ser Asp Phe Phe Pro Gly Leu Gly Trp Met
        195                 200                 205


Met Asn Arg Arg Leu Trp Val Asp Glu Leu Gln Ser Lys Trp Pro Gly
    210                 215                 220


Gly Tyr Trp Asp Asp Trp Leu Arg Glu Pro Ala Gln Arg Gln Asp Arg
225                 230                 235                 240


Ala Ile Leu Arg Pro Glu Ile Ser Arg Thr Tyr His Phe Gly Thr Glu
                245                 250                 255


Gly Gly Thr Ser Ser Asn Gln Phe Gly Ser His Leu Ser Lys Ile Leu
            260                 265                 270


Leu Asn Arg Glu Thr Val Asp Trp Ser Lys Ala Ala Asp Leu Glu Ala
        275                 280                 285


Gln Leu Arg Pro Glu Val Tyr Asp Pro Ala Tyr Trp Ala Met Val Gln
    290                 295                 300


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


Lys Ser Asn Ala Arg Leu Gln Tyr Thr Thr Ile Glu Gln Phe Lys Tyr
                325                 330                 335
```

Leu Ala His Lys Leu Lys Leu Met Ala Asp Glu Lys Ala Asn Val Pro
340 345 350

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

Tyr Phe Leu Phe Leu Thr Pro Pro Leu Ala Glu Leu Gln Lys Glu Phe
370 375 380

Asp Ile Pro Ser Pro Lys Arg
385 390

<210> 697
<211> 78
<212> PRT
<213> Saccharomyces cerevisiae

<400> 697

Met Met Pro Arg His His Ser Ser Gly Phe Ser Asn Gly Tyr Pro Arg
1 5 10 15

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

Pro Ser Pro Gln Glu Thr Gln Glu Asp Ser Asp Ser Arg Arg His Ser
35 40 45

Ser Cys Cys His Pro Arg Pro Arg Pro Leu Val Arg Pro Ala Pro Ile
50 55 60

Cys Arg Leu Pro His Leu Ala Arg His Leu Val Trp Ile Arg
65 70 75

<210> 698
<211> 391
<212> PRT
<213> Phaedactylum Tricornutum

<400> 698

```
Thr Lys Ser Val Pro Thr Phe Pro Thr Val Pro Thr Asp Ser Arg Pro
1               5                  10                  15

Ser Ala Ala Phe Val Val Ser Asp Ala Pro Gly Ala Tyr Glu Ser Pro
            20                  25                  30

Leu Leu Val Phe Thr Cys Arg Arg Asp Gln Tyr Leu Arg Glu Thr Leu
        35                  40                  45

Arg Asp Ile Trp Asn Tyr Ile Pro Thr Asp Cys Ser Val Gly Cys Pro
    50                  55                  60

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

Arg Glu Phe Thr Asp Glu Phe Ala Thr Lys Asn Val Pro Val Ile His
                85                  90                  95

Trp Thr His Thr Ser Ala Leu Arg Gly Ser Thr Asn Gly Tyr Gln Ala
            100                 105                 110

Leu Ala Ile His Tyr Gly Trp Ala Leu Arg Arg Val Phe Asp Gly Gln
        115                 120                 125

Thr Leu Ser Gly Ser Val His Gly Ala Lys His Gly Thr Pro Gln Arg
    130                 135                 140

Val Ile Ile Leu Glu Glu Asp Leu His Val Ala Pro Asp Phe Phe Asp
145                 150                 155                 160

Tyr Phe Ala Ala Thr Ala Pro Leu Leu Asp His Asp Ser Ser Leu Leu
                165                 170                 175

Ala Val Ser Ala Phe His Asp Asn Gly Phe Ala His Asn Val Arg Asn
            180                 185                 190
```

```
Ala Ser Arg Ile Leu Arg Ser Asp Phe Phe Pro Gly Leu Gly Trp Met
        195                 200                 205

Met Asn Arg Arg Leu Trp Val Asp Glu Leu Gln Ser Lys Trp Pro Gly
    210                 215                 220

Gly Tyr Trp Asp Asp Trp Leu Arg Glu Pro Ala Gln Arg Gln Asp Arg
225                 230                 235                 240

Ala Ile Leu Arg Pro Glu Ile Ser Arg Thr Tyr His Phe Gly Thr Glu
                245                 250                 255

Gly Gly Thr Ser Ser Asn Gln Phe Gly Ser His Leu Ser Lys Ile Leu
            260                 265                 270

Leu Asn Arg Glu Thr Val Asp Trp Ser Lys Ala Ala Asp Leu Glu Ala
        275                 280                 285

Gln Leu Arg Pro Glu Val Tyr Asp Pro Ala Tyr Trp Ala Met Val Gln
    290                 295                 300

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

Lys Ser Asn Ala Arg Leu Gln Tyr Thr Thr Ile Glu Gln Phe Lys Tyr
                325                 330                 335

Leu Ala His Lys Leu Lys Leu Met Ala Asp Glu Lys Ala Asn Val Pro
            340                 345                 350

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

Tyr Phe Leu Phe Leu Thr Pro Pro Leu Ala Glu Leu Gln Lys Glu Phe
    370                 375                 380
```

```
Asp Ile Pro Ser Pro Lys Arg
385                 390


<210>  699
<211>  86
<212>  PRT
<213>  Saccharomyces cerevisiae

<400>  699

Met Ala Ser Ser Ser Lys Thr Pro Gly Glu Ala Pro Val Arg Tyr Val
1               5                   10                  15


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


Leu Ser Ile Met Val Leu Ile Met Ala Ile Ile Gly Gln Gly Val Met
        35                  40                  45


Glu Ile Tyr Gly Val Ser Lys Pro Ile Leu Asn Ala Gln Lys Phe Val
    50                  55                  60


Pro Ser Trp His Gly Thr Leu Arg Asp Pro Thr His Pro Pro Ala Ala
65                  70                  75                  80


Phe Asn Lys Glu Tyr Leu
                85


<210>  700
<211>  391
<212>  PRT
<213>  Phaedactylum Tricornutum

<400>  700

Thr Lys Ser Val Pro Thr Phe Pro Thr Val Pro Thr Asp Ser Arg Pro
1               5                   10                  15
```

```
Ser Ala Ala Phe Val Val Ser Asp Ala Pro Gly Ala Tyr Glu Ser Pro
            20                  25                  30

Leu Leu Val Phe Thr Cys Arg Arg Asp Gln Tyr Leu Arg Glu Thr Leu
        35                  40                  45

Arg Asp Ile Trp Asn Tyr Ile Pro Thr Asp Cys Ser Val Gly Cys Pro
    50                  55                  60

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

Arg Glu Phe Thr Asp Glu Phe Ala Thr Lys Asn Val Pro Val Ile His
                85                  90                  95

Trp Thr His Thr Ser Ala Leu Arg Gly Ser Thr Asn Gly Tyr Gln Ala
            100                 105                 110

Leu Ala Ile His Tyr Gly Trp Ala Leu Arg Arg Val Phe Asp Gly Gln
        115                 120                 125

Thr Leu Ser Gly Ser Val His Gly Ala Lys His Gly Thr Pro Gln Arg
    130                 135                 140

Val Ile Ile Leu Glu Glu Asp Leu His Val Ala Pro Asp Phe Phe Asp
145                 150                 155                 160

Tyr Phe Ala Ala Thr Ala Pro Leu Leu Asp His Asp Ser Ser Leu Leu
                165                 170                 175

Ala Val Ser Ala Phe His Asp Asn Gly Phe Ala His Asn Val Arg Asn
            180                 185                 190

Ala Ser Arg Ile Leu Arg Ser Asp Phe Phe Pro Gly Leu Gly Trp Met
        195                 200                 205
```

```
Met Asn Arg Arg Leu Trp Val Asp Glu Leu Gln Ser Lys Trp Pro Gly
    210                 215                 220

Gly Tyr Trp Asp Asp Trp Leu Arg Glu Pro Ala Gln Arg Gln Asp Arg
225                 230                 235                 240

Ala Ile Leu Arg Pro Glu Ile Ser Arg Thr Tyr His Phe Gly Thr Glu
                245                 250                 255

Gly Gly Thr Ser Ser Asn Gln Phe Gly Ser His Leu Ser Lys Ile Leu
            260                 265                 270

Leu Asn Arg Glu Thr Val Asp Trp Ser Lys Ala Ala Asp Leu Glu Ala
        275                 280                 285

Gln Leu Arg Pro Glu Val Tyr Asp Pro Ala Tyr Trp Ala Met Val Gln
    290                 295                 300

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

Lys Ser Asn Ala Arg Leu Gln Tyr Thr Thr Ile Glu Gln Phe Lys Tyr
                325                 330                 335

Leu Ala His Lys Leu Lys Leu Met Ala Asp Glu Lys Ala Asn Val Pro
            340                 345                 350

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

Tyr Phe Leu Phe Leu Thr Pro Pro Leu Ala Glu Leu Gln Lys Glu Phe
    370                 375                 380

Asp Ile Pro Ser Pro Lys Arg
385                 390
```

<210> 701
<211> 64
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 701
aagttccctt cctctggcag caatcgaacc atcccattca ccttgtatct ctacacacag 60

gctc 64

<210> 702
<211> 61
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 702
gtccatcatt ccacgtcctt cagaccggcc ggccgaattc tcatcgtctt gacagcaatg 60

c 61

<210> 703
<211> 69
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 703
cctcgtgtac tgtgtaagcg cccactccac atctccactc gcgatcgcgg tctgaaggac 60

gtggaatga 69

<210> 704
<211> 62
<212> DNA
<213> Artificial Sequence

<220>

<223> PRIMER

<400> 704
ctcaaacccc tcatccactc caagtcaaca tcaacagaac tcacttcttg aggacgatga 60

cc 62

<210> 705
<211> 88
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 705
aacaaatata ggcacacatt ggcactaata cgagcaccaa gcgatcgcga gtggagatgt 60

ggagtgggcg cttacacagt acacgagg 88

<210> 706
<211> 88
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 706
cctcctatgc ttttacaagc tgctcctcta tccgccccca gcgatcgcag gtagacgctt 60

tgcgagtgtg tgtgtatcta agaagtgc 88

<210> 707
<211> 88
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 707
gcacttctta gatacacaca cactcgcaaa gcgtctacct gcgatcgctg ggggcggata 60

gaggagcagc ttgtaaaagc ataggagg 88

<210> 708
<211> 92
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 708
tcccttcctc tggcagcaat cgaaccatcc cattcaattt aaatgaattc ggccggccgg 60

tctgaaggac gtggaatgat ggacttaatg ac 92

<210> 709
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 709
ttcttcttat tgatttgagc ctgtgtgtag agatacaagg ccggccgagt ggagatgtgg 60

agtgggcgct tacacagtac 80

<210> 710
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 710
atgatgcctt tgcagaaatg gcttgctcgc tgactgatac ccttgtatct ctacacacag 60

gctcaaatca ataagaagaa 80

<210> 711
<211> 80
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 711
ttcttcttat tgatttgagc ctgtgtgtag agatacaagg gtatcagtca gcgagcaagc 60

catttctgca aaggcatcat 80

<210> 712
<211> 88
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 712
cctcgtgtac tgtgtaagcg cccactccac atctccactc gcgatcgcag gtagacgctt 60

tgcgagtgtg tgtgtatcta agaagtgc 88

<210> 713
<211> 88
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 713
gcacttctta gatacacaca cactcgcaaa gcgtctacct gcgatcgcga gtggagatgt 60

ggagtgggcg cttacacagt acacgagg 88

<210> 714
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 714
ccgcgttgaa cggcttccca 20

<210> 715
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 715
taacttgtac gctctcagtt cgag 24

<210> 716
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 716
gcgacggcga cccattagca 20

<210> 717
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 717
catcctcaag gcctcagac 19

<210> 718
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 718
tgcgctctca ccagcatcgc 20

<210> 719
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 719
gtcctgggcg agttccgcac 20

<210> 720
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 720
tgcgtcgccg tctcgctcct 20

<210> 721
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 721
tgacgtacca gttgggatga 20

<210> 722
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 722
gatgttgcgc ctgggttgac 20

<210> 723
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 723
tgacgtacca gttgggatga 20

<210> 724
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 724
tgcgtcgccg tctcgctcct 20

<210> 725
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 725
gattgtcatg gtgtacgtga 20

<210> 726
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 726
caagatggag ggcggcacag 20

<210> 727
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 727
gccagtagcg tgatagagaa gc 22

<210> 728
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 728
tcatcaagct gaaccagcag 20

<210> 729
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 729
gagcaggctc gacgtatttc 20

<210> 730
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 730
gattgtcatg gtgtacgtga 20

<210> 731
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 731
catcctcaag gcctcagac 19

<210> 732
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 732
atgatgactc caggccaaag 20

<210> 733
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 733
gatgttgcgc ctgggttgac 20

<210> 734
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 734
ctccgggttc gcagcagctt 20

<210> 735
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 735
ccatgagctt gaacaggtaa 20

<210> 736
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 736
gattgtcatg gtgtacgtga 20

<210> 737
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 737
caagatggag ggcggcacag 20

<210> 738
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> PRIMER

<400> 738
gccagtagcg tgatagagaa gc 22

<210> 739
<211> 670
<212> PRT
<213> Chlamydomonas reinharditii

<400> 739

Met Gly Ser Leu Ala Leu Leu Thr Tyr Val Trp Val Val Phe Val Leu
1 5 10 15

His Pro Ala Arg Val Ala Asp Ala Ala Val Thr Gln Gly Gly Ala Asp
20 25 30

Ser Gly Gly Ala Arg Ile Gly Arg Leu Arg Leu Asn Thr Gly Gly Ala
35 40 45

Thr Gly His Asp Leu Ser His Leu Leu Phe Gln Thr Pro Ser His Pro
50 55 60

Thr Lys Pro Gln Lys Thr Ala Ala Ala Lys Ala Ser Ser Pro Pro Pro
65 70 75 80

Pro Pro Pro Asp Glu Asp Asp Val Pro Glu Gly Pro His Pro Met Arg
85 90 95

His Tyr Pro Tyr Gln Asp Ala Lys Tyr Arg Ile Trp Ser Leu Pro Lys
100 105 110

Glu Asp Val Ser Pro Arg Cys Arg Ala Ser Gly Ile Cys Asp Gly Lys
115 120 125

Tyr Asp Cys Gly Ala Asp Gly Met Gly Cys Ile Thr Asp Ala Leu Lys
130 135 140

Arg Lys Met Lys Val Arg Asp Ala Ala Ala Trp Thr Trp Lys Gly Tyr
145 150 155 160

```
Arg Gln Tyr Ala Trp Gly His Asp Glu Leu Asn Ala Gly Ser Arg Asn
                165                 170                 175

Ser Arg Glu Trp Phe Asn Met Gly Leu Thr Ile Val Asp Ser Leu Asp
            180                 185                 190

Thr Leu Gln Ile Leu Gly Leu Leu Glu Glu Tyr Ala Glu Ala Arg Tyr
        195                 200                 205

Trp Val Val Asn His Leu Asp Leu Asn Gln Gly Asp Val Ser Val Phe
    210                 215                 220

Glu Thr Thr Ile Arg Ile Leu Gly Gly Leu Ala Ala Ala Phe Tyr His
225                 230                 235                 240

Ser Gly Gly Asp Glu Ala Phe Leu Met Lys Ala Val Glu Phe Ala Asp
                245                 250                 255

Arg Leu Met Pro Ala Phe Asn Thr Ser Ser Gly Leu Pro Gln Pro His
            260                 265                 270

Phe Ser Val His Asp Lys Asn Val Ala Thr Tyr Arg Gly Ser Ala Gly
        275                 280                 285

Ser Ser Cys Leu Ala Glu Ile Gly Thr Leu Ser Met Glu Phe Thr Ala
    290                 295                 300

Val Ser Arg Leu Ser Gly Arg Pro Glu Phe Arg Asp Thr Ala Met Lys
305                 310                 315                 320

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

Thr Met Leu Asn Ala Asp Leu Leu Ser Cys Asn Gly Asn His Tyr Thr
            340                 345                 350
```

```
Phe Gly Ala Ser Ala Asp Ser Thr Tyr Glu Tyr Met Leu Lys Gln Trp
        355                 360                 365

Val Leu Thr Asn Gly Thr Asp Glu Met Cys Leu Asp Met Tyr Lys Lys
    370                 375                 380

Ala Ile Gly Gly Met Arg Arg His Met Leu Thr Glu Leu Trp Met Gly
385                 390                 395                 400

Pro Asp Ile Gly Glu Val Trp Ile Ala Ala Glu Asn Asp Ala Gly Ala
                405                 410                 415

Ser Arg Asn Leu Val Leu Glu His Leu Thr Cys Phe Leu Pro Gly Thr
            420                 425                 430

Met Ala Leu Gly His Met Tyr Gly Val Asn Thr Gly Gly Ala Gly Glu
        435                 440                 445

Asp Asp Asp Leu Met Val Ala Ile Lys Leu Met Lys Ala Cys Tyr Glu
    450                 455                 460

Leu Tyr His Gln Thr Pro Ser Gly Val Ala Trp Asp Ser Val His Leu
465                 470                 475                 480

Asp Glu Pro Val Glu Val Thr Ser Thr Arg Glu Ala Gly Val Ile Asp
                485                 490                 495

Ser Asp Asp Gly Asp Asp Gly Ala Asp Gly Val Asp Gly Leu Gly Tyr
            500                 505                 510

Val Val Leu Asp Ala Glu Glu Arg Arg His Leu Met Ala Glu Ala Ser
        515                 520                 525

Gly Gly Ala Gly Asp Gly Ala Lys Pro Pro Gly Trp Gly Lys Val Lys
    530                 535                 540
```

```
Tyr Glu Phe Ala Pro Arg Ser Arg Glu Asn Phe Leu Arg Pro Glu Val
545                 550                 555                 560


Ala Glu Ser Leu Phe Tyr Leu Trp Arg Ala Thr Gly Asp Pro Ile Tyr
                565                 570                 575


Arg Glu Trp Gly Trp Asn Met Phe Arg Ala Tyr Glu Arg Trp Cys Arg
            580                 585                 590


Val Asp Ser Gly Gly Tyr Gln Met Glu Ser Phe Trp Ile Ala Glu Thr
        595                 600                 605


Leu Lys Tyr Phe Tyr Leu Leu Phe Ser Asp Asp Pro Asn Glu Ile Pro
    610                 615                 620


Leu Asp Glu Phe Val Phe Asn Thr Glu Ala His Pro Leu Ala Ile Trp
625                 630                 635                 640


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


Tyr Ala Phe Leu Met His Gln His Phe Arg Asn Asp Ala Leu
            660                 665                 670


<210>  740
<211>  852
<212>  PRT
<213>  Volvox carteri

<400>  740

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


Tyr Thr Cys Gly Val Asp Gly Leu Gly Cys Ile Thr Asp Ala Leu Leu
            20                  25                  30
```

```
Arg Lys Glu Lys Val Arg Glu Ala Ala Arg Trp Thr Trp Lys Gly Tyr
        35                  40                  45

Arg Gln Tyr Ala Trp Gly His Asp Glu Leu Asn Ala Gly Ser Arg Thr
    50                  55                  60

Ser Arg Glu Trp Phe Ala Leu Gly Leu Thr Ile Val Asp Ser Leu Asp
65                  70                  75                  80

Thr Leu Gln Ile Leu Gly Leu Leu Glu Glu Tyr Ala Glu Ala Arg Phe
                85                  90                  95

Trp Val Ala Asn His Leu Asn Phe Asn Gln Gly Glu Val Ser Val Phe
            100                 105                 110

Glu Thr Thr Ile Arg Ile Leu Gly Gly Leu Val Ala Ala Phe Tyr His
        115                 120                 125

Ser Gly Gly Asp Glu Leu Phe Leu Leu Lys Ala Val Glu Phe Ala Glu
    130                 135                 140

Ser Val His Asp Thr Glu Glu Pro Arg Gly Lys Phe Gly Ile Gly Ser
145                 150                 155                 160

Thr Cys Leu Ala Glu Val Ala Thr Val Ser Met Glu Phe Ser Ala Val
                165                 170                 175

Ser Arg Leu Ser Gly Arg Pro Glu Phe Arg Asp Thr Ala Met Ile Pro
            180                 185                 190

Trp Gln Lys Leu Thr Ser Met Gln Asp Leu Asp Gly Leu Tyr Cys Thr
        195                 200                 205

Phe Leu Asn Gly Asp Ser Leu Gly Cys Ser Gly Asn His Tyr Thr Met
    210                 215                 220
```

```
Gly Ala Ser Ala Asp Ser Ala Tyr Glu Tyr Met Leu Lys Gln Trp Ile
225                 230                 235                 240


Met Asn Lys Asn Asp Ser Met Cys Ile Asp Met Tyr Lys Lys Ala Ile
                245                 250                 255


Gly Gly Met Arg Lys His Met Leu Thr Gln Leu Trp Met Gly Glu Asp
            260                 265                 270


Ile Gly Asp Val Trp Ile Val Ala Glu Asn Asp Gly Gly Arg Thr Arg
        275                 280                 285


Ser Asn Ile Leu Glu His Leu Thr Cys Phe Leu Pro Gly Thr Ile Ala
    290                 295                 300


Leu Gly His Met Tyr Gly Ile Asn Thr Ala Ser Ser Pro Asp Glu Asp
305                 310                 315                 320


Asp Asp Leu Thr Val Ala Val Lys Leu Met Lys Ala Cys Tyr Glu Leu
                325                 330                 335


Tyr His Gln Thr Ala Thr Gly Val Ala Phe Asp Ser Val Leu Leu Val
            340                 345                 350


Pro Arg Tyr Ser Pro Glu Pro Val Val Asp Lys Gly Ile Gly Gln Phe
        355                 360                 365


Gln Thr Gly Thr Thr Phe Thr Ala Gly Ser Thr Ala Thr Gly Asn Gly
    370                 375                 380


Asn Gln Gln Glu Ser Ser Gly Lys Gly Arg Ile Leu Leu Gln Asp Gly
385                 390                 395                 400


Gly Ser Ala Gly Lys Thr Lys Tyr Ala Phe Ala Pro Arg Ser Arg Glu
                405                 410                 415
```

```
Asn Phe Leu Arg Pro Glu Val Ala Glu Ser Leu Phe Tyr Leu Trp Arg
            420                 425                 430

Ala Thr Gly Asp Pro Ile Tyr Arg Glu Trp Gly Trp Asn Met Phe Arg
        435                 440                 445

Ala Tyr Glu Arg Trp Cys Arg Val Ser Thr Gly Gly Tyr Gln Val Leu
    450                 455                 460

Asn Asn Val Asp Thr Val Pro Pro Ser Val Gly Asn Lys Met Glu Ser
465                 470                 475                 480

Phe Trp Met Ala Glu Thr Met Lys Tyr Phe Tyr Leu Leu Phe Ser Asp
                485                 490                 495

Asp Pro Asp Glu Ile Pro Leu Asp Glu Phe Val Phe Asn Thr Glu Ala
            500                 505                 510

His Pro Leu Ala Ile Trp Gly Thr Glu Thr Asp Leu Thr Leu Arg Glu
        515                 520                 525

Val Leu Ala Asn Ala His Gly Arg Leu Glu Ala Ser Gly Val Asn Ala
    530                 535                 540

Leu Gly Lys Ser Ala Gln Tyr Tyr Gln Ser Asn Leu Met Gly Met Thr
545                 550                 555                 560

Ala Ala Glu Arg His Lys Lys Phe Val Asn Asp Tyr Leu Thr Tyr Tyr
                565                 570                 575

Ala Cys Gly Arg Asp Glu Pro Ser Thr Lys Asn Asp Ala Ala Arg Ile
            580                 585                 590

Arg Thr Asp Ala Asp Ala Leu Arg Glu His His Arg Phe Ile Arg Ser
        595                 600                 605
```

```
Asp Ala Asp Asn Glu Ser Ser Ser Trp Glu Ala Arg Leu Ala Lys Arg
    610                 615                 620

Tyr Tyr Asp Arg Leu Phe Lys Glu Tyr Ala Ile Val Asp Leu Thr Tyr
625                 630                 635                 640

Tyr Lys Gln Ser Lys Leu Gly Met Arg Trp Arg Thr Gln Lys Glu Val
                645                 650                 655

Val Ser Gly Lys Gly Gln Phe Val Cys Gly Ala Lys Gly Cys Asp Ala
            660                 665                 670

Gly Glu Gly Leu Cys Ser Tyr Glu Val Asn Phe Ala Tyr Gln Glu Ala
        675                 680                 685

Gly Glu Arg Lys Gln Ala Leu Val Lys Leu Arg Leu Cys Pro Ala Cys
    690                 695                 700

Ala Phe Lys Leu Asn Tyr Arg Lys Glu Lys Gln Leu Gln Lys Ala Ala
705                 710                 715                 720

Asp Ala Ala Ala Ala Arg Lys Arg Lys Arg Glu Gln Glu Leu Glu Glu
                725                 730                 735

Arg Met Pro Asn Asp Pro Leu Val Gln Glu Ala Leu Glu Tyr Val Gln
            740                 745                 750

Arg Tyr Ala His Gly Gly Ser Asp Glu Ala Gly Pro Phe Asn Pro Glu
        755                 760                 765

Ala Gly Ile Gly Thr Ala Asp Phe Glu Arg Ala Thr Gly Asp Val Ala
    770                 775                 780

Pro Pro Pro Ala Ala Thr Ala Ala Arg Ala Gly Gly Ser Gly Val Ala
785                 790                 795                 800
```

Ile Asp Ala Leu Gly Gly Thr Gly Thr Glu Gly Ala Gln Arg Ala Pro
805 810 815

Ala Val Ile Thr Leu Pro Ala Asp Asn Ser Val Trp Glu Leu Lys Pro
820 825 830

Ala Gln Glu Thr Val Asn Val Glu Glu Glu Met Asp Ala Tyr Phe Glu
835 840 845

Gly Leu Phe Leu
850

<210> 741
<211> 475
<212> PRT
<213> Ostreococcus lucimarinus

<400> 741

Asp Ala Gly Arg Arg Asp Glu Val Lys Ala Ala Met Arg Glu Ala Phe
1 5 10 15

Gly Ala Tyr Arg Thr His Ala Leu Gly His Asp Glu Leu Ala Pro Arg
20 25 30

Ala Arg Thr Gly Arg Asp Asp Phe Gly Gly Ile Gly Ala Thr Leu Ile
35 40 45

Asp Ser Leu Asp Thr Leu His Ile Met Gly Leu Arg Ala Glu Phe Asp
50 55 60

Glu Ala Leu Arg Tyr Leu Lys Lys Pro Gly Ser Ala Phe Arg Asp Leu
65 70 75 80

Val Gln Gly Glu Thr Asp Arg Asp Val Ser Val Phe Glu Thr Asn Ile
85 90 95

Arg Val Leu Gly Gly Leu Leu Ala Ala His Asp Leu Ser Gly Asp Ala

```
            100                 105                 110

Asp Val Leu Glu Leu Ala Glu Ser Ile Ala Ala Arg Leu Ser Ala Ala
        115                 120                 125

Phe Asp Thr Pro Ser Gly Val Pro His Ser Phe Val Asn Val Lys Thr
    130                 135                 140

Gly Asn Ser Phe Gly Leu Pro Trp Thr Lys Gly Ala Ser Ile Leu Ala
145                 150                 155                 160

Asp Phe Gly Ser Met His Leu Glu Trp Ala Thr Leu Ser Ala Arg Thr
                165                 170                 175

Lys Asn Pro Val Tyr Glu Ala His Thr Asn His Val Phe Glu Thr Val
            180                 185                 190

Ser Ser Leu Gly Arg Arg Gly Lys Ser Gly Ala Ser Thr Lys Gly Leu
        195                 200                 205

Phe Ser Ala His Phe Asn Val Asp Thr Gly Glu Phe Ala Gly Gly Asp
    210                 215                 220

Val Thr Phe Gly Ala Leu Gly Asp Ser Phe Tyr Glu Tyr Leu Ile Lys
225                 230                 235                 240

Cys Trp Arg Ser Leu Gly Asp Leu Lys Asp Ala Glu Thr Trp Arg Glu
                245                 250                 255

Met Phe Asp Glu Ala Met Leu Gly Met Lys Thr Ser Leu Leu Arg Asp
            260                 265                 270

Trp Lys Thr Asp Glu Ala Thr Gly Glu Lys Tyr Ser Tyr Val Ser Pro
        275                 280                 285

Ile Gly Gly Ser Gly Ala Gly Ser Met Glu His Leu Ala Cys Phe Val
```

290 295 300

Pro Gly Met Leu Val Leu Gly Ala Ala Glu Ala Pro Thr Pro Thr Thr
305 310 315 320

Ala Asp Glu Tyr Val Gln Ile Ala Lys Asp Ile Ala Arg Thr Cys Val
325 330 335

Glu Met Tyr Ser Ser Gln Pro Cys Gly Leu Ser Ala Asp His Val Arg
340 345 350

Phe Asp Ser Gly Ser Lys Thr Ile Ser Asn Ile Asn Gly Lys Asn Ile
355 360 365

Gln Arg Pro Glu Thr Val Glu Ser Leu Phe Tyr Leu Tyr Arg Lys Thr
370 375 380

Gly Asp Glu Ile Tyr Arg Thr Gln Ala Trp Lys Ile Phe Gln Ser Met
385 390 395 400

Lys Ser Ala Tyr Arg Val Pro Glu Ser Gly Gly Trp Gln Gly Val Leu
405 410 415

Asp Val Ser Lys Thr Pro Thr Ala Gly Asp Asp Lys Met Gln Ser Phe
420 425 430

Phe Leu Ala Glu Thr Leu Lys Tyr Leu Tyr Leu Ile Phe Thr Asp Ser
435 440 445

Asp Thr Met His Leu Asp Glu Trp Val Phe Asn Thr Glu Ala His Pro
450 455 460

Leu Arg Ile Thr Lys Ala Arg Glu Arg Leu Asn
465 470 475

<210> 742

<211> 497
<212> PRT
<213> Ostreococcus tauri

<400> 742

```
Met Trp Ser Arg Thr Arg Arg Arg Gly Trp Ser Gly Glu Glu Gly Arg
1               5                  10                  15


Gly Arg Arg Tyr Trp Ala Thr Thr Arg Ala Asp Ala Arg Arg Arg Asp
            20                  25                  30


Ala Val Arg Asp Ala Phe Arg Glu Cys Leu Thr Ala Tyr Val Thr Tyr
        35                  40                  45


Ala Ser Gly His Asp Glu Leu Ala Pro Ala Ser Arg Arg Gly Val Asp
    50                  55                  60


Asp Phe Gly Gly Val Asp Thr Thr Leu Ala Asp Ala Leu Asp Thr Met
65                  70                  75                  80


Phe Ile Met Gly Met Lys Lys Glu Phe Ala Glu Gly Leu Gly Arg Leu
                85                  90                  95


Lys Ala Glu Thr Ser Gly Phe Arg Ala Leu Ile Asn Gly Glu Val Asp
            100                 105                 110


Arg Asp Val Ser Val Phe Glu Thr Asn Ile Arg Val Leu Gly Gly Leu
        115                 120                 125


Leu Ala Ala His Asp Leu Ser Gly Asp Gly Asp Ala Leu Glu Leu Ala
    130                 135                 140


Glu Ser Phe Ala Ala Arg Leu Ser Ala Ala Phe Asp Thr Pro Ser Gly
145                 150                 155                 160


Val Pro Lys Ser Phe Val Asn Val Lys Thr Gly Lys Ser Phe Thr Leu
                165                 170                 175
```

```
Gln Trp Thr Gly Gly Lys Ser Ile Leu Ala Asp Phe Gly Ser Met His
            180                 185                 190

Leu Glu Trp Ala Thr Leu Ser Ala Arg Thr Lys Asn Pro Val Tyr Glu
        195                 200                 205

Ala His Thr Gly His Val Phe Glu Gln Ile Ala Arg Ala Arg Arg Asn
    210                 215                 220

Ser Gly Ala Pro Val Gly Leu Phe Pro His Leu Tyr Asp Thr Asp Ala
225                 230                 235                 240

Gly Lys Phe Ala Gly Gly Thr Val Thr Phe Gly Ala Leu Gly Asp Ser
                245                 250                 255

Phe Tyr Glu Tyr Leu Ile Lys Cys Trp Arg Ser Leu Ala Asp Leu Lys
            260                 265                 270

Asp Ala Pro Leu Trp Arg Glu Met Phe Asp Asp Ala Val Ala Ala Met
        275                 280                 285

Thr Ala Ala Asn Met Thr Arg Glu Trp Lys Arg Glu Gly Asp Asp Val
    290                 295                 300

Tyr Leu Ala Leu Ser Pro Ile Gly Ser Thr Tyr Thr Met Glu His Leu
305                 310                 315                 320

Ala Cys Phe Ala Pro Gly Met Leu Val Leu Gly Gly Ala Glu Ala Pro
                325                 330                 335

Thr Lys Ala Leu Ala Glu Glu Tyr Val Glu Leu Ala Arg Lys Ile Ala
            340                 345                 350

Arg Thr Cys Val Ala Met Tyr Asp Ser Gln Pro Ser Gly Leu Ala Pro
        355                 360                 365
```

```
Asp His Val Lys Leu Val Pro Ser Pro Ser Ser Pro Ser Met Asn Val
    370                 375                 380

Ile Asp Gly Lys Asn Ile Gln Arg Pro Glu Thr Val Glu Ser Leu Phe
385                 390                 395                 400

Tyr Leu Tyr Arg Lys Thr Gly Glu Glu Gln Phe Arg Asp Gln Ala Trp
                405                 410                 415

Lys Ile Phe Gln Ser Met Lys Ala Ala Tyr Ser Val Pro Gly Ser Gly
            420                 425                 430

Trp Gln Gly Val Arg Asp Val Arg Gln Ser Pro Ala Gln Gly Asp Asp
        435                 440                 445

Lys Met Gln Ser Phe Phe Leu Ala Glu Thr Leu Lys Tyr Leu Tyr Leu
    450                 455                 460

Ile Phe Ser Asp Ser Asp Glu Met His Leu Asp Glu Trp Val Phe Asn
465                 470                 475                 480

Thr Glu Ala His Pro Phe Arg Ile Thr Lys Thr Arg Ala Lys Ser Asp
                485                 490                 495

Gly
```

<210> 743
<211> 517
<212> PRT
<213> Micromonas pusilla

<400> 743

```
Met Lys Ile Asp Trp Ala Pro Leu Ala Glu Leu Thr Ala Pro Gln Asn
1               5                   10                  15
```

```
Ile Glu Arg Met Ser Ser Gly Gly Asp Phe Pro Arg Pro Glu Thr Ser
            20                  25                  30

Thr Leu Ala Arg Asn Ser Gly Pro Asn Gly Glu Val Ala His Ser Gly
        35                  40                  45

Arg Val Pro Asn Ala Lys Trp Ala Thr Val Tyr Val Asp Glu Glu Lys
    50                  55                  60

Arg Asp Ala Val Arg Asp Ala Met Arg Asp Ala Tyr Asn Ala Tyr Glu
65                  70                  75                  80

Thr Tyr Ala Met Gly Tyr Asp Glu Leu Gln Pro Leu Thr Lys Arg Gly
                85                  90                  95

Lys Asn Ala Phe Gly Gly Leu Gly Ala Thr Val Ile Asp Ser Leu Asp
            100                 105                 110

Thr Leu Trp Ile Met Gly Leu Lys Asp Gln Tyr Ser Arg Ala Arg Asn
        115                 120                 125

Trp Val Ala Asp Arg Leu His Phe Asp Arg Asn Tyr Glu Ala Ser Val
    130                 135                 140

Phe Glu Thr Thr Ile Arg Val Val Gly Gly Leu Ile Ala Ala His Asp
145                 150                 155                 160

Leu Ser Gly Asp Glu Met Tyr Leu Ala Lys Cys Leu Asp Leu Val Arg
                165                 170                 175

His Leu Lys Pro Ala Phe Ser Thr Glu Thr Gly Ile Pro Tyr Asn Ile
            180                 185                 190

Val Asn Leu Lys Lys Gly Trp Ala Lys Asn Pro Thr Trp Ser Arg Gly
        195                 200                 205
```

```
Ala Ser Thr Leu Ala Glu Phe Gly Thr Leu Gln Met Glu Tyr Ile Ala
    210                 215                 220

Leu Ser Glu Arg Thr Gly Asp Asp Glu Trp Arg Gln Leu Ala Glu Ser
225                 230                 235                 240

Ile Val Glu Thr Val Arg Lys Ile Arg Thr Gln Thr Gly Thr Pro Leu
                245                 250                 255

Gly Leu Tyr Pro Leu Tyr Leu Asn Pro His Arg Gly Thr Trp Glu Asn
            260                 265                 270

Thr His Val Ser Phe Gly Ala Met Gly Asp Ser Trp Tyr Glu Tyr Leu
        275                 280                 285

Leu Lys Val Trp Val Gln Gly Gly Arg Thr Lys Ala Met Lys Gly Trp
    290                 295                 300

His Asp Met Trp Glu Glu Ser Met Arg Ala Met Ile Asp Lys Leu Val
305                 310                 315                 320

Phe Asp Gly Glu Glu Glu Gly Thr Lys Tyr Val Ala Glu Tyr Asn Ala
                325                 330                 335

Asn His Ala Val His Lys Met Asp His Leu Thr Cys Phe Val Gly Gly
            340                 345                 350

Met Leu Val Leu Gly Ser His Gly Ser Asp His Glu Asp Glu Tyr Met
        355                 360                 365

Lys Val Ala Ala Ala Ile Thr Lys Met Cys Trp Arg Met Tyr Ser Thr
    370                 375                 380

Gln Pro Thr Gly Ile Ala Pro Glu Phe Val Asn Phe Gln Asp Lys Lys
385                 390                 395                 400
```

```
Met His Val Gly Gly Lys Phe Asn Ile Gln Arg Pro Glu Ala Ile Glu
                405                 410                 415


Ala Ile Phe Tyr Met Tyr Arg Lys Thr Gly Asp Pro Val Tyr Arg Glu
            420                 425                 430


Trp Ala Trp Glu Met Phe Thr Asn Met Arg Arg His Tyr Arg Thr Glu
        435                 440                 445


Thr Gly Trp Val Gly Leu Lys Asp Val Arg Ser Pro Asn Pro Gly His
    450                 455                 460


Asp Asn Thr Met Gln Ser Phe Phe Leu Ala Glu Thr Leu Lys Tyr Phe
465                 470                 475                 480


Tyr Leu Ile Phe Ser Asp Ser Asp Thr Ile Asn Leu Asp Glu Trp Val
                485                 490                 495


Leu Asn Thr Glu Ala His Pro Ile Arg Val Met Pro Arg Asp Lys Ser
            500                 505                 510


Asp Val Gly Thr Asn
        515


<210>  744
<211>  631
<212>  PRT
<213>  Micromonas pusilla

<400>  744

Met Thr His Arg Ala Ala Ala Leu Ala Phe Ala Leu Ala Thr Leu Leu
1               5                   10                  15


Ala Ser Gly Val Val Val Ala Ala Pro Glu Pro Asp Ala Leu Gly Glu
            20                  25                  30
```

```
Leu Arg Val Ala Asn Ala Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser
        35                  40                  45

Ala Arg Arg Arg Leu Thr Phe Ala Ser Arg Ser Arg Gly Gly Glu Pro
    50                  55                  60

Ser Ser Gly Ala Ser Ala Ser Glu Pro Pro Arg Asp Leu Glu Trp Leu
65                  70                  75                  80

Leu Arg Ala Thr Ser Ala Ser Pro Arg Arg Arg Glu Asp Trp Arg Asp
                85                  90                  95

Gly Leu Gly Phe Ala Thr Ala Ile Asp Ala Leu Ser Pro Ser Asp Val
            100                 105                 110

Asp Ala Leu Leu Ser Leu Ser Asp Asp Asp Phe Arg Ala Ile Pro Thr
        115                 120                 125

Glu Thr Arg Arg Ala Ala Val Lys Ala Ser Val Gln His Ala Trp Arg
    130                 135                 140

Gly Tyr Arg Asp His Ala Trp Pro His Asp Glu Leu Ala Pro Leu Ser
145                 150                 155                 160

Arg Ser Gly Leu Arg Trp Leu Asp Val Gly Val Thr Ile Val Asp Ala
                165                 170                 175

Leu Asp Thr Leu Leu Ile Val Gly Leu Asp Asp Asp Ala Ala Glu Ala
            180                 185                 190

Ile Ser Trp Ile Ala Gly Gly Gly Gly Gly Asp Gly Asp Gly Thr Gly
        195                 200                 205

Ala Thr Ala Ala Ala Ala Glu Thr Arg Gly Gly Gly Leu Thr Phe Asp
    210                 215                 220
```

```
Ser Asp Val Asn Ala Asn Val Phe Glu Ala Thr Ile Arg Val Leu Gly
225                 230                 235                 240


Gly Leu Thr Ser Ala His Lys Leu Gly Gly Asp Thr Arg Asp Gly Gly
                245                 250                 255


Val Leu Arg Lys Ala Leu Asp Leu Ala Glu Lys Leu Leu Pro Ala Phe
            260                 265                 270


Lys Thr Ala Ser Gly Ile Pro Ile Met Asp Val Asn Phe Ala Thr Gly
        275                 280                 285


Asp Ala His Gln Pro Thr Trp Thr Asn Arg Ala Ser Leu Ala Glu Val
    290                 295                 300


Gly Thr Leu Val Leu Glu Trp Ala Ala Leu Glu Glu Ala Leu Leu Val
305                 310                 315                 320


Ala Glu Asn Arg Ser Glu Thr Thr Arg Thr Arg Gln Arg Trp Val Met
                325                 330                 335


His Gly Leu Ile Thr Lys Gly Leu Trp Asp Pro Ala Thr Gly Gly Leu
            340                 345                 350


Leu Pro Ser Ser Val Ser Ala Val Thr Ala Thr Phe Asp Ala Ser Ser
        355                 360                 365


Thr Leu Thr Leu Gly Ala Arg Gly Asp Ser Tyr Tyr Glu Tyr Leu Leu
    370                 375                 380


Lys His Trp Ile His Ala Gly Lys Pro Ala Gly Gly Glu Arg Ala Tyr
385                 390                 395                 400


Leu Asn Ala Met Asp Gly Val Leu Met Tyr Leu Leu His Arg Ala Gly
                405                 410                 415
```

```
Gly Glu Ala Leu Asn His Lys Met Asp His Leu Ala Cys Phe Leu Pro
            420                 425                 430

Gly Val Leu Ala Leu Gly Ala Ser Leu Pro Ala Ser Thr Thr His Leu
        435                 440                 445

Asp Ile Ala Arg Glu Leu Ala Arg Thr Cys Val Gln Met Tyr Ala Arg
    450                 455                 460

Thr Ser Thr Gly Leu Ala Pro Glu Met Val His Phe Ala Ala Glu Gly
465                 470                 475                 480

Ala Ser Thr Thr Ser His Gly Asp Phe Val Val Lys Leu Gln Asp Ala
                485                 490                 495

His Asn Val Leu Arg Pro Glu Thr Val Glu Ser Leu Tyr Val Leu Trp
            500                 505                 510

Lys Thr Thr Asn Glu Arg Glu Trp Arg Asp Ala Ala Trp Ala Met Trp
        515                 520                 525

Arg Ala Trp Glu Ile His Ala Lys Val Pro Ser Gly Gly Tyr Ala Ser
    530                 535                 540

Leu Arg Asp Val Glu Asn Gly Asp Asn Ser Glu Glu Gly Ala Lys Ile
545                 550                 555                 560

Asp Arg Met Glu Ser Phe Phe Leu Gly Glu Thr Leu Lys Tyr Leu Tyr
                565                 570                 575

Leu Thr Phe Ser Asp Asp Pro Ala Leu Leu Pro Met Glu Cys Phe Val
            580                 585                 590

Phe Asn Thr Glu Ala His Pro Leu Pro Val Leu Arg Asp Gly Val Ser
        595                 600                 605
```

Asp Gly Arg Ala Cys Val Glu Arg Val Val Glu Gly His Val Glu Thr
610 615 620

Leu Ala Glu Thr Leu Gly Val
625 630

<210> 745
<211> 555
<212> PRT
<213> Micromonas pusilla

<400> 745

Met Thr Lys Gln Asp Ala Arg Ala Glu Ala Thr Ala Arg Glu Glu Glu
1 5 10 15

Ala Lys Ile Phe Ser Ala Pro Ala Pro Thr Asp Ala Ala Val Ser Ala
20 25 30

Ala Arg Arg Asp Ser Glu Arg Leu Ala Pro Ala Lys Glu Trp Ser Phe
35 40 45

Pro Leu Pro Arg Arg Asn Asp Arg Gly Val Val Val Thr Gly Asp Gly
50 55 60

Gly Ala Ala Ala Lys Arg Gly Asp Val Pro Tyr Gly Gly Trp Ala Arg
65 70 75 80

Asp Ile Val Ala Asp Val Ala Arg Arg Asp Ala Val Arg Asp Ala Thr
85 90 95

Arg Asp Ala Tyr Ala His Tyr Glu Lys Tyr Ala Phe Gly Asp Asp Glu
100 105 110

Leu Arg Pro Arg Ala Lys Leu Gly Lys Asn Ala Phe Gly Gly Leu Gly
115 120 125

Ala Thr Ile Val Asp Ser Leu Asp Thr Leu Trp Ile Met Gly Leu Ser

```
    130                 135                 140

Asp Glu Tyr Gly Arg Ala Arg Glu Trp Val Ser Arg Arg Leu Ser Phe
145                 150                 155                 160

Asp Val Asp Arg Asp Ala Ser Val Phe Glu Thr Thr Ile Arg Val Leu
                165                 170                 175

Gly Gly Val Leu Ala Ala Tyr Asp Leu Ser Gly Asp Glu Met Tyr Ile
            180                 185                 190

Asn Lys Ala Thr Asn Leu Ala Thr Arg Leu Lys Pro Ala Phe Ala Thr
        195                 200                 205

Ala Ser Gly Ile Pro Tyr Pro Ile Val Asn Leu Lys Thr Gly Arg Ala
    210                 215                 220

Lys His Pro Gly Trp Ala His Gly Ser Ser Pro Leu Ala Glu Phe Gly
225                 230                 235                 240

Thr Leu Ser Leu Glu Phe Val Ser Leu Ser Asp Arg Val Gly Asp Pro
                245                 250                 255

Arg Trp Ser Asp Leu Ala Glu Thr Pro Ile Ala Lys Val Gln Ser Val
            260                 265                 270

Arg Gly Asp Val Gly Thr Val Pro Arg Gly Leu Tyr Pro Met Ser Ile
        275                 280                 285

Asp Pro Gly Lys Leu Lys Trp Ser Ser Gly Ala Val Ser Phe Gly Ala
    290                 295                 300

Met Gly Asp Ser Phe Phe Glu Tyr Leu Leu Lys Thr Tyr Val Met Gly
305                 310                 315                 320

Gly Arg Thr Arg Glu Leu Arg Gly Trp Ser Asp Met Trp Asp Glu Ser
```

```
                325                 330                 335

Met Arg Ala Met Leu Glu His Leu Val Phe Pro Gly Glu Glu Glu Gly
            340                 345                 350

Thr Lys Tyr Val Ala Glu Trp Asn Gly Arg Ala His His Lys Met Asp
        355                 360                 365

His Leu Ala Cys Phe Val Gly Gly Met Leu Val Leu Gly Ala His Gly
    370                 375                 380

Ser Asp Met Glu Lys Glu Tyr Val Ala Ala Ala Ala Glu Ile Thr Lys
385                 390                 395                 400

Met Cys Tyr Arg Met Tyr Thr Ser Gln Pro Thr Met Leu Ala Pro Glu
                405                 410                 415

Val Val Ser Phe Ala Lys Tyr Glu Lys Glu Asn Gly Gly Thr Pro Arg
            420                 425                 430

Gly Arg Arg Met Val Asn Gln Val Asn His Asn Leu Gln Arg Pro Glu
        435                 440                 445

Thr Ile Glu Ser Ile Phe Tyr Met Tyr Arg Lys Thr Gly Asp Pro Met
    450                 455                 460

Tyr Arg Glu Trp Ala Trp Asn Met Phe Cys Ala Met Arg Lys His Tyr
465                 470                 475                 480

Lys Thr Asp Ser Gly Trp Ala Gly Ile Lys Asp Val Arg Arg Asp Pro
                485                 490                 495

Pro Thr Asn Asp Asp Thr Met Gln Ser Phe Phe Ile Ala Glu Thr Met
            500                 505                 510

Lys Tyr Met Tyr Leu Ile Phe Ala Asp Gly Asp Val Ile Asp Leu Asp
```

515 520 525

Glu Trp Val Phe Asn Thr Glu Ala His Pro Leu Lys Val Lys Pro Arg
530 535 540

Arg Glu Thr Leu Val Pro Pro Tyr Lys Tyr Ser
545 550 555

<210> 746
<211> 464
<212> PRT
<213> Coccomyxa subellipsoidea

<400> 746

Met Arg His Ser Trp Ala Gly Tyr Ala Gln His Ala Trp Gly Phe Asp
1 5 10 15

Glu Leu Met Pro Leu Thr Gln Asn Gly Lys Asn Ser Phe Gly Gly Leu
20 25 30

Gly Ala Thr Ile Val Asp Ser Leu Asp Thr Leu Trp Leu Met Gly Leu
35 40 45

Lys Asp Glu Phe Lys Ala Ala Arg Asp Trp Val Val Asn Glu Leu Ser
50 55 60

Phe Asn Lys Phe Tyr Glu Ala Ser Val Phe Glu Thr Thr Ile Arg Val
65 70 75 80

Val Gly Gly Ile Leu Thr Ala His Glu Leu Ser Gly Asp Glu Ala Phe
85 90 95

Leu Arg Arg Ala Glu Glu Leu Val Gln Ile Leu Met His Ala Phe Asp
100 105 110

Thr Pro Thr Gly Ile Pro Tyr Gly Thr Ile Asn Leu Gln Thr Gln Gln
115 120 125

```
Gly Arg Asn Pro Thr Trp Thr Gln Lys Ala Ser Ile Leu Ser Glu Phe
    130                 135                 140

Gly Thr Glu Gln Leu Glu Leu Ile Gln Thr Ser Leu Lys Thr Gly Asn
145                 150                 155                 160

Pro Val Tyr Ala Gln Lys Thr Glu Ala Val Ile Lys Phe Leu Asn Asp
                165                 170                 175

Lys Trp Cys Ser Met Gln Gly Leu Leu Pro Leu Tyr Ile His Pro Gln
            180                 185                 190

Thr Gly Gln Ala Thr Thr Gln Met Val Ser Leu Gly Ala Met Gly Asp
        195                 200                 205

Ser Tyr Tyr Glu Tyr Leu Leu Lys Val Trp Ile Tyr Lys Gly Arg Arg
    210                 215                 220

Ala Glu Asp Glu Met Tyr Arg Ala Met Trp Glu Arg Ser Met Asp Glu
225                 230                 235                 240

Met Leu Arg Lys Leu Leu Phe Lys Asn Glu Glu Ser Gly Tyr Thr Tyr
                245                 250                 255

Val Ala Glu Phe Ala Arg Cys Gly Ser Pro Leu Leu His Lys Met Asp
            260                 265                 270

His Leu Ser Cys Phe Ile Pro Ala Met Leu Ala Leu Gly Ala His Ala
        275                 280                 285

Ser Ala Val Thr Gly Ala Lys Ala Thr Arg Tyr Leu Gln Val Ala Glu
    290                 295                 300

Glu Leu Thr His Thr Cys Trp Gln Met Tyr His Gln Met Ala Ser Gly
305                 310                 315                 320
```

```
Leu Ala Pro Glu Tyr Val Glu Phe Gly Thr Ala Gly Met Val Thr Ala
                325                 330                 335

Glu Lys Ala Lys His Asn Leu Leu Arg Pro Glu Ala Met Glu Ala Met
            340                 345                 350

Phe Val Leu Trp Arg Val Thr Gln Lys Glu Gln Tyr Arg Glu Trp Ala
        355                 360                 365

Trp Glu Met Phe Leu Ala Phe Glu Lys Asn Cys Lys Met Pro Val Gly
    370                 375                 380

Tyr Ala Gly Leu Lys Asp Val Thr Val Val Pro Pro Pro Thr Asp Asn
385                 390                 395                 400

Thr Met Gln Ser Phe Trp Leu Ala Glu Thr Leu Lys Tyr Leu Trp Leu
                405                 410                 415

Leu Phe Ala Pro Asn Asp Val Val Ser Leu Asp Asp Trp Val Leu Asn
            420                 425                 430

Thr Glu Ala His Pro Leu Arg Ile Ile Lys Lys Leu Pro Asp Phe Leu
        435                 440                 445

Thr Ser Asn Asn Thr Ala Gln Ala Gln Val Asn Pro Val Val Met Asn
    450                 455                 460
```

<210> 747
<211> 699
<212> PRT
<213> Chlorella variabilis

<400> 747

```
Met Leu Pro Val Thr Thr Gly Ile Ser Pro Pro Arg Arg Ala Arg Val
1               5                   10                  15
```

```
Gly Ser Thr Ser Asn Leu Thr Arg Arg Leu Gly Arg Gln Ala Gly Thr
            20                  25                  30

Pro Ala Ala Ile Val Leu Ala Ala Leu Ile Leu Ile Gly Gly Ile Ser
        35                  40                  45

Phe Leu Leu His Asn Arg Ile Ser Asp Glu Glu Glu Gly His Gly Leu
    50                  55                  60

His Val Val Ser Ser Lys Arg Arg Ser Leu Ala Asp Asp Ser Gly Gly
65                  70                  75                  80

Ser Gly Ser Gly Val Ala Glu Arg Ile Gln Leu Leu Ala Glu Gly Ala
                85                  90                  95

Glu Leu Glu Asn Asp Arg Met Ala Gln Leu Glu Asp Glu Gln Gln Gln
            100                 105                 110

Glu Asp Ser Asp Ser Glu Leu Ser Gly Thr Leu Phe Gly Ala Lys Glu
        115                 120                 125

Gly Val Lys Leu Ala Asn Gly Gln Gln Val Ala Ala Met Ala Ala Lys
    130                 135                 140

Thr Gly Ala Arg Asn Ala Ala Asn Ser Arg Thr Arg Ser Thr Gln Phe
145                 150                 155                 160

Gln Lys Ala Ser Pro Ser Arg Phe Ala Lys Lys Leu Glu Glu Thr Arg
                165                 170                 175

His Arg Val Gly Leu Gln Ala Ala Ser Arg Gln Arg Tyr Ser Ala Ile
            180                 185                 190

Val Ser Ser Phe Pro Ser Gln Pro Glu Pro Ala Val Glu Glu Leu Ser
        195                 200                 205
```

```
Glu Ala Glu Val Ala Arg Arg Arg Glu Ala Ile Lys Ala Ala Met Leu
    210                 215                 220

His Ser Trp Arg Gly Tyr Glu Lys Tyr Ala Trp Gly Gln Asp Glu Leu
225                 230                 235                 240

Cys Pro Val Ser Gln Gln Gly Lys Asn Ser Phe Gly Gly Leu Gly Ala
                245                 250                 255

Thr Met Ile Asp Ala Leu Asp Thr Leu His Met Met Gly Phe His Glu
            260                 265                 270

Glu Tyr Gly Arg Ala Ala Glu Trp Val Arg Ser Glu Met Pro Leu Asn
        275                 280                 285

Ala Ser Phe Asp Ala Ser Val Phe Glu Thr Ile Ile Arg Val Val Gly
    290                 295                 300

Gly Met Leu Ala Ala His Asp Met Thr Gly Asp Lys Val Met Leu Glu
305                 310                 315                 320

Arg Ala Gln Gln Val Ala Asp Arg Ile Leu Pro Ala Tyr Asn Thr Thr
                325                 330                 335

Thr Lys Ile Pro Leu Asn Ile Ile Asn Leu Ala Thr Gln Gln Ala Lys
            340                 345                 350

Asn Pro Thr Trp Asn Gln Arg Ala Ser Thr Leu Ala Glu Phe Gly Thr
        355                 360                 365

His Gln Val Glu Phe Trp Arg Leu Ser Gln Ser Thr Gly Asn Asp Thr
    370                 375                 380

Tyr Ala Glu Leu Ala Glu Gly Thr Ile Arg His Leu His Lys Gly Trp
385                 390                 395                 400
```

```
Pro Gln Gln Gly Val Met Pro Leu Phe Ile Ser Pro Thr Thr Gly Asn
                405                 410                 415

Phe Thr Ala Arg Arg Val Ser Phe Gly Ala Leu Gly Asp Ser Tyr Tyr
            420                 425                 430

Glu Tyr Leu Leu Lys Met Trp Leu Ile Lys Gly Arg Gln Asp Glu Met
        435                 440                 445

Tyr Arg Ser Met Trp Glu Arg Ala Met Asp Glu Met Ile Asn Lys Leu
    450                 455                 460

Val Phe Thr Ser Arg Glu Gly Leu Thr Tyr Val Ala Glu Phe Asp Arg
465                 470                 475                 480

Ser Ile Ile Lys His Lys Phe Asp His Leu Val Cys Phe Val Pro Gly
                485                 490                 495

Met Leu Ala Leu Gly Ala His Ser Gly Ala Val Gln Gly Ala Lys Ala
            500                 505                 510

Glu Arg Tyr Met Gln Leu Ala Ala Asp Leu Thr His Thr Cys Trp Gln
        515                 520                 525

Met Tyr His Arg Met Pro Ser Gly Leu Ser Pro Glu Tyr Val Thr Phe
    530                 535                 540

Ser Ala Gln Gly Met Lys Val Gly Ala Ala Tyr Asn Leu Leu Arg Pro
545                 550                 555                 560

Glu Ala Leu Glu Ala Met Trp Tyr Met Trp Arg Leu Thr His Asp Trp
                565                 570                 575

Lys Tyr Arg Ala Trp Gly Trp Gln Val Phe Gln Ala Phe Glu Ala His
            580                 585                 590
```

```
Cys Lys Val Glu Ala Gly Tyr Ser Gly Ile Lys Asp Val Arg Ala Ala
        595                 600                 605


Thr Pro Val Pro Asp Asp Thr Gln Gln Ser Phe Phe Leu Ala Glu Thr
    610                 615                 620


Leu Lys Tyr Leu Phe Leu Leu Phe Ser Asp Asp Ser Ala Phe Asp Met
625                 630                 635                 640


Asp Glu Trp Val Leu Asn Thr Glu Ala His Pro Leu Arg Thr Thr Gln
                645                 650                 655


Pro Lys Gln Glu Glu Gln Gln His Glu Arg Gln Gln Gln Glu Arg Lys
            660                 665                 670


Arg Trp Trp Trp Pro Pro Ser Arg Ser Lys Ser Gly Gly Gly Leu Ile
        675                 680                 685


Ser Gly Ser Asp Gly Ser Gly Ser Ile Ala Arg
    690                 695


<210>  748
<211>  661
<212>  PRT
<213>  Cyanidioschyzon merolae

<400>  748

Met Gln Trp Arg Pro Val Glu Gln His Val Pro Lys Ala Ser Tyr His
1               5                   10                  15


Glu Leu Asp Phe Cys Gly Ser Lys Thr Met Asn Thr Phe Cys Gly Leu
            20                  25                  30


Asn Pro Gly Leu Thr Arg Arg Thr Val His Arg Thr Ile Asn Ser Trp
        35                  40                  45
```

```
Gln Arg Thr Phe Ser Arg Phe Arg Tyr Tyr Arg Gln Leu Leu Ala Leu
    50                  55                  60

Thr Val Phe Thr Leu Leu Leu Trp Met Tyr Arg Val Gly Arg Pro Gln
65                  70                  75                  80

Ala Leu Asp Asp Glu Asn Glu Leu Ala Gly Arg Leu Gln Pro Arg Leu
                85                  90                  95

Pro Gly Leu Leu Ala Lys Ala Leu Ser Ala Gly Ser Thr Gln Arg Arg
            100                 105                 110

His Gln Ser Tyr Ser Arg Trp Pro Pro Ala Leu Arg Pro Asn Leu Thr
        115                 120                 125

Leu Gly Asn Glu Leu Phe Leu Asp Asp Val Thr Arg Asn Glu Arg Arg
    130                 135                 140

Arg Glu Ala Val Arg Arg Ala Met Gln His Ala Trp Arg Gly Tyr Arg
145                 150                 155                 160

Gln Tyr Ala Trp Asp His Asp Glu Leu Arg Pro Leu Ser His Ser Tyr
                165                 170                 175

Glu Asp Ser Met Asn Gly Val Gly Leu Thr Leu Ile Asp Ala Leu Asp
            180                 185                 190

Thr Leu Tyr Leu Met Gly Leu His Asp Glu Phe Arg Asp Ala Arg Ala
        195                 200                 205

Trp Leu Ala Arg Ser Glu His Arg Phe Ala Arg Pro Lys Ala Glu Pro
    210                 215                 220

Val Ser Ile Phe Glu Met Asn Ile Arg Leu Leu Gly Gly Leu Leu Ser
225                 230                 235                 240
```

```
Thr Tyr Gln Leu Ser Gly Asp Pro Leu Phe Leu Gln Lys Ala Glu Glu
                245                 250                 255

Leu Gly His Leu Phe Ala His Ala Phe Leu Gly Arg Pro Pro Pro Arg
            260                 265                 270

Met Pro His Pro Ser Cys Arg Phe Arg Val Arg Ser Gln Arg Thr Gly
        275                 280                 285

Ser Asp Asp Glu Asn Gly Thr Ile Val Thr Cys Arg Ala Ala Glu Arg
    290                 295                 300

Val Val Leu Ser Glu Cys Gly Thr Leu Gln Leu Glu Phe Arg Ala Leu
305                 310                 315                 320

Gly Ala Ala Thr Arg Asp Pro Leu Leu Lys Gly Leu Ala Glu Arg Ala
                325                 330                 335

Asp Gln Val Leu Arg Asp Ile Ile Ala Arg Ala Pro Leu Asp Gly Leu
            340                 345                 350

Pro Asn Asn Ile Leu Ser Ser Ala Asp Gly Ser Ser Phe Val Asn Lys
        355                 360                 365

Ser Ala Glu Ile Val Arg Phe Val Asn Leu Gly Ala Ala Gly Asp Ser
    370                 375                 380

Tyr Tyr Glu Tyr Ile Leu Lys Ser Tyr Ile Gln Leu Gly Arg Thr Asp
385                 390                 395                 400

Pro Phe Trp Arg Arg Glu Ser Asp Arg Ile Ile Asp Ala Leu Glu Arg
                405                 410                 415

Ile Val Phe Arg Arg Gly Val Leu Ile Glu Thr Leu Glu Ser Pro Ser
            420                 425                 430
```

```
Asp Pro Ala Arg Gln Thr Glu Arg Gln His Gln Leu Lys Gln Pro Leu
        435                 440                 445

Lys Arg Phe Val Asn Val Ser Trp Pro Val Val Leu Ser Asn Ser Glu
    450                 455                 460

Glu Ile His Gln Pro Asp His Leu Ser Cys Phe Ala Ser Ser Leu Phe
465                 470                 475                 480

Val Leu Ala Val Pro Pro Glu Gln Trp Asp Ala Ser Val Arg Asn Asp
                485                 490                 495

Arg Ala Glu Arg Leu Leu Arg Leu Ala Gly Glu His Ala Arg Phe Cys
            500                 505                 510

Phe Glu Met Tyr Leu Val Asn Ala Gly Leu Ser Ser Glu Ser Val Glu
        515                 520                 525

Val Gln Pro Ser Ser Pro Gln Asp Ser Pro Tyr Ala Asp Arg Pro Leu
    530                 535                 540

Val Gln Ile Arg Ser Tyr Val Arg Gly Tyr His Gln Arg Pro Glu Thr
545                 550                 555                 560

Leu Glu Ala Leu Phe Tyr Leu Trp Arg Ala Thr His Asp Pro Lys Tyr
                565                 570                 575

Arg Asp Trp Gly Trp Thr Ile Phe Gln Ala Met Glu Trp Tyr Thr Arg
            580                 585                 590

Val Pro Ser Gly Gly Tyr Val Gly Cys Arg Asp Pro Asp Asn Gly Cys
        595                 600                 605

Arg Ile Pro Ile Asp Lys Met Glu Ser Phe Leu Leu Ala Glu Thr Leu
    610                 615                 620
```

```
Lys Tyr Ala Tyr Leu Leu Phe Ser Asp Asp Ala Ala Leu Asp Ile Lys
625                 630                 635                 640


Asn Glu Trp Val Phe Asn Thr Glu Ala His Pro Leu Arg Ile Met Ser
                645                 650                 655


Val Ser Arg Glu Arg
            660


<210>  749
<211>  489
<212>  PRT
<213>  Phaeodactylum tricornutum

<400>  749

Tyr Val Asp Gly Thr Pro Gly Pro Tyr Glu Ile Thr Glu Thr Leu Arg
1               5                   10                  15


Gln Gln Ser Asp Gln Val Ala Arg Ser Arg Arg Phe His Val Gln Lys
            20                  25                  30


Ala Met Arg Phe Val Trp Gly Asn Tyr Val Lys Tyr Ala Phe Gly Lys
        35                  40                  45


Asp Glu Leu Lys Pro Gln Ser Ala Ser Gly Ser Asp Gln Trp Gly Gly
    50                  55                  60


Gln Gly Ile Thr Leu Val Asp Ser Leu Asp Thr Leu Trp Leu Met Asn
65                  70                  75                  80


Leu Lys Asp Glu Phe Trp Gln Ala Arg Asp Trp Val Arg Asp His Leu
                85                  90                  95


Asp His Ser Thr Val Gly Ser Val Ser Val Phe Glu Thr Thr Ile Arg
            100                 105                 110


Asp Leu Gly Gly Leu Leu Ala Ala Phe Asp Trp Ser Lys Asp Arg Val
```

```
        115                 120                 125

Phe Leu Asp Lys Ala Val Asp Leu Gly Asp Arg Leu Leu Arg Ala Phe
    130                 135                 140

Asp Gly Ala Thr Thr Gly Ile Pro Trp Gly Glu Val Asn Leu Ala Ser
145                 150                 155                 160

Gly Asn Arg Lys Asn Ile Gly Trp Ser Gly Asp Asn Ala Ile Val Ala
                165                 170                 175

Glu Phe Gly Thr Val Gln Ile Glu Asn Arg Tyr Leu Ser Lys Leu Thr
            180                 185                 190

Ala Asp Asp Lys Tyr Ala Lys Lys Thr Glu Arg Val Tyr Glu Ile Leu
        195                 200                 205

Asp Glu Ile Ser Tyr Pro Asp Gly Leu Tyr Pro Tyr Tyr Leu Arg Asn
    210                 215                 220

Asp Pro Arg Asn Lys Gly Lys Phe Leu Arg Asp Gly Val Thr Ile Arg
225                 230                 235                 240

Pro Glu Phe Ser Asn Asp Lys Leu Thr Phe Gly Ala Met Ala Asp Ser
                245                 250                 255

Leu Tyr Glu Tyr Phe Leu Lys Thr Trp Leu Gln Gly Gly Arg Thr Glu
            260                 265                 270

Pro Leu Tyr Arg Ala Met Tyr Asp Lys Ser Ile Gln Gly Met His Asp
        275                 280                 285

Gln Leu Leu Gln Thr Ser Thr Pro Ser Lys Leu Thr Tyr Ile Ala Asp
    290                 295                 300

Lys Asn Arg Asn Ser Gly Thr Met Asp His Lys Met Asp His Leu Val
```

305 310 315 320

Cys Phe Met Gly Gly Leu Leu Ala Leu Gly Ala Tyr Thr Asp Pro Leu
325 330 335

Gly Leu Asp Ser Thr Arg Ala Gln Arg Asp Leu Gln Thr Ala Lys Ala
340 345 350

Leu Thr Tyr Thr Cys Tyr Gln Met Tyr Ala Arg Met Asn Thr Gly Ile
355 360 365

Ser Ala Glu Tyr Val Gln Phe Tyr Ala Gly Arg Asp Phe Gln Ile Gly
370 375 380

Arg Gly Ala Pro His Tyr Leu Leu Arg Pro Glu Ala Val Glu Ser Phe
385 390 395 400

Phe Ile Leu His Gln Leu Thr Gly Asp Pro Val Tyr Arg Glu Trp Gly
405 410 415

Trp Glu Val Phe Gln Ala Ile Glu Lys Tyr Cys Lys Thr Pro Tyr Gly
420 425 430

Tyr Gly Ala Leu Asn Asn Val Ala Asp Val Asn Gly Lys Pro Arg Asp
435 440 445

Ser Met Glu Ser Phe Phe Leu Ala Glu Thr Leu Lys Tyr Leu Tyr Leu
450 455 460

Leu Gln Asp Pro Asp Thr Glu Val Asp Val Leu His Lys His Val Phe
465 470 475 480

Asn Thr Glu Ala His Pro Leu Arg Ile
485

<210> 750

<211> 446
<212> PRT
<213> Thalassiosira pseudonana

<400> 750

Met Lys His Val Trp Lys Asn Tyr Arg Glu Leu Ala Phe Gly Lys Asp
1 5 10 15

Glu Leu His Pro Val Ser Gly Lys Ala Thr Asn Ser Trp Gly Gly Met
20 25 30

Gly Ala Thr Leu Val Asp Ser Leu Asp Thr Leu Trp Leu Met Asp Leu
35 40 45

Lys Lys Glu Phe Asn Asp Gly Lys Asp Trp Val Glu Lys Thr Met Ser
50 55 60

His Thr Met Val Gly Glu Val Asn Gly Phe Glu Thr Thr Ile Arg Ile
65 70 75 80

Leu Gly Gly Leu Leu Ser Ala Tyr Asp Leu Ser Asn Glu Val Val Phe
85 90 95

Leu Lys Lys Ala Glu Tyr Leu Gly Ser Arg Leu Phe Lys Ala Phe Asp
100 105 110

Ser Lys Ser Gly Leu Pro Lys Gly Lys Ile Asn Leu Ser Asn Gly Arg
115 120 125

Ser Arg Tyr Ser Gly Glu Gly His Ser Phe Val Leu Ala Gln Val Ala
130 135 140

Ser Leu Gln Leu Glu Tyr Arg Asp Leu Ala Gln Ala Thr Gly Lys Ser
145 150 155 160

Glu Tyr Ala Thr Lys Ser Glu Arg Val Phe Asp Ile Leu Gly Arg Ile
165 170 175

```
Met Pro Arg Asp Gly Leu Leu Pro Leu Asn Ile Lys Glu Lys Arg Asn
            180                 185                 190

Gly Asp Val Tyr Phe Ser Asn Ser Lys Ile Ser Phe Gly Gly Met Gly
        195                 200                 205

Asp Ser Ala Tyr Glu Tyr Phe Leu Lys Ala Trp Leu Gln Gly Gly Arg
    210                 215                 220

Lys Glu Lys Ser Tyr Arg Asp Leu Trp Asp Arg Ser Val Asn Gly Met
225                 230                 235                 240

His Arg Asn Leu Leu Gln Lys Ser Ser Pro Asn Gly Leu Thr Tyr Ile
                245                 250                 255

Ala Glu Lys Asn Gly Lys Lys Met Asp His Lys Met Gly His Leu Thr
            260                 265                 270

Cys Phe Met Ala Gly Ser Leu Ala Leu Gly Ser Tyr Thr Asp Pro Asp
        275                 280                 285

Gly Phe Asp Ser Pro Arg Ala Gln Arg Asp Leu Lys Ala Ala Lys Ala
    290                 295                 300

Leu Ala Tyr Thr Cys Tyr Gln Met Tyr Ala Arg Ser Lys Thr Gly Ile
305                 310                 315                 320

Ser Pro Glu Tyr Val Asn Phe Asn Gly Cys Asp Asp Phe His Ile Ser
                325                 330                 335

Val Ser Ala Pro Asn Tyr Val Leu Arg Pro Glu Val Val Glu Ser Phe
            340                 345                 350

Tyr Tyr Leu Ser Val Leu Thr Gly Asp Pro Ile Tyr Arg Glu Trp Gly
        355                 360                 365
```

```
Trp Glu Val Phe Gln Ser Ile Glu Lys Tyr Cys Arg Ala Gln Tyr Gly
    370                 375                 380

Tyr Gly Ser Leu Lys Asn Val Asp Leu Pro Ser Met Gln Pro Gln Asp
385                 390                 395                 400

Glu Met Glu Ser Phe Phe Leu Ala Glu Thr Leu Lys Tyr Leu Tyr Leu
                405                 410                 415

Leu Phe Asp Pro Asp Ser Glu Ile Asp Ile Leu Asn Lys His Val Phe
            420                 425                 430

Asn Thr Glu Ala His Pro Leu Lys Ile Phe Glu Asp Ser Val
        435                 440                 445
```

<210> 751
<211> 449
<212> PRT
<213> Thalassiosira pseudonana

<400> 751

```
Val Lys Glu Ala Met Arg His Ala Trp Asn Gly Tyr Arg Lys Tyr Ala
1               5                   10                  15

Trp Gly Lys Asp Glu Val Leu Pro Leu Thr His Gly Gly Gln Asn Asn
            20                  25                  30

Trp Gly Gly Gln Gly Thr Thr Leu Val Asp Ser Leu Ser Thr Leu Trp
        35                  40                  45

Met Met Gly Met Lys Asp Glu Phe Asn Glu Ala Arg Asp Trp Ile Arg
    50                  55                  60

Asp Asn Leu Asp Phe Ser Lys Val Glu Gly Ala Val Ser Val Phe Glu
65                  70                  75                  80
```

```
Thr Thr Ile Arg Asn Leu Gly Ser Leu Leu Ser Ala Phe Asp Met Ser
                85                  90                  95

Gly Asp Lys Val Phe Leu Glu Lys Ala Asp Asp Leu Gly Asn Arg Leu
            100                 105                 110

Met Arg Ala Phe Asp Thr Pro Arg Gly Val Pro Phe Gly Glu Val Glu
        115                 120                 125

Leu Phe Asp Gly Gly Ser Ala Tyr Asn Thr Gly Trp His Lys Thr Ser
    130                 135                 140

Ala Val Leu Ser Glu Ile Gly Thr Leu Gln Val Glu Phe Arg Tyr Leu
145                 150                 155                 160

Ala Arg Val Thr Gly Lys Ser Glu Tyr Ala Thr Val Ala Met Arg Ala
                165                 170                 175

Leu Asp Glu Leu Leu Lys Leu Asp Thr Glu Ser Gly Leu Tyr Pro Thr
            180                 185                 190

Phe Ile His Asn Thr Lys Asn Ser Leu Ser Phe Ala Asn Asn Asp Ile
        195                 200                 205

Ser Ile Gly Ala Met Gly Asp Ser Phe Tyr Glu Tyr Leu Leu Lys Ile
    210                 215                 220

Trp Leu Gln Gly Gly Lys Thr Glu Gly Asn Tyr Arg Ile Leu Tyr Asp
225                 230                 235                 240

Arg Ala Val Asp Gly Ile Leu Asp Tyr Leu Val His Ser Ser Arg Pro
                245                 250                 255

Asn Tyr Leu Thr Tyr Val Ala Glu Leu Ser Gln Gly Lys Val Lys His
            260                 265                 270
```

```
Lys Met Asp His Leu Ser Cys Phe Leu Gly Gly Asn Leu Ala Leu Gly
        275                 280                 285

Ala Tyr Thr His Pro Asp Gly Leu Ala Ser Met Arg Ala Gln Arg Gln
    290                 295                 300

Leu Lys Val Gly Lys Gln Leu Ala Tyr Thr Cys Tyr Gln Met Tyr Ala
305                 310                 315                 320

Arg Ser Lys Ser Gly Leu Ser Pro Glu Tyr Val Ser Phe Glu Gly Ser
                325                 330                 335

Asp Asp Phe Val Lys Ala His Asp Ala Pro Tyr Tyr Asn Leu Arg Pro
            340                 345                 350

Glu Thr Ser Glu Thr Phe Phe Ile Leu Tyr His Leu Thr Lys Asp Pro
        355                 360                 365

Val Tyr Arg Glu Trp Gly Trp Glu Val Phe Gln Ala Ile Asp Trp His
    370                 375                 380

Cys Arg Thr Asp Ala Gly Tyr Ala Ala Ile Lys Asp Val Asp Thr Met
385                 390                 395                 400

Gln Lys Asn Asn Arg Met Glu Ser Phe Phe Ile Ala Glu Thr Leu Lys
                405                 410                 415

Tyr Leu Tyr Leu Leu Gln Gly Asp Ser His Gly Leu Asp Leu Leu Asn
            420                 425                 430

Lys His Val Phe Asn Thr Glu Ala His Pro Leu Arg Leu Leu Asp Leu
        435                 440                 445

Leu
```

<210> 752
<211> 445
<212> PRT
<213> Thalassiosira pseudonana

<400> 752

```
Met Lys His Val Trp Lys Asn Tyr Lys Glu Tyr Ala Phe Gly Lys Asp
1               5                  10                  15


Glu Leu His Pro Ile Ser His Lys Ser Thr Asn Asn Trp Gly Gly Met
            20                  25                  30


Gly Thr Ser Leu Val Asp Ser Leu Asp Thr Leu Trp Leu Met Asp Leu
        35                  40                  45


Lys Asp Glu Phe Tyr Glu Ala Arg Asp Trp Val Arg Glu Ser Leu Ser
    50                  55                  60


His Ser His Val Gly Asp Val Ser Ala Phe Glu Thr Thr Ile Arg Ser
65                  70                  75                  80


Leu Gly Gly Leu Leu Ser Ala Tyr Asp Leu Ser Arg Asp Ala Val Phe
                85                  90                  95


Leu Glu Lys Ala Glu Asp Leu Gly Ser Arg Leu Phe Lys Ser Phe Asn
            100                 105                 110


Thr Pro Ser Gly Leu Pro His Gly Ser Val Asn Leu Gln Thr Gly Thr
        115                 120                 125


Ser His Asn Phe Gly Trp Asn Gly Asn Ala Tyr Ile Leu Ala Glu Ile
    130                 135                 140


Gly Thr Val Gln Ile Glu Tyr Arg Tyr Leu Ala His Ala Thr Gly Lys
145                 150                 155                 160
```

```
Thr Glu Tyr Ala Thr Lys Ser Glu Arg Val Phe Asp Ile Leu Ala Asp
                165                 170                 175

Ile Met Pro Lys Asp Gly Leu Leu Ser Gln Asn Leu Lys Asp Lys Gly
            180                 185                 190

Gly Ser Ala Tyr Phe Ser Asn Asp Lys Val Ser Phe Gly Ala Met Gly
        195                 200                 205

Asp Ser Thr Tyr Glu Tyr Met Ile Lys Met Trp Leu Gln Gly Gly Arg
    210                 215                 220

Lys Glu Gln Lys Tyr Arg Asp Met Trp Asp His Ser Met Ser Gly Val
225                 230                 235                 240

His Glu Gln Leu Leu Gln Lys Ser Ser Pro Asn Gly Leu Ser Tyr Ile
                245                 250                 255

Ala Asp Arg Val Ser Gly Arg Ile Asp His Lys Met Asp His Leu Val
            260                 265                 270

Cys Phe Met Gly Gly Ala Leu Ala Ile Gly Ala Tyr Thr Asp Pro Leu
        275                 280                 285

Gly Phe Asp Ser Pro Arg Ala Gln Arg Asp Leu Lys Thr Ala Lys Ala
    290                 295                 300

Leu Thr Tyr Thr Cys Tyr Gln Met Tyr Ala Arg Ser Lys Thr Gly Ile
305                 310                 315                 320

Ala Pro Glu Phe Val Arg Phe Ala Gly Gly Asn Asp Phe Glu Ile Pro
                325                 330                 335

Ser Ser Ala Pro Phe Tyr Ile Leu Arg Pro Glu Thr Val Glu Ala Phe
            340                 345                 350
```

Tyr Tyr Leu Ser Val Leu Thr Gly Asp Pro Ile Tyr Arg Glu Trp Gly
        355   360   365

Trp Glu Ile Phe Gln Ser Ile Glu Lys Tyr Cys Arg Val Gln Tyr Gly
    370   375   380

Tyr Gly Ser Leu Lys His Val Asp Asn Val Asn Met Asn Pro Glu Asp
385   390   395   400

Arg Met Glu Ser Phe Phe Met Ala Glu Thr Leu Lys Tyr Phe Tyr Leu
                405   410   415

Leu Phe Asp Pro Asp Ser Glu Ile Asp Ile Leu Asn Lys His Val Phe
            420   425   430

Asn Thr Glu Ala His Pro Met Lys Ile Phe Glu Ser Gln
        435   440   445

<210> 753
<211> 455
<212> PRT
<213> Fragilariopsis cylindrus

<400> 753

Met Gln His Ala Tyr His Gly Tyr Glu Lys Tyr Ala Phe Gly Met Asp
1   5   10   15

Glu Leu Thr Pro Ile Ser Lys Ser Gly His Asn Asn Trp Gly Gly Ile
            20   25   30

Gly Thr Thr Leu Val Asp Ser Leu Asp Thr Leu Trp Leu Met Asp Met
        35   40   45

Lys Asp Glu Phe Tyr Arg Ala Arg Asp Trp Cys Lys Thr Ser Leu Asn
    50   55   60

His Asp Ile His Lys Lys Val Ser Val Phe Glu Thr Thr Ile Arg Ser

```
65                  70                  75                  80

Leu Gly Gly Leu Leu Ser Ala Tyr Asp Trp Ser Gly Asp Gln Ala Phe
                85                  90                  95

Leu Asp Gln Ala Asn Asp Leu Gly Glu Arg Leu Phe Lys Ala Phe Asp
            100                 105                 110

Thr Glu Ser Gly Ile Pro Arg Gly Gln Val Asn Leu Ala Ser Gly His
        115                 120                 125

Ser Asp Asn Ile Ala Trp Thr Gly Ser Ser Ala Ile Leu Ser Glu Phe
    130                 135                 140

Gly Thr Ile Gln Leu Glu Tyr Arg Val Leu Ala Arg Leu Asn Gly Arg
145                 150                 155                 160

Lys Asp Tyr Lys Asp Lys Val Glu Lys Ile Phe Glu Ile Met Asp Glu
                165                 170                 175

Met Asn Pro Glu Asp Gly Leu Tyr Pro Tyr Phe Ile Arg Asn Thr Gly
            180                 185                 190

Asp Lys Pro Glu Phe Ala Asn Lys Lys Ile Thr Phe Gly Ala Met Ser
        195                 200                 205

Asp Ser Phe Tyr Glu Tyr Met Leu Lys Ile Trp Ile Gln Gly Gly Lys
    210                 215                 220

Thr Glu Pro Leu Tyr Arg Lys Met Tyr Asp Lys Ser Ile Gln Gly Met
225                 230                 235                 240

His Asp Glu Leu Leu Ser Val Ser Thr Pro Ser Gly Leu Val Tyr Ile
                245                 250                 255

Ala Asp Lys Asn Ser Gly Thr Met Asp Tyr Lys Met Asp His Leu Val
```

```
            260                 265                 270

Cys Phe Met Gly Gly Leu Leu Ala Leu Gly Ala Tyr Thr Asp Pro Gln
        275                 280                 285

Gly Leu Gln Ser Asp Arg Ala Gln Arg Asp Leu Lys Thr Ala Lys Ala
    290                 295                 300

Leu Thr Tyr Thr Cys Tyr Gln Met Tyr Ala Arg Met Pro Thr Gly Ile
305                 310                 315                 320

Ser Pro Glu Tyr Ile Gln Phe Arg Lys Asp Asn Asp Phe Glu Ser Gly
                325                 330                 335

Arg Gly Ala Pro His Tyr Leu Leu Arg Pro Glu Thr Val Glu Ser Phe
            340                 345                 350

Phe Val Leu Tyr His Leu Thr Gly Asp Pro Val Tyr Arg Glu Trp Gly
        355                 360                 365

Trp Glu Val Phe Gln Ala Ile Glu Arg Tyr Cys Lys Thr Asp Ala Gly
    370                 375                 380

Tyr Gly Gln Leu Lys Asp Val Arg Arg Val Gly Arg Pro Ala Glu Asp
385                 390                 395                 400

Lys Met Glu Ser Phe Phe Leu Ala Glu Thr Leu Lys Tyr Ile Tyr Leu
                405                 410                 415

Leu Phe Asp Pro Glu Thr Pro Ile Asp Leu Leu Asn Lys His Val Phe
            420                 425                 430

Asn Thr Glu Ala His Pro Val Arg Thr Phe Pro Ala Met Asp Lys Asp
        435                 440                 445

Gly Val Ile Asp Leu Leu Lys
```

450 455

<210> 754
<211> 625
<212> PRT
<213> Fragilariopsis cylindrus

<400> 754

Met Lys Gly Phe Cys Phe Val Ser Ile Leu Ser Leu Val Phe Val Tyr
1 5 10 15

Phe Thr Leu Gln Ile Leu Pro Ser Glu Glu Trp Phe Thr Ser Glu His
20 25 30

Tyr Lys Asp Lys Lys Cys Arg His Leu Lys Pro Ile Asn Pro Asn Ile
35 40 45

Asp Leu Ser Val Leu Gly Ala Glu Arg Arg Glu Arg Phe Lys Ala Val
50 55 60

Gln Arg Ala Ile Gly His Ser Trp Gln Gly Tyr Thr Asn Ile Val Ser
65 70 75 80

Leu Asp Ser Tyr Trp Asn Gln Gly Phe Ile Pro His Asp Asp Leu Lys
85 90 95

Pro Gln Ser Ile Gln Gly His Ser Trp Leu His Tyr Gly Ala Thr Leu
100 105 110

His Asp Ser Ile Asp Thr Leu Tyr Leu Ala Asn Tyr Thr Lys Glu Tyr
115 120 125

Glu Gln Ala Val Arg Trp Ser Thr Ser Tyr Asp Ile Gln Thr Thr Ser
130 135 140

Pro Gln Ala Thr Lys Thr Phe Glu Tyr Ser Leu Arg Ile Leu Gly Gly
145 150 155 160

```
Leu Leu Gly Ala Tyr Ser Ile Ser Gly Asp Pro Arg Leu Phe Ser Ala
                165                 170                 175

Ala Gln Asn Ala Ala Asp Ala Ile Leu Glu Gly Pro Phe Gln Ala Ser
            180                 185                 190

Pro Thr Ile Val Pro Arg Pro Phe Asn Val Leu Ala Pro Ser Val Ser
        195                 200                 205

Ser Phe Asn Glu Cys Thr Trp Ile Trp Asp Trp Lys Trp Lys Ala Thr
    210                 215                 220

Ile Gln Arg Leu Tyr Gln Ala Ala Tyr Thr Ala Gly Arg Asn Gln Phe
225                 230                 235                 240

Thr Lys Glu His Arg Ser Asn Ser Leu Ala Gly Phe Gly Ser Phe Gly
                245                 250                 255

Leu Glu Phe Ser Phe Ile Ser Ala Leu Thr Gly Asp Pro Lys Tyr Lys
            260                 265                 270

Lys Lys Ser Asp Asp Ile Phe Tyr His Val Gln Thr Tyr Glu Lys Asn
        275                 280                 285

Gly Ile Ile Pro Ser Ser Trp Asp Val Leu Thr Gly Leu Pro Ile Ser
    290                 295                 300

His Ser Gly Ser Leu Gly Ser Gly Ser Asp Ser Phe Tyr Glu Tyr Leu
305                 310                 315                 320

Ile Lys Ile Pro Val Leu Asn Ser Cys Tyr Tyr Asp Asp Gly Met Glu
                325                 330                 335

Met Tyr Thr Asp Ser Cys Thr Asp Ser Asp Lys Asp His Ser Lys Leu
            340                 345                 350
```

```
Tyr Glu Lys Met Val Arg Glu Thr Leu Thr Pro Phe His Val Lys Arg
        355                 360                 365

Gln Ser Ile Gly Asp Asp Ile Asn Ser Thr Lys Ser Gln Gln Ser Phe
    370                 375                 380

Pro Val Asp Tyr Ser Asn His Tyr Asp His Leu Leu Cys Phe Leu Pro
385                 390                 395                 400

Gly Met Leu Ser Leu Gly Ala Ser Ser Lys Tyr Pro Ser Gly Ser Lys
                405                 410                 415

Ser Leu Val Asp Asn Glu Gln His Arg Leu Ala Arg Gln Leu Leu Glu
            420                 425                 430

Gly Cys Ala Ala Ile Tyr Arg Arg Ser Gln Thr Asn Leu Ser Pro Asp
        435                 440                 445

Thr Gly Ser Phe Arg Pro Gly Lys Phe Asn Val Asp Asp Pro Ser Phe
    450                 455                 460

Tyr Leu Arg Pro Glu Tyr Val Glu Ser Leu Phe Val Ile Tyr Arg Leu
465                 470                 475                 480

Thr Lys Asp Arg Glu Leu Gln Asp Met Ala Trp Asp Val Phe Gln Ser
                485                 490                 495

Leu Glu Lys Tyr Cys Lys Ile Ser Ser Gly Gly Tyr Ala Val Leu Lys
            500                 505                 510

Asp Val Asn Asp His Lys Lys Gly His His Asp Asp Met Pro Ser Tyr
        515                 520                 525

Phe Leu Ala Glu Thr Leu Lys Tyr Leu Leu Leu Ile Phe Ala Pro Asp
    530                 535                 540
```

```
Asp Tyr Val Ser Leu Asp Asp Phe Val Phe Thr Thr Glu Ala Tyr Pro
545                 550                 555                 560


Leu Arg Lys Leu Gln Val Asn Glu Asp Val Leu Pro Leu Cys Phe Leu
                565                 570                 575


Gln Cys Arg Pro Pro Thr Pro Met Pro Trp Thr Leu Leu Cys Phe Gly
            580                 585                 590


Gly Ile Ile Ile Ser Val Tyr Val Ala Met Phe Phe Val Val Ser Asn
        595                 600                 605


Val Ser Arg Thr Phe Leu Ile Ala Leu Val Asn Asp Lys Arg Lys Thr
    610                 615                 620


Leu
625


<210>  755
<211>  461
<212>  PRT
<213>  Aureococcus anophagereffens

<400>  755

Arg Arg Ala Ala Ile Ala Ala Ala Val Lys His Ala Trp Gln Gly Tyr
1               5                   10                  15


Arg Asp Arg Ala Phe Gly Arg Asp Ser Val Ala Pro Val Ser Gly Arg
            20                  25                  30


Ala Val Gly Ser Gly Phe Asp Met Ala Val Thr Leu Val Asp Ser Leu
        35                  40                  45


Asp Thr Leu Trp Ile Val Gly Leu Lys Glu Glu Phe Lys Glu Ala Arg
    50                  55                  60
```

```
Asp Phe Val Ala Thr Glu Ala Phe Gly Lys Lys Leu Arg Ser Pro Pro
65                  70                  75                  80

Ser Ser Ala Ser Ile Phe Glu Thr Thr Ile Arg Val Leu Gly Gly Leu
                85                  90                  95

Leu Gly Ala Tyr Glu Val Ser Arg Asp Lys Ile Phe Val Thr Arg Ala
            100                 105                 110

Leu Asp Ile Gly Asn Val Ile His Gly Lys Leu Asp Lys Arg Ser Gly
        115                 120                 125

Val Cys Pro Pro Ser Phe Gly Ala Arg Ser Gly Gly Gly Cys Pro Ser
    130                 135                 140

Leu Ala His Ala Gly Thr Thr Gln Leu Glu Leu Ile Tyr Leu Ala Arg
145                 150                 155                 160

Val Ser Gly Asp Pro Lys Phe Leu Lys Thr Ala Arg Leu Phe Tyr Asp
                165                 170                 175

His Ile Lys Arg Ala Ala Arg Leu Glu Pro Gly Leu Tyr Ala Gln Cys
            180                 185                 190

Val Gly Ala Ser Ser Gly Lys Ile Thr Leu Gly Ala Glu Ala Asp Ser
        195                 200                 205

Phe Tyr Glu Tyr Leu Pro Lys Val Trp Leu Leu Gln Gly Gly Ala Asp
    210                 215                 220

Arg Arg Ala Thr Arg Thr Lys Ser Ala Glu Pro Leu Asp Phe Glu Asp
225                 230                 235                 240

Ala Trp Gln Met Tyr Asn Asp Ala Leu Asp Gly Met Glu Gln Arg Leu
                245                 250                 255
```

```
Thr Ser Arg Gly Asp Asp Gly Leu Leu Tyr Leu Asp Asn Leu Asn Trp
            260                 265                 270

Arg Gly Gly Ser Ala Phe Ser Arg Glu Ser Ala Met Glu His Leu Gln
        275                 280                 285

Cys Phe Val Pro Gly Trp Val Ala Leu Gly Ala Ala Tyr Gln Asp Asp
    290                 295                 300

Pro Ala Arg Ala Ala Arg His Leu Ala Leu Ala Asp Glu Leu Ala Thr
305                 310                 315                 320

Thr Cys Phe Ala Met Tyr Asp Lys Gln Pro Thr Lys Ile Gly Pro Glu
                325                 330                 335

Arg Val Lys Arg Lys Arg Met Asp Leu Ser Ala Thr Asp Thr Lys Glu
            340                 345                 350

Tyr Ile Leu Arg Pro Glu Ala Ala Glu Gly Trp Trp Tyr Leu Ser Ile
        355                 360                 365

Leu Pro Gly Leu Asp His Met Arg Asp Lys Tyr Arg Ala Trp Ser Trp
    370                 375                 380

Gln Ser Phe Gln Ala Ile Asp Asp Leu Leu Arg Ala Pro Phe Gly His
385                 390                 395                 400

Ala Ser Met Arg Asp Val Ser Lys Pro Arg Ala Ser Ala Ser Ala Asn
                405                 410                 415

Arg Leu Asp Arg Met Glu Ser Phe Trp Ile Ala Glu Thr Leu Lys Tyr
            420                 425                 430

Phe Tyr Leu Ile Gln Glu Glu Thr Pro Ser Phe Pro Leu Asp Ala Tyr
        435                 440                 445
```

```
Val Phe Asn Thr Glu Ala His Pro Phe Ser Ile His Thr
    450                 455                 460


<210>  756
<211>  1193
<212>  PRT
<213>  Aureococcus anophagereffens

<400>  756

Met Gly His Asp Ala Gly Ala Ala Pro Asp Ala Pro Leu Arg Arg Ser
1               5                   10                  15


Leu Arg Gly Gly Ala Gly Ala Ala Pro Pro Pro Ile Ala Ala Ala Pro
            20                  25                  30


Val Ala Ala Ala Pro Ile Ala Ala Ala Pro Asn Ala Ala Ala Pro Lys
        35                  40                  45


Ala Ala Ala Pro Ile Ala Ala Ala Pro Ala Pro Pro Ala Ala Ala Pro
    50                  55                  60


Leu Glu Ala Pro Arg Ala Ala Pro Pro Pro Pro Ala Ala Ser Thr Asp
65                  70                  75                  80


Arg Ser Arg Arg Val Lys Ser Leu Arg Ser Leu Arg Asp Gly Thr Ala
                85                  90                  95


Tyr Ala Arg Ala Ser Ala Pro Leu Asp Arg Asp Ser Val Ser Gly Ala
            100                 105                 110


Ala Phe Val Tyr Val Asp Gly Ala Asp Lys Ser Ala Asp Ile Lys Thr
        115                 120                 125


Val Val Ser Asn Lys Glu Thr Gly Cys Asp Val Gly Asp Ala Arg Asp
    130                 135                 140
```

```
Gly Tyr Ala Leu Ala Val Asn Asn Trp Glu Thr Arg Asp Gly Gln Leu
145                 150                 155                 160


Thr Leu Glu Trp Gly Asp Ala Ala Thr Gly Cys Arg Lys Leu Ala Ser
                165                 170                 175


Gly Pro Arg Ala Val Val Ala Pro Asp Arg Trp Thr His Val Ala Phe
            180                 185                 190


Val Leu Ser Pro Thr Thr Ala Ala Leu Phe Val Asp Gly Ala Glu Val
        195                 200                 205


Ala Arg Glu Arg Val Gly Asp Arg Arg Ser Pro Gln Arg Thr Gln Pro
    210                 215                 220


Leu Arg Val Ala Gln Tyr Ala Asp Ala Phe Tyr Pro Phe Val Gly Asn
225                 230                 235                 240


Ile Ser Gly Leu Val Ile Phe Asp Gly Ala Leu Thr Ala Ser Asp Val
                245                 250                 255


Arg Ala Leu Ala Ala Ala Ser Ala Pro Gly Ala Ala Ala Ala Pro Pro
            260                 265                 270


Arg Thr Gly Pro Ala Val Ala Ala Ser Phe Pro Leu Ala Asp Trp Pro
        275                 280                 285


Gly Ala Lys Gly Ala Asn Val Ala Gly Asp Gly Arg Gly Leu Ala Tyr
    290                 295                 300


Ala Arg Ala Ser Pro Ala Ala Arg Ala Gly Ala Ala Arg Ala Ser Pro
305                 310                 315                 320


Gly Gly Ser Phe Ala Val Gly Tyr Asp Ala Trp Glu Pro Thr Pro Glu
                325                 330                 335
```

```
Lys Leu Ala Ala Ser Asp Ala Thr Ala Ala Gly Arg Ala Ala Lys Val
            340                 345                 350

Arg Asp Ala Met Arg His Ala Trp Lys Gly Tyr Lys Asp Arg Ala Trp
        355                 360                 365

Gly Arg Asp Glu Leu Lys Pro Val Ser Gly Arg Gly His Asp Asn Trp
    370                 375                 380

Gly Gly Met Gly Val Thr Leu Val Asp Ser Leu Asp Thr Leu Trp Leu
385                 390                 395                 400

Met Gly Leu Arg Gln Glu Phe Asp Glu Ala Lys Lys Trp Val Arg Asp
                405                 410                 415

Ser Leu Arg Phe Asp Arg Thr Gly Asp Val Ser Val Phe Glu Thr Thr
            420                 425                 430

Ile Arg Glu Leu Gly Gly Leu Leu Ala Ala Phe Asp Leu Ser Gly Asp
        435                 440                 445

Lys Val Phe Leu Asp Lys Ala Arg Asp Leu Gly Gln Arg Leu Ala His
    450                 455                 460

Ala Phe Asp Thr Pro Thr Gly Ile Pro Lys Gly Ser Thr Ser Leu Arg
465                 470                 475                 480

Glu Gly Arg Ala Lys Asp Val Gly Trp Thr Gly Gly Asn Ala Val Leu
                485                 490                 495

Ala Glu Leu Gly Ser Val Glu Leu Glu Phe Arg Tyr Leu Gly Tyr Lys
            500                 505                 510

Leu Gly Asp Ala Ser Phe Ser Asp Lys Ala Asn Arg Val Phe Glu Gln
        515                 520                 525
```

```
Phe Ser Thr Met Lys Gly Thr Gln Gly Leu Phe Pro Ile Tyr Val Asp
    530                 535                 540

Pro Arg Asn Gly Gly Leu Lys Ser Arg Lys Ile Thr Phe Gly Ala Leu
545                 550                 555                 560

Gly Asp Ser Tyr Tyr Glu Tyr Leu Leu Lys Thr Trp Leu Gln Gly Gly
                565                 570                 575

Arg Thr Glu Thr Arg Leu Arg Glu Met Tyr Asp Glu Ala Met Asp Gly
            580                 585                 590

Met Val Asp Leu Leu Leu Gln His Ser Ser Pro Ser Asn Leu Ala Tyr
        595                 600                 605

Val Ala Asp Ile Asp Gly Gly Thr Val His Lys Met Asp His Leu Val
    610                 615                 620

Cys Phe Leu Gly Gly Val Leu Ala Leu Gly Ala Lys Thr Asp Pro Arg
625                 630                 635                 640

Gly Phe Asp Ser Pro Arg Ala Arg Arg Asp Leu His Val Ala Glu Ala
                645                 650                 655

Leu Thr His Thr Cys Val Gln Met Tyr Leu Arg Gln Pro Thr Lys Leu
            660                 665                 670

Ala Pro Glu Phe Val Thr Phe Arg Arg Gly Ala Asp Met Val Val Ala
        675                 680                 685

Pro Ser Ala Pro Phe Tyr Ile Leu Arg Pro Glu Thr Ala Glu Ser Leu
    690                 695                 700

Phe Val Leu His Glu Val Thr Lys Asn Pro Val Tyr Arg Asp Trp Gly
705                 710                 715                 720
```

```
Trp Glu Ile Phe Ser Ala Ile Glu Ala Arg Cys Arg Thr Ala His Gly
                725                 730                 735

Tyr Gly Ser Val Pro Asp Val Arg Lys Val Thr Lys Pro Asp Asp Arg
            740                 745                 750

Met Glu Ser Phe Phe Leu Ala Glu Thr Leu Lys Tyr Leu Tyr Leu Leu
        755                 760                 765

Gln Asp Pro Asn His Ala Val Asp Leu Glu Thr Ala Val Phe Asn Thr
    770                 775                 780

Glu Ala His Pro Leu Arg Asn Ile Gly Pro Gly Lys Phe Thr Asp Asn
785                 790                 795                 800

Met Val Pro Lys Phe Leu Leu Phe Phe Cys Gly Ala Ala Ala Ala Leu
                805                 810                 815

Val Ala Pro His Pro Lys Arg Ala Cys Val Ala Ala Arg Pro Ser Val
            820                 825                 830

Ala Leu Pro Asp Ala Asp Val Ala Ala Val Pro Gly Asp Gly Glu Ala
        835                 840                 845

Asp Arg Pro Pro Glu Leu Glu Ala Ser Gly Pro Ala Pro Ala Thr Leu
    850                 855                 860

Ala Thr Pro Phe Arg Ala Gly Phe Val Gly Val Val Gly Ser Pro Asn
865                 870                 875                 880

Val Gly Lys Ser Thr Leu Thr Asn Ala Leu Leu Gly Gln Asp Leu Cys
                885                 890                 895

Ile Thr Asn Ser Lys Ala Gln Thr Thr Arg His Arg Ile Leu Gly Val
            900                 905                 910
```

```
Ala Asn Gly Asp Gly Tyr Gln Leu Val Leu Ser Asp Thr Pro Gly Ile
        915                 920                 925


Leu Cys Asp Pro Ala Tyr Ala Leu Gln Ser Thr Met Met Thr Ala Ala
    930                 935                 940


Lys Ala Ala Ala Arg Asp Ala Glu Cys Val Leu Phe Val Thr Asp Val
945                 950                 955                 960


Phe Glu Asp Pro Glu Val Val Ala Glu Ser Ala Ala Trp Leu Asp Ala
                965                 970                 975


Gln Leu Ala Ser Arg Ala Gly Asp Glu Pro Lys Pro Pro Val Val Val
            980                 985                 990


Ala Leu Asn Lys Val Asp Leu Leu  Gly Val Asp Asp Asp  Gly Tyr Pro
        995                 1000                1005


Leu Leu  Gly Glu Ala Ala Ser  Arg Arg Val Gly Ser  Leu Asp Asp
    1010                1015                1020


Ala Val  Ala Arg Ala Arg Ala  Ala Val Pro Gly Ala  Ala Ala Val
    1025                1030                1035


Val Pro  Leu Ser Ala Ala Thr  Gly Ala Gly Val Asp  Glu Leu Ala
    1040                1045                1050


Arg Ala  Leu Ala Ser Glu Leu  Pro Glu Ser Ala Ala  Leu Phe Asp
    1055                1060                1065


Asp Glu  Tyr Phe Thr Asp Arg  Pro Ser Arg Phe Phe  Ala Ala Glu
    1070                1075                1080


Ile Ile  Arg Glu Lys Ile Leu  Ala Gln Phe Ala Lys  Glu Ile Pro
    1085                1090                1095
```

```
Tyr Ser  Cys Glu Val Arg Ile  Asp Arg Phe Lys Glu  Asp Leu Glu
    1100                1105                1110


Leu Lys  Gly Arg Pro Phe Val  Asn Ile Asp Ala Ala  Val Leu Val
    1115                1120                1125


Ala Arg  Asp Ser Gln Lys Gly  Ile Leu Val Gly Lys  Arg Gly Ala
    1130                1135                1140


Ala Ile  Lys Ala Ile Gly Val  Ala Ala Arg Glu His  Leu Glu Thr
    1145                1150                1155


Phe Phe  Asp Ala Lys Val His  Leu Ala Leu Arg Val  Lys Val Ser
    1160                1165                1170


Lys Asp  Trp Arg Ala Asp Glu  Gly Lys Leu Lys Ala  Met Gly Tyr
    1175                1180                1185


Pro Val  Ala Gly Arg
    1190
```

<210> 757
<211> 764
<212> PRT
<213> Emiliania huxley

<400> 757

```
Met Arg Gln His Ser Asp Phe Ser Asp Ala Phe Gly Pro Leu Ser Ser
1               5                   10                  15


Lys Arg Arg Arg Gly Thr Asn Phe Ala Ala Val Arg Arg Arg Leu Pro
            20                  25                  30


Trp Leu Phe Ile Ala Leu Leu Leu Val Tyr Gly Leu Ser Phe Leu Trp
        35                  40                  45


Gly Gly Ala Glu His Ala Ser Gly Gly Ser Asp Pro Ala Met Glu Ala
```

```
    50                  55                  60

Leu Gly Ile Lys Met Val Gln Gln Ala Arg Gly Lys Val Ser Glu Pro
65                  70                  75                  80

Gly Cys Asp Arg Gly Ala Ala Gly Ala Gln Ala Ala Ser Gly Ser Ala
                85                  90                  95

Met Ala Gly Asp Phe Lys Ser Leu Arg Pro Lys Ser Asp Lys Val Glu
            100                 105                 110

Leu Arg Ala Ala Gly Ala Ala Leu Asp Gly Ala Ser Leu Ser Leu Ala
        115                 120                 125

Ala Trp Val Leu Pro Pro Ala Pro Ala Asp Gly Lys Val Leu Ser Ile
    130                 135                 140

Gln Thr Ile Ala Ser Thr Lys Ala Ser Gly Cys Ala Val Asp Ala Asp
145                 150                 155                 160

His Arg Gly Val Ala Val Phe Leu Asn Glu Trp Gln Thr Asn Ser Gly
                165                 170                 175

Gln Leu Tyr Leu Ser Trp Gly Ser Ala Ala Ser Gly Cys Glu Glu Ile
            180                 185                 190

Ala Thr Ala Val Asn Ser Val Lys Pro Gly Arg Trp Thr His Val Ala
        195                 200                 205

Ala Thr Leu Ser Ala Ser Arg Ala Arg Leu Tyr Val Asp Gly Glu Leu
    210                 215                 220

Leu Ala Asp Ser Glu Arg Asp Gly Ser Gly Lys Leu Leu Gly Val Asp
225                 230                 235                 240

Asn Phe His His Gly Gly Asp Gln Ser Ala Gly Val Ser Asp Arg Leu
```

```
                245                 250                 255

Phe Arg Gly Gly Glu Thr Ala Leu Arg Gly Ser Leu Ser Gly Val Asp
            260                 265                 270

Glu Leu Glu Thr Val Pro Ile Ala Gln Val Val Pro Lys Glu Asp Val
        275                 280                 285

Ala Ile Ser Ala Arg Tyr Ala Glu Val Asn Ala Ser Asp Ala Leu Ala
    290                 295                 300

Arg Val Arg Leu Glu Ala Val Arg Gly Ala Phe Lys Arg Ala Trp Gly
305                 310                 315                 320

Ala Tyr Arg Lys His Ala Trp Gly Met Asp Glu Ile Lys Pro Ile Ser
                325                 330                 335

Asn Lys Ser His Asp Trp Leu His Leu Gly Ala Thr Met Ile Asp Cys
            340                 345                 350

Leu Asp Asn Leu Trp Ile Phe Gly Leu Lys Ala Glu Phe Asp Glu Ala
        355                 360                 365

Lys Glu Trp Val Ala Thr Lys Leu Ser Phe Ser Arg Ala Val Gly Ile
    370                 375                 380

Ser Met Phe Glu Thr Val Ile Arg Ile Ile Gly Gly Leu Leu Ser Ala
385                 390                 395                 400

Phe Glu Leu Ser Arg Glu Ala Val Phe Leu Arg Lys Ala Glu Glu Leu
                405                 410                 415

Ala Gly Leu Met Met Tyr Ser Phe Lys Ala Asn Pro Glu Thr Gly Val
            420                 425                 430

Pro Cys Thr Thr Ile Ser Leu Asp Gly Ser Arg Arg Cys Thr Phe Pro
```

```
        435                 440                 445

Thr Trp Thr Gln Arg Asn Ala Ile Leu Ala Glu Phe Gly Thr Ile Gln
    450                 455                 460

Leu Glu Phe Lys Tyr Leu Ala His His Thr Gly Arg Lys Glu Phe Trp
465                 470                 475                 480

Glu Val Ala Glu Arg Gln Ile Arg Asn Val Arg Gly Arg Thr Gln Pro
                485                 490                 495

Ala Gly Leu Tyr Pro Asn Phe Met Ser Pro Lys Thr Leu Arg Trp Thr
            500                 505                 510

Thr Thr Lys Val Ser Met Gly Ala Leu Ala Asp Ser Phe Tyr Glu Tyr
        515                 520                 525

Leu Leu Lys Gln Trp Leu Leu Thr Gln Arg Thr Glu Pro Tyr Leu Arg
    530                 535                 540

Thr Met Phe Asp Glu Ala Met Leu Gly Met Ala Arg Ser Met Val Ala
545                 550                 555                 560

Arg Ser Thr Pro Ser Glu Leu Val Tyr Ile Ala Asp Tyr Val Ser Glu
                565                 570                 575

Gly Lys Leu Val His Lys Met Asp His Leu Ala Cys Phe Ala Gly Gly
            580                 585                 590

Met Leu Ala Val Gly Ala Gln His Gly Gly Glu Phe Asp Arg Glu Tyr
        595                 600                 605

Met Thr Leu Ala Glu Arg Ile Gly Glu Thr Cys Tyr Glu Phe Tyr Arg
    610                 615                 620

Arg Thr Thr Ser Gly Leu Ser Pro Glu Phe Met Ser Phe Val Gly Gly
```

625 630 635 640

Ser Asp Pro Lys Val Pro Arg Asn Ala Ala Tyr Asn Ile Gly Arg Pro
645 650 655

Glu Ala Val Glu Thr Phe Phe Ile Met Trp Tyr Tyr Thr Arg Asp Pro
660 665 670

Lys Trp Arg Glu Met Gly Trp Glu Val Phe Ser Ser Phe Glu Arg His
675 680 685

Ala Arg Thr Pro Ser Gly Trp Ala Ala Leu Lys Asp Val Asn Asn Pro
690 695 700

Ala Lys Leu Asp Asp Lys Met Glu Ser Phe Val Leu Ala Glu Thr Met
705 710 715 720

Lys Tyr Leu Phe Leu Leu Phe Asp Ser Ser Tyr Pro Ile Pro Leu Asp
725 730 735

Lys Tyr Val Phe Asn Thr Glu Ala His Pro Leu Gly Thr Phe Asp Ala
740 745 750

Ser Ala Phe Thr Ser Ala Ala Pro Pro Lys Arg Arg
755 760

<210> 758
<211> 549
<212> PRT
<213> Emiliania huxley

<400> 758

Met Ala Cys Leu Val Leu Thr Ala Ala Leu Ala Ile Pro Gly Ala Thr
1 5 10 15

Thr Asp Gly Glu Cys Ala Ala Glu Asp Ala Pro Pro Ala Val Val Arg
20 25 30

```
Arg Gly Ala Gln Val Glu Arg Gln Asn Ala Thr Arg Ser Ala Phe Leu
        35                  40                  45

His Ala Trp Arg Ser Tyr Ala Thr Tyr Ala Trp Gly Gln Asp Glu Val
    50                  55                  60

Asn Pro Val Ser Arg Leu Ala Val Ser Ser Phe Gly Met Gly Leu Thr
65                  70                  75                  80

Leu Val Asp Ser Leu Asp Thr Met His Leu Met Gly Leu Ser Glu Glu
                85                  90                  95

Phe Ala Ala Ala Val Ala Trp Val Arg Thr Arg Leu Arg Phe Gly Glu
            100                 105                 110

Gln Glu Glu Ile Asn Val Thr Ile Arg Val Leu Gly Gly Leu Leu Ser
        115                 120                 125

Ala Tyr Glu Leu Ser Gly Glu Arg Ser Val Leu Asp Ala Ala Asp Glu
    130                 135                 140

Leu Gly Gln Arg Leu Val Phe Ala Phe Asp Ser Pro Thr Gly Leu Pro
145                 150                 155                 160

Tyr Gly Thr Val Gly Leu Lys Ser Arg Lys Arg Tyr Asn Pro Thr Trp
                165                 170                 175

Ser Arg Gly Ala Pro Arg Ala Ser Thr Val Ala Glu Val Ala Thr Leu
            180                 185                 190

Gln Val Glu Phe Arg Ala Leu Ser Arg His Ala Arg Arg Pro Pro Val
        195                 200                 205

Tyr Glu Ala Val Ala Gln Arg Val Met Ala His Leu Arg Glu Met Ser
    210                 215                 220
```

```
Arg Leu Tyr Pro Thr Met Ile Ser Pro Val Ser Gly Glu Phe Ala Ser
225                 230                 235                 240

Ser Asp Leu Thr Leu Gly Ala Arg Ala Asp Ser Ala Tyr Glu Asn Pro
                245                 250                 255

Ala Gln Ala Tyr Leu Leu Lys Gln Trp Leu Met Ser Ser Arg Thr Asp
            260                 265                 270

Ser Arg Val Ala Gln Met Tyr Thr Glu Ser Val Ala Ala Ile Thr Ala
        275                 280                 285

His Leu Val Arg Glu Gly Gly Leu Ala Arg Cys Ala Asn Cys Thr Tyr
    290                 295                 300

Ile Gly Arg Trp Asn Phe Arg Thr Lys Arg Tyr Glu Asp Lys Met Asp
305                 310                 315                 320

His Leu Val Cys Phe Val Pro Gly Met Leu Ala Leu Gly Ala His Ser
                325                 330                 335

Gly Ile His Gly Val Arg Gly Gly Ala Ala Ala Arg Ala Thr Met Ala
            340                 345                 350

Leu Ala Glu Gln Leu Met Glu Thr Cys Tyr Arg Met Tyr Ser Asp Gln
        355                 360                 365

Pro Thr Gly Leu Ala Pro Glu Ile Ala Glu Leu Arg Glu Gly Thr Ser
    370                 375                 380

Arg Val Ala Ala Asp Ser Gly Ala Arg His Asn Leu Leu Arg Pro Glu
385                 390                 395                 400

Thr Val Glu Ser Leu Phe Val Leu Trp Trp Val Thr Gly Asp Glu Lys
                405                 410                 415
```

```
Tyr Arg Asp Trp Gly Trp His Ile Phe Val Ala Phe Glu Arg Leu Cys
            420                 425                 430

Arg Leu Gln Asp Gly Gly Tyr Ser Gly Leu Lys Asp Val Thr Asp Arg
        435                 440                 445

His Gly Gly Gly His Asn Gly Lys Met Glu Ser Phe Phe Leu Ala Glu
    450                 455                 460

Thr Leu Lys Tyr Leu Trp Leu Leu Phe Gly Asp Gly Thr Glu Val Pro
465                 470                 475                 480

Leu Asp Glu Tyr Val Phe Asn Thr Glu Ala His Pro Leu Arg Ile His
                485                 490                 495

Glu Asp Tyr Arg Phe Gly Ser Arg Phe Gly Ser Leu Pro Leu Ala Glu
            500                 505                 510

Asp Leu Ala Asn Asp Ser Pro Glu Arg Pro Leu Phe Asp Gln Ser Val
        515                 520                 525

Arg Ala Arg Val Ala Asp Arg Ala Glu Leu Leu Ala Arg Thr Phe Pro
    530                 535                 540

Ala Ala Ala Glu Thr
545
```

<210> 759
<211> 590
<212> PRT
<213> Emiliania huxley

<400> 759

```
Met Ile Thr Phe Phe Ser Met Glu Thr Arg Arg Gln Glu Glu Gln Arg
1               5                   10                  15
```

```
Glu Met Gln Lys Glu Leu His Arg Leu Arg Thr Asp Asn Leu Ala Lys
            20                  25                  30

Glu Arg Lys Leu Ile Lys Leu Ala Glu Arg Ala Glu Ser Trp Arg Phe
        35                  40                  45

Asp Arg Gly Gly Glu Ser Glu Asp Asp Ala Gly Gly Glu Phe Asn Glu
    50                  55                  60

Asp Glu Trp Ser Glu Glu Ser Asp Glu His Pro Pro Gly Glu Asp Gly
65                  70                  75                  80

Thr Pro Tyr Gly Ala Glu Ala Leu Ala Pro Glu Glu Glu Ala Leu Pro
                85                  90                  95

Ala Glu Lys Arg Ala Gly Cys Ala Arg Leu Lys Glu Gly Trp Trp Val
            100                 105                 110

Tyr Glu Val Cys Leu Gly Gln His Val Arg Gln Phe His Ala Ala Asp
        115                 120                 125

Ala Lys Ala Ala Phe Ala Glu Asn Met Leu Gly Met Ala Pro His Ala
    130                 135                 140

Cys Gly Ala Glu Glu Ala Gly Cys His Cys Met Arg Leu Arg Glu Asp
145                 150                 155                 160

Asp Ala Ala Leu Ser Cys His Lys Ala Glu Glu Glu Tyr Val Arg Gly
                165                 170                 175

Asp Ala Cys Pro Asp Arg Glu Ser Thr Arg Ser Val Thr Val Lys Leu
            180                 185                 190

Val Cys Arg Glu Gly Glu Glu Ala Ala Asp Ser Val Leu Ala Glu Gly
        195                 200                 205
```

```
Ala Leu Ala Leu Val Ser Val His Glu Pro Glu Thr Cys Arg Tyr Glu
    210                 215                 220

Ala Thr Val Glu Ala Pro Ala Gly Phe Gly Gly Glu Glu Ala Gly Cys
225                 230                 235                 240

Gly Gly Gly Ala Ala Arg Leu Gly Glu Gly Gly Lys Asp Trp Val Gly
                245                 250                 255

Leu Gly Leu Thr Ile Leu Asp Ser Leu Asp Val Leu Trp Met Ala Asn
            260                 265                 270

Leu Thr Lys Glu Phe Ala His Gly Val Glu Trp Thr Ile Pro Asn Trp
        275                 280                 285

Thr Gly Gly Ser Leu Leu Leu Ala Glu Val Gly Thr Val Gln Met Glu
    290                 295                 300

Phe Phe Ala Leu Ala His His Ala Gly Arg Pro Glu Phe Arg Glu Arg
305                 310                 315                 320

Ala Gln Arg Ala Ile Asp Leu Leu Asp Ser Gln Gly Gly Gly Leu Thr
                325                 330                 335

Asp Gly Gly Arg Leu Trp Pro Ile His Ile Arg Pro Glu Ser Gly Arg
            340                 345                 350

Pro Ser Gly Ser Thr Ile Ser Trp Gly Ala Met Gly Asp Ser Phe Tyr
        355                 360                 365

Glu Tyr Leu Leu Lys Thr Trp Leu Leu Thr Gly Lys Lys His Glu Gln
    370                 375                 380

Tyr Lys Arg Met Tyr Leu Glu Ala Val Lys Gly Met Gln Arg Arg Leu
385                 390                 395                 400
```

```
Ile Ile Glu Glu Gly Gly Leu Thr Tyr Leu Cys Glu Glu Lys Ser Gly
                405                 410                 415

Lys Leu Val Arg Lys Met Asp His Leu Val Cys Phe Val Pro Gly Thr
            420                 425                 430

Leu Ala Leu Gly Ala Gln His Leu Pro Glu Gln His Asp Glu His Met
        435                 440                 445

Ala Leu Ala Ala Lys Leu Ala Glu Thr Cys His Arg Met Tyr Thr Leu
    450                 455                 460

Thr Pro Thr Gly Leu Ala Pro Glu Phe Val Lys Ile Val Gly Gly Ser
465                 470                 475                 480

Met Val Ala Gly Ala Asn His Asn Leu Leu Arg Pro Glu Thr Ile Glu
                485                 490                 495

Ala Phe Phe Tyr Leu Trp Arg Phe Thr Lys Asp Ala Arg Tyr Arg Glu
            500                 505                 510

Trp Gly Trp Glu Ile Phe Ser Ala Phe Glu Arg His Cys Arg Val Pro
        515                 520                 525

Ser Gly Gly Tyr Ser Gly Leu Lys Asn Val Lys Leu Arg Gly Ser Ala
    530                 535                 540

Lys Asp Asp Thr Met Gln Thr Phe Trp Leu Ala Glu Ser Leu Lys Tyr
545                 550                 555                 560

Phe Leu Leu Leu Phe Ser Asp Asp Ser Leu Leu Asp Leu Asn Thr His
                565                 570                 575

Val Ile Asn Thr Glu Ala His Pro Ile Lys Ile Leu Pro Ser
            580                 585                 590
```

<210> 760
<211> 414
<212> PRT
<213> Emiliania huxley

<400> 760

```
Met Leu Ala Ala Ala Ala Ala Val Ala Gly Ala Leu Pro Pro Met Pro
1               5                   10                  15


Asp Ser Leu Ala Glu Ala Ala Asn Ala Val Arg Glu Glu Gly Arg Ser
            20                  25                  30


Thr Trp Ala Ala Tyr Tyr Lys His Ala Arg Gly Phe Asp Ser Leu Arg
        35                  40                  45


Pro Leu Ser His Arg Gly Val Asn Asp Trp Gly Ser Val Gly Met Met
    50                  55                  60


Ala Ile Asp Cys Leu Asp Thr Leu Trp Leu Met Asn Leu Thr Ala Glu
65                  70                  75                  80


Phe Lys Gln Ala Arg Ser Ile Val Glu Glu Ile Asp Tyr Thr Pro Ala
                85                  90                  95


Gly Arg Glu Ala Arg Ser Val Ser Thr Phe Glu Met Thr Ile Arg Gly
            100                 105                 110


Leu Gly Gly Leu Leu Ser Ala His Ala Leu Ser Gly Asp Arg Leu Phe
        115                 120                 125


Leu Arg Lys Ala Glu Gln Leu Gly Glu Ala Leu Asn Thr Ala Phe Val
    130                 135                 140


Pro Gly Arg Phe Pro Leu Pro Ser Ser Ser Gly Gly Ala His Pro Thr
145                 150                 155                 160
```

```
Gly Arg Val Ser Leu Gly Ala Met Gly Asp Ser Tyr Tyr Glu Tyr Leu
                165                 170                 175

Ala Lys Thr Ala Ile Leu Asp Pro Arg Leu Arg Pro Thr Ala Gly Ala
            180                 185                 190

Met Phe Lys Ala Ala Leu Leu Glu Ile Glu Gln Gln Leu Leu Val Pro
        195                 200                 205

Arg Glu His Gly Arg Thr Phe Leu Ala Glu Glu Ser Ala Tyr Thr Ser
    210                 215                 220

Leu Asp Asp Val Tyr Ala Gln Pro Ser Arg Arg Arg Asp Asp Met Pro
225                 230                 235                 240

Thr Phe Trp Leu Ala Glu Thr Leu Lys Tyr Leu Phe Leu Asn Phe Ala
                245                 250                 255

Pro Pro Thr Leu Leu Pro Leu Asp Gly Trp Val Phe Asn Thr Glu Ala
            260                 265                 270

His Pro Leu Arg Ile Phe Pro Arg Gly Ala Glu Ala Ala Gly Ala Ala
        275                 280                 285

Ala Ala Ala Ala Ala Ala Ala Ala Glu Gln Ala Lys Val Ala Ser Leu
    290                 295                 300

Val Ala Gln Leu Gln Gly Gln Glu Gln Ala Ala Leu Glu Gln Met Arg
305                 310                 315                 320

Ala Arg Ala Ala Gln Arg Gln Ala Arg Leu Ala Pro Lys Ser Ala Arg
                325                 330                 335

Arg Tyr Val Gly Arg Ser Gln Ser Pro Phe Ser Ser Arg Trp Ala Lys
            340                 345                 350
```

```
Arg Ala Gly Ser Arg Ala Pro Glu Arg Arg Ala Ser Leu Arg Glu Glu
        355                 360                 365

Arg Lys Gly Arg Met Leu Glu Ile Glu Glu Lys Leu Arg Arg Val His
    370                 375                 380

Gly Ala Thr Arg Asp Ser Ser Glu His Val Leu Lys Ala Pro Ser Arg
385                 390                 395                 400

Ala Gly Ala Arg Leu Arg Gln Ser Pro Ser Gln Thr Ser Thr
                405                 410
```

<210> 761
<211> 735
<212> PRT
<213> Guillardia theta

<400> 761

```
Met Ile Ala Leu His Arg Ser Asn Arg Asp Val Met Tyr Ala Lys Ser
1               5                   10                  15

Leu Gly Lys Lys Tyr Ser Ser Leu Pro Glu Ser Pro Ser Ser Val Ile
            20                  25                  30

Leu Asp Ile Ser Leu Ile Phe Val Leu Phe Phe Leu Phe Leu Ala Leu
        35                  40                  45

Val Tyr His Leu Ile Tyr Asp Ile Phe Gly Thr Asn Leu His Ser Leu
    50                  55                  60

Leu Thr Gly Gly Ile Ser Arg Thr Phe Phe Val Ser Val Cys Leu Gly
65                  70                  75                  80

Ile Ile Leu Arg Thr Leu Lys Asn Leu Tyr Leu Leu Ile Arg Thr Val
                85                  90                  95

Glu Ser Ser Ser Asp Ala Ser Val Ile Gln Trp Tyr Arg His Leu Leu
```

```
            100                 105                 110

Thr Leu Thr Leu Phe Gly Ala Tyr Phe Leu Ala Phe Phe Asn Gly Lys
        115                 120                 125

Asp Ile Ser Lys His Val Met Gln Leu Trp Ser Ser Phe Asp Val Ala
    130                 135                 140

Ser Phe His Ser His Phe Asn Asn Asn Asn Asn Asn Asn Ala Ile Lys
145                 150                 155                 160

Ile Thr Tyr Asn Gln His Asp Trp Glu Arg Glu Arg Glu Ala Leu Met
                165                 170                 175

Gln Val Ala Glu Pro Ala Ala Ala Leu Leu Ser Asp Thr Val Ala Pro
            180                 185                 190

Lys Val Ala Glu Asp Cys Ala Ile Arg Glu Lys Ala Leu Met Gln Gln
        195                 200                 205

Ala Ser Glu Arg Lys Arg Met Pro His Arg Leu Met Gln Glu Ser Thr
    210                 215                 220

Arg Gly His Glu Thr Ala Gln Trp Ser Ser Val Gly Ser Thr Pro Gly
225                 230                 235                 240

Arg Glu Gln Gly Gly Pro Ser Ser Ala Ala Lys Glu Leu Ala Ala Lys
                245                 250                 255

Ile Ala Asn Glu Gln Ala Leu Ala Ser Met Val Asn Glu Pro Leu Asp
            260                 265                 270

Ile Phe Asp Asp Asp Asp Ser Thr Arg Ile Lys Arg Leu Ala Ile Lys
        275                 280                 285

Asn Ala Phe Leu His Ala Trp Glu Ala Tyr Glu Met His Ala Phe Gly
```

```
    290                 295                 300

Lys Asp Glu Val His Pro Leu Ser Gln Gln Gly His Asp Ile Met Gly
305                 310                 315                 320

Leu Gly Val Thr Ile Ile Asp Ala Leu Asp Thr Met Leu Val Met Gly
                325                 330                 335

Leu Ala Ser Ser Pro Val Tyr Lys Arg Ala Arg Ser Trp Val Gln Ser
            340                 345                 350

Gly Phe Asp Pro Lys Pro Asn Lys Asp Ile Ser Val Phe Glu Ala Thr
        355                 360                 365

Ile Arg Val Leu Gly Gly Leu Leu Ser Ala Phe Gly Leu Thr Gly Asp
    370                 375                 380

Arg Met Tyr Ala Glu Lys Ala Thr Glu Leu Gly Asp Val Leu Leu Thr
385                 390                 395                 400

Ala Met Gln Thr Pro Thr Gly Leu Pro Ala Ser Val Ile Asn Pro Lys
                405                 410                 415

Leu Gly Ser Ser Lys Gln Ser Phe Ile Asn Pro Tyr Asn Gly Asn Gln
            420                 425                 430

Cys Lys Phe Gly Asp Pro Thr Thr Leu Ala Glu Ala Gly Ser Val Gln
        435                 440                 445

Met Glu Leu Gln Tyr Leu Ser His Ile Thr Gly Asp Pro Lys Tyr Ala
    450                 455                 460

Ala Ala Ala Asp Arg Ser Ile Ala Lys Leu Leu Ser Leu Ala Val Lys
465                 470                 475                 480

Ser Lys Asp Lys Pro Glu Asn Pro Leu Phe Pro Val Asp Val His Pro
```

```
                485                 490                 495

Arg Glu Gly Arg Phe Val Thr Asp Arg Ile Ser Met Gly Ser Gly Gly
            500                 505                 510

Asp Ser Phe Tyr Glu Cys Ile Leu Lys Gln Ala Ile Leu Arg Pro Leu
        515                 520                 525

Ser Ala Gly His Leu Arg Ser Ile Phe Gln Asn Val Thr Val Ser Ala
    530                 535                 540

Ile Glu Lys Val Gly Ala Glu Val Asp Gly Leu Ser Phe Leu Gly Gln
545                 550                 555                 560

Cys Ser Val Thr Ser Pro Glu Thr Met Lys Arg Met Glu Val Asn Glu
                565                 570                 575

Thr Ser Ala Ser Leu Phe Cys Arg Asp Val Ile Met Lys His Leu Ala
            580                 585                 590

Cys Phe Ala Pro Ala Met Leu Val Leu Ala Tyr Asn Glu Asp Arg Ser
        595                 600                 605

Gln Thr Ala Tyr Leu Val Glu Ala Glu Asn Leu Met Arg Thr Cys Met
    610                 615                 620

Ser Met Tyr Gln Val Thr Gln Thr Gly Leu Ala Ala Glu Gln Tyr Asp
625                 630                 635                 640

Ile Lys Val Lys Pro Thr Lys Leu Thr Pro Thr Val Arg Gln Lys Tyr
                645                 650                 655

Ser Leu Leu Arg Pro Glu Ala Val Glu Ser Ala Phe Phe Leu Trp Arg
            660                 665                 670

Arg Ile Tyr Arg Asp Phe Gly Trp Gln Phe Phe Met Ser Leu Glu Lys
```

675 680 685

Tyr Cys Arg Arg Ser Phe Gln Gly Gly Gly Tyr Thr Ala Ile Leu Asp
690 695 700

Val Asp His Ala Ala Ser Ala Gly Ser Ala Ser Asp Ala Asn Arg Met
705 710 715 720

Asp Arg Leu Asp Ser Phe Phe Phe Ser Glu Thr Leu Lys Tyr Leu
725 730 735

<210> 762
<211> 600
<212> PRT
<213> Guillardia theta

<400> 762

Met Ala Trp Arg Tyr Gly Ser Lys Arg Thr Glu Arg Leu Leu Leu Leu
1 5 10 15

Leu Leu Leu Leu Leu Leu Ser Leu Thr Arg Cys Ser Pro His Leu Pro
20 25 30

Asp Ala Pro Ser Leu Pro Pro Pro Leu Pro Pro Gln Arg Ser Leu Ala
35 40 45

Leu Pro Ala Pro Leu Thr Leu Thr Leu Ala Ser Arg Arg Ala Gln Val
50 55 60

Arg Glu Ala Ile Arg His Ala Trp Ser Gly Tyr Met Lys Tyr Gly Arg
65 70 75 80

Leu Gly Asp Asp Leu Lys Pro Val Ser Arg Gly Val Asp Asn Trp Met
85 90 95

Asn Ala Arg Leu Thr Leu Phe Asp Ser Leu Asp Thr Leu Tyr Leu Ser
100 105 110

```
Gly Cys Gln Asp Leu Phe His Glu Ala Ala Gln Gln Val Leu Ala Gly
        115                 120                 125

Gly Val Pro Gly Asp Ala Ile Phe Pro Ser Lys Val Phe Glu Tyr His
    130                 135                 140

Ile Arg Ile Val Gly Gly Leu Leu Ser Val His Ser Leu Thr Gly Asp
145                 150                 155                 160

Ala Arg Phe Leu Asp Leu Ala Ser Arg Ala Ala Asp Asn Val Leu Glu
                165                 170                 175

Ala Met Gln Asn Pro Ser Gly Leu Pro Tyr Met His Phe Arg Phe Val
            180                 185                 190

Asp Arg Lys Arg Arg Pro Val Thr Trp Leu Val Ser Arg Thr Met Asp
        195                 200                 205

Phe Ile Arg Ala Ser Tyr Asp Ser Ala Ile Trp Arg Asn Ser Leu Val
    210                 215                 220

Gly Ile Gly Ser Met Gly Pro Glu Leu Arg Tyr Leu Thr Arg Glu Thr
225                 230                 235                 240

Gly Ala Arg Arg Tyr Glu Glu Ala Ala Asp Arg Val Leu Ala Glu Ile
                245                 250                 255

His Ala Ala Trp Lys Lys Leu Gly Gly Arg Asn Ser Ser Lys Pro Leu
            260                 265                 270

Pro Leu Trp Trp Asp Thr Pro Pro Arg Leu Ser Arg Ser Tyr Arg Pro
        275                 280                 285

Leu Phe Asn Gln Leu Glu Gly Ser Glu Ala Thr Leu Gly Ser Gly Gly
    290                 295                 300
```

```
Asp Ser Phe Phe Glu Tyr Leu Leu Lys Glu Gln Leu Leu Gln Ser Ser
305                 310                 315                 320

Ser Arg Ser Gln Leu Val Asp Met Tyr Glu Trp Leu Thr Ser Arg Leu
                325                 330                 335

Leu Asp Gly His Ala Asn Gln Leu Ile Arg Arg Val His Gly Val Asp
            340                 345                 350

Phe Leu Val Asn Arg Arg Cys Asp Tyr Glu His Leu Thr Cys Phe Val
        355                 360                 365

Pro Gly Met Leu Ala Leu Gly Ala Ser Gln Leu Lys Gly Asn Arg Ser
    370                 375                 380

Ser Gln Leu Ser Leu Ala Arg Arg Leu Met Glu Ser Cys Ile Tyr Leu
385                 390                 395                 400

Tyr Gln Ala Ser Pro Thr Gly Leu Ala Pro Asp Thr Gly Ser Val Cys
                405                 410                 415

Gly Asp Gln Phe Thr Ala Asn Ser Pro Glu Tyr Leu Leu Arg Pro Glu
            420                 425                 430

Thr Val Glu Ser Leu Phe Ile Leu Phe Arg Val Thr Lys Asp Gly Arg
        435                 440                 445

Tyr Arg Glu Ile Ala Trp Glu Ile Phe Arg Ser Ile Glu Lys Tyr Cys
    450                 455                 460

Lys Val Glu Ser Gly Gly Tyr Ser Gly Leu Val Asn Val Asn Asp Val
465                 470                 475                 480

Asn Gly Ser Lys Asn Asp Asn Met Pro Ser Tyr Phe Ile Ala Glu Thr
                485                 490                 495
```

```
Leu Lys Tyr Leu Tyr Leu Ile Phe Asp Asp Ala Ala Val Ser Leu Asp
            500                 505                 510

Asp Phe Val Phe Thr Thr Glu Ala His Pro Leu Ala Arg Tyr Asn Arg
        515                 520                 525

Cys Asp Arg Gln Gly Val Ser Arg Tyr His Ser Glu Cys Val Ser Ser
    530                 535                 540

Ser Ile Asp Leu Phe Leu Leu Ser Pro Glu Asn Leu Met Leu Leu Leu
545                 550                 555                 560

Leu Leu Leu Thr Cys Leu His Arg Cys Arg Cys Val Ser Leu Ala Trp
                565                 570                 575

Leu Lys Arg Ala Leu Val Gln Arg Ile Arg Ser Phe Leu Lys Arg Arg
            580                 585                 590

Arg Leu Gly Arg His His Met Val
        595                 600
```

<210> 763
<211> 413
<212> PRT
<213> Phaeodactylum tricornutum

<400> 763

```
Met Arg Leu Trp Lys Arg Thr Thr Ser Gly Val Pro Pro Pro Arg Arg
1               5                   10                  15

Arg Arg Arg Gly Gly Arg Glu Glu Arg Leu Ala Ile Gly Leu Leu Leu
            20                  25                  30

Thr Leu Ala Val Val Trp Gly Thr Val Leu Val Gly Thr Leu Val Ala
        35                  40                  45
```

```
Leu Val Ala Ser Pro Thr Lys Ser Val Pro Thr Phe Pro Thr Val Pro
    50                  55                  60

Thr Asp Ser Arg Pro Ser Ala Ala Phe Val Val Ser Asp Ala Pro Gly
65                  70                  75                  80

Ala Tyr Glu Ser Pro Leu Leu Val Phe Thr Cys Arg Arg Asp Gln Tyr
                85                  90                  95

Leu Arg Glu Thr Leu Arg Asp Ile Trp Asn Tyr Ile Pro Thr Asp Cys
            100                 105                 110

Ser Val Gly Cys Pro Leu Val Ile Ser Gln Asp Gly Asn Asp Pro Ala
        115                 120                 125

Val Gln Arg Val Val Arg Glu Phe Thr Asp Glu Phe Ala Thr Lys Asn
    130                 135                 140

Val Pro Val Val His Trp Thr His Thr Ser Ala Leu Arg Gly Gly Thr
145                 150                 155                 160

Asn Gly Tyr Gln Ala Leu Ala Ile His Tyr Gly Trp Ala Leu Arg Arg
                165                 170                 175

Val Phe Asp Gly Gln Thr Leu Ser Gly Ser Val His Gly Ala Lys His
            180                 185                 190

Gly Thr Pro Lys Arg Val Ile Ile Leu Glu Glu Asp Leu His Val Ala
        195                 200                 205

Pro Asp Phe Phe Asp Tyr Phe Ala Ala Thr Ala Pro Leu Leu Asp His
    210                 215                 220

Asp Ser Ser Leu Leu Ala Val Ser Ala Phe His Asp Asn Gly Phe Ala
225                 230                 235                 240
```

```
His Asn Val Arg Asn Ala Ser Arg Ile Leu Arg Ser Asp Phe Phe Pro
                245                 250                 255

Gly Leu Gly Trp Met Met Asn Arg Arg Leu Trp Val Asp Glu Leu Gln
            260                 265                 270

Ser Lys Trp Pro Gly Gly Tyr Trp Asp Asp Trp Leu Arg Glu Pro Ala
        275                 280                 285

Gln Arg Gln Asp Arg Ala Ile Leu Arg Pro Glu Ile Ser Arg Thr Tyr
    290                 295                 300

His Phe Gly Thr Glu Gly Gly Thr Ser Ser Asn Gln Phe Gly Ser His
305                 310                 315                 320

Leu Ser Lys Ile Leu Leu Asn Arg Glu Thr Val Asp Trp Ser Lys Ala
                325                 330                 335

Val Asp Leu Glu Ala Gln Leu Arg Pro Glu Val Tyr Asp Pro Ala Tyr
            340                 345                 350

Trp Ala Met Val Gln Ala Ser Thr Leu Thr Tyr Thr Ile Pro Asp Ala
        355                 360                 365

Leu Glu Gln Ala Lys Lys Ser Asn Ala Arg Leu Gln Tyr Thr Thr Ile
    370                 375                 380

Glu Gln Phe Lys Tyr Leu Ala His Lys Leu Lys Leu Met Ala Asp Glu
385                 390                 395                 400

Lys Ala Asn Val Pro Arg Thr Ala Tyr Lys Gly Ile Val
                405                 410
```

<210> 764
<211> 636
<212> PRT

<213> Micromonas pusilla

<400> 764

```
Met Asn Lys Ser Ser Gly Ser His Gly Arg Thr Gly Lys Val Lys Pro
1               5                   10                  15


Thr Phe Arg Val Pro Leu Lys Ile Ala Ser Leu Arg Phe Ser Val Gln
            20                  25                  30


Lys Ser Arg Leu Tyr Pro Leu Gln Arg Gly Leu Pro Arg Ile Lys Ser
        35                  40                  45


Cys Arg Leu Phe Phe Tyr Leu Phe Val Ala Phe Ala Ile Ala Arg Val
    50                  55                  60


Gly Ile Ile Tyr Val Asp Arg Ser Lys Lys Asn Leu Ile Val Lys Asn
65                  70                  75                  80


Ser Leu Val Ala Ser Thr Ser Lys Tyr Ala Arg Arg Glu Gly Glu Phe
                85                  90                  95


Leu Leu Gln Asp Val Met Asp His His Arg Gly Ser Ala Trp Lys Lys
            100                 105                 110


Thr Arg Gln Leu Val Arg Gly Gly Ser Arg Ser Ala Gly Ala Ser Asn
        115                 120                 125


Ala Pro Leu Gln Ser Arg Ala Gly Thr Thr Gly Gly His Arg Asn Pro
    130                 135                 140


Arg Arg Ala Asp Glu Leu Glu Leu Gln Thr Ala Glu His Glu Pro Val
145                 150                 155                 160


Glu Arg Val Ala Arg Glu Asp Ser Ser Glu Lys Leu Val Asp Gly Asp
                165                 170                 175
```

```
Thr Ser Gln Gly His Val Glu Ser Met Ala Val Leu Val Val Ala Tyr
            180                 185                 190

Asn Arg Pro Asp Tyr Leu Arg Gln Thr Leu Asp Ser Leu Ala Lys Val
        195                 200                 205

Ser Arg Leu Ser Asp Ile Ser Val Tyr Val Ser Gln Asp Gly Phe Asp
    210                 215                 220

Glu Gly Val Ala Arg Val Ala Ser Glu Gly Gln Leu Arg Gly Leu Gly
225                 230                 235                 240

Lys Pro Gln Thr Arg Gly Tyr Glu His Trp Gln Arg Glu Arg Ile Pro
                245                 250                 255

Gln Leu Gly Gln Asn Gln Pro Gly His Ala Trp Leu Ala Gln His Tyr
            260                 265                 270

Lys Trp Ala Ile Asp Lys Ile Phe Ile Asp Arg Ala His Ser His Val
        275                 280                 285

Ile Ile Val Glu Asp Asp Met Leu Phe Ser Pro Asp Phe Leu Val Phe
    290                 295                 300

Phe Lys Gln Thr Ala His Leu Leu Ala Arg Asp Glu Ser Leu Trp Cys
305                 310                 315                 320

Ile Ser Thr Trp Asn Asp Asn Gly Leu Ala Ser His Ala Arg Asp Pro
                325                 330                 335

Leu Arg Leu Phe Arg Thr Ser Tyr Phe Pro Gly Leu Gly Trp Met Met
            340                 345                 350

Arg Arg Glu Leu Trp Asn Glu Ile Gly Ser Ile Trp Pro Lys Glu His
        355                 360                 365
```

```
Trp Asp His Trp Met Arg Leu Asn Thr Thr Ser Lys Gly Arg Glu Cys
    370                 375                 380

Ile Val Pro Glu Val Asn Arg Asn Phe Asn Ile Gly Arg Thr Gly Ala
385                 390                 395                 400

Asn Met Arg Arg Asp Thr Tyr Asp Arg Tyr Leu Lys Arg Met Ser Phe
                405                 410                 415

Asn Val Leu Asp Ile Asn His Tyr Gly Asn Leu Ala Tyr Leu Asp Arg
            420                 425                 430

Asp Val Tyr Arg Gln Arg Leu Gln Arg Leu Thr Gln Ser Ala Ala Val
        435                 440                 445

Trp Pro Trp His Gln His Gln His Ser Ile Leu Ser Ser Leu Gln His
    450                 455                 460

Trp Leu Lys Thr Glu Lys Gly Asp Asn Ala Gly Glu Asn Ala Val Leu
465                 470                 475                 480

Ala Leu Tyr Arg Met Glu Asn Tyr Glu Leu Leu Ala Asn Ala Leu Asp
                485                 490                 495

Leu Trp Pro Tyr Pro Arg Gly His Ser Gln His Ala Ile Glu Val Ser
            500                 505                 510

Ile Asp Gly Val Thr Ile Ile Leu Ala Asp Glu Arg Ser Cys Pro Tyr
        515                 520                 525

Leu Pro Ser His Leu Arg Val Arg Pro Ser Arg Gly Leu Thr Pro Val
    530                 535                 540

Ala Ala Val Gln Gly Gln Thr Cys Asp Ala Ala Cys Arg Tyr Asn His
545                 550                 555                 560
```

```
Met Lys Cys His Ala Pro Asp Phe Trp Phe Leu Asn Ser Cys Glu Val
                565                 570                 575


Leu Ala Lys Phe Phe Pro Cys Glu Ala Gly Cys Ala Leu Val Leu Gly
            580                 585                 590


Asp Asp Ile Pro Asn Tyr Val Val Ser Asn Arg Met Asp Thr Tyr Gln
        595                 600                 605


Lys Cys Leu Val Ser Glu Arg Gln Ala Thr Cys Ala Ala Ser His Arg
    610                 615                 620


Ala Thr Thr Arg Leu Cys Ala Cys Val Pro Ser Thr
625                 630                 635


<210>  765
<211>  339
<212>  PRT
<213>  Micromonas pusilla

<400>  765

Ala Ala Val Val Ile Met Ala Cys Asp Arg Ala Asp Tyr Leu Glu Arg
1               5                   10                  15


Thr Val Ala Ser Val Arg Ala Ala Leu Gly Val Arg Pro Gly Asp Val
            20                  25                  30


Asp Lys Phe Pro Val Phe Ile Ser Gln Asp Gly Arg His Lys Ala Thr
        35                  40                  45


Arg Ala Phe Ala Glu Gly Pro Lys Ala Lys Asp Phe His Trp Met Gln
    50                  55                  60


His Leu Glu Asp Arg Pro Pro Thr Thr Arg Thr Arg Phe Arg Trp Asp
65                  70                  75                  80


Ser Val Ala Tyr Tyr Arg Ile Ala Ala His Tyr Lys Trp Ala Met Lys
```

```
                85                  90                  95

Thr Leu Phe Asp Asp Leu Gly Tyr Glu Arg Val Ile Val Leu Glu Asp
            100                 105                 110

Asp Met Glu Leu Ser Pro Asp Phe Phe Gly Tyr Phe Glu Ala Ala Gly
        115                 120                 125

Lys Val Met Asp Ala Asp Pro Ser Val Tyr Thr Val Ser Ser Trp Asn
    130                 135                 140

Asp Asn Gly Gln Lys Ile His Val Ser Asp Glu Arg Arg Leu Tyr Arg
145                 150                 155                 160

Ser Asp Phe Phe Pro Gly Leu Gly Trp Met Leu His Lys Ala Leu Trp
                165                 170                 175

Arg Glu Leu Ala Pro Lys Trp Pro Asp Ser Tyr Trp Asp Asp Trp Met
            180                 185                 190

Arg Leu Ser Asp Val Arg Arg Gly Arg Glu Ser Ile Arg Pro Glu Val
        195                 200                 205

Cys Arg Thr Phe Asn Phe Gly Glu Val Gly Ser Ser Lys Gly Gln Phe
    210                 215                 220

Phe Arg Ala Tyr Leu Arg Glu Ile Lys Pro Ala Ser Glu Arg Ile Asp
225                 230                 235                 240

Trp Ala Ser Gln Ser Leu Ala Tyr Ile Ser Asn Gly Asp Ala Tyr Glu
                245                 250                 255

Asp Gln Val Arg Arg Thr Leu Ala Ser Ala Thr Ile Ile Asp Ser Pro
            260                 265                 270

Thr Gln Val Arg Leu Val Pro Pro Glu Asn Ala Ala Thr Asn Val Tyr
```

275 280 285

Lys Val Ile Tyr Ala Ser Glu Arg Asp Phe Asn Arg Leu Ala Lys Arg
290 295 300

Phe Gly Val Phe Ala Glu Trp Lys Asp Gly Val Pro Arg Ala Gly Tyr
305 310 315 320

Arg Gly Val Val Thr Phe Lys Met Tyr Lys Gly Arg Ala Thr Val Met
325 330 335

Leu Val Pro

<210> 766
<211> 386
<212> PRT
<213> Micromonas pusilla

<400> 766

Met Asp Gly Asp Asp Ala Leu Pro Asp Gly Ala Ser Leu Arg Asp Arg
1 5 10 15

Pro Thr Ala Tyr Ala Ala Val Val Val Ile Ala Cys Asp Arg Val Lys
20 25 30

Tyr Leu Thr Arg Thr Val Glu Ser Ile Ala Arg Ala Val Ala Ser Ser
35 40 45

Pro Asp Pro Lys Lys Thr Arg Glu Glu Phe Pro Leu Phe Ile Ser Gln
50 55 60

Asp Gly Asp Asp Ala Arg Thr Thr Thr Tyr Ala Arg Thr Leu Glu Gly
65 70 75 80

Lys Phe Tyr His Val Arg His Arg Gln Glu Arg Leu Pro Lys Leu Arg
85 90 95

```
Asp Gly Asp Ser Ala Arg His Arg Ala Tyr Tyr Arg Ile Ser Ala His
            100                 105                 110

Tyr Lys His Ala Leu Gly Arg Leu Phe Asp Asp Leu Gly Tyr Glu Arg
        115                 120                 125

Val Val Ile Leu Glu Asp Asp Met Asp Leu Ala Pro Asp Phe Phe Ala
    130                 135                 140

Tyr Phe Arg Arg Leu Gly Asp Val Leu Glu Arg Asp Pro Ser Val Tyr
145                 150                 155                 160

Ala Ile Ser Ser Trp Asn Asp Asn Gly Gln Lys Ser Leu Val Lys Asp
                165                 170                 175

Glu Arg Arg Leu Tyr Arg Ser Asp Phe Phe Pro Gly Leu Gly Trp Met
            180                 185                 190

Met His Ala Arg Leu Trp Lys Glu Leu Arg Pro Lys Trp Pro Asp Ala
        195                 200                 205

Tyr Trp Asp Asp Trp Met Arg Gln Ser Ala Val Arg Leu Gly Arg Glu
    210                 215                 220

Thr Ile Arg Pro Glu Val Cys Arg Thr Phe Asn Phe Gly Glu Lys Gly
225                 230                 235                 240

Ala Ser Glu Gly Gln Trp Tyr Lys Thr His Leu Ala Asn Val Lys Leu
                245                 250                 255

Ala Ser Glu Lys Val Asp Trp Gly Asn Glu Asp Leu Ser Tyr Leu Asp
            260                 265                 270

Ala Asp Ala Tyr Glu Arg Ala Val Ala Glu Ala Val Asp Ala Ala Thr
        275                 280                 285
```

```
Pro Ala Arg Asp Pro Ser Gln Ile Thr Arg Ala Glu Ile Thr Asn Pro
    290                 295                 300

Lys Gly Val Phe Lys Val Leu Tyr Lys Asp Glu Ala Glu Phe Arg Arg
305                 310                 315                 320

Leu Ala Ala Lys Phe His Val Phe Pro Glu Trp Lys Asp Gly Val Pro
                325                 330                 335

Arg Gly Gly Tyr Arg Gly Val Val His Leu Lys Met Asn Asp Gly Arg
            340                 345                 350

His Glu Val Met Leu Val Pro Arg Asp Ala Ala Lys Val Thr Lys Thr
        355                 360                 365

Phe Ala Glu Tyr Leu Ala Ser Val Asp Gly Gly Lys Ala Glu Val Leu
    370                 375                 380

Gly Leu
385
```

<210> 767
<211> 316
<212> PRT
<213> Coccomyxa subellipsoidea

<400> 767

```
Val Ala Ala Val Val Ser Val Val Phe Asn Arg Pro Asp Tyr Leu Lys
1               5                   10                  15

Arg His Ala Ala Ser Leu Leu Ala Val His Gly Ser Asp Pro Thr Phe
            20                  25                  30

Arg Gln Lys Phe Pro Leu Phe Phe Ser Gln Asp Gly Asn Met Pro His
        35                  40                  45
```

```
Ala Ala Thr Gln Glu Val Ala Gln Ser Tyr Glu Gln Ile Ser Tyr Leu
    50                  55                  60

His His Leu Glu Arg Val Ala Pro Val Val Arg Gln Ser Gln Glu Lys
65                  70                  75                  80

Ile Glu Tyr Tyr Arg Ile Ala Ala His Tyr Lys Phe Ile Leu Arg Thr
                85                  90                  95

Ile Phe Asp Cys Phe Arg Tyr Pro Arg Leu Ile Ile Leu Glu Glu Asp
            100                 105                 110

Met Glu Leu Ala Pro Asp Phe Phe Ser Tyr Phe Glu Ala Leu His Pro
        115                 120                 125

Leu Leu Asp Thr Asp Pro Ser Leu Met Cys Ile Ser Ser Trp Asn Asp
    130                 135                 140

His Gly Gln Asp Lys Phe Val Arg Asp Ala His Gln Leu Tyr Arg Ser
145                 150                 155                 160

Asp Phe Phe Pro Gly Leu Gly Trp Met Leu Arg Asn Glu Leu Trp Gln
                165                 170                 175

Glu Leu Lys Gly Gly Trp Pro Gly Ser Tyr Trp Asp Asp Trp Leu Arg
            180                 185                 190

Gln Asn Gly Thr Arg Lys Gly Arg Gln Cys Ile Arg Pro Glu Val Cys
        195                 200                 205

Arg Asn Tyr Asn Phe Gly Arg Asp Gly Ser Ser Lys Gly Met Phe Phe
    210                 215                 220

Ser Gln Phe Leu Glu Pro Ile Arg Leu Asn Lys Glu Pro Ile Asp Trp
225                 230                 235                 240
```

```
Leu Ala Ala Asp Leu Ser Tyr Leu Gln Leu Pro Arg Tyr Asp Glu Glu
                245                 250                 255


Met Ala Ala Thr Leu Ala Ala Ala Lys Glu Val Gly Gly Ala Asp Glu
            260                 265                 270


Ala Ala Gly Val Ala Gly Asp Val Val Leu Arg Tyr Asp Ser Gln Glu
        275                 280                 285


His Tyr Glu Arg Val Gly Gly Gly Phe Gly Met Leu Leu Glu Trp Arg
    290                 295                 300


Asp Gly Val Pro Arg Gly Ala Tyr Lys Gly Val Val
305                 310                 315


<210>  768
<211>  229
<212>  PRT
<213>  Chlorella variabilis

<400>  768

Leu Gln Asp Asp Met Glu Leu Ser Pro Asp Phe Phe Pro Tyr Phe Glu
1               5                   10                  15


Ala Thr Ala Ala Val Leu Asp Ala Asp Pro Ser Leu Tyr Cys Val Ser
            20                  25                  30


Ser Trp Asn Asp His Gly Gln Asp Arg Phe Val Ala Asn Ala Thr Gln
        35                  40                  45


Leu Tyr Arg Ser Asp Phe Phe Pro Gly Leu Gly Trp Met Leu Asn Arg
    50                  55                  60


Arg Val Trp Glu Ser Ile Arg Ser Met Trp Pro Arg Gly Tyr Trp Asp
65                  70                  75                  80
```

Asp Phe Met Arg Leu Asp Ala Thr Arg Gln Gly Arg Gln Cys Ile Arg
85 90 95

Arg Ala Ala Val Cys Arg Thr Tyr Asn Phe Gly Asp Ile Gly Ser Ser
100 105 110

Ser Gly Gln Tyr Phe Arg Leu Phe Leu Lys Pro Ile Lys Leu Asn Ser
115 120 125

Gly Thr Gly Ala Gln Gly Arg Pro Trp Cys Ser Ala Gln Met Asp Leu
130 135 140

Gly Phe Leu Glu Gln Ala Gln Tyr Gln Gln Arg Phe Glu Ala Glu Leu
145 150 155 160

Ala Ala Ala Gln Pro Leu Arg Gly Leu Asp Glu Met Ala Thr Ala Val
165 170 175

Pro Gly Arg Asp Tyr Val Leu Arg Tyr Asp Ser Gln Gln Ala Tyr Glu
180 185 190

Ala Leu Thr Gly Lys Leu Arg Met Leu Arg Glu Trp Arg Asp Gly Val
195 200 205

Pro Arg Gly Ala Tyr Arg Gly Thr Val Ala Ile Arg Asn Pro Ala Gly
210 215 220

Ala Arg Ile Phe Leu
225

<210> 769
<211> 723
<212> PRT
<213> Galdieria sulphuraria

<400> 769

Met Asn Asn Lys Leu Leu Gln His Ile Ile Ile Leu Ser Leu Thr Trp

```
1               5                   10                  15

Asn Asn Met Phe Tyr Tyr Cys Ser Ser Leu Leu Ser Asp Leu Asn Leu
            20                  25                  30

Leu Arg Asn Asn Lys Ala Tyr Ser Ile Val Leu Ile Thr Asn Cys Gln
        35                  40                  45

Arg Asp Ser Ile Ser Leu Thr Leu Gln Ser Leu Tyr Arg Leu Pro Gln
    50                  55                  60

Ile Glu Tyr Phe Ser Val Phe Ile Ser Met Asp Cys Asn Gln Thr Asn
65                  70                  75                  80

Lys Asn Ile Gln Asn Trp Ile Glu Gln Lys Tyr Gln Lys Ile Ala Arg
                85                  90                  95

Gly Ile Leu Tyr Phe Pro Arg His Arg Tyr Pro Lys Val Ser Arg Asn
            100                 105                 110

Asn Ser Tyr Ser Gln Ile Ser Cys His Leu His Phe Ala Ile Gln Gln
        115                 120                 125

Val Phe Glu Val His Asn Tyr Ser Ser Leu Val Val Ile Glu Asp Asp
    130                 135                 140

Leu Leu Phe Ala Glu Asp Phe Leu Leu Leu Phe Leu Glu Thr Tyr Pro
145                 150                 155                 160

Leu Leu Met Thr Asp Lys Ser Leu Leu Cys Val Ser Ala Tyr His Asp
                165                 170                 175

Leu Gly Leu Lys Gln Phe Ser Trp Lys His Asn Arg Leu Lys Arg Val
            180                 185                 190

Gln Gly Phe Thr Gly Leu Gly Trp Met Leu Ser Arg Asp Lys Trp Leu
```

```
        195                 200                 205

Lys Glu Leu Ser Tyr Ile Trp Pro Leu Tyr Pro Phe Ser Gly Trp Asp
    210                 215                 220

His Trp Leu Arg Met Tyr Gln Arg Ile His His Leu Asp Cys Ile Val
225                 230                 235                 240

Pro Glu Val Ser Arg Ser Ile His Gln Lys Val Ser Gly Ser His Leu
                245                 250                 255

Ser His Lys Glu Trp Gln Arg Arg Phe Ser His Leu Leu Phe Tyr Asp
            260                 265                 270

Asn Glu Ser Val Asp Thr Phe Gly Asn Leu Asp Tyr Leu Gln Arg Glu
        275                 280                 285

Val Tyr Asp Arg Glu Ile Gln Met Leu Leu Thr Cys Ala Ser Lys Leu
    290                 295                 300

His Ser Leu Ser Ser Asn Ile Leu Lys Gln Ser Gly Glu Asn Ile Gln
305                 310                 315                 320

Ile Ile Ile Pro Cys Thr Leu Pro Lys Gly Asn Arg Tyr Trp Arg His
                325                 330                 335

Trp Phe Arg Phe Leu Glu Ile Pro Leu Ser Gln Glu Ile Glu Ser Phe
            340                 345                 350

Tyr Glu Gly Ile Leu Leu Phe Pro Met Gly Phe Gln Thr Ile Leu Phe
        355                 360                 365

Ile Cys Thr Asn Ser Pro Phe Tyr Glu Thr Lys Arg Leu Ser Thr Asn
    370                 375                 380

Phe Gly Ser Tyr Tyr Ile Ile Arg Ser His Glu Asn Ala Ser Cys Ser
```

```
385                 390                 395                 400

Glu Ala Cys Asp Lys Val Phe Leu Gly Lys Tyr Arg Cys Gln Ser Glu
                405                 410                 415

Thr Leu Ala Gln Ile Asp Ser Phe Ala Ile Ile Asn Thr Tyr Phe Asp
            420                 425                 430

Cys Ser Lys Gly Phe Gln Leu Val Thr Arg Ser Trp Ala Pro Gly Cys
        435                 440                 445

Leu Phe Pro Asp Asp Arg His Gln Ala Ala Val Glu Cys Val Cys Val
    450                 455                 460

Met His Asn Gln Trp Ala Ile Gly Tyr His Pro Tyr Ser Cys Asp Gln
465                 470                 475                 480

Lys Ala Pro Arg Leu Arg Arg Leu Tyr Phe Phe Gln Ala Leu Ser Lys
                485                 490                 495

Asp Leu Val Glu Asp Glu Arg Lys Phe Met Ala Ser Ser Ser Val Ala
            500                 505                 510

Leu Arg Gln Lys Leu Leu Glu Glu Leu Leu Arg Glu Ala Leu Glu Ser
        515                 520                 525

Ser Gly Lys Thr Leu Glu Glu Gln Glu Thr Leu Val Lys Ile Lys Leu
    530                 535                 540

Arg Asp Arg Gly Leu Lys Leu Gln Glu Asn Gln Gln Arg Gln Gln Ser
545                 550                 555                 560

Lys Ser Ser Lys Arg Lys Lys Gln Thr His Leu Thr Ala Lys Glu Leu
                565                 570                 575

Arg Gly Asn His Leu Phe Ala Ile Pro Lys Lys Glu Gln Cys Phe Gln
```

580 585 590

Ala Phe Ile Pro Leu His Trp Leu Trp Leu Gly Tyr Ala Arg Lys Val
595 600 605

Leu Ser Asn Ser Gly Ile Leu Ser Ala Arg Glu Asn Cys Asp Arg Ser
610 615 620

Gln Leu His Ser His Ser Gly Ile Glu Trp Leu Tyr Arg Met Asp Leu
625 630 635 640

His Gly Ala Ile Leu Thr Val Ile Arg Ser Lys Ala Pro Gln Gln Val
645 650 655

Gly Asn Trp Gly Ile Val Leu Gln Glu Thr Ser Asn Val Phe Lys Leu
660 665 670

Ile Arg Pro Asp Asn Thr Val Val Ala Val Pro Lys Glu Ile Ser Asp
675 680 685

Trp Gly Cys Arg Ile Asp Glu Phe Cys Phe Val Leu His Gly Lys Ala
690 695 700

Tyr Arg Met Lys Ser Ser Glu Arg Ser Val Lys Lys Leu Lys Arg Lys
705 710 715 720

Ile Ser Asp

<210> 770
<211> 738
<212> PRT
<213> Galdieria sulphuraria

<400> 770

Met Asn Asn Lys Leu Leu Gln His Ile Ile Ile Leu Ser Leu Thr Trp
1 5 10 15

```
Asn Asn Met Phe Tyr Tyr Cys Ser Ser Leu Leu Ser Asp Leu Asn Leu
            20                  25                  30

Leu Arg Asn Asn Lys Ala Tyr Ser Ile Val Leu Ile Thr Asn Cys Gln
        35                  40                  45

Arg Asp Ser Ile Ser Leu Thr Leu Gln Ser Leu Tyr Arg Leu Pro Gln
    50                  55                  60

Ile Glu Tyr Phe Ser Val Phe Ile Ser Met Asp Cys Asn Gln Thr Asn
65                  70                  75                  80

Lys Asn Ile Gln Asn Trp Ile Glu Gln Lys Tyr Gln Lys Ile Ala Arg
                85                  90                  95

Gly Ile Leu Tyr Phe Pro Arg His Arg Tyr Pro Lys Val Ser Arg Asn
            100                 105                 110

Asn Ser Tyr Ser Gln Ile Ser Cys His Leu His Phe Ala Ile Gln Gln
        115                 120                 125

Val Phe Glu Val His Asn Tyr Ser Ser Leu Val Val Ile Glu Asp Asp
    130                 135                 140

Leu Leu Phe Ala Glu Asp Phe Leu Leu Leu Phe Leu Glu Thr Tyr Pro
145                 150                 155                 160

Leu Leu Met Thr Asp Lys Ser Leu Leu Cys Val Ser Ala Tyr His Asp
                165                 170                 175

Leu Gly Leu Lys Gln Phe Ser Trp Lys His Asn Arg Leu Lys Arg Val
            180                 185                 190

Gln Gly Phe Thr Gly Leu Gly Trp Met Leu Ser Arg Asp Lys Trp Leu
        195                 200                 205
```

```
Lys Glu Leu Ser Tyr Ile Trp Pro Leu Tyr Pro Phe Ser Gly Trp Asp
    210                 215                 220

His Trp Leu Arg Met Tyr Gln Arg Ile His His Leu Asp Cys Ile Val
225                 230                 235                 240

Pro Glu Val Ser Arg Ser Ile His Gln Lys Val Ser Gly Ser His Leu
                245                 250                 255

Ser His Lys Glu Trp Gln Arg Arg Phe Ser His Leu Leu Phe Tyr Asp
            260                 265                 270

Asn Glu Ser Val Asp Thr Phe Gly Asn Leu Asp Tyr Leu Gln Arg Glu
        275                 280                 285

Val Tyr Asp Arg Glu Ile Gln Met Leu Leu Thr Cys Ala Ser Lys Leu
    290                 295                 300

His Ser Leu Ser Ser Asn Ile Leu Lys Gln Ser Gly Glu Asn Ile Gln
305                 310                 315                 320

Ile Ile Ile Pro Cys Thr Leu Pro Lys Gly Asn Arg Tyr Trp Arg His
                325                 330                 335

Trp Phe Arg Phe Leu Glu Ile Pro Leu Ser Gln Glu Ile Glu Ser Phe
            340                 345                 350

Tyr Glu Gly Ile Leu Leu Phe Pro Met Gly Phe Gln Thr Ile Leu Phe
        355                 360                 365

Ile Cys Thr Asn Ser Pro Phe Tyr Glu Thr Lys Arg Leu Ser Thr Asn
    370                 375                 380

Phe Gly Lys Asn Cys Asp Asn Glu Arg Ser Ile Cys Asn Tyr Gly Gln
385                 390                 395                 400
```

```
Gly Ser Tyr Tyr Ile Ile Arg Ser His Glu Asn Ala Ser Cys Ser Glu
                405                 410                 415

Ala Cys Asp Lys Val Phe Leu Gly Lys Tyr Arg Cys Gln Ser Glu Thr
            420                 425                 430

Leu Ala Gln Ile Asp Ser Phe Ala Ile Ile Asn Thr Tyr Phe Asp Cys
        435                 440                 445

Ser Lys Gly Phe Gln Leu Val Thr Arg Ser Trp Ala Pro Gly Cys Leu
    450                 455                 460

Phe Pro Asp Asp Arg His Gln Ala Ala Val Glu Cys Val Cys Val Met
465                 470                 475                 480

His Asn Gln Trp Ala Ile Gly Tyr His Pro Tyr Ser Cys Asp Gln Lys
                485                 490                 495

Ala Pro Arg Leu Arg Arg Leu Tyr Phe Phe Gln Ala Leu Ser Lys Asp
            500                 505                 510

Leu Val Glu Asp Glu Arg Lys Phe Met Ala Ser Ser Ser Val Ala Leu
        515                 520                 525

Arg Gln Lys Leu Leu Glu Glu Leu Leu Arg Glu Ala Leu Glu Ser Ser
    530                 535                 540

Gly Lys Thr Leu Glu Glu Gln Glu Thr Leu Val Lys Ile Lys Leu Arg
545                 550                 555                 560

Asp Arg Gly Leu Lys Leu Gln Glu Asn Gln Gln Arg Gln Gln Ser Lys
                565                 570                 575

Ser Ser Lys Arg Lys Lys Gln Thr His Leu Thr Ala Lys Glu Leu Arg
            580                 585                 590
```

```
Gly Asn His Leu Phe Ala Ile Pro Lys Lys Glu Gln Cys Phe Gln Ala
        595                 600                 605

Phe Ile Pro Leu His Trp Leu Trp Leu Gly Tyr Ala Arg Lys Val Leu
    610                 615                 620

Ser Asn Ser Gly Ile Leu Ser Ala Arg Glu Asn Cys Asp Arg Ser Gln
625                 630                 635                 640

Leu His Ser His Ser Gly Ile Glu Trp Leu Tyr Arg Met Asp Leu His
                645                 650                 655

Gly Ala Ile Leu Thr Val Ile Arg Ser Lys Ala Pro Gln Gln Val Gly
            660                 665                 670

Asn Trp Gly Ile Val Leu Gln Glu Thr Ser Asn Val Phe Lys Leu Ile
        675                 680                 685

Arg Pro Asp Asn Thr Val Val Ala Val Pro Lys Glu Ile Ser Asp Trp
    690                 695                 700

Gly Cys Arg Ile Asp Glu Phe Cys Phe Val Leu His Gly Lys Ala Tyr
705                 710                 715                 720

Arg Met Lys Ser Ser Glu Arg Ser Val Lys Lys Leu Lys Arg Lys Ile
                725                 730                 735

Ser Asp
```

<210> 771
<211> 483
<212> PRT
<213> Thalassiosira pseudonana

<400> 771

```
Met Ala Thr Asn Leu Asp Ser Thr Thr Ala Thr Gly Gln Gln Ser Ser
1               5                  10                  15

Ser Ser Leu Leu Ala Arg Pro His Ile Tyr Asn Pro Lys Glu Gly Ser
            20                  25                  30

Arg Val Gly Trp Leu Ile Arg Gln Lys Ile Gln Arg Ala Gln Met Arg
        35                  40                  45

Ile Gln Lys Pro Val Pro Leu Leu Asp Val Ser Gln Met Asp Ser Pro
    50                  55                  60

Val Leu Ile Phe Thr Tyr Glu Arg Ala Glu Tyr Leu Glu Arg Thr Leu
65                  70                  75                  80

Trp Ala Val Phe Glu His His Pro Ala Gln Gln Gln Gln Gln Gln Thr
                85                  90                  95

Thr Asn Glu Asn Ile Arg Ser Asp Gly Glu Thr Ile Lys Arg Gly Arg
            100                 105                 110

Ile Val Gly Ala Pro Ile Ile Ile Ser Gln Asp Gly Asn Asn Ala Asp
        115                 120                 125

Val Ala Ala Val Val Glu Thr Tyr Arg Gln Leu Phe Glu Ile Lys Leu
    130                 135                 140

Gly Ile Pro Leu Tyr Arg Ile Glu His Pro Arg Pro Arg Thr Pro Ser
145                 150                 155                 160

Asn Asn Glu Tyr Asn Phe Tyr Asp Thr Asp Trp Ala Leu Pro Tyr Lys
                165                 170                 175

Met Leu Ala Gln His Tyr Gly Trp Gly Leu Glu Gln Thr Phe Ser Gly
            180                 185                 190
```

```
Asp Val Tyr Ala Thr Asn Thr Asn Lys His Ser Arg Ser Ile Ser Gln
        195                 200                 205

Pro Pro Met Pro Lys Arg Val Ile Ile Leu Glu Glu Asp Ile Glu Ile
    210                 215                 220

Ser Arg Asp Phe Phe Ser Leu Met Asn Ala Thr Ala Asp Met Leu Asp
225                 230                 235                 240

Ser Asp Ser Thr Leu Phe Ala Val Ser Ala Tyr Asn Asp Asn Gly Asn
                245                 250                 255

Glu Gly Leu Val Ser Asp Pro Asn Arg Leu Val Arg Ser Asp Phe Phe
            260                 265                 270

Pro Gly Leu Gly Trp Met Met Pro Arg Ser Val Trp Asp Gly Pro Ala
        275                 280                 285

Gln Gln Pro Glu Ala Arg Leu Lys Gly Ser Trp Pro Glu Gly Tyr Trp
    290                 295                 300

Asp Asp Trp Ile Arg Glu Pro Asn Val Arg Arg Gly Arg Gln Val Ile
305                 310                 315                 320

Arg Pro Glu Val Ser Arg Thr Phe His Phe Gly Asn Val Lys Gly Ala
                325                 330                 335

Ser Gln Gly Glu Phe Ile Lys Lys Leu Ser Lys Ile Gln Leu Asp Glu
            340                 345                 350

Val Asn Val Arg Trp Glu Asp Gln Asp Leu Ser His Leu Asp Thr Thr
        355                 360                 365

Ala Phe Ala Lys Asp Tyr Trp Asp Arg Val Ser Arg Ala Lys Ile Val
    370                 375                 380
```

```
Ala Ser Asp Val Glu Ala Lys Lys Glu Val Ala Phe Cys Asp Val Arg
385                 390                 395                 400


Ile Glu Trp Asn Glu Trp Lys Gln Phe Lys Leu Leu Ala Thr Lys Phe
                405                 410                 415


Asp Ile Met Lys Asp Glu Lys Ala Gly Val Pro Arg Thr Ala Tyr Glu
            420                 425                 430


Gly Ile Val Glu Ile Arg Tyr Gly Gly Gly Asp Phe Phe Ile Tyr Leu
        435                 440                 445


Thr Pro Pro Tyr Leu Ser Asp Val Ala Met Pro Thr Asp Phe Gly Ser
    450                 455                 460


Lys Ala Phe Met Gly Phe Thr Lys Glu Thr Leu Leu Gln Arg Leu Gly
465                 470                 475                 480


Ile Ser Asp
```

<210> 772
<211> 529
<212> PRT
<213> Thalassiosira oceanica

<400> 772

```
Met Gln Gln Gln Leu His Leu His Arg Lys Arg Gly Gly Gly Asn Pro
1               5                   10                  15


Ala Leu Ile Val Phe Arg Gly Ile Ile Val Ile Val Ile Cys Cys Ser
            20                  25                  30


Leu Phe Trp Ile Ser Met Ile Leu His Leu Met Ala Thr Ala Asn Glu
        35                  40                  45
```

```
Gln His Gly Arg Gln Ala His Ser Ala Asn Ser Leu Leu Met Arg Pro
    50                  55                  60

Gln Phe Phe Arg Gly Lys Arg Ser His Ile Arg Asn Glu Leu Asn His
65                  70                  75                  80

Lys Met Gln Arg Ile Glu Gln His Leu Leu Asp Arg Pro Val Glu Leu
                85                  90                  95

Ala Gly Ala Ala Ser Leu Val Ser Pro Leu Leu Val Leu Ser Tyr Lys
            100                 105                 110

Arg Ala Asp Tyr Leu Glu Arg Thr Leu Trp Lys Ile Phe Ser Asn His
        115                 120                 125

Pro Ala Asn Asn Gly Asn Gln Gly Pro Thr Glu Asp Lys Gly Arg Ile
    130                 135                 140

Val Gly Cys Pro Ile Val Val Ser Gln Asp Gly Pro Asn Ser Glu Val
145                 150                 155                 160

Gln Asp Val Ile Glu Thr Tyr Gln Gln Leu Phe Glu Tyr Lys Leu Gly
                165                 170                 175

Ile Pro Leu Tyr Arg Ile Gln His Glu Arg Glu Pro Asn Glu Met Tyr
            180                 185                 190

Glu Lys Asp Leu Phe Glu Pro Tyr Lys Arg Leu Ala Lys His Tyr Gly
        195                 200                 205

Trp Ala Ile Glu Gln Val Phe Ser Ser Asp Ala Tyr Thr Ala Gly Ala
    210                 215                 220

Lys His Ser Arg Ser Asp Leu Ser Asp Arg Thr Pro Pro Lys Pro His
225                 230                 235                 240
```

```
Arg Leu Ile Val Leu Glu Glu Asp Ile Glu Val Ala Arg Asp Phe Phe
                245                 250                 255

Ser Leu Met Asn Ala Thr Ala Asp Leu Leu Asp Leu Asp Asp Thr Leu
            260                 265                 270

Ile Ala Val Ser Ser Tyr Asn Asp Asn Gly Arg Ser Asp Leu Val Ala
        275                 280                 285

Asp Pro Lys Arg Leu Val Arg Ser Asp Phe Phe Pro Gly Leu Gly Trp
    290                 295                 300

Met Met Asn Arg Ala Val Trp Asp Gly Lys Val Gly His Pro Gly Leu
305                 310                 315                 320

Lys Asp Gly Glu Gly Phe Ala Pro Gly Gly Phe Trp Asp Asp Trp Leu
                325                 330                 335

Arg Glu Pro Gly Ile Arg Arg Gly Arg Gln Ile Ile Arg Pro Glu Ile
            340                 345                 350

Ser Arg Thr Tyr His Phe Gly Asn Val Asp Gly Ala Ser Glu Gly Glu
        355                 360                 365

Lys Asn Asn Met Leu Asn Lys Ile Glu Leu Glu Glu Ser His Ala Lys
    370                 375                 380

Phe Glu Asn Leu Pro Leu Thr Ser Gln Leu Glu Gly Arg Ala Phe Ala
385                 390                 395                 400

Ala Glu Tyr Trp Ser Arg Val Ser His Ala Arg Lys Val Glu Thr Ala
                405                 410                 415

Gly Glu Ala Lys Tyr Tyr Val Met Ala Ser His Val Arg Leu Thr Tyr
            420                 425                 430
```

Asn Ser Met Glu Ile Phe Arg Gln Leu Ala Ser Gln Phe Asp Ile Thr
        435   440   445

Glu Asp Glu Lys Ala Gly Val Pro Arg Thr Ala Tyr Glu Gly Ile Val
    450   455   460

Glu Ile Arg Tyr Gly Lys Gly Asn Tyr Phe Val Phe Leu Thr Pro Pro
465   470   475   480

Tyr Leu Asp Glu Ala Cys Asp Lys Gly Gly Gly Ser Met Pro Arg His
                485   490   495

Phe Gly Asn Lys Ala Trp Lys Asp Tyr Thr Lys Glu Thr Leu Met Glu
            500   505   510

Thr Leu Gly Val Asn Asp Ile Ser Phe Asp Glu Arg Pro Gly Ile Asn
        515   520   525

Trp

<210> 773
<211> 382
<212> PRT
<213> Fragilariopsis cylindrus

<400> 773

Met Pro Glu Gly Glu Ser Val Arg Leu Pro Ile Ile Ser Ser Pro Phe
1   5   10   15

His Pro His Thr Glu Asn Ile Val Ser Ser Gly Ser Pro Leu Leu Ile
            20   25   30

Phe Thr Cys Gln Arg Ala Asn Tyr Leu Asn Arg Thr Leu Glu Asn Val
        35   40   45

Tyr Ala Ser Ile Ser Arg Pro Gln His Asp Glu Glu Asn Glu Glu Cys

```
    50                  55                  60

Arg Phe Gly Cys Pro Ile Ile Val Ser Glu Asp Gly Glu His Ala Asp
65                  70                  75                  80

Ile Arg Thr Ile Val Leu Ser Tyr Arg Lys Lys Phe Glu Val Ile Gly
                85                  90                  95

Ile Pro Leu Val His Met His His Pro Gln Lys Lys Lys Ile Leu Arg
            100                 105                 110

Ser Thr Ser Ala Ser Tyr Val Ala Leu Ala Arg His Tyr Gly Trp Ala
        115                 120                 125

Leu Ser Glu Val Phe Ala Gly Lys Ala Gly Asp Ser Ser Phe Ser Leu
    130                 135                 140

Pro His Arg Val Ile Ile Leu Glu Glu Asp Ile Gln Val Ala Pro Asp
145                 150                 155                 160

Phe Phe Ser Tyr Met Glu Ser Thr Ser Ser Ile Leu Asp Asn Asp Ser
                165                 170                 175

Thr Leu Phe Ala Val Ser Ala Phe Asn Asp Asn Gly His Val Asp Asn
            180                 185                 190

Gly Asp Pro Lys Arg Leu Leu Arg Ser Asp Phe Phe Pro Gly Leu Gly
        195                 200                 205

Trp Met Met Thr Arg Asp Leu Trp Ile Asn Glu Leu Gln Lys Asn Trp
    210                 215                 220

Ala Pro Asp Gly Tyr Trp Asp Asp Trp Leu Arg Asp Ser Thr Gln Arg
225                 230                 235                 240

Lys Gly Arg Gln Val Ile Arg Pro Glu Ile Ser Arg Thr Tyr His Phe
```

```
                245                 250                 255


Gly Thr Glu Gly Gly Val Ser Gly Asn Gln Phe Gly Ser Ile Leu Glu
            260                 265                 270


Gln Val Lys Leu Asp Glu Lys Pro Ile Arg Trp Glu Met Glu Asp Leu
        275                 280                 285


Ser Tyr Leu Glu Asn Ser Leu Tyr Lys Thr Gln Tyr Met Glu Leu Val
    290                 295                 300


Thr Asn Ser Lys Phe Ala Thr Thr Leu Asp Glu Ala Glu Gln Met Ser
305                 310                 315                 320


Lys Thr Gly Asn Val Arg Ile Glu Tyr Asp Ser Tyr Thr Gln Phe Arg
                325                 330                 335


Ile Phe Ala Lys Lys Ile Gly Ile Met Asp Asp Glu Lys Ala Lys Val
            340                 345                 350


Pro Arg Thr Ala Tyr Asn Gly Ile Val Glu Thr Arg Arg Gly Asn Ser
        355                 360                 365


Leu Leu Phe Leu Thr Pro Lys Gly Gly Ile Val Gly Tyr Lys
    370                 375                 380


<210>  774
<211>  410
<212>  PRT
<213>  Emiliania huxley

<400>  774

Met Arg Arg Ser Pro Gly Ser Ser Arg Glu Pro Arg Leu Thr Thr Ser
1               5                   10                  15


Thr Ala Val Leu Ala Val Ala Ser Ala Leu Ile Leu Leu Met Leu Ser
            20                  25                  30
```

```
Phe Asn Ala Arg Leu Tyr Phe Ser Ala Ala Cys Asp Gln Arg Leu Gln
        35                  40                  45

Gln Leu Ala Asp Glu Lys Asp Arg Glu Leu Gln Arg Leu Ala Arg Arg
    50                  55                  60

Asp Leu Val Ala Tyr Val Asp Trp Thr Pro Gly Ala Leu Thr Pro Pro
65                  70                  75                  80

Arg Ile Ala Val Leu Val Ile Ala Tyr Asn Arg Ala Ser Tyr Leu Asp
                85                  90                  95

Arg Ala Leu Gly Ser Val Met Leu Arg His Pro Gly Gly Ala Asn Trp
            100                 105                 110

Pro Val Tyr Val Ser Gln Asp Gly Glu Asn Asp Glu Val Ala Arg Val
        115                 120                 125

Ile Ala Lys His Gly Ala Arg Arg Leu Val His Pro Arg Arg Gln Leu
    130                 135                 140

Asp Leu Ser Arg Ala Glu Lys Phe Leu Lys Lys Ala Pro Gly Tyr Ala
145                 150                 155                 160

Tyr Leu Ser Val His Tyr Gly Trp Ala Leu Arg Thr Leu Phe Ala Asp
                165                 170                 175

Ala Ala Arg Tyr Glu Gly Val Ile Ile Leu Glu Glu Asp Ile Glu Asp
            180                 185                 190

Asp Thr Leu Leu Ala Val Ser Ala Phe Asn Asp Asn Gly Gln Pro Arg
        195                 200                 205

Tyr Ser Ser Asp Thr Ser Ala Leu Tyr Arg Ser Asp Phe Phe Pro Gly
    210                 215                 220
```

```
Leu Gly Trp Leu Leu Thr Arg Arg Leu Trp Ala Glu Ile Gly Ala Gly
225                 230                 235                 240

Trp Pro Glu Glu Arg Gly Phe Trp Asp Asp Trp Met Arg Glu Pro Pro
                245                 250                 255

Gln Arg Gln Gly Arg Ala Ser Ile Arg Pro Glu Thr Ser Arg Ser Arg
            260                 265                 270

Thr Phe Gly Gln Lys Gly Thr Ser Leu Ser Gln Phe Tyr Ile Lys Phe
        275                 280                 285

Leu Ala Pro Ile Gln Phe Ser Asp Gln Ala Ala Pro Ala Trp Ala Gly
    290                 295                 300

Arg Asn Leu Ser Phe Leu Leu Lys Ala Ala Tyr Asp Pro Pro Phe Ala
305                 310                 315                 320

Ala Arg Val Ala Ala Ala Arg Glu Val Glu Leu Arg Arg Val Ile Asp
                325                 330                 335

Arg Ser Phe Thr Ala Ser Gly Gly Gly Asp Val Val Val Arg Tyr Ser
            340                 345                 350

Thr Pro Lys Val Leu Leu Gly Phe Cys Lys Gln Leu Gly Ile Met Glu
        355                 360                 365

Asp Leu Lys Ala Gly Val Pro Arg Thr Ala Tyr His Gly Val Ile Pro
    370                 375                 380

Leu Arg Val Gly Gly Val Met Val Phe Leu Ala Pro Ser Phe Ala Val
385                 390                 395                 400

Asp Gln Asp Ile Thr Gln Arg Lys Pro Pro
                405                 410
```

<210> 775
<211> 442
<212> PRT
<213> Guillardia theta

<400> 775

```
Met Lys Ser Ser Lys Ser Arg Gly Phe Gln Gly Ile Leu Val Ile Cys
1               5                   10                  15


Ile Val Val Leu Leu Leu Leu Ala Asn Leu Met Trp Met Lys Lys Val
            20                  25                  30


Gln Ser Asp Gln Ala Leu His Asp Ala Glu Lys Arg Ile Val Asp Leu
        35                  40                  45


Ser Ser Lys Ile Lys Val Leu Gln Gly Ser Leu Ser Thr Ser Gln Val
    50                  55                  60


Glu Gln Glu Thr Asp His Ser Arg Val Lys Thr Leu Met Met Arg Ile
65                  70                  75                  80


Asn Glu Leu Glu Ser Lys Met Gly Phe Ser Gly Ala Lys Asp Thr Ser
                85                  90                  95


Ser Ala Leu Gln Gly Ser Pro Asn Ala Pro Pro Pro Ser Ile Val Lys
            100                 105                 110


Gly Ser Thr Ala Gly Arg Gly Glu Ser Glu Ser Glu Arg Arg Glu Lys
        115                 120                 125


Ser Asn Glu Val Ser Ala Ser Phe Pro Ser Ser Val Gln Gln Ser Ala
    130                 135                 140


Gly Gly Glu Glu Ala Gln Val Val Pro Ile Ile Ile Phe Ala Cys Cys
145                 150                 155                 160
```

```
Arg Ala Lys Tyr Leu Asp Arg Thr Leu Ser Ile Val Leu Glu Arg Leu
                165                 170                 175

Pro Lys Gln Ser Lys Val Lys Phe Asp Ile Ile Val Ser Gln Asp Gly
            180                 185                 190

Asn Asp Pro Ser Val Lys Ser Leu Met His Thr Lys Tyr Ala Asn Ile
        195                 200                 205

Lys Phe Leu Glu His Met Glu Gln Val Asp Leu Ser Thr Ala Gly Pro
    210                 215                 220

Gln Glu Gln Ala Ser Tyr Tyr Arg Ile Ala Gln His Tyr Gly Trp Cys
225                 230                 235                 240

Phe Ser Lys Val Phe Ala Asp Gln Arg Tyr Glu Trp Ala Ile Val Leu
                245                 250                 255

Glu Asp Asp Leu Glu Val Ala Val Asp Phe Phe Glu Tyr Met Met Ala
            260                 265                 270

Ala Ala Glu Leu Leu Lys Lys Asp Pro Thr Leu Trp Thr Ala Thr Ala
        275                 280                 285

Trp Asn Asp Asn Gly Phe Pro Ser Tyr Ser His Asp Pro His Lys Leu
    290                 295                 300

Tyr Arg Ser Asp Phe Phe Gly Gly Leu Gly Trp Leu Leu Thr Arg Lys
305                 310                 315                 320

Leu Trp Gln Glu Leu Gly Pro Lys Trp Pro Lys Ala Tyr Trp Asp Asp
                325                 330                 335

Trp Met Arg Glu Pro Lys Gln Arg Met Gly Arg Ala Cys Ile Arg Pro
            340                 345                 350
```

```
Gln Ile Ser Arg Thr Val Thr Phe Gly Lys Glu Gly Thr Ser Asn Gly
        355                 360                 365


Gln Phe Phe Asp Ser His Leu Ser Lys Met Val Leu Asn Ser Val His
    370                 375                 380


Ile Ala Trp Thr Thr Lys Asp Ile Ser Phe Leu Leu Lys Glu Asn Tyr
385                 390                 395                 400


Asp Glu Gln Leu Arg Arg Gln Val Glu Glu Ala Pro Leu Val Gly Leu
                405                 410                 415


His Asp Ser Arg Ala Thr Gly Lys Ile Phe Tyr Lys Asp His Pro Ser
            420                 425                 430


Phe Lys Val Leu Ala Gln Ser Arg Thr Leu
        435                 440


<210>  776
<211>  712
<212>  PRT
<213>  Phaeodactylum tricornutum

<400>  776

Met Ile Glu Ser Glu Glu His Arg Lys Leu Ser Glu Gln Asp Leu Asp
1               5                   10                  15


Arg Glu Gly Leu Trp Glu Glu His Phe Gln Ser His Gln Asp Ser Lys
            20                  25                  30


Pro Phe Gly Pro Met Ser Val Gly Met Asp Ile Asp Phe Pro Glu Ser
        35                  40                  45


Asn His Leu Tyr Gly Ile Pro Glu His Ala Ser Ser Ala Thr Leu Lys
    50                  55                  60
```

```
Thr Thr Phe Gly Glu Asn Ala His Phe Lys Glu Pro Tyr Arg Leu Tyr
65                  70                  75                  80

Asn Leu Asp Val Phe Glu Tyr Glu Leu Asp Glu Thr Met Ala Leu Tyr
                85                  90                  95

Gly Asn Ser Val Lys Thr Gly Thr Thr Gly Val Phe Trp Phe Asn Pro
            100                 105                 110

Thr Glu Thr Tyr Val Asp Ile Ala Ser Ser Ser Gly Ser Thr Gly Thr
        115                 120                 125

His Trp Ile Ser Glu Ser Gly Ile Ile Asp Val Phe Leu Leu Pro Gly
    130                 135                 140

Pro Asp Pro Ser Ser Val Tyr His Gln Tyr Ala Thr Leu Thr Gly Thr
145                 150                 155                 160

Thr Pro Thr Pro Pro Met Phe Ser Leu Gly Tyr His Gln Cys Arg Trp
                165                 170                 175

Asn Tyr Lys Asp Glu Lys Asp Val Tyr Met Val His Gly Lys Phe Glu
            180                 185                 190

Glu Leu Asp Tyr Pro Tyr Asp Val Leu Trp Leu Asp Ile Glu His Thr
        195                 200                 205

Asn Gly Lys Arg Tyr Phe Thr Trp Asp Ser Ser Leu Phe Pro Asp Pro
    210                 215                 220

Lys Thr Met Gln Lys Thr Leu Ala Asp Gln Gly Arg Arg Met Val Thr
225                 230                 235                 240

Ile Val Asp Pro His Ile Leu Arg Asp Asn Asn Tyr Tyr Ile His Lys
                245                 250                 255
```

```
Glu Ala Thr Ala Lys Gly Leu Tyr Ile Lys Asp Lys Gln Gly Glu Lys
            260                 265                 270

Asp Tyr Asp Gly Trp Cys Trp Pro Gly Ser Ser Ser Tyr Leu Asp Phe
        275                 280                 285

Thr Asp Glu Asn Val Arg Ser Trp Trp Ala Asp Gln Phe Ser Tyr Ser
    290                 295                 300

Arg Tyr Glu Gly Ser Thr Pro Thr Leu Phe Thr Trp Asn Asp Met Asn
305                 310                 315                 320

Glu Pro Ser Val Phe Asn Gly Pro Glu Val Ser Met Gln Lys Asp Leu
                325                 330                 335

Arg Asn Leu His Gly Asp Glu His Arg Glu Trp His Asn Leu Tyr Gly
            340                 345                 350

Met Leu Phe His Arg Ala Thr Gly Glu Gly His Ile Arg Arg Ser Pro
        355                 360                 365

Ser Glu Asp Ile Arg Pro Phe Val Leu Ser Arg Ala Phe Phe Ala Gly
    370                 375                 380

Ser Gln Lys Tyr Gly Ala Ile Trp Thr Gly Asp Asn Thr Ala Asp Trp
385                 390                 395                 400

Gly His Leu Gln Val Ala Gly Pro Met Leu Leu Ser Leu Asn Thr Ala
                405                 410                 415

Ala Leu Ser Phe Val Gly Ala Asp Val Gly Gly Phe Phe Gly Asn Pro
            420                 425                 430

Asp Ala Glu Leu Phe Thr Arg Trp Met Gln Ala Gly Ala Tyr Gln Pro
        435                 440                 445
```

```
Phe Phe Arg Gly His Ala His His Asp Ser Lys Arg Arg Glu Pro Trp
    450                 455                 460

Met Tyr Gly Glu Glu Thr Met Gln Arg Leu Arg Gln Ala Ala Leu Trp
465                 470                 475                 480

Arg Tyr Gln Leu Leu Pro Phe Trp Tyr Thr Val Phe His Glu Ala Glu
                485                 490                 495

Ile Ser Gly Met Pro Val Met Arg Met Met Trp Met Gln Tyr Pro Glu
            500                 505                 510

Thr Glu Ala Ile Phe Gly Val Asp Asp Gln Tyr Leu Ile Gly Ala Asp
        515                 520                 525

Leu Leu Val Lys Pro Ile Thr Ala Ala Gly Val Ser Glu Val Glu Val
    530                 535                 540

Leu Phe Pro Thr Asp His Leu Trp Tyr Asp Val Lys Ser Leu Gln Ile
545                 550                 555                 560

Val Cys Ser Thr Ile Ala Ser Met Ser Val Glu Ser Arg Thr Ile Ser
                565                 570                 575

Ser Ala Ile Asp Glu Ile Pro Val Phe Gln Arg Gly Gly Ser Ile Ile
            580                 585                 590

Pro Arg Lys Leu Arg Leu Arg Arg Ser Thr Thr Thr Met Lys Thr Asp
        595                 600                 605

Pro Tyr Thr Leu Phe Val Ala Leu Asp Asp Ser Tyr Gln Ala Ser Gly
    610                 615                 620

Thr Leu Tyr Met Asp Asp Glu Glu Thr Leu Gly Tyr Ser Lys Arg Ala
625                 630                 635                 640
```

Glu Cys Ala Asp Ala Ser Ile Ser Ala Asp Leu Ser Glu Gly Ala Ala
645 650 655

Glu Asp Arg Met Ile Glu Arg Ile Val Ile Met Gly Phe Pro Ser Thr
660 665 670

Pro Lys Ala Val Ser Val Asn Glu Glu Ser Leu Asp Phe Ser Phe Asn
675 680 685

Lys Ser Ser Asn Val Leu Val Val Arg Lys Pro Glu Val Ser Ala Leu
690 695 700

Arg Asp Trp Ser Ile Lys Ile Val
705 710

<210> 777
<211> 903
<212> PRT
<213> Chlamydomonas reinhardtii

<400> 777

Met Arg Arg Ala Ile Ala Leu Gly Val Gly Leu Ala Leu Leu Gly Leu
1 5 10 15

Leu Leu Pro Gly Ser Leu Ala Phe Lys Glu Asn Glu Phe Lys Lys Cys
20 25 30

Ala Gln Thr Ser Phe Cys Ser Arg Asn Arg Asn Val Gln Gln Gly Ala
35 40 45

Asn Phe Glu Ile Val Pro Ala Ser Val Thr Leu Asn Thr Ala Thr Leu
50 55 60

Thr Ala Thr Leu Met Asn Lys Gln Ala Ser Lys His Leu Gln Leu Thr
65 70 75 80

Leu Thr Ala His Ala Asp Gly Phe Val Arg Leu Leu Ile Asp Glu Leu

```
                85                  90                  95

Pro Ser Val Gly Arg Tyr Gln Val Pro Ser Asp Ile Leu Val Ser Gly
            100                 105                 110

Trp Glu Thr Arg Lys Ala Ala Ile Lys Glu Glu Ser Arg Ser Ala Asn
        115                 120                 125

Gly Val Val Leu Val Thr Gly Asp Thr Lys Leu Glu Leu Asn Tyr Ala
    130                 135                 140

Pro Phe Thr Leu Ala Val Ser Val Lys Gly Val Pro Ala Leu Gln Leu
145                 150                 155                 160

Asn Ser Arg Asn Leu Phe Asn Phe Glu His Arg Arg Pro Lys Gln Asp
                165                 170                 175

Ser Asp Pro Ala Gly Tyr Trp Glu Glu Thr Trp Met Gly His Thr Asp
            180                 185                 190

Thr Lys Pro Lys Gly Pro Glu Ala Met Ser Leu Asp Leu Val Phe Pro
        195                 200                 205

Gly Phe Ser His Val Tyr Gly Ile Pro Glu Arg Ala Thr Ser Leu Ser
    210                 215                 220

Leu Lys Ala Thr Asn Gly Asn Ala Pro Tyr Gly Glu Pro Tyr Arg Leu
225                 230                 235                 240

Tyr Asn Leu Asp Val Phe Glu Tyr Leu Asp Asp His Pro Phe Gly Leu
                245                 250                 255

Tyr Gly Ser Ile Pro Val Met Leu Ala His Lys Lys Gly Leu Thr Val
            260                 265                 270

Gly Val Tyr Trp Asn Asn Ala Ala Glu Met Phe Val Asp Val Val Lys
```

```
        275                 280                 285

Gly Arg Asp Val Gly Thr Gln Trp Ile Ala Glu Ser Gly Val Val Asp
    290                 295                 300

Leu Phe Val Phe Thr Gly Ala Thr Gly Pro Ala Val Leu Ala Ser Tyr
305                 310                 315                 320

Ala Lys Val Ala Gly Thr Thr Ala Leu Pro Gln Leu Phe Ser Leu Gly
                325                 330                 335

Tyr His Gln Cys Arg Trp Asn Tyr Lys Asp Glu Ala Asp Val Lys Ala
            340                 345                 350

Val Asp Gly Gly Phe Asp Ala His Glu Ile Pro Tyr Asp Val Leu Trp
        355                 360                 365

Leu Asp Ile Glu His Thr Asn Gly Lys Arg Tyr Leu Thr Trp Asp Ser
    370                 375                 380

Ser Leu Phe Pro Asn Pro Val Ala Met Gln Glu Asp Val Ala Ser Arg
385                 390                 395                 400

Gly Arg Lys Met Val Thr Ile Val Asp Pro His Val Lys Arg Asp Ser
                405                 410                 415

Ser Tyr Tyr Ile Phe Ser Glu Ala Glu Ser Ala Gly His Tyr Val Lys
            420                 425                 430

Asn Lys His Gly Ser Asp Phe Asp Gly Trp Cys Trp Pro Gly Gln Ser
        435                 440                 445

Ser Tyr Leu Asp Val Thr Ser Pro Val Val Arg Asn Trp Trp Ala Gln
    450                 455                 460

Gln Phe Thr Thr Asp Lys Tyr Gln Gly Ser Thr Lys His Leu Tyr Ile
```

```
465                 470                 475                 480

Trp Asn Asp Met Asn Glu Pro Ser Val Phe Asn Gly Pro Glu Ile Thr
                485                 490                 495

Met His Lys Asp Asn Leu His Tyr Gly Asn Val Glu His Arg Asp Asn
            500                 505                 510

His Asn Leu Phe Gly Val Tyr Tyr His Met Gly Thr Ala Asp Gly Leu
        515                 520                 525

Lys Leu Arg Gly Ser Gln Asn Gly Asp Arg Pro Phe Val Leu Ser Arg
    530                 535                 540

Ala Phe Phe Ser Gly Thr Gln Arg Val Gly Pro Ile Trp Thr Gly Asp
545                 550                 555                 560

Asn Ala Ala Gln Trp Ser His Leu Lys Val Ser Val Pro Met Leu Leu
                565                 570                 575

Thr Leu Gly Leu Thr Gly Leu Pro Tyr Ser Gly Ala Asp Val Gly Gly
            580                 585                 590

Phe Phe Gly Asn Pro Asp Ala Glu Leu Met Thr Arg Trp Tyr Gln Leu
        595                 600                 605

Gly Ile Tyr Tyr Pro Phe Phe Arg Gly His Ala His Leu Glu Thr Gln
    610                 615                 620

Arg Arg Glu Pro Trp Leu Phe Gly Pro Asp Val Thr Ala Arg Ile Arg
625                 630                 635                 640

Ala Ala Ile Arg Gly Arg Tyr Ala Leu Leu Pro His Ile Tyr Thr Leu
                645                 650                 655

Phe Arg Ala Ala Asn Thr Thr Gly Gln Pro Ile Leu Arg Pro Leu Trp
```

```
            660                 665                 670

Phe Glu Phe Pro Glu Gln Glu Asp Leu Tyr Ala Glu Glu Glu Glu Phe
        675                 680                 685

Met Val Gly Ser Ser Met Leu Val Lys Pro Val Thr Ala Pro Ser Thr
    690                 695                 700

Phe Thr Val Asp Val Thr Phe Pro Gln Gly Ser Arg Trp Tyr Asp Ala
705                 710                 715                 720

Thr Thr Gly Ala Pro Val Pro Pro Lys Thr Lys Thr Gln Arg Val Glu
                725                 730                 735

Val Asn Leu Asn Gly Ile Pro Val Tyr Tyr Arg Gly Gly Ser Val Val
            740                 745                 750

Pro Arg Arg Glu Arg Pro Arg Arg Ser Thr Ala Ala Gln Leu Ala Asp
        755                 760                 765

Pro Tyr Thr Leu Val Val Ala Ala Asp Asp Lys Gly Glu Ala Glu Gly
    770                 775                 780

Gln Leu Tyr Val Asp Asp Gly Arg Ser Phe Ala Phe Gln Arg Gly Leu
785                 790                 795                 800

Tyr Leu His Arg Asp Phe Lys Phe Ser Gly Asn Lys Leu Thr Ser Thr
                805                 810                 815

Lys His Val Glu Pro Gly Val Pro Asp Gly Thr Leu Thr Val Pro Thr
            820                 825                 830

Thr Ile Glu Arg Val Val Phe Leu Gly Leu Pro Ala Ala Lys Lys Gly
        835                 840                 845

Tyr Lys Ala Val Ile Ser Asp Gly Val Ser Gly Ala Lys His Thr Val
```

850 855 860

Ala Leu Glu Ala Gly Pro Leu Ser Met Ala Ala Ala Pro Asp Ser Thr
865 870 875 880

Gln Ala Leu Val Leu Arg Lys Pro Asp Leu Pro Val Ser His Asp Trp
885 890 895

Thr Val Glu Ile Val Gln Val
900

<210> 778
<211> 898
<212> PRT
<213> Volvox carteri

<400> 778

Met Arg Ala Ala Ile Ser Cys Leu Leu Leu Val Thr Leu Gly Ile Ser
1 5 10 15

Gln Leu Ala Thr Ala Phe Lys Glu Asn Glu Phe Lys Lys Cys Ala Gln
20 25 30

Thr Ser Phe Cys Ser Arg Asn Arg Asn Met Gln Gln Gly Ala Asn Phe
35 40 45

Asp Ile Val Pro Gly Ser Ile Val Leu Asn Thr Ala Thr Leu Thr Ala
50 55 60

Thr Leu Leu Asn Lys Gly Phe Asp Lys His Leu Gln Leu Thr Val Thr
65 70 75 80

Ser His Ser Asp Gly Phe Ile Arg Val Leu Val Asp Glu Leu Pro Asp
85 90 95

Val Gly Arg Tyr Gln Val Pro Ser Asp Val Leu Val Ser Gly Trp Glu
100 105 110

```
Thr Lys Lys Leu Ala Phe Lys Glu Glu Ser Arg Thr Ser Ser Ala Ile
        115                 120                 125

Thr Leu Ser Gly Gly Glu Thr Lys Leu Val Leu Asn Phe Gln Pro Phe
    130                 135                 140

Ser Leu Ala Ile Ser Val Lys Gly Val Pro Ala Leu Gln Ile Asn Ser
145                 150                 155                 160

Arg Asn Leu Phe Asn Phe Glu His Arg Arg Pro Lys Gln Glu Asn Asp
                165                 170                 175

Pro Ala Gly Phe Trp Glu Glu Thr Trp Met Gly His Thr Asp Ser Lys
            180                 185                 190

Pro Lys Gly Pro Glu Ala Ile Ser Leu Asp Leu Val Phe Pro Gly Phe
        195                 200                 205

Gln His Val Tyr Gly Ile Pro Glu Arg Ala Thr Ser Leu Ser Leu Arg
    210                 215                 220

Ser Thr Asn Gly Ala Ala Pro Tyr Gly Glu Pro Tyr Arg Leu Tyr Asn
225                 230                 235                 240

Leu Asp Val Phe Glu Tyr Leu Asp Asp His Pro Phe Gly Leu Tyr Gly
                245                 250                 255

Ser Ile Pro Val Met Leu Ala His Lys Lys Gly Leu Thr Val Gly Val
            260                 265                 270

Phe Trp Leu Asn Ala Ala Glu Met Phe Val Asp Val Val Lys Gly Arg
        275                 280                 285

Ser Glu Val Gly Thr Gln Trp Ile Ala Glu Ser Gly Ile Leu Asp Leu
    290                 295                 300
```

```
Phe Val Phe Thr Gly Gly Ser Ala Pro Ala Val Leu Ser Ser Tyr Ala
305                 310                 315                 320

Arg Val Ala Gly Thr Thr Ala Leu Pro Gln Leu Phe Ser Leu Gly Tyr
                325                 330                 335

His Gln Cys Arg Trp Asn Tyr Lys Asp Glu Glu Asp Val Lys Glu Val
            340                 345                 350

Asp Gly Gly Phe Asp Ser His Glu Ile Pro Tyr Asp Val Leu Trp Leu
        355                 360                 365

Asp Ile Glu His Thr Asn Gly Lys Arg Tyr Leu Thr Trp Asp Ser Ser
    370                 375                 380

Leu Phe Pro Ser Pro Val Ala Met Gln Glu Asp Leu Ala Ser Arg Gly
385                 390                 395                 400

Arg Gln Met Val Thr Ile Val Asp Pro His Val Lys Arg Asp Ser Gly
                405                 410                 415

Tyr Tyr Ile Phe Ser Glu Ala Glu Lys Ala Gly His Phe Val Lys Asn
            420                 425                 430

Lys His Gly Ser Asp Phe Asp Gly Trp Cys Trp Pro Gly Ser Ser Ser
        435                 440                 445

Tyr Leu Asp Val Thr Ser Pro Ala Val Arg Glu Trp Trp Ala Gln Gln
    450                 455                 460

Phe Thr Leu Asp Lys Tyr Gln Gly Ser Thr Lys His Leu Tyr Ile Trp
465                 470                 475                 480

Asn Asp Met Asn Glu Pro Ser Val Phe Asn Gly Pro Glu Ile Thr Met
                485                 490                 495
```

```
Gln Lys Asp Asn Leu His Tyr Gly Asn Val Glu His Arg Asp Asn His
            500                 505                 510

Asn Leu Tyr Gly Ile Tyr Tyr His Met Gly Thr Ala Glu Gly Leu Lys
        515                 520                 525

Leu Arg Gly Ser Gln Val Asp Pro Glu Asn Gly Asp Arg Pro Phe Val
    530                 535                 540

Leu Ser Arg Ala Phe Phe Ser Gly Thr Gln Arg Val Gly Pro Ile Trp
545                 550                 555                 560

Thr Gly Asp Asn Ala Ala Gln Trp Ser His Leu Lys Val Ser Val Pro
                565                 570                 575

Met Leu Leu Thr Leu Gly Leu Thr Gly Leu Pro Tyr Ser Gly Ala Asp
            580                 585                 590

Val Gly Gly Phe Phe Gly Asn Pro Asp Ala Glu Leu Met Thr Arg Trp
        595                 600                 605

Tyr Gln Leu Gly Ile Tyr Tyr Pro Phe Phe Arg Gly His Ala His Leu
    610                 615                 620

Glu Thr Gln Arg Arg Glu Pro Trp Leu Phe Gly Pro Glu Thr Thr Ala
625                 630                 635                 640

Arg Ile Arg Thr Ala Ile Arg Gly Arg Tyr Thr Leu Leu Pro Tyr Ile
                645                 650                 655

Tyr Thr Leu Phe Arg Phe Ala Asn Thr Ser Gly Leu Pro Ile Leu Arg
            660                 665                 670

Pro Leu Trp Tyr Glu Phe Pro Glu Asn Glu Asp Leu Phe Ala Val Glu
        675                 680                 685
```

```
Glu Glu Phe Met Ala Gly Pro Ala Ile Leu Val Lys Pro Ile Val Ala
    690                 695                 700

Pro Gly Val Ser Ser Val Asp Val Thr Leu Pro Val Gly Ala Arg Trp
705                 710                 715                 720

Tyr Asp Ala Leu Ser Gly Ala Ala Val Pro Ala Arg Ser Arg Ser Gln
                725                 730                 735

Arg Val Thr Leu Asp Ser Ile Pro Val Tyr Tyr Arg Gly Gly Asn Ile
            740                 745                 750

Leu Pro Leu Arg Glu Arg Pro Arg Arg Ser Thr Ala Ala Gln Leu Ala
        755                 760                 765

Asp Pro Tyr Thr Leu Val Val Ala Leu Asp Asp Lys Gly Glu Ala Thr
    770                 775                 780

Gly Ser Leu Tyr Val Asp Asp Gly Arg Ser Phe Ala Phe Gln Arg Gly
785                 790                 795                 800

Gln Tyr Leu His Arg Asp Phe Thr Met Lys Ser Leu Lys Leu Ser Ser
                805                 810                 815

Ser Lys His Val Glu Pro Gly Val Pro Ser Gly Ala Leu Thr Val Pro
            820                 825                 830

Thr Thr Ile Glu Arg Val Val Phe Leu Gly Leu Pro Ala Ser Lys Arg
        835                 840                 845

Gly Tyr Lys Ala Leu Ile Gly Ala Lys His Ala Val Pro Leu Glu Pro
    850                 855                 860

Gly Pro Leu Thr Met Leu Ala Pro Gln Tyr Glu Asn Ala Leu Val Leu
865                 870                 875                 880
```

Arg Lys Pro Gly Leu Pro Val Ser His Asp Trp Glu Val Glu Ile Val
885 890 895

Ala Leu

<210> 779
<211> 952
<212> PRT
<213> Ostreococcus tauri

<400> 779

Met Ser Val Asp Arg Arg His Arg Ala Met Gly Thr Gly Ala Arg Arg
1 5 10 15

Gly Arg Arg Thr Gly Thr Ala Thr Ala Thr Arg Ala Gly Trp Ala Leu
20 25 30

Ala Leu Cys Val Leu Ala Arg Ala Cys Ala Arg Gly Arg Ala Phe Lys
35 40 45

Gly Gln Asp Phe Lys Thr Cys Glu Thr Ser Ser Phe Cys Ala Arg Leu
50 55 60

Arg Asp Gly Val Ala Arg Asp Asp Asp Arg Asn His Val Leu Gly His
65 70 75 80

Gly Val Asp Val Arg Ala Val Val Arg Ser Lys Ser Ala Arg Val Val
85 90 95

Glu Leu Asp Val Val Asn Val Gly Ala Val Gly Glu Glu Gly Asp Ala
100 105 110

Arg Ala Arg Val Ala Val Glu Ala Phe Gly Ser Gly Ala Ile Arg Val
115 120 125

```
Arg Val Asp Asp Val Gln Lys Pro Arg Tyr Val Pro Lys Asp Val Leu
    130                 135                 140

Val Arg Glu Val Glu Phe Asp Val Ser Ala Arg Ala Leu Leu Ala Val
145                 150                 155                 160

Thr Glu Ser Ala Gly Glu Val Met Ile Glu Ala Arg Glu Thr Gly Ala
                165                 170                 175

Arg Ala Arg Val Arg Leu Gln Pro Phe Ala Val Glu Val Phe Ala Pro
            180                 185                 190

Gly Ser Gly Ser Ile Pro Ser Ala Val Phe Asn Lys Arg Gly Gly Phe
        195                 200                 205

Ala Met Glu Leu Ala Arg Glu Glu Ser Gly Glu Trp Ser Glu Thr Phe
    210                 215                 220

Asn Gly His Thr Asp Thr Arg Lys Gly Gly Pro Thr Gly Val Ala Phe
225                 230                 235                 240

Asp Val Thr Phe Pro Phe Ala Ser Asp Val Tyr Gly Ile Pro Glu Arg
                245                 250                 255

Ala Thr Ser Leu Ser Leu Lys Ser Thr Arg Gln Tyr Glu Ser Ala Ser
            260                 265                 270

Lys Gly Trp Phe Lys Gly Gly Gly Ala Ala Ser Glu Ser Glu Arg Asn
        275                 280                 285

Glu Ser Thr Leu Gly Glu Pro Tyr Arg Met Tyr Asn Leu Asp Val Phe
    290                 295                 300

Glu Tyr Leu Asp Asp Ser Pro Phe Gly Leu Tyr Gly Ser Ile Pro Met
305                 310                 315                 320
```

```
Met Thr Ala His Gly Ile Ser Arg Ser Ser Glu Thr Ile Thr Ser Gly
                325                 330                 335

Val Tyr Phe His Asn Pro Ser Glu Met Tyr Val Asp Val Asn Val Asp
            340                 345                 350

Gly Ser Asn Gly Val His Thr Lys Trp Met Ala Glu Ser Gly Ala Ile
        355                 360                 365

Asp Val Phe Ile Leu Pro Gly Thr Thr Pro Gly Lys Val Leu Gln Gln
    370                 375                 380

Tyr Thr Ala Leu Thr Gly Thr Thr Ser Met Pro Pro Leu Phe Ser Leu
385                 390                 395                 400

Gly Tyr His Gln Cys Arg Trp Asn Tyr Arg Asp Glu Asn Asp Val Lys
                405                 410                 415

Glu Val Asp Lys Gly Phe Asp Glu His Asp Ile Pro Tyr Asp Val Leu
            420                 425                 430

Trp Leu Asp Ile Glu His Thr Asp Gly Lys Arg Tyr Met Thr Trp Asp
        435                 440                 445

Lys Ala Val Phe Pro Thr Pro Gln Arg Met Ile Glu Asp Leu Ser Ser
    450                 455                 460

Arg Gly Arg Lys Met Val Thr Ile Val Asp Pro His Val Lys Arg Asp
465                 470                 475                 480

Glu Ala Tyr Pro Ile Tyr Lys Glu Ala Lys Asp Lys Gly Phe Tyr Val
                485                 490                 495

Lys Lys Asn Asp Gly Asn Thr Asp Phe Asp Gly Trp Cys Trp Pro Gly
            500                 505                 510
```

```
Ser Ser Ser Tyr Leu Asp Val Thr Asn Pro Asp Val Arg Glu Trp Trp
        515                 520                 525

Ala Gly Lys Phe Ser Leu Asn Ser Tyr Glu Gly Ser Thr Lys Asp Leu
    530                 535                 540

Tyr Ile Trp Asn Asp Met Asn Glu Pro Ser Val Phe Asn Gly Pro Glu
545                 550                 555                 560

Ile Thr Met Gln Lys Asp Leu Ile His His Gly Gly Val Glu His Arg
                565                 570                 575

Asp Val His Asn Ala Phe Gly Met Tyr Tyr His Met Ala Thr Ala Glu
            580                 585                 590

Gly Leu Lys Arg Arg Asn Asp Gly Asn Arg Pro Phe Val Leu Ser Arg
        595                 600                 605

Ala Phe Phe Ala Gly Thr Gln Arg Val Gly Pro Ile Trp Thr Gly Asp
    610                 615                 620

Asn Ala Ala Asp Trp Lys His Leu Ala Val Ser Leu Pro Met Val Leu
625                 630                 635                 640

Thr Leu Gly Val Ser Gly Leu Thr Phe Ser Gly Ala Asp Val Gly Gly
                645                 650                 655

Phe Phe Gly Asn Pro Asp Ala Glu Leu Met Thr Arg Trp Tyr Gln Val
            660                 665                 670

Gly Thr Tyr Tyr Pro Phe Phe Arg Gly His Ala His Leu Glu Thr Lys
        675                 680                 685

Arg Arg Glu Pro Trp Leu Phe Gly Glu Glu Asn Thr Ala Ile Ile Arg
    690                 695                 700
```

```
Asp Ala Ile Arg Glu Arg Tyr Ala Leu Leu Pro Tyr Ile Tyr Thr Leu
705                 710                 715                 720


Phe Glu Glu Ser His Arg Thr Gly Ala Pro Val Met Arg Pro Leu Trp
                725                 730                 735


Tyr Glu Phe Pro Ala Asp Ala Asp Val Leu Lys Thr Gln Asp Ala Phe
            740                 745                 750


Met Leu Gly Thr Ala Met Leu Ile Arg Pro Val Leu Glu Gln Gly Ala
        755                 760                 765


Lys Ser Val Ser Val Tyr Leu Pro Lys Gly Ile Trp Tyr Glu Lys Arg
    770                 775                 780


Ser Gly Val Arg His Val Gly Pro Lys Ser Phe Asp Val Ala Val Ser
785                 790                 795                 800


Leu Ser Asp Val Pro Val Phe Leu Arg Gly Gly Thr Ile Phe Val Arg
                805                 810                 815


Lys Asp Arg Ala Arg Arg Ser Thr Thr Ala Met Arg Gly Asp Pro Leu
            820                 825                 830


Thr Val Ile Val Ala Leu Asp Glu Asn Gly Arg Ala Ser Gly Thr Tyr
        835                 840                 845


Tyr Ala Asp Asp Gly Glu Ser Tyr Glu Phe Ala Ser Lys Lys Ser Ala
    850                 855                 860


Phe Met Arg Arg Arg Leu Thr Phe Ser Asn Asn Glu Phe Asn Val Ala
865                 870                 875                 880


Gly Ala Gly Ala Glu Asp Gly Asn Ala Gly Asp Ala Lys Ser Phe Ile
                885                 890                 895
```

```
Asp His Ser Leu Ile Glu Arg Val Thr Val His Gly Leu Ser Ala Thr
            900                 905                 910


Gly Asp Val Ala Thr Cys Ala Ala Thr Arg Asp Ser Phe Asp Val Val
        915                 920                 925


Arg Val Gly Ala Val Ala Asn Ile Arg Arg Pro Asn Leu Pro Ile Ser
    930                 935                 940


Arg Asp Phe Thr Ile Ala Val Gln
945                 950


<210>  780
<211>  796
<212>  PRT
<213>  Micromonas pusilla

<400>  780

Met Gly Phe Ser Ser Glu Thr Pro Val Gly Ser Glu Val Lys Val Val
1               5                   10                  15


Ile Glu His Ala Pro Val Lys Ile Thr Thr Leu Val Asp Gly Val Glu
            20                  25                  30


Ala Val Val Phe Asn Ala Asn Gly Ala Phe Glu Phe Glu Arg Arg Lys
        35                  40                  45


Thr Lys Ser Glu Glu Asp Ala Pro Pro Pro Glu Pro Ser Pro Glu Thr
    50                  55                  60


Phe Asn Ser His Thr Asp Ser Arg Pro Asn Gly Pro Met Ala Leu Ser
65                  70                  75                  80


Phe Asp Ile Thr Phe Pro Asp Ala Ser His Ala Tyr Gly Leu Pro Glu
                85                  90                  95
```

```
Arg Ala Thr Thr Met Ser Leu Arg Glu Thr Lys Ala Ala Asp Gly Ala
            100                 105                 110

Ile Ala Thr Glu Pro Tyr Arg Leu Tyr Asn Leu Asp Val Phe Glu Tyr
        115                 120                 125

Glu His Asp Ser Pro Phe Gly Leu Tyr Gly Ser Ile Pro Met Leu Leu
    130                 135                 140

Gly His Ser Ser Arg Pro Pro Arg Val His Gly Val Tyr Phe Asn Asn
145                 150                 155                 160

Pro Thr Glu Leu Tyr Val Asp Val Thr Lys Gly Gly Ser Ser Gly Gly
                165                 170                 175

Ile Ser Ser His Trp Met Ala Glu Ser Gly Ala Phe Asp Leu Phe Ile
            180                 185                 190

Phe Pro Gly Pro Ser Pro Arg Glu Thr Met Arg Gln Tyr Ser Met Ile
        195                 200                 205

Thr Gly Gly Thr Ala Met Pro Pro Ala Phe Ala Leu Gly Tyr His Gln
    210                 215                 220

Cys Arg Trp Asn Tyr Arg Asp Glu Ala Asp Val Ala Ala Val Asp Ala
225                 230                 235                 240

Gly Phe Asp Glu His Asp Ile Pro Tyr Asp Val Leu Trp Leu Asp Ile
                245                 250                 255

Glu His Thr Asp Gly Lys Arg Tyr Met Thr Trp Asp Gly Ala Thr Phe
            260                 265                 270

Pro Thr Pro Arg Arg Met Ile Glu Asp Val Ala Ser Arg Gly Arg Lys
        275                 280                 285
```

```
Met Val Thr Ile Val Asp Pro His Val Lys Lys Asp Ala Asn Tyr Pro
    290                 295                 300

Val Tyr Lys Glu Ala Glu Ser Lys Gly Leu Phe Val Lys Gln Lys Asp
305                 310                 315                 320

Gly Val Gly Asp Phe Asp Gly Trp Cys Trp Pro Gly Ser Ser Ala Tyr
                325                 330                 335

Leu Asp Val Thr Ser Pro Ala Val Arg Ala Trp Trp Ala Asp Lys Phe
            340                 345                 350

Ser Leu Lys Asn Tyr Gln Gly Ser Thr Lys Asp Leu Tyr Ile Trp Asn
        355                 360                 365

Asp Met Asn Glu Pro Ser Val Phe Asn Gly Pro Glu Ile Thr Met Gln
    370                 375                 380

Lys Asp Leu Ile His His Gly Asn Val Glu His Arg Glu Val His Asn
385                 390                 395                 400

Ala Phe Gly Met Tyr Tyr His Ala Ala Thr Ala Ala Gly Ile Glu Lys
                405                 410                 415

Arg Asn Asp Gly Glu Arg Pro Phe Val Leu Ser Arg Ala Phe Phe Ala
            420                 425                 430

Gly Thr Gln Arg Val Gly Pro Ile Trp Thr Gly Asp Asn Ala Ala Asp
        435                 440                 445

Trp Asn His Leu Arg Val Ser Leu Pro Met Val Leu Thr Leu Gly Ala
    450                 455                 460

Thr Gly Leu Ala Phe Ser Gly Ala Asp Val Gly Gly Phe Phe Gly Asn
465                 470                 475                 480
```

```
Pro Asp Gly Glu Leu Met Thr Arg Trp Tyr Gln Thr Gly Ile Tyr Tyr
                485                 490                 495

Pro Phe Phe Arg Gly His Ala His Leu Asp Thr Lys Arg Arg Glu Pro
            500                 505                 510

Trp Leu Phe Gly Glu Pro Tyr Thr Ala Leu Ile Arg Ala Ala Ile Arg
        515                 520                 525

Arg Arg Tyr Gln Leu Met Pro Tyr Leu Tyr Thr Leu Phe Glu Glu Ala
    530                 535                 540

His Arg Asp Gly Ala Pro Val Met Arg Pro Leu Trp Tyr Glu Phe Pro
545                 550                 555                 560

Asn Asp Pro His Ala Ala Ala Lys Glu Asp Ala Phe Met Leu Gly Pro
                565                 570                 575

Ala Leu Leu Val His Pro Val Thr Thr Gln Gly Ala Ser Ser Val Glu
            580                 585                 590

Val Tyr Leu Pro Ala Gly Val Trp Tyr Asp Tyr Asp Thr Asn Glu Met
        595                 600                 605

His Ala Gly Pro Lys Thr Phe Ser Val Ala Val Thr Leu Ala Asp Thr
    610                 615                 620

Pro Thr Phe Val Arg Gly Gly His Val Ile Val Arg Lys Asp Arg Ala
625                 630                 635                 640

Arg Arg Ser Thr Arg Ala Met Thr His Asp Pro Phe Thr Ile Val Val
                645                 650                 655

Ala Pro Asp Glu Ser Gly Lys Tyr Ala Tyr Gly Glu Val Tyr Leu Asp
            660                 665                 670
```

```
Asp Gly Lys Ser Tyr Ala Phe Glu Glu Lys Asp Ala Phe Ser Arg Arg
        675                 680                 685

Gln Ile Ile Phe Glu Asp Gly Asp Ser Leu Val Cys Ala Ala Lys Trp
    690                 695                 700

Arg Gly Gly Ser Trp Gly Trp Thr Thr His Asp Ala Glu Gln Lys His
705                 710                 715                 720

Leu Glu Gly Asp Pro Leu Ala Phe Pro Glu Ile Ala Ala Glu Val Glu
                725                 730                 735

Arg Val Ile Val Leu Gly Pro Arg Arg Phe Gly Glu Asp Ala Glu Val
            740                 745                 750

Arg Asn Lys Arg Lys Glu Ile His Leu Val Ser Ala Ser Gly Lys Glu
        755                 760                 765

Gly Ser Pro Ala Ala Ala Thr Ala Val Lys Lys Pro Gly Val Val Leu
    770                 775                 780

Ala Gln Asp Trp Ser Ile Leu Phe Ser Val Ala Asp
785                 790                 795
```

<210> 781
<211> 916
<212> PRT
<213> Coccomyxa subellipsoidea

<400> 781

```
Met Gly Glu Glu Met Ile Asn Pro Ser Arg Lys Gly Asn His Ser Phe
1               5                   10                  15

Leu Thr Ser Phe Phe Leu Ile Phe Leu Phe Ser Ser Leu Gln Phe Gln
            20                  25                  30

Leu Ser Thr Ser Val Lys Val Glu Asp Phe Lys Lys Cys Thr Asp Ala
```

```
        35                  40                  45

Ala Phe Cys Asn Arg Leu Leu Gly Thr Arg Asp Glu Gly Tyr Tyr Ile
    50                  55                  60

Asp Pro Ala Ser Val Gln Phe Ser Gly Pro Ser Val Thr Ala Arg Leu
65                  70                  75                  80

Leu Asn Lys Ala Lys Gly Thr Asp Val Thr Leu Thr Met Lys Ala Tyr
                85                  90                  95

Lys Gly Phe Val Arg Leu Leu Val Asn Glu Asp Ala Ser Lys Lys Arg
            100                 105                 110

Phe Glu Val Pro Gly Val Leu Met His Asp Leu Gly Ser Arg Glu Ala
        115                 120                 125

Ile Trp Ser Lys Lys Ala Gln Thr Ala Gln Ser Leu Leu Leu Gln Leu
    130                 135                 140

Glu Asp Ala Glu Met Gln Leu Gln Tyr Ser Pro Phe Gln Ile Gly Ile
145                 150                 155                 160

Ser Ile Lys Gly Lys Pro Val Met Ser Phe Asn Gly Arg Gln Met Phe
                165                 170                 175

Asn Phe Glu His Leu Arg Gln Lys Gln Glu Gly Asp Pro Glu Gly Trp
            180                 185                 190

Trp Glu Glu Thr Phe Lys Gly His Val Asp Ser Lys Pro Arg Gly Pro
        195                 200                 205

Glu Ala Ile Ser Phe Asp Leu Glu Phe Pro Asp Thr Gln His Val Tyr
    210                 215                 220

Gly Leu Pro Glu His Ala Thr Ser Leu Ser Leu Asn Pro Thr Val Asp
```

```
225                 230                 235                 240

Leu Ala Asp Asn Ala Thr Ser Glu Pro Tyr Arg Leu Tyr Asn Leu Asp
                245                 250                 255

Val Phe Glu Tyr Ala Pro Glu Ser Pro Phe Gly Leu Tyr Gly Ser Ile
            260                 265                 270

Pro Phe Leu Trp Ala Gln Lys Leu Gly Val Ala Val Gly Ala Phe Trp
        275                 280                 285

Leu Asn Ala Ala Glu Met Tyr Val Asp Val Gly Lys Thr Glu Glu Gly
    290                 295                 300

Thr Phe Thr Asn Trp Val Ala Glu Ser Gly Ile Leu Asp Leu Phe Leu
305                 310                 315                 320

Leu Leu Gly Pro Thr Pro Ala Lys Val Ser Glu Gln Tyr Ala Gln Ile
                325                 330                 335

Thr Gly Ala Thr Ala Leu Pro Gln Tyr Phe Ala Leu Gly Tyr His Gln
            340                 345                 350

Cys Arg Trp Asn Tyr Arg Asp Glu Ala Asp Val Arg Gln Val Asp Ala
        355                 360                 365

Gly Phe Asp Ala Tyr Asp Ile Pro Tyr Asp Val Ile Trp Leu Asp Ile
    370                 375                 380

Glu His Thr Asp Gly Lys Arg Tyr Phe Thr Trp Asp Lys Ser Leu Phe
385                 390                 395                 400

Pro Asp Pro Val Lys Leu Gln Glu Asp Val Ala Ser His Gly Arg Lys
                405                 410                 415

Val Val Thr Ile Ile Asp Pro His Ile Lys Arg Asp Pro Gly Tyr Tyr
```

```
            420                 425                 430

Ile Tyr Gln Glu Ala Glu Gln Asn His Tyr Phe Val Arg Asp Lys Asp
        435                 440                 445

Gly Lys Asp Phe Asp Gly Trp Cys Trp Pro Gly Ser Ser Ser Tyr Leu
    450                 455                 460

Asp Met Leu Asn Pro Glu Val Arg Ala Trp Trp Ala Gln Gln Phe Ala
465                 470                 475                 480

Leu Ser Lys Tyr Lys Gly Ser Thr Pro Asn Leu Tyr Val Trp Asn Asp
                485                 490                 495

Met Asn Glu Pro Ser Val Phe Thr Gly Pro Glu Ile Thr Met Gln Lys
            500                 505                 510

Asp Asn Leu His Trp Arg Glu Val Glu His Arg Asn Leu His Asn Leu
        515                 520                 525

Tyr Gly Ala Leu Phe His Gln Gly Thr Ala Glu Gly Leu Ile Glu Arg
    530                 535                 540

Gly Lys Ala Val Tyr Gly Ser Asp Ala Asp Arg Pro Phe Val Leu Ser
545                 550                 555                 560

Arg Ala Phe Phe Ala Gly Thr Gln Arg Val Gly Pro Ile Trp Thr Gly
                565                 570                 575

Asp Asn Cys Ala Asp Trp Lys His Leu Arg Val Ser Leu Pro Met Ile
            580                 585                 590

Met Ser Val Gly Ile Ala Gly Leu Pro Phe Asn Gly Ala Asp Val Gly
        595                 600                 605

Gly Phe Phe Gly Asn Pro Asp Ala Glu Leu Gln Thr Arg Trp Asn Gln
```

610 615 620

Val Ala Thr Phe Tyr Pro Phe Phe Arg Gly His Ala His Leu Asp Ala
625 630 635 640

Lys Arg Arg Glu Pro Trp Leu Phe Gly Glu Asp Ala Thr Arg Arg Ile
645 650 655

Arg Asp Ala Ile Arg Ala Arg Tyr Val Leu Leu Pro Tyr Ile Tyr Thr
660 665 670

Leu Phe Arg His Ala Asn Thr Thr Gly Leu Pro Val Met Arg Pro Leu
675 680 685

Trp Tyr Glu Phe Pro Glu Val Glu Ala Thr His Gly Val Asp Asp Glu
690 695 700

Phe Met Leu Gly Pro Ala Leu Leu Val Ser Pro Val Leu Glu Glu Gly
705 710 715 720

Ala Glu Ser Arg Ala Val Phe Leu Pro Gly Lys Gly Pro Trp Tyr Ser
725 730 735

Ala Arg Thr Gly Glu Pro Val Lys Pro Asp Ala Gly Gly Ala Leu Thr
740 745 750

Val Pro Val Thr Met Asp Ser Val Pro Ser Tyr Leu Arg Gly Gly His
755 760 765

Ile Met Pro Leu Arg Glu Arg Ala Arg Arg Ser Thr Ala Ala Ala Arg
770 775 780

Lys Asp Pro Tyr Thr Leu Leu Val Ala Leu Asp Ser Glu Gly Gln Ala
785 790 795 800

Ser Gly Asp Leu Tyr Leu Asp Asp Gly Ser Ser Phe Ala Tyr Lys Arg

805 810 815

Gly Leu Phe Ala His Arg Leu Phe Ser Phe Lys Asp Gly Met Leu Ser
820 825 830

Asn Gln Glu Leu Pro Gly Asn Pro Ser Pro Pro Arg Tyr Ser Thr Asp
835 840 845

Leu Val Ile Glu Arg Ile Ile Ile Val Gly Leu Gly His Pro Ala Lys
850 855 860

Ser Phe Ser Val Lys Glu Val Gly Thr Gly Lys Val Leu Gln Thr Gly
865 870 875 880

Ala Gly Pro Val Val Gln Glu Ala Gly Val Pro Glu Leu Ala Leu Val
885 890 895

Ile Arg Lys Pro Glu Leu Pro Val Thr Gly Asp Trp Ser Ile Gln Leu
900 905 910

Ser Val Thr Ala
915

<210> 782
<211> 515
<212> PRT
<213> Chlorella variabilis

<400> 782

Met Ser Arg Gly Ala Ala Val Leu Leu Leu Leu Leu Ala Ser Ala Val
1 5 10 15

Ala Thr Val Gln Gly Phe Lys Ala Glu Glu Phe Lys Lys Cys Glu Asp
20 25 30

Ala Ala Phe Cys Lys Arg Leu Arg Gly Asn Thr Ser Glu Ala Phe Val
35 40 45

```
Leu Leu Pro Asp Ser Val Lys Val Glu Gly Ala Arg Val Thr Ala Thr
    50                  55                  60

Val Gln Asn Thr Gln Asn Ala Asn Gly Thr Phe Ser Leu Val Leu Thr
65                  70                  75                  80

Ala Tyr Gly Asp Thr Leu Arg Leu Phe Ile Asp Glu Ala Pro Glu Lys
                85                  90                  95

Gly Arg Trp Gln Val Pro Asp Val Leu Leu Pro Gly Leu Glu Gln Arg
            100                 105                 110

Glu Gln Ala Trp Glu Val Val Lys Lys Ser His Thr Lys Leu Arg Val
        115                 120                 125

Arg Cys Gly Ala Ala Glu Ala Glu Leu Arg Thr Ser Pro Ala Gln Leu
    130                 135                 140

Glu Val Ser Val Gly Gly Thr Pro Ala Leu Val Trp Asn Ala Gly Lys
145                 150                 155                 160

Gln Phe Ile Phe Glu His Leu Arg Glu Gln Gln Glu Gly Asp Pro Glu
                165                 170                 175

Gly Trp Trp Ala Glu Asn Phe Lys Thr His His Asp Ser Lys Pro Lys
            180                 185                 190

Gly Pro Ala Ala Ile Ser Phe Asp Val His Phe Pro Gly Thr Arg His
        195                 200                 205

Leu Tyr Gly Leu Pro Glu Arg Ala Ser Ser Leu Ala Leu Gln Pro Thr
    210                 215                 220

Arg Gly Pro Glu Gly Pro Leu Ser Glu Pro Tyr Arg Leu Tyr Asn Leu
225                 230                 235                 240
```

```
Asp Val Phe Glu Tyr Leu His Asp Ser Pro Phe Gly Leu Tyr Gly Ala
                245                 250                 255

Ile Pro Leu Met Leu Ala His Arg Pro Glu Gln Thr Val Gly Val Phe
            260                 265                 270

Trp Leu Asn Ala Ala Glu Met Tyr Val Asp Val Ser Gln Asp Glu Gly
        275                 280                 285

Gly Ala Ser Thr Gln Trp Leu Ala Glu Ser Gly Val Val Asp Val Phe
    290                 295                 300

Val Phe Val Gly Pro Arg Pro Ala Asp Val Ala Arg Gln Met Ala Ala
305                 310                 315                 320

Leu Thr Gly Gly Ser Ala Leu Pro Gln Met Phe Ala Leu Gly Tyr His
                325                 330                 335

Gln Cys Arg Trp Asn Tyr Lys Asp Glu Gln Asp Val Ala Ala Val Asp
            340                 345                 350

Gly Gly Phe Asp Ala His Asn Ile Pro Tyr Asp Val Leu Trp Cys Trp
        355                 360                 365

Pro Gly Ser Ser Ser Tyr Leu Asp Met Val Asn Gly Glu Val Arg Asp
    370                 375                 380

Trp Trp Ser His Gln Phe Ser Thr Ser Val Tyr Ser Gly Ser Thr Lys
385                 390                 395                 400

His Leu Tyr Ile Trp Asn Asp Met Asn Glu Pro Ser Val Phe Asn Gly
                405                 410                 415

Pro Glu Ile Thr Met His Lys Asp Asn Leu His Leu Asn Gly Thr Ala
            420                 425                 430
```

```
Glu His Arg Asp Val His Asn Val Tyr Gly Tyr Phe Tyr His Met Ala
        435                 440                 445

Thr Ala Asp Gly Leu Arg Lys Arg Gly Phe Glu Glu Trp Gly Pro Asp
    450                 455                 460

Gly Asp Arg Pro Phe Val Leu Ser Arg Ala Phe Phe Ala Gly Thr Gln
465                 470                 475                 480

Arg Ile Gly Ala Ile Trp Thr Gly Asp Asn Glu Ala Thr Trp Glu His
                485                 490                 495

Leu Lys Val Ser Val Pro Met Leu Leu Ala Ile Asn Ile Ala Gly Leu
            500                 505                 510

Pro Phe Ser
        515
```

<210> 783
<211> 970
<212> PRT
<213> Cyanidioschyzon merolae

<400> 783

```
Met Gln Arg Ala Arg Phe Arg Ala Gly Ser Gln Tyr Pro Leu Trp Ser
1               5                   10                  15

Thr Val Gly Phe Ile Phe Val Leu Cys Phe Leu Ile Trp Glu Leu Ala
            20                  25                  30

Gly Val Gln Ala Ala Glu Arg Gly Lys Tyr Ala Arg Cys Ser Thr Gln
        35                  40                  45

Ser Phe Cys Ala Tyr His Arg Gln Arg Arg Glu Gln Gln Thr Ser Gln
    50                  55                  60
```

```
Gln Glu Leu Ala Ala Asn Ala Thr Ala Pro Gly Thr Arg Cys Arg Leu
65                  70                  75                  80

Arg Glu Pro Glu Pro Phe Arg Leu Gln Lys Thr Ser Ser Ser Val Leu
                85                  90                  95

Ile Phe Glu Leu Leu Gln Arg Glu Ala Asn Asp Ser Gly Thr Leu Ser
            100                 105                 110

Gln Leu Gln Leu Glu Val Gly Ala Val Thr His Ser Ile Phe Ser Ile
        115                 120                 125

Arg Val Arg Glu Pro Pro Pro Ser Asp Thr Ile Gln Leu Gly Leu Leu
    130                 135                 140

Arg Arg Arg Lys Gln His Ala Ser Val Ser Lys Tyr Glu Arg Tyr Ser
145                 150                 155                 160

Pro Val Glu Asp Val Met Met Tyr Arg Glu Pro Trp Leu Gln Leu Glu
                165                 170                 175

Arg Leu Ala Ala Ser Thr Ala Thr Ser Cys Pro Tyr Val Ser Ser Ala
            180                 185                 190

Ala Trp Leu Ser Ser Asp Thr Glu Thr Val Ile Val Thr Ala Ser Thr
        195                 200                 205

Ser His Ala Ser Thr Glu Pro Val Tyr Asn Val Leu Arg Val Gln His
    210                 215                 220

Glu Pro Cys Arg Ile Ala Leu Phe Asn Asn Val Ala Asp Trp Cys Ala
225                 230                 235                 240

Leu Leu Gln Asn Ser Thr Ala Thr Thr Thr Arg Pro Ser Leu Val Trp
                245                 250                 255
```

```
Asn Ala Ala Glu Leu Leu Ala Trp Ile Pro Leu Asp Ala Asn Thr Thr
            260                 265                 270

Ala Ala Gly Ser Val Ala Ala Asp Val Ala Phe Pro Arg Ala Ile Gly
        275                 280                 285

Leu Tyr Gly Leu Pro Glu His Ala Leu Asp Leu Arg Leu Pro Thr Thr
    290                 295                 300

Cys Thr Arg Glu Pro Leu Arg Leu Tyr Asn Leu Asp Val Phe Glu Tyr
305                 310                 315                 320

Glu Leu Asn Ser Glu Leu Gly Leu Tyr Gly Ser Ile Pro Phe Ile Leu
                325                 330                 335

Ala Leu Asn Gly Ser Ala His Thr Val Gly Ala Leu Trp Met Pro Ala
            340                 345                 350

Ser Glu Thr Tyr Val Asp Leu Cys Pro Leu Leu Asp Gln Glu Arg Gly
        355                 360                 365

Thr Ala Met Pro His Ala His Phe Ile Ser Glu Arg Gly Ile Pro Glu
    370                 375                 380

Met Phe Val Phe Ala Gly Pro Ser Pro Val Glu Val Ser Gln Gln Leu
385                 390                 395                 400

Ala Leu Leu Thr Gly His Ala Pro Leu Pro Pro Val Phe Ala Leu Gly
                405                 410                 415

Tyr His Gln Ser Arg Trp Asn Tyr Arg Asp Glu Ala Asp Ala Leu His
            420                 425                 430

Val Asp Gly Gln Phe Asp Ala Asn Asp Ile Pro Tyr Asp Val Leu Trp
        435                 440                 445
```

```
Leu Asp Ile Glu His Thr Asp Asn Lys Lys Tyr Phe Thr Trp Asp Gly
    450                 455                 460

Ala Lys Phe Pro Asp Pro Ala Arg Leu Gln Gln Thr Leu Phe Glu Lys
465                 470                 475                 480

Ala Lys Arg Lys Leu Val Thr Ile Val Asp Pro His Ile Lys Ala Glu
                485                 490                 495

Pro Asn Tyr Ser Leu His Glu Arg Ala Leu Lys Glu Asp Trp Tyr Val
            500                 505                 510

Arg Ser Gly Asp Gly Val Ser Ile Tyr Glu Gly Trp Cys Trp Pro Gly
        515                 520                 525

Lys Ser His Tyr Pro Asp Phe Met Asp Pro Arg Val Gln Thr Gly Trp
    530                 535                 540

Ser Ser Cys Phe Val Pro Ser Phe Tyr His Gly Met Thr Glu His Leu
545                 550                 555                 560

His Ile Trp Val Asp Met Asn Glu Pro Ser Val Phe Asn Gly Pro Glu
                565                 570                 575

Gly Thr Phe Pro Lys Asn Val Arg His Arg Leu Gly Ala Leu Glu His
            580                 585                 590

Ser Asp Ile His Asn Ile Tyr Gly His Met Val His Arg Ala Thr Phe
        595                 600                 605

Glu Gly Leu Tyr Arg Gly Arg Gln Gly Asn Leu Arg Pro Phe Val Leu
    610                 615                 620

Ser Arg Ser Phe Phe Thr Gly Ser Gln Arg Phe Gly Ala Val Trp Thr
625                 630                 635                 640
```

```
Gly Asp Asn Ala Ala Gln Trp Ser His Leu Ala Ala Ser Val Pro Met
               645                 650                 655

Leu Leu Ser Ile Ser Val Ala Gly Ile Ala Phe Val Gly Ala Asp Val
            660                 665                 670

Gly Gly Phe Phe Gly Asn Pro Gln Ala Asp Leu Leu Thr Arg Trp Tyr
        675                 680                 685

Gln Ala Ala Ala Tyr Gln Pro Phe Phe Arg Gly His Ala His Leu Asp
    690                 695                 700

Thr Lys Arg Arg Glu Pro Trp Leu Phe Gly Glu Pro Tyr Thr Ser Leu
705                 710                 715                 720

Ile Arg Glu Ala Ile Gln Glu Arg Tyr Ala Leu Leu Pro Tyr Trp Tyr
               725                 730                 735

Val Leu Phe Ala Ala Glu Arg Thr Leu Pro Val Ile Arg Pro Leu Phe
            740                 745                 750

Tyr Val Phe Pro Asp Glu Ser Ser Leu Ala Gly Val Gln Ser Ser Trp
        755                 760                 765

Leu Leu Gly Asp Ala Leu Leu Val Ala Pro Val Leu Glu Ala Ala Pro
    770                 775                 780

Ser Thr His Arg Ile Thr Leu Pro Gly Pro Ala Ser Leu Cys Trp Tyr
785                 790                 795                 800

Pro Val Leu Pro Arg Thr Arg Arg Leu Phe Ser Gly Glu His Leu Val
               805                 810                 815

His Arg Gly Gln Asp Thr Leu Val Tyr Pro Lys Pro Ala Leu Ser Ser
            820                 825                 830
```

```
Met Tyr Val Phe Gln Arg Gly Gly Ser Ile Ile Pro Arg Trp Glu Arg
        835                 840                 845

Gln Arg Arg Ser Ser Ser Leu Met Leu Gly Asp Pro Leu Thr Leu His
    850                 855                 860

Val Ala Leu Asp Ala Gly Phe Gln Ala Arg Gly Met Leu Tyr Leu Asp
865                 870                 875                 880

Asp Gly Leu Ser Tyr Gly Tyr Gln Arg Gly Asp Tyr Cys Phe Trp Arg
                885                 890                 895

Ile Ala Ala Met Gly Gln Arg Leu Ala Asn Gly Ser Thr Ser Leu Gln
            900                 905                 910

Leu Arg Leu Thr Leu Gln Ala Leu Asp Ala Leu Pro Pro Pro Ser Asn
        915                 920                 925

Leu Ser Arg Cys Ala His Val Pro Leu Glu Arg Phe Val Phe Tyr Leu
    930                 935                 940

His Ala Gly Glu Arg Val Val Val Arg Lys Pro Thr Leu Ser Val Ser
945                 950                 955                 960

Gly Asp Val Thr Thr Trp Gln Gly Val Cys
                965                 970
```

<210> 784
<211> 945
<212> PRT
<213> Galdieria sulphuraria

<400> 784

```
Met Arg Ile Ile Pro Ser Lys Val Ala Ile Ile Ile Ile Ile Phe Phe
1               5                   10                  15
```

```
Leu Leu Tyr Ile Val Ser Arg Cys Ser Gly Ala Lys Trp Ala Asp Leu
            20                  25                  30

Cys Lys Cys Glu Glu Leu Ser Phe Cys Arg Arg Asn Arg Val Thr Asp
        35                  40                  45

Gln Thr Pro Leu Glu Gly Asn Leu Leu Phe Pro Glu Thr Arg Val Arg
    50                  55                  60

Glu Gly Ser Val Lys Ala Gln Gln Val Lys Val Lys Gly Val Val Gly
65                  70                  75                  80

Asp Ser Leu Tyr Ala Ile Leu Glu Ser Arg Val Gly Asn Val Ser Thr
                85                  90                  95

Asp Leu Val Leu Gln Val Phe Pro Leu Thr Gly Gly Ser Phe Arg Ile
            100                 105                 110

Thr Ile Ala Glu Glu Gln Ala Pro Leu Leu Arg Phe Asp Ala Lys Asp
        115                 120                 125

Ala Leu Lys Glu Pro Phe Pro Leu Gly His Phe Asp Leu Ser Pro Tyr
    130                 135                 140

His Asp Val Glu Ala Thr Leu Leu Trp Asn Glu Gly Lys Lys Leu Ile
145                 150                 155                 160

Leu Lys Tyr Val Pro Phe Glu Leu Leu Val Phe Ser Asn Asn Gln Ser
                165                 170                 175

Leu Tyr Pro Asp Ile Val Val Asn His His Arg Leu Thr Lys Leu Glu
            180                 185                 190

Val Leu Gln Asn His Ser Asn His Phe Cys Ala Ala Leu Glu Glu Thr
        195                 200                 205
```

```
His Leu Ala Asn Asp Asn Ile Ser Ile Val Glu Asn Met Ser Thr Asn
    210                 215                 220

Thr Lys Glu Asp Ser Leu Leu Gln Leu Tyr Cys Gln Asn Ala Phe Glu
225                 230                 235                 240

Glu Thr Val His Gly His Leu Asp Gln Lys Lys Arg Gly Leu Glu Ala
                245                 250                 255

Val Ser Met Asp Ile Met Phe Pro Phe Gly Gln His Leu Tyr Gly Leu
            260                 265                 270

Ala Glu Arg Ala Thr Asp Leu Ser Leu Ser Phe Thr Lys Asp Ser Leu
        275                 280                 285

Tyr Gly Ser Val Tyr Ser Glu Pro Tyr Arg Phe Tyr Asn Leu Asp Val
    290                 295                 300

Phe Glu Tyr Glu Thr Gln Lys Pro Leu Gly Leu Tyr Gly Ser Ile Pro
305                 310                 315                 320

Val Leu Tyr Thr Leu Glu Glu Lys Ser Thr Ser Gly Cys Leu Trp Leu
                325                 330                 335

Asn Ala Ala Glu Thr Phe Val Asp Ile Phe Pro Ser Asn Trp Ser Gln
            340                 345                 350

Glu Ser Ser Leu Ala Ser His Phe Ile Ser Glu Thr Gly Leu Leu Asp
        355                 360                 365

Val Val Leu Phe Pro Gly Gly Lys Thr Pro Gln Asp Val Phe Asn Gln
    370                 375                 380

Tyr Leu Leu Val Thr Gly Arg Pro Ala Met Thr Gln Arg Phe Ala Leu
385                 390                 395                 400
```

```
Gly Tyr His Gln Ser Arg Trp Asn Tyr Arg Asp Gln Met Asp Thr Leu
                405                 410                 415

Ala Val Asn Gln Arg Phe Asp Gln Phe Asn Ile Pro Cys Asp Val Ile
            420                 425                 430

Trp Leu Asp Ile Glu His Thr Asn Gly Lys Arg Tyr Phe Thr Trp Asp
        435                 440                 445

Met Glu Lys Phe Pro Asp Pro Ser Ser Leu Leu Lys Arg Ile Gly Asp
    450                 455                 460

Asn Gly Arg Lys Leu Val Thr Ile Val Asp Pro His Ile Lys Val Asp
465                 470                 475                 480

Asn Asp Tyr Phe Val Tyr Arg Glu Ala Lys Ala Asn Gln Phe Phe Ile
                485                 490                 495

Arg Lys Gln Asn Glu Glu Glu Glu Tyr Ser Gly Trp Cys Trp Ala Gly
            500                 505                 510

Leu Ser Ser Tyr Leu Asp Phe Val Ser Lys Lys Val Arg Asn Trp Trp
        515                 520                 525

Ser Thr Arg Phe Gln Phe Arg Tyr Tyr Pro His Phe Gly Asp Asn Leu
    530                 535                 540

Tyr Thr Trp Ile Asp Met Asn Glu Pro Thr Val Phe Asp Gly Pro Glu
545                 550                 555                 560

Asn Thr Ile Pro Lys Ser Val Ile His Leu Asp Gly Trp Glu His Arg
                565                 570                 575

Gln Val His Asn Met Tyr Gly Phe Tyr Met His Lys Ala Thr Tyr Asp
            580                 585                 590
```

```
Gly Leu Leu Gln Ser Arg Asn Phe Ser Asp Arg Pro Phe Val Leu Ser
        595                 600                 605

Arg Ser Phe Phe Ala Gly Ser His Arg Tyr Gly Ala Val Trp Thr Gly
    610                 615                 620

Asp Asn Gln Ala Asn Trp Glu His Leu Arg Tyr Ser Ile Pro Met Ile
625                 630                 635                 640

Leu Ser Leu Gln Ile Ser Gly Met Ile Leu Ser Gly Ala Asp Val Gly
                645                 650                 655

Gly Phe Phe Phe Asp Pro Asp Pro Glu Leu Leu Ile Arg Trp Tyr Glu
            660                 665                 670

Val Ala Ala Phe Gln Pro Phe Phe Arg Ala His Ala His Glu Asp Thr
        675                 680                 685

Arg Arg Arg Glu Pro Trp Glu Phe Asp Ala Gln Thr Thr Thr Leu Ile
    690                 695                 700

Arg Lys Ala Ile Leu Arg Arg Tyr Glu Leu Leu Pro Tyr Trp Tyr Thr
705                 710                 715                 720

Leu Phe Ala Ala Ser Ser Ser Val Asn Cys Glu Ala Asp Phe Glu Thr
                725                 730                 735

Cys Gly Pro Pro Met Arg Pro Met Phe Trp Glu Phe Ser Tyr Asp Lys
            740                 745                 750

Glu Thr Trp Lys Glu Gln Thr Glu Trp Met Ile Gly Asn Ala Leu Leu
        755                 760                 765

Val Ala Pro Ile Leu Glu Lys Asp Ser Leu Phe Arg Thr Val Tyr Leu
    770                 775                 780
```

```
Pro Pro Gly Asn Val Ser His Gln Glu Gln Trp Phe Asp Leu Phe Ser
785                 790                 795                 800


Thr Asp Ser Lys Lys Arg Ser Ile Ala Gln Arg Gly Phe Val Gln Val
                805                 810                 815


Asn Ala Pro Leu Gly Arg His Ile Val Phe Gln Arg Gly Gly Thr Ile
            820                 825                 830


Val Pro Phe Arg Asn Arg Thr Arg Arg Ser Thr Val Cys Met Glu Arg
        835                 840                 845


Asp Pro Ile Gly Leu Arg Ile Ala Leu Asp His Asp Gly Lys Ala Lys
    850                 855                 860


Gly Leu Ile Tyr Leu Asp Asp Gly Arg Ser Phe Leu Tyr Glu Ser Gly
865                 870                 875                 880


His Phe Arg Leu Ala Lys Tyr Leu Trp Asn Ser Thr Gly Thr Leu Gln
                885                 890                 895


Val Met Ile His Pro Leu Gly Asn Lys Pro Phe Val Gly Ser Asp Ile
            900                 905                 910


Ile Ile Glu Gln Ile Val Val Tyr Gly Met Lys Gln Gln Pro Lys Arg
        915                 920                 925


Ala Tyr Val Ser Ser Gln Leu Asn Asn Ala Thr Leu His Phe Ser Ser
    930                 935                 940


Thr
945
```

<210> 785
<211> 859
<212> PRT
<213> Thalassiosira pseudonana

<400> 785

```
Met Leu Gln Phe Glu Pro Phe Ala Val Tyr Phe Phe Arg Gly Asn Asp
1               5                  10                  15


Asp Ser Pro Pro Met Ile Val Ala Gly Thr Ser Gly Leu Thr His Phe
            20                  25                  30


Glu Val Arg Arg Ser Lys Glu Cys Ser Glu Ser Met Asn Asp Gly Thr
        35                  40                  45


Ser Asn Gln Arg Lys Leu Thr Glu Asp Asn Val Glu Asp Asp Val Asp
    50                  55                  60


His His Gly Gly Lys Glu Ile Val Gly Tyr Trp Glu Asp Gly Leu Ala
65                  70                  75                  80


Ile Tyr Ala Asp Gly Ser Arg Glu Glu Arg Arg Glu Asp Thr Ile Ala
                85                  90                  95


Ala Thr Glu Glu Asp Asp Glu Gly Ile Asp Lys Gly Glu Gly Arg Glu
            100                 105                 110


Gln Arg Arg Leu Asp Glu Asp Asp Tyr Asp Thr Asp Gly Met Trp Glu
        115                 120                 125


Glu Lys Phe Gly Asp His Arg Asp Ser Lys Pro His Gly Pro Met Ser
    130                 135                 140


Val Gly Met Glu Leu Thr Phe Pro Ser Ser Asn His Leu Phe Gly Leu
145                 150                 155                 160


Pro Glu His Ala Ser Ser Thr Gln Leu Lys Thr Thr Val Gly Ser Gly
                165                 170                 175


Gly His His Tyr Tyr Lys Glu Pro Tyr Arg Leu Tyr Asn Leu Asp Val
```

```
            180                 185                 190

Phe Glu Tyr Glu Leu Asp Glu Thr Met Ala Leu Tyr Gly His Ile Pro
        195                 200                 205

Leu Val Val Ser Gln Ser Glu Lys Met Gly Thr Ala Gly Ala Phe Trp
    210                 215                 220

Phe Asn Pro Thr Glu Thr Phe Val Asp Val Glu Glu Thr Pro Glu Val
225                 230                 235                 240

Ser Thr Lys Asp Val Glu Ser Arg Ala His Phe Met Ser Glu Ser Gly
                245                 250                 255

Ile Val Asp Leu Phe Leu Leu Pro Gly Pro Asp Pro Ala Glu Leu Tyr
            260                 265                 270

Ser Gln Tyr Ala Arg Leu Thr Gly Arg Met Pro Leu Pro Pro Met Phe
        275                 280                 285

Ser Leu Gly Tyr His Gln Cys Arg Trp Asn Tyr Arg Asp Glu Ala Asp
    290                 295                 300

Val Tyr Phe Val His Gly Lys Phe Glu Glu Leu Asp Tyr Pro Tyr Asp
305                 310                 315                 320

Val Leu Trp Leu Asp Ile Glu His Thr Asp Gly Lys Arg Tyr Phe Thr
                325                 330                 335

Trp Asp His Lys Leu Phe Pro Asn Pro Ala Lys Met Gln Gln Gln Leu
            340                 345                 350

Gly Ser Asp Gly Arg Arg Met Val Thr Ile Ile Asp Pro His Ile Lys
        355                 360                 365

Arg Asp Pro Asn Tyr Tyr Ile His Lys Glu Ala Thr Ser Leu Gly Leu
```

```
    370                 375                 380

Tyr Ile Lys Asp Lys Asn Gly Asp Lys Asp Tyr Asp Gly Trp Cys Trp
385                 390                 395                 400

Pro Gly Ser Ser Ser Tyr Leu Asp Phe Thr Ala Glu Lys Val Arg Asp
                405                 410                 415

Trp Trp Ala Asp Gln Phe Gln Tyr Asn Lys Tyr Lys Gly Ser Thr Pro
            420                 425                 430

Glu Leu Phe Thr Trp Asn Asp Met Asn Glu Pro Ser Val Phe Asn Gly
        435                 440                 445

Pro Glu Val Ser Met Gln Lys Asp Leu Leu Asn Leu Asn Lys Gln Glu
    450                 455                 460

His Arg Glu Trp His Asn Leu Tyr Gly Met Leu Phe His Arg Ser Thr
465                 470                 475                 480

Ser Glu Gly Leu Thr Lys Arg Asn Glu Gly Thr Asn Val Arg Pro Phe
                485                 490                 495

Val Leu Ser Arg Ser Phe Phe Ala Gly Ser Gln Arg Tyr Gly Ala Ile
            500                 505                 510

Trp Thr Gly Asp Asn Gly Ala Gln Trp Ser His Leu Glu Ile Ala Thr
        515                 520                 525

Pro Met Leu Leu Gly Leu Asn Val Gly Ala Leu Ser Phe Val Gly Ala
    530                 535                 540

Asp Val Gly Gly Phe Phe Gly Asp Pro Asp Ala Glu Leu Met Thr Arg
545                 550                 555                 560

Trp Met Gln Ala Gly Ala Tyr Gln Pro Phe Phe Arg Gly His Ala His
```

```
                565                 570                 575

His Asp Ala Lys Arg Arg Glu Pro Trp Met Phe Gly Asp Glu Thr Met
            580                 585                 590

Ile Arg Leu Arg Arg Ala Ala Met Thr Arg Tyr Ala Leu Leu Pro Tyr
        595                 600                 605

Trp Tyr Thr Val Phe Trp Gln Ala Gly Val Thr Gly Met Pro Val Met
    610                 615                 620

Arg Thr Met Trp Met Gln Tyr Pro Asn Ile Pro Ser Leu Tyr Ser Ile
625                 630                 635                 640

Asp Asn Gln Phe Leu Val Gly Ser Asp Leu Leu Val Lys Pro Val Thr
                645                 650                 655

Thr Pro Gly Ala Thr Thr Ser Glu Ile Gln Phe Pro Leu Ala Asp Ser
            660                 665                 670

Trp Tyr Asp Val Asp Thr Met Gln Arg Val Ser Val Glu Gly Lys Ala
        675                 680                 685

Asn Ser Ala Val Thr Lys Ile Val Asp Ser Gly Ile Asp Lys Ile Pro
    690                 695                 700

Val Tyr Gln Arg Gly Gly Ser Ile Ile Pro Arg Lys Leu Arg Leu Arg
705                 710                 715                 720

Arg Ser Ser Tyr Leu Met Val Asn Asp Pro Tyr Thr Leu Tyr Ile Ala
                725                 730                 735

Leu Ser Ala Asn Phe Lys Ala Glu Gly Thr Leu Tyr Met Asp Asp Glu
            740                 745                 750

Thr Thr Phe Asp His Glu Asn Arg Asp Asp Tyr Gly Val Ala Asn Phe
```

```
        755                 760                 765

Ser Ala Asp Trp Gly Asp Ala Ser Ile Ala Ile Gln Asn Ser Val Ile
    770                 775                 780

Ile Gly Ser Ser Asp Gly Leu Thr Ala Lys Ala Arg Asp Ala Arg Met
785                 790                 795                 800

Val Glu Arg Ile Val Val Met Gly Val Pro Lys Lys Pro His Ser Ile
                805                 810                 815

Glu Leu Phe Val Asp Asp Ala Ser Glu Val Ala Ala Ile Glu Phe Gln
            820                 825                 830

Tyr Asp Ala Ser Ser Glu Val Leu Val Ile Arg Lys Pro Glu Ile Ser
        835                 840                 845

Ala Leu Asp Ser Trp Thr Met Met Ile Ser Lys
    850                 855
```

<210> 786
<211> 777
<212> PRT
<213> Fragilariopsis cylindrus

<400> 786

```
Met Val Ile Asp Glu Glu Asn Lys Asp Val Asp Gln Ser Glu Lys Glu
1               5                   10                  15

Ile Val Gly Tyr Trp Glu Asp Gly Leu Ala Ile Tyr Ala Asp Gly Thr
            20                  25                  30

Arg Glu Glu Arg Lys Val Asp Lys Asn Gln Val Asp Arg Arg Gln Leu
        35                  40                  45

Ser Glu Leu Glu Leu Asp Arg Glu Gly Leu Trp Glu Glu Lys Phe Gln
    50                  55                  60
```

```
Ser His Thr Asp His Lys Pro His Gly Pro Met Ser Val Gly Ser Asp
65                  70                  75                  80

Ile Thr Phe Pro Gly Ser Lys Phe Leu Tyr Gly Leu Pro Glu His Ala
                85                  90                  95

Ser Ser Thr Val Leu Lys Asn Thr Val Gly Ser Asn Ala Glu Tyr Glu
            100                 105                 110

His Pro Tyr Arg Leu Tyr Asn Leu Asp Val Phe Glu Tyr Asp Leu Asp
        115                 120                 125

Val Pro Met Ala Leu Tyr Gly Ala Val Pro Leu Leu Val Ser Gln Ser
    130                 135                 140

Val Lys Thr Gly Thr Ser Gly Val Phe Trp Phe Asn Pro Ser Glu Thr
145                 150                 155                 160

Tyr Ile Asp Ile Asn Asp Asp Asp Ser Gly Ser Lys Thr Ser His Trp
                165                 170                 175

Met Ser Glu Ser Gly Ile Ile Asp Val Phe Phe Ile Pro Gly Pro Thr
            180                 185                 190

Pro Lys Asp Phe Tyr Arg Gln Tyr Ala Lys Leu Thr Gly Thr Thr Pro
        195                 200                 205

Leu Pro Pro Ile Phe Ser Leu Gly Tyr His Gln Cys Arg Trp Asn Tyr
    210                 215                 220

Lys Asp Glu Gln Asp Val His Gln Val His Asp Lys Phe Glu Glu Leu
225                 230                 235                 240

Asp Tyr Pro Tyr Asp Val Leu Trp Leu Asp Ile Glu His Thr Asp Gly
                245                 250                 255
```

```
Lys Arg Tyr Phe Thr Trp Asp Lys Asn Leu Phe Pro Asn Pro Lys Thr
            260                 265                 270

Met Gln Glu Lys Leu Trp Ser Gln Gly Arg Arg Met Val Thr Ile Val
        275                 280                 285

Asp Pro His Val Lys Arg Asp Asn Gly Tyr Tyr Ile His Lys Asp Ala
    290                 295                 300

Thr Ala Lys Gly Leu Tyr Ile Lys Asp Arg Asp Gly Glu Lys Asp Phe
305                 310                 315                 320

Asp Gly Trp Cys Trp Pro Gly Ser Ser Ser Tyr Leu Asp Phe Thr Asp
                325                 330                 335

Glu Lys Ala Arg Ser Trp Trp Ala Asp Gln Phe Ala Tyr Asp Arg Tyr
            340                 345                 350

His Gly Ser Thr Pro Thr Leu Tyr Thr Trp Asn Asp Met Asn Glu Pro
        355                 360                 365

Ser Val Phe Asn Gly Pro Glu Ile Thr Met Gln Lys Asp Leu Leu Asn
    370                 375                 380

Leu His Gly Asp Glu His Arg Glu Trp His Asn Leu Tyr Gly Met Leu
385                 390                 395                 400

Phe Gln Arg Ser Thr Met Glu Gly Leu Ile Arg Arg Asn Lys Glu Glu
                405                 410                 415

Asn Ile Arg Pro Phe Val Leu Ser Arg Ser Phe Phe Ala Gly Ser Gln
            420                 425                 430

Lys Tyr Gly Ser Ile Trp Thr Gly Asp Asn Ala Ala Glu Trp Ser His
        435                 440                 445
```

```
Leu Glu Ile Ala Ala Pro Met Leu Leu Ser Leu Asn Val Gly Ala Leu
    450                 455                 460

Ser Phe Val Gly Ala Asp Val Gly Gly Phe Phe Gly Asn Thr Asp Ala
465                 470                 475                 480

Glu Leu Met Thr Arg Trp Met Gln Ala Gly Ala Tyr Gln Pro Phe Phe
                485                 490                 495

Arg Gly His Ala His His Asp Ala Lys Arg Arg Glu Pro Trp Met Phe
            500                 505                 510

Gly Asp Glu Thr Met Val Arg Leu Arg Lys Ala Ser Met Ala Arg Tyr
        515                 520                 525

Ala Leu Leu Pro Phe Trp Tyr Thr Val Phe His Glu Ala Ser Ile Thr
    530                 535                 540

Gly Met Pro Val Met Arg Thr Met Trp Met Gln Tyr Pro Gln Ile Glu
545                 550                 555                 560

Ser Leu Tyr Ser Ile Asp Asp Gln Tyr Ile Ile Gly Ser Asp Leu Leu
                565                 570                 575

Val Lys Pro Val Thr Ala Pro Gly Val Thr Asp Ser Val Val Lys Phe
            580                 585                 590

Pro Gly Asp Asn Val Trp Tyr Asp Ala Glu Ser Leu Val Leu Val Ser
        595                 600                 605

Lys Arg Gly Lys Glu Gly Thr Val Gln Glu Ile Thr Val Pro Ser Asp
    610                 615                 620

Ile Asp Thr Val Pro Val Phe Gln Arg Gly Gly Ser Val Ile Pro Arg
625                 630                 635                 640
```

```
Lys Leu Arg Leu Arg Arg Ser Ser His Thr Met Thr Arg Asp Pro Tyr
                645                 650                 655

Thr Leu Tyr Val Ala Leu Asp Thr Asp Gly Ser Ala Ser Gly Glu Leu
            660                 665                 670

Tyr Met Asp Asp Glu Asn Thr Phe Asn Tyr Val Asn Lys Asn Glu Phe
        675                 680                 685

Ala Ser Ala Lys Phe Thr Val Glu Ile Gly Gly Lys Tyr Gly Tyr Ile
    690                 695                 700

Arg Asn Ser Ala Thr Val Gly Glu Gly Trp Lys Gly Ile Ser Glu Glu
705                 710                 715                 720

Thr Asn Lys Met Ile Glu Arg Ile Ile Val Met Gly Val Glu Lys His
                725                 730                 735

Pro Gln Ser Val Asp Glu Val Gly Glu Ser Leu Gly Phe Thr His Asp
            740                 745                 750

Ser Asn Ala His Val Leu Val Ile Arg Lys Pro Glu Leu Ser Ala Leu
        755                 760                 765

Val Asp Trp Glu Val Lys Ile Thr Phe
    770                 775
```

<210> 787
<211> 976
<212> PRT
<213> Aureococcus anophagefferens

<400> 787

```
Met Arg Ser Leu Leu Arg Leu Ala Leu Leu Gly Val Ala Cys Arg Ala
1               5                   10                  15
```

```
Val Asp Lys Ser Lys Phe Arg Thr Cys Gln Asp Thr Arg Phe Cys Arg
            20                  25                  30

Val His Ala Arg Pro Ala Ala Pro Pro Pro Thr Tyr Ala Val Asn Asp
        35                  40                  45

Ala Ser Val Ala Met Ala Asp Gly Ala Leu Arg Phe Glu Val Ser Glu
    50                  55                  60

Gly Thr Leu Ala Pro Leu Val Val Thr Val Leu Pro His Ala Asp Ala
65                  70                  75                  80

Gly Val Val Asn Val Arg Val Thr Glu Ala Gly Val Ser Arg Trp Glu
                85                  90                  95

Pro Asp Asp Val Leu Leu Gly Pro Phe Ala Leu Asp Gly Asp Ala Lys
            100                 105                 110

Leu Ser Lys Thr Pro Ala Gly Ala Thr Leu Thr Leu Gly Gly Gly Gly
        115                 120                 125

Ala Val Ala Val Thr Tyr Ala Pro Phe Thr Leu Ser Leu Gly Pro Ala
    130                 135                 140

Gly Gly Asp Pro Leu Ile Val Val Asn Gly Lys Asp Leu Leu His Tyr
145                 150                 155                 160

Glu Arg Gly Arg Ala Ala Ala Ala Ala Ala Pro Ser Leu Gly Asp Pro
                165                 170                 175

Ser Gly Gly Asp Ala Asp Ser His Gly Cys Glu Asp Gly Phe Ala Trp
            180                 185                 190

Asn Gly Glu Arg Cys Leu Glu Ile Ala Gly Tyr Trp Glu Asp Gly Leu
        195                 200                 205
```

```
Ala Arg Phe Ala Asp Gly Thr Lys Glu Val Lys Thr Tyr Lys Ala Ala
    210                 215                 220


Glu Val Ala Lys Asp Asp Gly Asp Phe Ser Glu Thr Phe Ser Gly His
225                 230                 235                 240


Thr Asp Asp Val Pro Asn Gly Pro Met Ser Val Gly Val Asp Val Ser
                245                 250                 255


Phe Pro Gly Ser Lys Ala Leu Phe Gly Leu Ala Glu His Ala Ser Gln
            260                 265                 270


Phe Ala Leu Lys Lys Thr Thr Gly Gly Gly Gly Tyr Asp Glu Pro Phe
        275                 280                 285


Arg Phe Tyr Asn Leu Asp Val Phe Glu Tyr Asp Leu Asp Val Pro Met
    290                 295                 300


Ala Leu Tyr Gly Thr Ile Pro Leu Ala Trp Ala Val Ala Pro Gly Arg
305                 310                 315                 320


Glu Lys His Ser Thr Val Gly Val Phe Tyr Asp Asn Pro Thr Glu Thr
                325                 330                 335


Tyr Val Asp Val Gly Ala Gly Pro Asp Asp Thr Asn Trp Asp Leu His
            340                 345                 350


Phe Val Ser Glu Ser Gly Val Leu Ser Leu Phe Leu Ile Leu Pro Glu
        355                 360                 365


Thr Pro Leu Asp Gly Phe Ala Lys Tyr Ala Ala Leu Thr Gly Ala Gln
    370                 375                 380


Glu Leu Pro Pro Leu Phe Ala Leu Gly Tyr His Gln Cys Arg Trp Asn
385                 390                 395                 400
```

```
Tyr Lys Asp Glu Lys Asp Val Ala Ala Val His Gly Gln Phe Glu Ala
                405                 410                 415

Leu Asp Ile Pro Tyr Asp Val Leu Trp Leu Asp Ile Glu His Thr Asp
            420                 425                 430

Gly Lys Arg Tyr Phe Thr Trp Asp Ala Asn Leu Phe Pro Asp Pro Ala
        435                 440                 445

Thr Met Gln Asp Thr Leu Ala Lys Thr Gly Arg Lys Met Val Thr Ile
    450                 455                 460

Val Asp Pro His Ile Lys Arg Asp Asn Asn Tyr Asp Val His Lys Lys
465                 470                 475                 480

Ala Thr Asp Ala Gly Leu Tyr Val Lys Glu Arg Lys His Gly Glu Leu
                485                 490                 495

Lys Asp Phe Glu Gly Trp Cys Trp Pro Gly Ser Ser Ser Tyr Leu Asp
            500                 505                 510

Phe Thr Ala Ala His Val Arg Gln Trp Trp Ala Glu Arg Phe Ser Leu
        515                 520                 525

Ala Asn Tyr Gly Gly Ser Thr Ala Asn Leu Tyr Thr Trp Asn Asp Met
    530                 535                 540

Asn Glu Pro Ser Val Phe Asn Gly Pro Glu Val Thr Met Ala Lys Thr
545                 550                 555                 560

Leu Val Asn Leu Gly Gly Val Glu His Arg Glu Trp His Asn Leu Tyr
                565                 570                 575

Gly Met Tyr Phe His Arg Ala Thr Ala Glu Gly Leu Met Leu Arg Asp
            580                 585                 590
```

```
Ser Lys Glu Asn Lys Arg Pro Phe Val Leu Ser Arg Ala Phe Tyr Ala
        595                 600                 605

Gly Ser Gln Arg Trp Gly Ala Ile Trp Thr Gly Asp Asn Ala Ala Arg
    610                 615                 620

Trp Asp His Leu Lys Val Ala Ser Gln Met Leu Leu Ser Ile Ser Val
625                 630                 635                 640

Cys Gly Leu Ser Phe Ala Gly Ala Asp Ala Gly Gly Phe Phe Gly Asp
                645                 650                 655

Pro Asp Pro Glu Leu Met Val Arg Trp Ile Gln Ala Ala Ala Tyr Thr
            660                 665                 670

Pro Phe Phe Arg Gly His Ala His His Asp Ala Lys Arg Arg Glu Pro
        675                 680                 685

Trp Ser Phe Gly Glu Pro His Thr Ala Arg Met Arg Gly Ala Ile Ala
    690                 695                 700

Asp Arg Tyr Ala Leu Leu Pro Tyr Trp Tyr Thr Thr Phe Ala Ala Ala
705                 710                 715                 720

Arg Phe Ala Gly Leu Pro Val Met Arg Pro Leu Trp Ala His His Ala
                725                 730                 735

His Asp Ala Asp Ala Leu Leu Val Gly Asp Ala Trp Leu Val Gly Glu
            740                 745                 750

Asp Leu Leu Val Lys Pro Ala Thr Asp Ala Gly Val Ser Thr Val Asp
        755                 760                 765

Val Tyr Leu Pro Lys Gly Thr Thr Trp Phe Glu Thr His Thr Ala Ala
    770                 775                 780
```

```
Met Thr Lys Arg Ser Gly Gly Val Leu Ala Lys Gly Val Pro Ala Pro
785                 790                 795                 800

Leu Asp Gly Thr Ala Pro Ala Leu Gln Arg Gly Gly Ser Ile Ile Pro
                805                 810                 815

Arg Gln Arg Arg Leu Arg Arg Ser Thr Ala Ala Met Arg Ser Asp Pro
            820                 825                 830

Tyr Glu Leu Thr Val Ala Leu Asp Asp Ala Gly Glu Ala Ser Gly Ser
        835                 840                 845

Leu Tyr Leu Asp Asp Phe Glu Thr Phe Gly Phe Thr Gly Gly Ala Phe
    850                 855                 860

His Lys Ser Val Phe Thr Phe Ala Gly Gly Lys Leu Ser Ala Asn Ala
865                 870                 875                 880

Gly Asn Asp Cys Asp Ala Arg Ala Ala Ala Leu Gly Ile Ala Ala Asp
                885                 890                 895

Ala Gly Ser Phe Ala Pro Thr Asn Val Val Glu Arg Val Val Val Leu
            900                 905                 910

Gly Leu Ala Ala Pro Pro Thr Ala Val Ser Gln Ser Arg Ala Val Ala
        915                 920                 925

Ala Asp Asp Asp Ala Ala Ala Thr Leu Pro Ser Ala Cys Met Leu Arg
    930                 935                 940

Arg Ala Met Lys Pro Ser Asn Glu Ser Lys Gly Gly Leu Arg Gly Ser
945                 950                 955                 960

Val Ser Ser Gly Ile Lys Arg Leu Trp Arg Ser Ile Pro Ala Ala Arg
                965                 970                 975
```

<210> 788
<211> 1006
<212> PRT
<213> Nannochloropsis gaditana

<400> 788

```
Met Ala Ser Met Gly Trp Phe Arg Ala Pro Phe Ala Ser Arg Pro Ser
1               5                   10                  15


Phe Pro Lys Ser Asp Ala Ser Leu Leu Ser Ser Pro Val Arg Lys Ser
            20                  25                  30


Thr Ser Arg Asn Val Leu Ala Leu Gly Arg Leu Thr Thr Ala Phe Val
        35                  40                  45


Met Ile Ser Ser Val Cys Gln Arg Thr Thr Thr Val Ala Val Asp Arg
    50                  55                  60


Ser Lys Phe Arg Lys Cys Ala Asp Thr Gly Phe Cys Lys Glu Phe Arg
65                  70                  75                  80


Asp Val Val Pro Gly Ala Leu Pro Arg Phe Arg Val Asp Ala Ala Ser
                85                  90                  95


Leu Lys His Asp Glu His Ala Gly Phe Leu Gly Gly Gln Leu Leu Ser
            100                 105                 110


Ser Asp Ala Asn Ala Lys Ala Leu Asn Phe Ser Leu Gln Phe Tyr Asn
        115                 120                 125


Asp Gly Thr Ser Arg Leu Lys Ile Lys Glu Cys Asp Pro Leu Arg Glu
    130                 135                 140


Arg Trp Glu Pro Pro Asp Val Val Ile Glu Glu Ser Leu Asp Pro Thr
145                 150                 155                 160
```

```
Ala Ile Arg Val Asp Thr Ser Lys Ser Asp Gly Ser Leu His Val Glu
               165                 170                 175

Phe Ala Asn Asp Lys Leu Leu Arg Val Gln Leu Asp Pro Phe Gln Val
            180                 185                 190

Asp Leu Leu Val Gly Gly Val Pro Ala Leu Thr Val Asn Lys Gly Gly
        195                 200                 205

Leu Leu His Phe Gln Ala Tyr Arg Ala Lys Lys Asp Lys Ala Asn Ala
    210                 215                 220

Gly Ser Gly Gly Glu Glu Ser Gly Gln Lys Ile Glu Glu Glu Val Val
225                 230                 235                 240

Asp Lys His Gly Gly Lys Lys Ile Val Gly Tyr Trp Glu Asp Gly Leu
               245                 250                 255

Ala Ile Tyr Glu Asp Gly Ser Arg Glu Glu Lys Pro Ser Ala Glu Glu
            260                 265                 270

Glu Ala Ala Glu Ala Arg Arg Leu Gln Glu Ala Ala Ala Ala Asp Glu
        275                 280                 285

Asp Lys Trp Glu Glu Tyr Phe Gly Gly His Thr Asp Ser Arg Pro His
    290                 295                 300

Gly Pro Ala Ser Val Gly Ile Asp Val Arg Phe Pro Gly Ala Glu His
305                 310                 315                 320

Leu Tyr Gly Leu Pro Glu His Ala Ser Ser Phe Arg Leu Lys Thr Thr
               325                 330                 335

Lys Gly Pro Asn Ala Gln Tyr Ala Glu Pro Phe Arg Leu Tyr Asn Leu
            340                 345                 350
```

```
Asp Val Phe Glu Tyr Glu Leu Asp Glu Pro Met Ala Leu Tyr Gly Ser
        355                 360                 365

Ile Pro Phe Val Ala Ser His Thr Ala Ala Leu Ser Ala Gly Val Phe
    370                 375                 380

Leu Phe Asn Pro Ser Glu Thr Phe Val Asp Val Glu Ala Gly Ser Gly
385                 390                 395                 400

His Gly Asp Gly Tyr Gln Thr His Trp Met Ser Glu Cys Gly Val Leu
                405                 410                 415

Asp Leu Phe Leu Leu Pro Gly Pro Thr Pro Arg Ala Val Ala Lys Gln
            420                 425                 430

Met Thr Ala Leu Thr Gly Thr Gln Ala Leu Pro Pro Leu Phe Ser Leu
        435                 440                 445

Gly Tyr His Gln Cys Arg Trp Asn Tyr Lys Asp Glu Lys Asp Val Ala
    450                 455                 460

Gln Val His Gly Lys Phe Glu Glu Leu Asp Phe Pro Tyr Asp Val Leu
465                 470                 475                 480

Trp Leu Asp Ile Glu His Thr Asp Gly Lys Arg Tyr Phe Thr Trp Asp
                485                 490                 495

Gln Gly Val Phe Pro Asp Pro Val Ser Met Gln Asp Ser Leu Ala Ala
            500                 505                 510

Gln Gly Arg Lys Met Val Thr Ile Ile Asp Pro His Ile Lys Arg Asp
        515                 520                 525

Asp Asn Phe Ala Ile His Ser Glu Ala Thr Ala Lys Gly Leu Tyr Val
    530                 535                 540
```

```
Lys Asp Lys Phe Gly Ala Asp Phe Asp Gly Phe Cys Trp Pro Gly Gln
545                 550                 555                 560


Ser Ser Tyr Leu Asp Phe Thr Asp Ala Gly Val Arg Arg Trp Trp Ala
                565                 570                 575


Glu Arg Phe Ala Leu Asp Lys Tyr Thr Gly Ser Thr Ser Asn Leu Tyr
            580                 585                 590


Thr Trp Asn Asp Met Asn Glu Pro Ser Val Phe Asn Gly Pro Glu Val
        595                 600                 605


Ser Met Gln Lys Asp Cys Arg Asn Leu Ala Gly Val Glu His Arg Glu
    610                 615                 620


Trp His Asn Leu Tyr Gly Met Tyr Met Gln Arg Ala Thr Ala Glu Gly
625                 630                 635                 640


Leu Thr Leu Arg Asp Pro Lys Gly Leu Glu Arg Pro Phe Val Leu Ser
                645                 650                 655


Arg Ala Phe Tyr Ala Gly Ser Gln Arg Phe Gly Ala Ile Trp Thr Gly
            660                 665                 670


Asp Asn Lys Ala Ala Trp Glu His Leu Gln Val Ala Ala Pro Met Leu
        675                 680                 685


Leu Ser Ile Asn Leu Ala Gly Leu Ser Phe Ser Gly Ala Asp Val Gly
    690                 695                 700


Gly Phe Phe Gln Asp Thr Asp Ala Glu Leu Met Thr Arg Trp Met Gln
705                 710                 715                 720


Ala Gly Ala Phe Gln Pro Phe Phe Arg Gly His Ala His His Asp Thr
                725                 730                 735
```

```
Lys Arg Lys Glu Pro Trp Val Tyr Gly Glu Pro Thr Thr Ser Arg Ile
            740                 745                 750

Arg Ala Ala Val Met Ala Arg Tyr Thr Leu Leu Pro Tyr Trp Tyr Thr
        755                 760                 765

Thr Phe Tyr Ile Ala Tyr Ala Glu Gly Leu Pro Val Met Arg Pro Leu
    770                 775                 780

Trp Met Glu Tyr Pro Thr Glu Lys Ala Thr Phe Asp Met Asp Asp Gln
785                 790                 795                 800

Trp Leu Ile Gly Gln Asp Leu Leu Val Lys Pro Val Thr Thr Ala Gly
                805                 810                 815

Ala Thr Ser Leu Ser Val Tyr Phe Pro Gln Gly Leu Trp Tyr Asp Ile
            820                 825                 830

Glu Thr Leu Ser Ser Ile Ser Gly Pro Ala Thr Arg Thr Val Pro Ala
        835                 840                 845

Pro Leu Glu Lys Ile Pro Val Tyr Gln Arg Gly Gly Ser Ile Ile Pro
    850                 855                 860

Arg Lys Met Arg Leu Arg Arg Ser Ser Ser Leu Met Thr His Asp Pro
865                 870                 875                 880

Phe Thr Leu Val Val Ala Met Asn Ala Lys Gly Leu Ala Glu Gly Leu
                885                 890                 895

Val Tyr Met Asp Asp Glu His Thr Leu Lys His Glu Lys Ala Gly Glu
            900                 905                 910

Phe Val Leu Arg Lys Val Thr Leu Ala Asp Gly Met Leu Arg Asn Val
        915                 920                 925
```

```
Arg Gln Gly Gly Ala Glu Asp Arg Pro Phe Arg Asn Gln Val Glu Arg
    930                 935                 940

Ile Val Val Leu Gly Trp Lys Ala Lys Pro Lys Ala Val Thr Leu Ser
945                 950                 955                 960

Val Ser Glu Gln Gly Gly Ala Glu Lys Gln Ala Thr Thr Gln Arg Ser
                965                 970                 975

Leu Glu Phe Met Tyr Asp Ala Lys Lys Arg Val Leu Thr Ile Arg Lys
            980                 985                 990

Pro Glu Val Met Leu Asp Glu Asp  Trp Thr Ile Gly Leu  Arg
        995                 1000                 1005
```

<210> 789
<211> 713
<212> PRT
<213> Emiliania huxleyi

<400> 789

```
Met Asp Met Arg Phe Gly Gly Thr Gln His Leu Phe Gly Leu Ala Glu
1               5                   10                  15

His Thr Ala Pro Phe Asn Leu Pro Ser Thr Ser Gly Asp Gly Ala Lys
            20                  25                  30

Tyr Ala Glu Pro Tyr Arg Leu Trp Thr Leu Asp Val Tyr Asp Tyr Glu
        35                  40                  45

Leu Asp Ser Pro Met Ala Leu Tyr Gly Gly Val Pro Leu Leu Leu Ala
    50                  55                  60

His Ala Pro Asn Arg Thr Thr Gly Ala Leu Ser Leu Ser Arg Ser Cys
65                  70                  75                  80

Cys Ser His Leu Leu Pro Leu Ser His Trp Leu Glu Ala Ala Ala Pro
```

```
                85                  90                  95

Ser Pro Leu Thr Leu Arg Gly Ala Leu Pro Gln Ala Arg Ser Glu Arg
            100                 105                 110

Gly Ser Thr Ser Ala Tyr Trp Met Ser Glu Ser Gly Val Val Asp Val
        115                 120                 125

Phe Leu Leu Pro Gly Pro Ser Pro Gln Glu Leu Phe Ala Gln Tyr Ala
    130                 135                 140

Ser Leu Thr Gly Tyr Thr Pro Leu Pro Pro Leu Phe Ser Leu Gly Tyr
145                 150                 155                 160

His Gln Cys Arg Trp Asn Tyr Asn Asp Glu Ala Asp Val Arg Tyr Val
                165                 170                 175

His Gly Gln Phe Glu Glu Leu Asp Leu Pro Tyr Asp Val Leu Trp Leu
            180                 185                 190

Asp Ile Glu His Thr Asp Gly Lys Arg Tyr Phe Thr Trp Asp Ser Phe
        195                 200                 205

Lys Phe Pro Lys Pro Lys Glu Met Gln Ala Glu Leu Ala Ala Thr Gly
    210                 215                 220

Arg Lys Met Val Thr Ile Val Asp Pro His Ile Lys Arg Asp Ser Asn
225                 230                 235                 240

Tyr Lys Val Tyr Gln Glu Ala His Glu Lys Lys Leu Phe Ile Gln Asn
                245                 250                 255

Lys Asp Gly Ala Glu Phe Asn Gly Trp Cys Trp Pro Gly Asp Ser Ala
            260                 265                 270

Tyr Leu Asp Phe Thr Ser Ala Ala Val Arg Asp Trp Trp Ala Gly Arg
```

```
        275                 280                 285

Phe Ala Tyr Asp Val Tyr Glu Gly Ser Thr Pro Ser Leu Tyr Thr Trp
    290                 295                 300

Asn Asp Met Asn Glu Pro Ser Val Phe Asn Gly Pro Glu Val Ser Met
305                 310                 315                 320

Gln Lys Asp Ala Lys Ser Leu Ser Gly Val Glu His Arg Glu Trp His
                325                 330                 335

Asn Leu Tyr Gly Met Tyr Met Gln Arg Ala Thr Ala Glu Gly Leu Leu
            340                 345                 350

Gln Arg Asn Glu Lys Arg Asp Lys Arg Pro Phe Val Leu Ser Arg Ser
        355                 360                 365

Phe Tyr Ala Gly Ser Gln Arg Trp Gly Ala Ile Trp Thr Gly Asp Asn
    370                 375                 380

Ala Cys Lys Trp Asp His Leu Val Ala Ser Val Pro Met Leu Leu Thr
385                 390                 395                 400

Leu Gly Leu Cys Gly Ile Thr Phe Ser Gly Ala Asp Val Gly Gly Phe
                405                 410                 415

Leu Gly Lys Gly Gly Gly Tyr Gly Asp Pro Asp Ala Glu Leu Phe Thr
            420                 425                 430

Arg Trp Phe Glu Ala Gly Ala Tyr Thr Pro Phe Phe Arg Gly His Ala
        435                 440                 445

His His Asp Ser Ala Arg Arg Glu Pro Trp Thr Phe Gly Asp Glu Thr
    450                 455                 460

Thr Gln Thr Leu Arg Glu Val Ala Lys Glu Arg Tyr Gln Leu Leu Ala
```

```
465                 470                 475                 480

Tyr Trp Tyr Thr Val Phe Arg His Ala Glu Gln Thr Gly Thr Pro Thr
                485                 490                 495

Met Arg Pro Leu Trp Val His Tyr Pro Ala Asp Glu Lys Thr Trp Asp
            500                 505                 510

Met Ser Asp Gln Trp Leu Val Gly Ser Asp Leu Leu Val Arg Pro Val
        515                 520                 525

Thr Gln Gln Gly Ala Thr Ser Ala Pro Val Tyr Leu Pro Gly Ser Gln
    530                 535                 540

Pro Trp Tyr Ala Val Arg Asp Gly Thr Lys His Ala Ala Pro Ala Thr
545                 550                 555                 560

Pro Thr Val Glu Ala Pro Leu Gly Ala Val Pro Val Phe Gln Arg Gly
                565                 570                 575

Gly Ser Ile Leu Pro Arg Gln Met Arg Leu Arg Arg Ala Ser Ser Leu
            580                 585                 590

Met Lys Leu Asp Pro Tyr Thr Leu Val Val Ala Pro Asp Ala Asp Gly
        595                 600                 605

Ala Ala Ala Gly Thr Leu Tyr Leu Asp Ala Gly Asp Gly Phe Glu Tyr
    610                 615                 620

Leu Asp Gly Ala Tyr Ala Glu Arg Arg Tyr Glu Leu Ala Ala Gly Val
625                 630                 635                 640

Leu Thr Ser Thr Ala Val His Ala Ser Asp Ala Phe Thr Pro Pro Asn
                645                 650                 655

Met Leu Glu Arg Leu Glu Leu Leu Gly Thr Lys Pro Pro Gly Lys Val
```

660 665 670

Leu Leu Glu Ser Gly Gly Glu Thr Arg Glu Leu Glu Ala Thr Trp Ser
675 680 685

Glu Ala Thr Gly Arg Thr Val Val Arg Lys Pro Gly Val Pro Met Ala
690 695 700

Ala Asp Trp Thr Ile Arg Leu Val Ala
705 710

<210> 790
<211> 843
<212> PRT
<213> Guillardia theta

<400> 790

Met Ala Phe Lys Glu Glu Glu Phe Arg Tyr Cys Lys Asp Ser Ser Phe
1 5 10 15

Cys Arg Arg Gln Arg Lys Phe Asp Gly Gln Asp Asp Arg Ala Thr Tyr
20 25 30

Lys Leu His Asn Ala His Leu Glu Asp Asn Gly Val Val Ala Glu Met
35 40 45

Lys Asn Ala Leu Asn Pro Asn Gln Pro Leu Lys Leu Arg Ala Thr Ile
50 55 60

Tyr Lys Ser Gly Ile Phe Arg Ile Glu Ile Asp Glu Ala Ser Ser Ala
65 70 75 80

Lys Pro Arg Tyr Arg Val Lys Asp Val Leu Val Gly Asp Ile Ser Gln
85 90 95

His Ser Ser Ser Glu Gly Ala Met Glu Asp Ile Thr Gly Glu Asn Asp
100 105 110

```
Gly Leu Trp Glu Glu Ser Phe Lys Gly His Ser Asp Ser Lys Pro Asn
        115                 120                 125

Gly Pro Glu Ser Ile Gly Val Asp Phe Asp Phe Met Gly Ala Lys His
    130                 135                 140

Val Tyr Gly Leu Pro Glu Arg Gly Ser Arg Leu Met Leu Gly Asn Thr
145                 150                 155                 160

Arg Gly Glu Gly Ala Ala Arg Asp Glu Pro Tyr Arg Leu Tyr Asn Leu
                165                 170                 175

Asp Val Phe Glu Tyr Glu Pro Leu Tyr Gly Ala Val Pro Ile Leu Tyr
            180                 185                 190

Ser His Arg Pro Asn Phe Ser Ser Ala Leu Phe Trp Leu Asn Ala Ala
        195                 200                 205

Glu Thr Met Val Asp Val Glu Asp Gly Pro Asp Met Lys Arg Thr His
    210                 215                 220

Trp Phe Ser Glu Ser Gly Val Ile Asp Val Phe Leu Leu Ser Ser Asp
225                 230                 235                 240

Thr Pro Lys Gly Val Gln Met Gln Phe Ala Ser Leu Val Gly Thr Gln
                245                 250                 255

Phe Met Pro Pro Met Phe Ser Leu Gly Tyr His Gln Cys Arg Trp Asn
            260                 265                 270

Tyr Lys Asp Asp Ala Asp Val Arg Met Val Asp Ser Lys Phe Asp Glu
        275                 280                 285

Tyr Asp Ile Pro Tyr Asp Val Leu Trp Leu Asp Ile Glu His Thr Val
    290                 295                 300
```

```
Gly Lys Arg Tyr Leu Thr Trp Asp Lys His Leu Phe Pro Asp Pro Glu
305                 310                 315                 320

Gly Leu Gln His Asp Leu Ala Ser Arg Gly Arg Lys Met Val Thr Ile
                325                 330                 335

Ile Asp Pro His Leu Lys Val Asp Met Gly Tyr Ser Val Tyr Ala Glu
            340                 345                 350

Ala Lys Arg Leu Gly Phe Phe Cys Lys Asn Lys Asp Gly Gly Asp Phe
        355                 360                 365

Glu Gly His Cys Trp Pro Gly Thr Ser Ser Trp Leu Asp Tyr Leu Asn
    370                 375                 380

Pro Glu Val Arg Asp Tyr Trp Ala Ser Arg Phe Leu Pro Ala Asn Tyr
385                 390                 395                 400

Val Gly Ser Thr Glu His Leu Tyr Thr Trp Asn Asp Met Asn Glu Pro
                405                 410                 415

Ser Val Phe Asn Gly Pro Glu Ile Thr Met Pro Lys Asp Leu Leu His
            420                 425                 430

Tyr Gly Asn Val Glu His Arg Asp Val His Asn Leu Tyr Gly Phe Tyr
        435                 440                 445

Met Thr Met Ala Thr Val Ala Gly His Lys Leu Leu Arg Pro Gly Arg
    450                 455                 460

Arg Pro Phe Ile Leu Ser Arg Ala Phe Phe Ala Gly Ser Gln Arg Tyr
465                 470                 475                 480

Ala Ala Val Trp Thr Gly Asp Asn Gly Ala Arg Trp Asp His Leu Ala
                485                 490                 495
```

```
Ser Ala Thr Pro Met Leu Leu Gln Leu Ser Leu Gly Gly Ile His Phe
            500                 505                 510

Cys Gly Ala Asp Val Gly Gly Phe Phe Gly Asn Pro Glu Pro Glu Leu
        515                 520                 525

Leu Val Arg Trp Tyr Gln Ala Ala Ala Tyr Thr Pro Phe Phe Arg Gly
    530                 535                 540

His Ala His Ile Asp Thr Gln Arg Arg Glu Pro Trp Leu Phe Gly Asp
545                 550                 555                 560

Val Val Met Gly Gln Ile Arg Ala Ala Ile Arg Ala Arg Tyr Leu Val
                565                 570                 575

Leu Pro Tyr Leu Tyr Thr Leu Phe His Met Ala His Thr Gln Gly Leu
            580                 585                 590

Pro Ile Met Arg Pro Leu Trp Met Glu Phe Pro Gly Asp Glu Val Thr
        595                 600                 605

Ile Ala Met Asp Asp Glu Phe Met Leu Gly Glu Ala Leu Leu Val Lys
    610                 615                 620

Pro Val Val Ser Ala Asn Thr Arg Ser Ser Asn Val Tyr Leu Pro Ser
625                 630                 635                 640

Asp Lys Asp Asp Ile Trp Tyr Pro Phe Arg Asn Gly Gln Thr Pro Lys
                645                 650                 655

Glu Gln Gly Val Phe Thr Ser Leu Trp Ser Arg Phe Arg Gly Gln Thr
            660                 665                 670

Gly Ser Leu Arg Gly Gln Ala Gln Ala Gly Gly Lys Thr Ile Ser Val
        675                 680                 685
```

```
Asp Ser Gly Val Glu Gln Gly Ile Pro Val Phe Gln Arg Gly Gly Thr
    690                 695                 700

Ile Ile Pro Thr Arg Glu Arg Ala Arg Arg Ser Thr Ser Ala Met Arg
705                 710                 715                 720

Ala Asp Pro Phe Thr Leu His Val Ala Leu Asn Val Arg Glu Glu Ala
                725                 730                 735

Ser Gly Ser Leu Tyr Leu Asp Asp Gly Asp Thr Asp Glu His Thr Ala
            740                 745                 750

Gly Gly Phe Phe Leu Phe Gly Leu Lys Phe Gln Ser Asn Gln Leu Glu
        755                 760                 765

Tyr Arg Gln Thr Glu Gly Ser Gly Phe Lys Phe Ser His Pro Pro Pro
    770                 775                 780

Ala Leu Glu Arg Val Ile Val Tyr Gly Ile Thr Lys Gln Pro Ala Arg
785                 790                 795                 800

Val Thr Leu Lys Arg Lys Asn Gly Gly Gly Ser Glu Leu Glu Phe Ile
                805                 810                 815

Tyr Asp Lys Glu Ser Ala Met Leu Ile Val Arg Lys Pro Asn Val Pro
            820                 825                 830

Met Asn Glu Glu Trp Ser Ile Ser Phe Ala Lys
        835                 840
```

<210> 791
<211> 802
<212> PRT
<213> Phaeodactylum tricornutum

<400> 791

```
Met Thr Arg Phe Ser Trp Ser Arg Leu Val Met Val Val Val Leu Ala
1               5                   10                  15

Ala Ser Gly Ser Val Arg Ile Gln Ala Thr Pro Ala Thr Val Ala Glu
            20                  25                  30

Cys Pro Ala Gly Phe Gly Ser Glu Thr Met Val Arg Leu Leu Pro Ser
        35                  40                  45

Gln Ile Asn Asp Gly Tyr Cys Asp Cys Pro Thr Thr Gly Gln Asp Glu
    50                  55                  60

Pro Lys Thr Gln Ala Cys Ser Gly Gln Asp Ala Trp Pro Gly Gln Pro
65                  70                  75                  80

Tyr Glu Pro Asp Ser Thr Lys Ser His Arg Asp Pro Leu Val Phe Val
                85                  90                  95

Cys Pro Asn Gln Ser Asn Leu Ser Ile Pro Pro Ser Arg Val Asp Asp
            100                 105                 110

Gly Ile Cys Asp Cys Cys Asp Gly Ala Asp Glu Arg Pro Gly Thr Cys
        115                 120                 125

Glu Asp Asn Cys Glu Ser Leu Arg Gln Ala Glu Arg Gln Val Arg Gln
    130                 135                 140

Val Trp Gln Asp Ala Tyr Thr Ala Gly Ser Ser Arg Arg Ala Met Glu
145                 150                 155                 160

Leu Thr Thr Phe Ala Asn Val Arg Ala Glu Thr Leu His Asn Leu Arg
                165                 170                 175

Leu Ala Glu Ser Asp Val Tyr Phe Leu Glu Gln Glu Gln Ser Gln Thr
            180                 185                 190
```

```
Gln Gln Glu Leu Glu Glu Ala Lys Ile Lys Ala Trp Lys Ser Arg Gln
        195                 200                 205

His Val His Ser Leu Ala Leu Ala Asn Leu Leu Thr Ala Glu Pro Gly
    210                 215                 220

Ala Pro Phe Arg Gly Met Leu Ser Val Leu Thr Lys Ser Glu Leu Ile
225                 230                 235                 240

Trp Phe Ile Thr His Ala Cys Gln Leu Ala Gly Glu Ile Leu Asp Thr
                245                 250                 255

Thr Glu Ser Val Asp Gly Gly Lys Thr Cys Val Pro Leu Arg Leu Ala
            260                 265                 270

Gly Leu Asp Ala Ser Leu Leu Trp Gln Ser Lys Thr Tyr Asp Leu Glu
        275                 280                 285

Arg Ile Leu Asp Ala Asn Gln Gly Asp Thr Asp Glu Ser Asp Gln Ala
    290                 295                 300

Gln Asn Glu Gln Trp Ser Leu Leu Val Glu Leu Leu Glu Tyr Asn Met
305                 310                 315                 320

Ala Asn Glu Pro Lys Ile Trp Asn Gln Ser Thr Leu Gln Gln Met Gln
                325                 330                 335

Lys Thr Arg Arg Arg Leu Met Glu Glu Asp Ala Asp Tyr Asp Ser Met
            340                 345                 350

Asp Tyr His Asp Asp Tyr Leu Gly Ala Asp Asp Asp Tyr Asp Tyr Ala
        355                 360                 365

Gly Asp Asp Leu Asp Tyr Asp Tyr Ala Glu Thr Glu Thr Thr Asp Asp
    370                 375                 380
```

```
Leu Pro Ala Pro Asp Asp Ala Pro Thr Asp Gly Lys Arg Glu Glu Leu
385                 390                 395                 400


Met Ser Leu Ile Arg Ser Gln Pro Phe Ser His Gly Arg Val Thr Phe
                405                 410                 415


Phe Asp Glu Ser Ser Ser Leu Leu Glu Lys Ile Lys Ala Ile Thr Asp
            420                 425                 430


Ala Glu Glu Gln Asp Asp Lys Glu Val Asp Glu Glu Val Ser Asp Ser
        435                 440                 445


Val Pro Pro Ser Leu Asp Pro Met Ala Leu Pro Met Val Arg Ser Gln
    450                 455                 460


Leu Glu Gln Arg Gln Arg Arg Val Gln Arg Gly Phe Ser Tyr Ala Val
465                 470                 475                 480


Ser Ala Gln Ala Leu Leu Glu Gly Leu Glu Arg Tyr Ala Tyr Ala Ser
                485                 490                 495


Glu Glu Asp Glu Val Leu Asp Leu Tyr Ser Leu Ala Met Gly Val Ile
            500                 505                 510


Asn His Gly Gln Leu Ser Thr Thr His Val Trp Gln Ile Leu Leu Gly
        515                 520                 525


Ile Ile Pro Glu Leu Val Val Glu Asn Ala Met Gln Thr Cys Val Ser
    530                 535                 540


Ala Leu Ala Ser Ser Cys Pro Pro Arg Ser Val Tyr Arg Ser Ile Gly
545                 550                 555                 560


Glu Ala Ser Val Pro Ile Pro Ala Pro Leu Leu Leu Glu Ala Gly Glu
                565                 570                 575
```

```
Ala Phe Cys Thr Met His Ala Thr Pro Asn Glu Met Glu Asp Val Cys
            580                 585                 590

Val Asp Ser Ser Ile Gly Thr Thr Asp Ile Pro Ser Ser Val Pro Asp
        595                 600                 605

Gly Leu Leu Gly Tyr Phe Glu Thr Lys Pro Arg Asp Asp Ser Asp Ala
    610                 615                 620

Phe Ser His Leu Phe Met Asn Leu Ser Leu Asn Gly Gly Thr Glu Thr
625                 630                 635                 640

Trp Lys Lys Ile Glu Ala Leu Gln Glu Arg Leu Arg Lys Thr Gln Glu
                645                 650                 655

Asp Lys Lys Asp Thr Glu Ala Arg Met Gly Asn Met Glu Asp Ser Ile
            660                 665                 670

Gly Gly Lys Asp Gly Pro Gly Thr Thr Leu Gly Val Asp Gly Glu Leu
        675                 680                 685

Phe Ala Leu Lys Asp Gln Cys Phe Asn Val Glu Ala Gly Lys Tyr Ile
    690                 695                 700

Tyr Glu Ile Cys Ile Phe Gly Ser Ala Ala Gln Lys Glu Lys Thr Gly
705                 710                 715                 720

Gly Ser Thr Ser Leu Gly Glu Trp Ile Gly Val Asp Ile Glu Ala Glu
                725                 730                 735

Thr Gly Arg Arg Val Trp Lys Trp Gly Asn Gly Ala Lys Cys Trp Asn
            740                 745                 750

Gly Pro Gln Arg Ser Val Thr Ala Phe Val Thr Cys Gly Ser Glu Thr
        755                 760                 765
```

```
Lys Val Leu Ser Ala Gly Glu Pro Asp Thr Cys Arg Tyr Glu Val Glu
    770                 775                 780


Val Glu Ser His Ile Ala Cys Asp Glu Ser Tyr Arg Met Arg Tyr Gly
785                 790                 795                 800


Leu Glu
```

<210> 792
<211> 486
<212> PRT
<213> Chlamydomonas reinhardtii

<400> 792

```
Met Arg Gly Ser Val Ala Leu Leu Leu Leu Ala Gly Leu Ala Leu Cys
1               5                   10                  15


Ala Asn Ala Gln Asn Ala Ile Arg Gly Leu Asn Pro Asp Leu Ala Ala
            20                  25                  30


His Tyr Ser Gly Ala Gly Gly Lys Phe Thr Cys Ile Ser Gly Gly Lys
        35                  40                  45


Thr Ile Pro Phe Lys Gln Val Asn Asp Asp Tyr Cys Asp Cys Ala Asp
    50                  55                  60


Gly Ser Asp Glu Pro Gly Thr Ala Ala Cys His Asn Gly Arg Phe Tyr
65                  70                  75                  80


Cys Arg Asn Leu Gly His Glu Pro Lys Leu Leu Ala Ala Ala Phe Val
                85                  90                  95


Asp Asp Gly Val Cys Asp Cys Cys Asp Gly Ser Asp Glu Val Lys Gly
            100                 105                 110
```

```
Lys Cys Ser Asn Thr Cys Leu Gln Ala Ser Ala Ala His Arg Glu Ser
        115                 120                 125

Leu Lys Ser Asn Ile Ala Gln Tyr Glu Gln Ala Leu Ala Thr Lys Ala
    130                 135                 140

Asp Phe Ile Ser Gln Ala Arg Ala Phe Lys Gln Lys Leu Gln Thr Lys
145                 150                 155                 160

Ala Ala Thr Ile Asp Gln Asp Tyr Ala Ala Ala Gln Ala Glu Val Glu
                165                 170                 175

Arg Leu Lys Ala Glu Val Ser Arg Leu Glu Ala Glu Glu Ser Val Gln
            180                 185                 190

Arg Ala Ala Glu Glu Ala Gln Arg Ala Ala Asp Gln Ala Ala Gln Glu
        195                 200                 205

Gln Ala Ala Ala Ala Ala Ala Glu His Gln Glu Leu Asn Ala Gly Ser
    210                 215                 220

Asp Gly His Ala Glu Arg Thr Leu Gln Glu Glu Gly Gln Gln Ala Ser
225                 230                 235                 240

Glu Glu Arg Glu Glu Thr Pro Glu Glu Arg Gly Arg Arg Ile Ala Ser
                245                 250                 255

Gln Trp Thr Asn Asp Pro Glu Ala Ala Gly Val Pro Gly Ser Gln Glu
            260                 265                 270

His Val Asn Glu Gly Gln Gly Glu Gly Glu Glu His Glu His His Gly
        275                 280                 285

Asp Tyr Ser His Gln Asp Gln His Asp His Glu Asp Gly Asp Gly Glu
    290                 295                 300
```

```
Tyr His Glu Pro Arg Pro Asp Ala Ser Thr Pro Leu Gly Glu Val Arg
305                 310                 315                 320

Ala Lys Leu Tyr Asp Ala Glu Ala Thr Leu Arg Glu Ala Glu Arg Asp
                325                 330                 335

Lys Glu Arg Ile Ala Thr Tyr Leu Tyr Gly Asn Leu Asp Phe Gly Pro
            340                 345                 350

Glu Asp Ile Phe Leu Ala Leu Ala Asp Gln Cys Phe Thr Ser Ser Gln
        355                 360                 365

Thr Arg Trp Thr Tyr Glu Ala Cys Ile Phe Lys His Ala Val Gln Arg
    370                 375                 380

Glu Gly Tyr Ser Asn Ser Val Thr Val Gly Arg Trp Ser Gly Phe Ser
385                 390                 395                 400

Ser Asp Tyr Lys Thr Met Leu Phe Thr Gly Gly Asp Glu Cys Trp Asn
                405                 410                 415

Val Gly Pro Arg Ser Phe Thr Val Ala Met Ser Cys Gly Asn Glu Asn
            420                 425                 430

Val Leu Ser Asp Gly Glu Glu Pro Ala Thr Cys Ala Tyr Ser Ala Lys
        435                 440                 445

Phe Thr Ser Pro Ala Leu Cys Asn Asp Glu Glu Leu Ile Gly Leu Arg
    450                 455                 460

Asn Gln Leu Ala Asn Leu Glu Ala Phe Glu Arg Glu Val Ala Glu Lys
465                 470                 475                 480

Ile Ala Lys Asp Glu Leu
                485
```

<210> 793
<211> 503
<212> PRT
<213> Volvox carteri

<400> 793

```
Met Gln Ala Leu Tyr Val Leu Ala Leu Phe Ala Gly Leu Ala Leu Ala
1               5                  10                  15


Gln Thr Asp Asn Leu Arg Gly Val Asn Pro Asp Leu Ala Ser His Tyr
            20                  25                  30


Ser Gly Lys Gly Gly Ala Phe Thr Cys Ile Ser Gly Ile Pro Lys Thr
        35                  40                  45


Ile Pro Phe Ser Arg Val Asn Asp Asp Tyr Cys Asp Cys Pro Asp Gly
    50                  55                  60


Ser Asp Glu Pro Gly Thr Ser Ala Cys His Asn Gly Arg Phe Tyr Cys
65                  70                  75                  80


Arg Asn Leu Gly His Glu Ser Arg Leu Leu Ala Ser Ala Phe Val Asp
                85                  90                  95


Asp Gly Val Cys Asp Cys Cys Asp Gly Ala Asp Glu Pro Lys Gly Lys
            100                 105                 110


Cys Gln Asn Thr Cys Leu Gln Ala Ala Ala Val Arg Lys Glu Glu Leu
        115                 120                 125


Arg Gly Lys Ile Gln Leu His Glu His Met Leu Asn Arg Lys Lys Glu
    130                 135                 140


Tyr Thr Thr Lys Ala Ser Thr Phe Lys Glu Glu Leu Lys Leu Lys Ala
145                 150                 155                 160


Glu Thr Ile Asp Glu Asp Ile Ala Arg Gln Gln Ala Glu Ile Asp Asn
```

```
                165                 170                 175

Leu Lys Gly Glu Val Thr Arg Leu Glu Ala Glu Glu Ala Ala Arg Gln
            180                 185                 190

Ala Glu Ile Ala Ala Ala Asn Gln Ala Ala Glu Glu Ala Arg Lys Ala
        195                 200                 205

Glu Ala Glu Ala Gln Ala Glu Gln Ala Ala Ser Leu Gln Gly Glu Glu
    210                 215                 220

Ala Ala Ser Ser Met Asp Phe Lys Ala Asp Glu Gly Glu His Ala Glu
225                 230                 235                 240

Gly Gln Ala Gln Gln Glu Glu Arg Glu Glu Thr Pro Glu Glu Arg Gly
                245                 250                 255

Arg Arg Ile Ala Ser Gln Trp Thr Asn Asp Pro Glu Ala Ala Ala Val
            260                 265                 270

Pro Glu Ser Glu Gly His Leu Asn Pro Asp Asp Gln Glu Glu Asp Val
        275                 280                 285

Asp Gly His Tyr Asp Gly Thr Glu Asp Asp Gly Thr Glu Gly His Phe
    290                 295                 300

Asp Tyr Pro Asn Thr Glu Ala Gln Ser Ser Asp Tyr His Pro Asp His
305                 310                 315                 320

Ala Arg Arg Pro Pro Arg Pro Asp Pro Tyr Ser Pro Leu Asn Lys Ala
                325                 330                 335

Arg Ala Ala Val Met Glu Ala Glu Arg Lys Leu Gln Gly Leu Gln Lys
            340                 345                 350

Asp Lys Glu Asn Ile Gly Thr Phe Leu His Arg Pro Leu Asp Leu Gly
```

```
        355                 360                 365

Pro Asp Asp Ile Phe Leu Ala Leu Ala Asn Lys Cys Phe Thr Ser Tyr
    370                 375                 380

Gln Thr Arg Trp Thr Tyr Glu Ile Cys Met Phe Asp Lys Ala Val Gln
385                 390                 395                 400

Lys Glu Gly Tyr Thr Asn Ser Val Val Val Gly Arg Trp Tyr Gly Phe
                405                 410                 415

Ser Asp Asp Tyr Arg Thr Met Tyr Phe Thr Gly Gly Asp Glu Cys Trp
            420                 425                 430

Asn Val Gly Pro Arg Ser Met Thr Val Ala Leu Ser Cys Gly Trp Asp
        435                 440                 445

Glu Arg Leu Ser Asp Gly Glu Glu Pro Ser Thr Cys Ala Tyr Ala Ala
    450                 455                 460

Lys Leu Thr Thr Pro Ala Val Cys Thr Glu Ala Glu Leu His Glu Leu
465                 470                 475                 480

Gln Gln Gln Leu Glu Asn Leu Glu Ala Phe Glu Lys Glu Val Gln Glu
                485                 490                 495

Lys Ile Leu Lys Asp Glu Leu
            500
```

<210> 794
<211> 521
<212> PRT
<213> Ostreococcus tauri

<400> 794

```
Met Arg Arg Pro His Val Leu Ala Leu Val Leu Val Leu Gly Leu Thr
1               5                   10                  15
```

```
Val Val His Thr Ala Arg Ala Asp Ala Arg Arg Arg His Val Arg Arg
            20                  25                  30

Gly Val Ala Pro Ile Asp His His Arg Phe Thr Glu Thr His Thr Thr
        35                  40                  45

Phe Gln Cys Asp Asp Ala Ser Thr Val Ile Ser Ile Asp Arg Val Asn
    50                  55                  60

Asp Glu Tyr Cys Asp Cys Val Asp Gly Ser Asp Glu Pro Gly Thr Ser
65                  70                  75                  80

Ala Cys Ala Gly Arg Gly Asn Asp Arg Gly Phe Tyr Cys Val Asn Ala
                85                  90                  95

Gly Gly Val Ala Thr Arg Val Pro Ala Ser Arg Val Asp Asp Gly Val
            100                 105                 110

Cys Asp Cys Cys Asp Gly Ser Asp Glu Asp Gly Glu Met Gly Ser Val
        115                 120                 125

Lys Cys Ala Asn Thr Cys Gly Glu Glu Ala Arg Ala Arg Arg Glu Gly
    130                 135                 140

Leu Met Lys Thr Leu Arg Glu Ala Thr Arg Gly Glu Arg Arg Arg Ala
145                 150                 155                 160

Lys Glu Ala Asp Lys Ala Arg Gly Arg Arg Glu Glu Trp Lys Arg Glu
                165                 170                 175

Arg Asp Ala Leu Glu Glu Lys Ile Gly Glu Lys Arg Lys Arg Val Asp
            180                 185                 190

Lys Leu Leu Arg Glu Ala Glu Glu Ala Glu Ala Glu Glu Arg Lys Ile
        195                 200                 205
```

```
Arg Glu Glu Glu Glu Ala Lys Arg Arg Thr Leu Glu Glu Met Lys Ser
    210                 215                 220

Asn Asp Asp Ala Pro Asn Asp Asp Ala Pro Asn Asp Asp Ala Pro Asn
225                 230                 235                 240

Ala Ala Ala Thr Thr Asn Gly Asn Asp Glu Gly Asp Asp Glu Asn Gly
                245                 250                 255

Arg Pro Thr Glu Glu Thr Thr Ala Gly Glu Asp Ala Gly Glu Ile Ile
            260                 265                 270

Gly Glu Thr Asp Glu Glu Arg Gly Lys Arg Ile Ala Ser Gln Trp Ile
        275                 280                 285

Ser Asn Asp Asp Ala Pro Pro Glu Ser Ala Glu Glu Thr Gly Glu Asp
    290                 295                 300

Asp Gly Asn Asp Ala Pro Ile Asp Ala Arg Val Asp Glu Gly Asp Ala
305                 310                 315                 320

Asp Asp Val Val Ser Ser Gly Arg Ser Lys Leu Arg Ser Met Phe Asp
                325                 330                 335

Arg Ala Arg Arg Leu Leu Lys Pro Ser Arg Asp Glu Ala Leu Ala Ala
            340                 345                 350

Gln Ala Ser Lys Arg Arg Asp Ala His Asp Ala Ala Arg Arg Glu Leu
        355                 360                 365

Asp Asp Met Asn Asp Lys Leu Asp Glu Leu Arg Ala Lys Val Asp Arg
    370                 375                 380

Asp Tyr Gly Pro Asp Asp Val Leu Ile Ser Leu Ser Gly Gln Cys Phe
385                 390                 395                 400
```

```
Glu Gln Lys Ile Asp Lys Tyr Thr Tyr Ser Ala Cys Pro Phe Gly Glu
                405                 410                 415


Ala Lys Gln Asp Asp Val Arg Leu Gly Lys Asn Val Ala Val Arg Val
            420                 425                 430


Asp Asp Ala Thr Gly Ser Met Thr Leu Lys Phe Glu Asn Gly Glu Gly
        435                 440                 445


Cys Trp Asn Gly Pro Ser Arg Ser Leu Ala Leu Ala Leu Glu Cys Ser
    450                 455                 460


Asp Glu Asn Arg Leu Ala Ser Ile Glu Glu Pro Ser Arg Cys Glu Tyr
465                 470                 475                 480


Ala Gly Val Phe His Thr Pro Phe Ala Cys Ser Pro Thr Met Val Ser
                485                 490                 495


Asn Leu Glu Asn Glu Leu Ala Glu Leu Asp Arg Val Val Ala Ala Ala
            500                 505                 510


Ser Arg Asp Ala Ser Arg Asp Glu Leu
        515                 520


<210>  795
<211>  493
<212>  PRT
<213>  Micromonas pusilla

<400>  795

Met Arg Thr Thr Arg Gly Ala Leu Arg Ile Leu Thr Ala Ala Leu Leu
1               5                   10                  15


Val Ala Ala Val Arg Cys Gly Ser Ile Asp Ala Gly Ser Arg Val Leu
            20                  25                  30
```

```
Pro Arg Gly Ala Asn Pro Ala Asp Ala Glu Arg Tyr Ala Ala His Asp
        35                  40                  45

Gly Ser Ser Ala Phe Val Cys Asp Gly Gly Ala Thr Thr Ile Asp Arg
    50                  55                  60

Ser Arg Val Asn Asp Asp Tyr Cys Asp Cys Asp Asp Gly Ala Asp Glu
65                  70                  75                  80

Pro Gly Thr Ser Ala Cys Ala Asn Gly Glu Phe His Cys Arg Asn Arg
                85                  90                  95

Gly His Arg Ser Ile Ser Leu Pro Ser Ser Arg Val Asn Asp Gly Val
            100                 105                 110

Cys Asp Cys Cys Asp Gly Thr Asp Glu His Asp Gly Gly Ala Arg Cys
        115                 120                 125

Pro Asn Thr Cys Leu Ala Ala Gly Ala Ser Arg Arg Asp Glu Ile Arg
    130                 135                 140

Ala Arg Val Ser Ser Ala Arg Gly Gly Val Asp Ala Arg Arg Lys Ile
145                 150                 155                 160

Leu Glu Gly Ala Pro Ala Leu Arg Arg Arg Trp Gln Asp Glu Ser Val
                165                 170                 175

Lys Leu Glu Lys Asp Val Ala Ala Gln Arg Glu Ile Val Arg Asp Ala
            180                 185                 190

Ser Val Ala Lys Glu Ala Ala Glu Ala Glu Glu Lys Lys Ala Thr Glu
        195                 200                 205

Ala Glu Asp Arg Leu Asn Lys Arg Glu Ala Ser Lys Asn Lys Gly Asp
    210                 215                 220
```

```
Asp Asp Ala Ser Gly Asn Glu Thr Ala Val Ala Asp Thr Ala Val Ala
225                 230                 235                 240


Asp Ala Val Pro Thr Pro Thr Pro Thr Ser Thr Glu Thr Val Asp Glu
                245                 250                 255


Tyr Pro Val Ile Glu Asp Asp Ala Val Pro Glu Leu Gln Ala Ile Asp
            260                 265                 270


Asp Val Ala Asp Glu Arg Glu Glu Ser Glu Glu Glu Arg Gly Arg Arg
        275                 280                 285


Ile Ala Gln Gln Trp Ile His Gly Asp Ser Glu Ser Thr Gly Thr Ala
    290                 295                 300


Pro Ser Gly Pro Ser Ser Pro Ala Asp Val Pro Asp Ala Ile Arg Asp
305                 310                 315                 320


Arg Ala Thr Arg Ala Lys Lys Ala Ala Asn Asp Lys Arg Asp Val His
                325                 330                 335


Ala Gln Ala Gln Arg Thr Leu Thr Glu Leu Glu Gly Lys His Lys Asp
            340                 345                 350


Val Thr Lys Arg Leu Ser Thr Phe Phe Gly Pro Asn Met Glu Leu Ala
        355                 360                 365


His Met Val Gly Glu Cys Tyr Lys Leu Thr Val Glu Gln Tyr Ala Tyr
    370                 375                 380


Glu Val Cys Pro Phe Gly Asp Ala Lys Gln Asp Thr Thr Arg Leu Gly
385                 390                 395                 400


Thr Met Gln Pro Val Asp Val Lys Asp Pro Arg Thr Met Val Phe Asn
                405                 410                 415
```

```
Gly Gly Glu Arg Cys Trp Asn Gly Pro Ala Arg Ser Ile Thr Val Ser
            420                 425                 430

Leu Arg Cys Gly Gly Gly Gly Asn Lys Leu Ala Asp Val Glu Glu Pro
        435                 440                 445

Ser Arg Cys Glu Tyr Ala Ala Lys Leu Tyr Thr Pro Ala Ala Cys Asp
    450                 455                 460

Pro Gly Glu Val Asp Ala Leu Glu Arg Glu Leu Ala Glu Met Glu Glu
465                 470                 475                 480

Glu Ala Arg Ala Ala Met Gly Ala Pro His Asp Glu Leu
                485                 490
```

<210> 796
<211> 617
<212> PRT
<213> Micromonas pusilla

<400> 796

```
Met Arg Glu Glu Ala Arg Gly Val Ser Gly Ala Ile Ala Arg Ser Leu
1               5                   10                  15

Ser Arg Ala Arg Gly Pro Ala Ala Thr Met Thr Ser Thr Ser Arg Ser
            20                  25                  30

Thr Thr Arg Ala Val Phe Ala Ala Arg Arg Leu Pro Leu Leu Ala Ala
        35                  40                  45

Thr Ala Ala Ala Ala Ala Ile Val Leu Leu Leu Ala Ala Thr Pro Ala
    50                  55                  60

Arg Ala Ser Glu Gly Asp Ala Gly Gly Ser Ser Arg Pro Pro Val Asn
65                  70                  75                  80
```

```
Leu Leu Gly Val His Pro Ser Leu Leu Ala Ser Tyr Arg Ala Ser Asp
                85                  90                  95

Arg Phe Ser Cys Asp Asp Gly Arg Val Val Leu Asp Pro Ser Lys Ile
            100                 105                 110

Asn Asp Glu Tyr Cys Asp Cys Ala Asp Gly Met Asp Glu Pro Gly Thr
        115                 120                 125

Ser Ala Cys Ala Asn Gly Arg Phe His Cys Arg Asn Arg Gly Gly Glu
    130                 135                 140

Pro Lys Asp Leu Pro Ser Ser Arg Val Asn Asp Gly Val Cys Asp Cys
145                 150                 155                 160

Cys Asp Gly Ser Asp Glu Val Gly Arg Val Gly Gly Val Arg Cys Glu
                165                 170                 175

Lys Thr Cys Ala Ala Ala Gly Arg Lys Arg Arg Ala Glu Leu Leu Glu
            180                 185                 190

Arg Leu Lys Leu Ala Lys Gly Gly Val Ala Lys Arg Arg Ala Ala Ile
        195                 200                 205

Ala Ala Ala Pro Ala Ala Arg Ala Lys Trp Ser Ala Glu Val Ala Arg
    210                 215                 220

Leu Gln Asn Glu Arg Asp Ala Lys Lys Ile Ala Ala Asp Ala Ser Glu
225                 230                 235                 240

Lys Leu Lys Asp Asp Ala Asp Glu Arg Ala Lys Ala Leu Glu Lys Val
                245                 250                 255

Glu Glu Glu Glu Lys Ala Ala Ala Ala Ala Asp Glu Glu Glu Glu Lys
            260                 265                 270
```

```
Lys Arg Ala Glu Glu Ala Glu Ala Ser Ala Ala Lys Glu Gly Ala Glu
        275                 280                 285

Asp Asp Thr Ala Gly Ala Ala Ala Ala Glu Arg Ser Glu Arg Ser Glu
    290                 295                 300

Gln Ser Glu Asp Leu Ala Lys Leu Ser Arg Asp Leu Asp Glu Leu Glu
305                 310                 315                 320

Ala Met Ile Asp Asp Ile Gly Asp Gly Ala Ala Ala Pro Ala Pro Ala
                325                 330                 335

Pro Glu His Glu Glu Thr Asp Glu Glu Arg Gly Glu Arg Met Met Arg
            340                 345                 350

Gln Trp Val Lys Asp Asp Ala Pro Glu Lys Lys Asp Asp Asp Val Val
        355                 360                 365

Glu Asp Asp Ala Ala Arg Asp Leu Glu Asp Pro Thr Pro Tyr Leu Pro
    370                 375                 380

Glu Asp Val Asp Ala Asp Ala Tyr Asp Asp Val Asn Glu Ser Glu Pro
385                 390                 395                 400

Glu Pro Glu Pro Glu Ser Gly Gly Leu Leu Gly Lys Ala Ser Lys Met
                405                 410                 415

Phe Lys Gly Trp Gly Ala Arg Arg Arg Arg Ser Ala Lys Lys Thr Arg
            420                 425                 430

Gly Gly Asn Ala Ser Ser Asp Ala Asp Ala Ser Pro Ser Ala Ala Thr
        435                 440                 445

Glu Ala Arg Ala Glu Ala Asn Arg Leu Arg Asp Ala Trp Ser Ala Asp
    450                 455                 460
```

```
Ala Thr Ala Leu Arg Glu Thr Glu Asp Ala Leu Arg Glu Asn Glu Ala
465                 470                 475                 480


Arg Leu Thr Arg Phe Met Gly Glu Asp Asp Glu Tyr Ala Tyr Met Val
                485                 490                 495


Gly Glu Cys Tyr Glu Ala Lys Val Asp Lys Tyr Val Tyr Glu Ala Cys
            500                 505                 510


Pro Phe Gly Lys Ala Ser Gln Asp Ser Thr Ser Leu Gly Thr Met Gln
        515                 520                 525


Asp Ile Asp Arg Ala Ser Pro Arg Thr Phe Lys Phe Thr Gly Gly Glu
    530                 535                 540


Gly Cys Trp Asn Gly Pro Ala Arg Ser Leu Thr Ala Thr Ala Arg Cys
545                 550                 555                 560


Gly Ala Glu Asn Lys Leu Ala Glu Val Ile Glu Thr Ser Arg Cys Glu
                565                 570                 575


Tyr Val Ala Thr Leu Val Thr Pro Ala Ala Cys Ala Glu Asp Glu Glu
            580                 585                 590


Arg Ala Ala Arg Glu Glu Leu Asp Ala Leu Glu Arg Glu Met Arg Ala
        595                 600                 605


Ala Glu Glu Gly Gly His Asp Glu Leu
    610                 615


<210>  797
<211>  562
<212>  PRT
<213>  Coccomyxa subellipsoidea

<400>  797

Met Gly Ile Trp His Val Phe Ala Ala Leu Ile Leu Ser Ala Ser Ser
```

```
1               5                   10                  15

Leu Val His Cys Ser Asp Ile Ser Phe Arg Gly Leu Asp Pro Ala Leu
            20                  25                  30

Glu Leu Tyr Tyr Arg Thr Lys Gly Asp Ser Phe Ala Cys Leu Asp Gly
        35                  40                  45

Leu Lys Thr Ile Lys Tyr Glu Asn Ile Asn Asp Asn Tyr Cys Asp Cys
    50                  55                  60

Phe Asp Gly Ser Asp Glu Pro Gly Ser Ser Ala Cys Val Asn Gly Lys
65                  70                  75                  80

Phe Tyr Cys Ala Asn Lys Gly Tyr Asn Pro Gln His Leu Asn Ser Ser
                85                  90                  95

Met Val Asp Asp Thr Phe Cys Asp Cys Cys Asp Gly Ser Asp Glu Gln
            100                 105                 110

Pro Gly Val Cys Lys Asn Thr Cys Ser Glu Val Gly Ala Ala Ala Arg
        115                 120                 125

Ala Ala Leu Lys Glu Arg Ala Glu Ala Glu Ala Ala Gly Ser Lys Leu
    130                 135                 140

Arg Glu Ala Tyr Phe Thr Gln Ala Ser Glu Met Met Thr Lys Trp Ala
145                 150                 155                 160

Ala Glu Glu Ala Gln Leu Ala Lys Ser Ile Ala Asp Gln Lys Ala Leu
                165                 170                 175

Thr Asp Lys Trp Lys Val Lys His Asp Ala Val Val Glu Gln Glu Arg
            180                 185                 190

Lys Gln Lys Glu Arg Glu Asp Glu Ala Ala Arg Gln Glu Ala Glu Arg
```

195 200 205

Ile Ala Lys Thr Pro Ile Asp Thr Ala Gly Gln Asp Thr Ala Thr Ala
210 215 220

Ala Ala Ala Asp Gly Ala Ala Asp Ala Ala Val Pro Glu Glu Pro Ala
225 230 235 240

Gly Asp His Ile Thr Ser Met Glu Pro Ala Leu Thr Gly Ser Glu Ser
245 250 255

Ala Val Asp Ala Ala Asp Glu Ile Met Lys Gly Ala Ile Lys Glu Ala
260 265 270

Ala Glu Gly Thr Ala Gln Ala Leu Asp Val Pro Leu Glu Ala Val Glu
275 280 285

Gln Glu Ala Asp Thr Arg Ala Met Asn Pro His Glu Ala Ala Lys Gln
290 295 300

Gln Glu Gln Gln Glu Gly Glu Thr Ala Glu Glu Arg Ala Lys Arg Val
305 310 315 320

Ala Ala Gln Trp Ile Arg Asp Glu Thr Ser Asp Ala Pro Ala Glu Asp
325 330 335

Ala Gln Glu Ala Glu Glu Ala Ser Glu Gly Gly Ala Ala Glu Glu Glu
340 345 350

Ala Val Glu Glu Ala Ala Ala Asp Glu Asp Leu Pro Gln Thr Pro Val
355 360 365

Gln Ser Gly Pro Pro Ser Leu Leu Gly Arg Ile Lys Thr Ala Val Leu
370 375 380

Ser Phe Leu Asn Ala Thr Pro Phe Gly Pro Ala Glu His Ile Ser Asp

385 390 395 400

Gly Gln Ala Val Lys Asp Lys Tyr Trp Glu His His Asn Val Leu Ala
405 410 415

Asp Leu Glu Arg Gln His Ala Glu Val His Lys Lys Leu Gln Leu Asp
420 425 430

Phe Gly Pro Asn Lys Glu Phe Leu Pro Leu His Gly Lys Cys Phe Glu
435 440 445

Ala Asp Val Asp Lys Tyr Val Tyr Glu Ile Cys Pro His Gly Ser Ala
450 455 460

Val Gln Lys Asp Gly Ala Ala Arg Val Ser Leu Gly Asn Trp Glu Gly
465 470 475 480

Phe Arg Glu Gly His Thr Val Met Ala Phe Thr Gly Gly Gln His Cys
485 490 495

Trp Asn Gly Pro Gln Arg Ser Met Val Val Ser Ile Ser Cys Gly Lys
500 505 510

Val Glu Lys Leu Lys His Val Glu Glu Pro Ser Arg Cys Glu Tyr Val
515 520 525

Ala His Leu Thr Thr Pro Ala Ala Cys Ser Glu Glu Val Ala Arg Gln
530 535 540

Leu Gln Gln Gln Val Glu Glu Ala Glu Gln Ala Val Arg Ala His Asp
545 550 555 560

Glu Leu

<210> 798

<211> 603
<212> PRT
<213> Chlorella variabilis

<400> 798

```
Met Gly Cys Arg Ala Ala Leu Gly Leu Leu Ala Leu Ala Leu Val Pro
1               5                  10                  15


Ala Leu Cys Ala Gly Gly Pro Pro Ile Arg Gly Leu Asp Pro Ala Leu
            20                  25                  30


Gly Pro Arg Tyr Glu Pro Thr Ala Asp Gly Lys Phe Ala Cys Leu Asp
        35                  40                  45


Gly Lys Lys Ser Val Pro Phe Glu Gln Val Asn Asp Asn Tyr Cys Asp
    50                  55                  60


Cys Phe Asp Gly Ser Asp Glu Pro Gly Thr Ser Ala Cys Pro Asn Gly
65                  70                  75                  80


His Phe Phe Cys Ala Asn Lys Phe Tyr Leu Pro Leu Leu Leu Asn Ala
                85                  90                  95


Ser Met Val Asp Asp Gly Val Cys Asp Cys Cys Asp Gly Ser Asp Glu
            100                 105                 110


Pro Ala Gly Arg Cys Pro Asn Asn Cys Tyr Glu Lys Gly Tyr Lys Ser
        115                 120                 125


Leu Ile Ala Leu Lys Asp Gln Met Ala Ala Ala Asp Lys Gly Val Gln
    130                 135                 140


Ala Arg Asn Lys Tyr Val Glu Glu Ala Gly Ala Ser Lys Gln Lys Trp
145                 150                 155                 160


Ala Asp Arg Lys Ala Gln Val Asp Ala Glu Val Glu Lys His Arg Lys
                165                 170                 175
```

```
Glu Lys Glu Ala Ala Asp Ala Asp Lys Ser Lys Leu Glu Glu Glu Gln
            180                 185                 190

Arg Lys Leu Gln Asp Arg Lys Arg Glu Leu Glu Glu Glu Lys Lys Lys
        195                 200                 205

Arg Gln Pro Pro Glu Glu Pro Ala Lys Ser Glu Gly Glu Gln Gln Gln
    210                 215                 220

Glu Thr Ala Ala Phe Glu Asp Glu Gln Gln Val Gly Gly Ala Glu Gly
225                 230                 235                 240

Val Gly Glu Glu Gln Ala Glu Pro Gly Val Glu Glu Ala Ala Glu Asp
                245                 250                 255

Glu Ala Val Glu Lys Ser Glu Glu Glu Leu Ala Lys Glu Arg Met Ala
            260                 265                 270

Gln Trp Ile Pro Gly Ala Lys Asp Gly Asp Gly Gly Ala Val Glu Glu
        275                 280                 285

Glu Ala Gly Pro Glu Glu Asp Ala Asp Pro Val Leu Pro Ser Tyr Asp
    290                 295                 300

Gly Glu Asp Leu His Ala Ala Asp Ala Ala Ala Leu Glu Glu Glu Asp
305                 310                 315                 320

Ala Glu Pro Gln Gln Phe Phe Pro Asp Glu Gly Ala Ala Asp Val Asp
                325                 330                 335

Val Gly Ala Ser Gly Ala Asp Gly Asp Gly Gly Asp Ala Gly Glu Pro
            340                 345                 350

Gly Ala Glu Glu Gly Ala Ala Gly Ala Gly Ala Ser Ala Ala Gly Ala
        355                 360                 365
```

```
Gly Ala Ser Ala Ala Gly Gly Asn Ala Gly Gln Arg Pro Thr Ser Ala
    370                 375                 380

Phe Gly Lys Ala Arg Leu Leu Leu Lys Lys Val Phe Lys Ala Leu Ala
385                 390                 395                 400

Lys Pro Gly Asn Glu Thr Val Ala Asp Asp Thr Glu Leu Thr Gly Ala
                405                 410                 415

Ile Ala Ala Ile Asp Ala Glu Ile Ser Ala Leu Lys Thr Arg Leu Asp
            420                 425                 430

Pro Ala Arg Thr Lys Ala Asn Glu Ala Arg Gln Lys Leu Asn Asp Leu
        435                 440                 445

Glu Gln Glu Gln Arg Lys Leu Gln Ala Lys Leu Asp Gly Ser Tyr Gly
    450                 455                 460

Glu Gly Asp Ala Phe Val Ala Leu Val Asp Arg Cys Phe Asp Ala Lys
465                 470                 475                 480

Val Asp Lys Tyr Thr Tyr Glu Val Cys Pro Phe Asp Lys Ala Ser Gln
                485                 490                 495

Lys Glu Gly Gly Ser Ala Thr Ser Leu Gly Ser Trp Ser Gly Phe Glu
            500                 505                 510

Ala Gly Glu Thr Lys Leu Ala Phe Lys Asn Gly Ala Thr Cys Trp Gln
        515                 520                 525

Gly Pro Ser Arg Ser Met Thr Val Ser Leu His Cys Gly Gln Thr Glu
    530                 535                 540

Arg Leu Ala Lys Val Glu Glu Pro Ser Arg Cys Glu Tyr Ser Ala Glu
545                 550                 555                 560
```

```
Leu Gln Thr Pro Ala Ala Cys Thr Pro Ala Ala Ala Glu Ala Leu Arg
                565                 570                 575


Arg Glu Val Glu Ala Arg Gln Arg Phe Leu Glu Gly Gly Asp Glu Val
            580                 585                 590


Glu Gly Asp Pro Gln Ala Asn Arg Asp Glu Leu
        595                 600
```

<210> 799
<211> 553
<212> PRT
<213> Cyanidioschyzon merolae

<400> 799

```
Met Lys Leu Gly Arg Leu Gly Thr Pro Val Met Arg Pro Ala Leu His
1               5                   10                  15


Val Trp Cys Leu Leu Trp Leu Cys Ala Leu Leu Thr Glu Phe Val Ala
            20                  25                  30


Ala Gly Thr Ile Gln Arg Val Ile Gly Ala Asp Pro Glu Thr Glu Arg
        35                  40                  45


Arg Phe Ile Ala Gln Ile Ala Ser Leu Gly Gly Phe Arg Cys Ser Asn
    50                  55                  60


Asp Ser Gly Thr Leu Leu Pro Pro Ser Phe Leu Asn Asp Asp Tyr Cys
65                  70                  75                  80


Asp Cys Pro Asn Gly Ala Asp Glu Pro Gly Thr Ala Ala Cys Ala Gly
                85                  90                  95


Leu Ala Pro Leu Ser Gln Lys Phe Phe Cys Pro Gly Glu Asp Asn Asp
            100                 105                 110
```

```
Lys Gln Thr Leu Pro Leu Ser Trp Val Asn Asp Gly Gln Cys Asp Cys
        115                 120                 125

Cys Asp Gly Ser Asp Glu Trp Leu Ser Gly Val Gln Cys Glu Asn Val
    130                 135                 140

Cys Asp Val Leu Arg Ser Glu Arg Leu Arg Glu Leu Glu Leu Gln Leu
145                 150                 155                 160

Ala Arg Tyr Arg Gln Gly Leu Glu Lys Arg Ala Glu Leu Val Glu Glu
                165                 170                 175

Ala Ala Arg Ile Arg Gln Ala Glu Gly Asn Gln Leu Val Val Thr Lys
            180                 185                 190

Arg Gln Arg Leu Ala Glu Ala Glu Arg Thr Leu Ala Ala Ile Glu Gln
        195                 200                 205

Lys Arg Arg Phe Phe Glu Thr Trp Leu Arg Trp Phe Asp Thr Ser Thr
    210                 215                 220

Glu Ala Leu Ala Asp Ala Gly Glu Arg Pro Pro Ala Gln Gln Gln Asp
225                 230                 235                 240

Ala Gln Gln Gln Ala Ser Pro Ser Gly Leu Ala Glu Met Val Thr Ser
                245                 250                 255

Glu Val Glu Arg Glu Leu Ala Ala Val Pro Ser Glu Arg Asp Leu Thr
            260                 265                 270

Thr Ala Pro Gln Ala Lys Pro Leu Trp Arg Arg Trp Trp Trp Trp Ser
        275                 280                 285

Trp Arg Arg His His Phe Trp Glu Arg Phe Ile Gly Ala Ser Asp Ser
    290                 295                 300
```

```
Ser Ala Pro Ile Val Glu Leu Asp Glu Pro Val Asp Leu Glu Ser Thr
305                 310                 315                 320


Ala Cys Met Arg Leu Met Arg Leu Gln Ala Pro Ile Trp Val Val Gln
                325                 330                 335


Arg Phe Glu Arg Leu Trp Gly Gln His Leu Ala Pro Met Glu Arg Ile
            340                 345                 350


Arg Arg Ser Val Gly Arg Phe Ala Ala Pro Leu Leu Lys Arg Ser Val
        355                 360                 365


Gln His Arg His Ile Arg Thr Cys Leu Arg Leu Ala Gln Gly Gly Val
    370                 375                 380


Ala Arg Ala His Arg Glu Arg Glu Glu Ala Ala Arg Ala Leu Glu Glu
385                 390                 395                 400


Ala Gln Arg Leu Glu Asp Ala Tyr Leu Gly Pro Gln Asp Val Leu Leu
                405                 410                 415


Gly Met Arg Asp His Pro Cys Leu Arg Lys Thr Val Gly Gln Tyr Asp
            420                 425                 430


Tyr Glu Val Cys Leu Leu Gln His Val Lys Gln Tyr Glu Arg Val Ser
        435                 440                 445


Arg Gly Ser His Thr Gly Ile Val Leu Gly Ser Phe Ala Tyr Ala Glu
    450                 455                 460


His Val Ser Val Asn Trp Ser Gly Ser Pro Asp Lys Leu Ala Leu Gln
465                 470                 475                 480


Tyr Leu Gly Gly Asp Met Cys Trp Asn Gly Pro Gln Arg Glu Ala Thr
                485                 490                 495
```

```
Val Ile Val Glu Cys Asp Pro Asn Leu Ser Ile Leu Thr Val Thr Glu
            500                 505                 510


Thr Glu Arg Cys Lys Tyr Arg Val Thr Leu Gln Gly Pro Leu Gly Cys
        515                 520                 525


Phe Glu Glu Ala Leu Ala Glu Leu Glu Arg Gln Arg Ala Arg Leu Ser
    530                 535                 540


Val Gln Gln Gln Pro Ala Ser Ser Ser
545                 550


<210>  800
<211>  490
<212>  PRT
<213>  Galdieria sulphuraria

<400>  800

Met Gly Leu Ile Lys Met Arg Pro Val Pro Val Phe Leu Ile Trp Ile
1               5                   10                  15


Leu Leu Leu Val Thr Gln Glu Thr Cys Gly Ile Ser Lys Val Arg Gly
            20                  25                  30


Ala Asp Pro Gln Lys Leu His Leu Tyr Glu Asn Lys Glu Gly Phe Phe
        35                  40                  45


His Cys Leu Asn Ser Ser Gln Lys Val Pro Tyr Ser Ser Leu Asn Asp
    50                  55                  60


Asp Phe Cys Asp Cys Asp Asp Gly Thr Asp Glu Pro Gly Thr Ala Ala
65                  70                  75                  80


Cys Asp Gly Ser Thr Phe Tyr Cys Glu Asn Ile Gly Tyr Val Pro Val
                85                  90                  95
```

```
Asn Ile Leu Ser Ser Gln Val Asn Asp Gly Ile Cys Asp Cys Cys Asp
            100                 105                 110

Gly Ser Asp Glu Trp Leu Gly Tyr Val Asp Cys Pro Asn Arg Cys Val
        115                 120                 125

Gln Asn Gly Lys Glu Arg Ile Glu Gln Met Leu Ala Glu Val Lys Ile
    130                 135                 140

Ile Lys Gln Gly Leu Lys Lys Arg Glu Glu Leu Lys Ser Leu Ser Ser
145                 150                 155                 160

Leu Arg Phe Ser Glu Leu Val Asn Lys Thr Lys Leu Leu Gln Val Ser
                165                 170                 175

Ile His Glu Ala Glu Val Leu Glu Arg Lys Ala Lys Lys Glu Leu His
            180                 185                 190

Trp Leu Glu His Val Leu Arg Val Ile Glu Ala Arg Asp Ile Val Ala
        195                 200                 205

Asn Ala Ser Val Gly Asn Leu Ser Ser His Ser Ser Gly Asp Val Val
    210                 215                 220

Thr Thr Asn Glu Glu Ser Ser Asn Asp Leu Gly Arg Thr His Ser Leu
225                 230                 235                 240

Gln Asn Glu Asp Asp Glu Leu Asn Val Asn Ser Glu Lys Thr Ser Asp
                245                 250                 255

Glu Val Tyr Lys Ser Thr Met Arg Ser Asp Phe Val Leu Glu Thr Cys
            260                 265                 270

Gln Asn Ile Ser Lys Val Tyr Thr Ser Ser His Met Leu Leu Arg Leu
        275                 280                 285
```

```
Gln Lys Leu Phe Phe Asp Phe Leu Ser Lys Phe Pro Val Leu Ser Asn
    290                 295                 300

Phe Phe Lys Gly Ser Gln Arg Lys Ile Asp Thr Glu Val Leu Lys Leu
305                 310                 315                 320

Cys Ile Ser Asn Leu Lys Glu His Leu Glu Thr Leu Arg Ser Glu Leu
                325                 330                 335

Glu Lys Asn Arg Thr Glu Leu Glu Arg Val Gln Gln Tyr Phe Ser Ser
            340                 345                 350

Asp Tyr Gly Pro Glu Asn Val Phe Leu Ala Leu Arg Asp Ile Cys Leu
        355                 360                 365

Glu Val Asp Ser Gln Gly Tyr His Tyr Lys Leu Cys Leu Leu Ser His
    370                 375                 380

Val Thr Gln Asp Ser Ile Asn Leu Gly Lys Phe Ser Gln Trp Asp Ser
385                 390                 395                 400

Asn Tyr Thr Lys Met Ile Phe Ser Asp Gly Thr Pro Cys Trp Asn Gly
                405                 410                 415

Pro Ala Arg Ser Thr Val Val Asn Leu Leu Cys Gly Val Asn Glu Thr
            420                 425                 430

Ile Leu Lys Val Ser Glu Pro Ser Lys Cys Gln Tyr His Phe Trp Met
        435                 440                 445

Thr Thr Cys Ala Val Cys Ser Val His Glu Met Lys Lys Leu Arg Asp
    450                 455                 460

Glu Ala Asn Ile Ile Leu Ser Asn Leu Asn Leu Thr Lys Gly Gln Lys
465                 470                 475                 480
```

Ser Asn Met Ala His Lys His Asp Glu Leu
485 490

<210> 801
<211> 999
<212> PRT
<213> Thalassiosira pseudonana

<400> 801

Met Tyr Ser Leu Ala Ser Ala Leu Tyr Ala Ile Ser Leu Ala Leu Ser
1 5 10 15

Ile Leu Gln Gln Asn Gln His Lys Met Phe Ala Ser Ala Ser Val Ser
20 25 30

Trp Ser Leu Glu Cys Ala Ser Asn Ala Trp Phe Asp Gly Ala Pro Lys
35 40 45

Thr Leu His Thr Ile Phe Ala Asp Arg Ile Asn Asp Gly Tyr Cys Asp
50 55 60

Cys Pro Leu Asp Gly Leu Asp Glu Pro Glu Thr Gly Ala Cys Ser Gly
65 70 75 80

Ser Met Asp Gly Met Trp Ala Gly Val Pro Ala Ile Val Lys Asn Ala
85 90 95

Ala Val Ala Asn Ser Phe Val Cys Pro Gln Gln Pro Ser Leu Arg Leu
100 105 110

Pro Leu Ser Arg Val Asn Asp Gly Ile Cys Asp Cys Cys Asp Gly Ala
115 120 125

Asp Glu His Leu Ser Pro Leu Ala Pro Ser Ala Ser Ser Ser Glu Pro
130 135 140

Ser Thr Ser Ala Cys Pro Asp Ile Cys Asp Ala Val Leu Ala Ala Glu

```
145                 150                 155                 160

Arg Ala Ala Lys Ala Lys Ala Glu Glu Asp Tyr Lys Val Gly Ser Gln
                165                 170                 175

Lys Arg Leu Glu Ser Ile Ala Gln Tyr Gln Lys Trp Asn Glu Ser Thr
            180                 185                 190

Arg Arg Asn Leu Gln Gln Leu Lys Asp Val Glu Leu Ala Lys Val Asn
        195                 200                 205

Asn Asp Val Ser Glu Val Glu Gln Glu Leu Met Leu Ser Lys Ile Ala
    210                 215                 220

Leu Ala Lys Glu Trp Leu Arg Val Val Lys Glu Asp Val Leu Asn Ser
225                 230                 235                 240

Val Pro Leu Met Gly Ile Val Gly Lys Thr Ser Gln Ser Ser Ser Asn
                245                 250                 255

Asn His Met Ser Leu Asp Asp Leu Ala Ser Phe Ile Ile Ser Leu Cys
            260                 265                 270

Trp Val Ser Gly Glu Ala Ser Ser Ala Asn Val Ala Ser Gly Arg Cys
        275                 280                 285

Leu Pro Leu Asp Arg Ala Ser Met Asp Val Gly Ile Leu Trp Asp His
    290                 295                 300

Thr Thr Glu Glu Ser Leu Pro Thr Phe His Tyr Leu Asp Ser Asp Asn
305                 310                 315                 320

Glu Ala Ser Leu Leu Asp Phe Gly Glu Lys Ile Leu Leu Arg Leu Glu
                325                 330                 335

Gly Asn Asp Ser Ala Thr Glu Lys Pro Leu Lys Lys Asn Asn Lys Gln
```

```
            340                 345                 350

Tyr Glu Lys Asp Glu Ser Glu Pro Asp Tyr Gly Asp Asp Asp Tyr Phe
        355                 360                 365

Gly Asp Asp Tyr Glu Asp Tyr Arg Asp Glu Gly Asp Val Glu Ser Ser
    370                 375                 380

Asp Ser Ala Glu Val Ala Ser Ser Glu Thr Asp Glu Ile Gln Gln Lys
385                 390                 395                 400

Glu Pro Asn Pro Asp Asp Ser Met Val Gly Ser Arg Leu Lys Arg Leu
                405                 410                 415

His Leu Ala Ser Thr Arg Gln Leu Phe Lys Glu Gln Ala Lys Leu Leu
            420                 425                 430

Leu Glu Tyr Ala Ser Thr Val His Asn Glu Ser Glu Glu Glu Glu Asn
        435                 440                 445

Gly His Glu Glu Ser Ser Ser Leu Asp Glu Arg Glu Thr Leu Glu Gly
    450                 455                 460

Gly Glu Glu Thr Lys Ser Pro His Ser Ser Gly Ile Asp Pro Met Ala
465                 470                 475                 480

Val Lys Met Val Thr Ser Thr Ile Gly Lys Arg Leu Ser Asn Ile Ser
                485                 490                 495

Arg Gly Glu Ala Ser Ala Lys Ser Ala Ala Pro Tyr Ile Val Ser Leu
            500                 505                 510

Met Lys Asn Arg Ser Gly Gly Gly Ser Val Leu Asp Asp Leu Gln Ser
        515                 520                 525

Leu Ala Ile Met Ala Met Tyr His Ser Asn Val Arg Thr Lys Asp Leu
```

```
    530                 535                 540

Ala Glu Ile Val Tyr Thr Thr Ser Ser Glu Phe His Ser Ala Thr Lys
545                 550                 555                 560

Thr Gln Asp Glu Thr Ser Cys Ser Ala Val Ser Pro Trp Ser Asn Met
                565                 570                 575

Cys Pro Pro Arg Val Val Ser Leu Gln Gly Asp Ala Lys His Thr Phe
            580                 585                 590

Pro Pro Pro Phe Val Phe Glu Ala Ala Arg Gln Arg Cys Glu Lys Arg
        595                 600                 605

Glu Asp Ala Leu Val Ala Asp Glu Lys Glu Phe Pro Thr Ser Met Pro
    610                 615                 620

Glu Gly Tyr Tyr Asn Tyr Tyr Thr Pro Gln Pro Arg Gly Ser Ala Asp
625                 630                 635                 640

Glu Leu Ser Ser Leu Phe Ser Asn Val Asp Thr Leu His Lys Met Pro
                645                 650                 655

Thr Asp Ile Val Glu Leu Arg Glu Arg Lys Gly Lys Leu Asp Asn Ser
            660                 665                 670

Lys Lys Ser Leu Leu Ser Thr Ile Ser Lys Leu Glu Ser Glu Thr Gly
        675                 680                 685

Ser Gly Gly Asn Ser Pro Lys Phe Gly Val Asp Gly Glu Leu Tyr Ile
    690                 695                 700

Ile Arg Asp Thr Cys His Thr Val Glu Ser Gly Lys Tyr Glu Tyr Glu
705                 710                 715                 720

Val Cys Ile Phe Gly Lys Ala Thr Gln Arg Asp Ala Gly Gln Lys Ser
```

```
                725                 730                 735

Gly Gly Thr Asn Leu Gly Ser Trp Asp Lys Val Glu Arg Tyr Asp Gly
            740                 745                 750

Gly Arg Arg Leu Lys Trp Ser Gly Gly Thr Lys Cys Trp Asn Gly Pro
        755                 760                 765

Ala Arg Ser Ala Glu Val Val Val Thr Cys Gly Ser Glu Thr Lys Leu
    770                 775                 780

Leu Thr Ala Asp Glu Pro Glu Thr Cys Arg Pro Pro Pro Pro Pro Thr
785                 790                 795                 800

His Thr His Lys His His Lys Pro Phe Pro Ser Glu Met Lys Val Asn
                805                 810                 815

Val His Phe Leu Glu Leu Ala Thr Val Gly Ser Glu Gln Asn Leu Asn
            820                 825                 830

Val Leu Trp His Leu Val Asp Ile Gln Ser Pro Pro Gln Leu Ser Gln
        835                 840                 845

Ser Ala Leu Pro Gln Gly Trp Ala Ile Leu Glu Gly Asp Leu Val Val
    850                 855                 860

Phe Pro Ser Leu Ala Ser Gly Ala Gly Glu Met Glu Met Val Arg Phe
865                 870                 875                 880

Val Gly Pro Lys Thr Ser His Val Ser Glu Lys Gly Asp Glu Asp Ala
                885                 890                 895

Leu Pro Leu Leu Ala Ala Gly Val Glu Tyr Pro Gln Phe Pro Gln Leu
            900                 905                 910

Ile Val Ser Leu Ala Glu Glu Arg Gly Val Ser Leu Arg Glu Met Tyr
```

915 920 925

Glu Ala Pro Leu Asp Leu Val Leu Arg Thr Gln Pro Pro Asn Leu Gly
930 935 940

Leu Arg Asp Leu Tyr Ser Asn Asp Asp Glu Ala Tyr Glu Gly Phe Trp
945 950 955 960

Gln Asn Pro Pro Val Ala Arg Arg Arg Gly Pro Ser Gly Asp Pro Trp
965 970 975

Arg Ile Ser Leu Lys Asp Cys Val Trp Lys Gln Thr Val Glu Leu Pro
980 985 990

Thr Ala Lys Gly Asp Glu Leu
995

<210> 802
<211> 797
<212> PRT
<213> Thalassiosira oceanica

<400> 802

Met Ala Arg Arg Lys Val Ile Ala Phe Ala Leu Ser Thr Ser Leu Leu
1 5 10 15

Leu Leu Gln Asn Ala Ser Ser Ser Gly Leu Val Cys Lys Thr Trp Thr
20 25 30

Gly Ala Asp Gln Glu Val Pro Pro Pro Arg Val Asn Asp Gly Tyr Cys
35 40 45

Asp Cys Pro His Asp Gly Ser Asp Glu Val Gly Thr Gly Ala Cys Ala
50 55 60

Gly Ser Met Asp Gly Met Trp Ala Gly Leu Ser Pro Arg Leu Leu Pro
65 70 75 80

```
Ser Asp Ala Asp Ala Ala Val Pro Pro Ala Ala Phe Ala Cys Arg Gln
                85                  90                  95

Gln Pro Ser Leu Arg Leu Pro Leu Ser Arg Leu Asn Asp Gly Ile Cys
            100                 105                 110

Asp Cys Cys Asp Gly Ser Asp Glu Ala Thr Asp Pro Ser Leu Ser Ser
        115                 120                 125

Val Ser Met Arg Gly Ser Cys Pro Asp Ile Cys Asp Glu Val Leu Ala
    130                 135                 140

Asp Glu Arg Ala Arg Val Ala Lys Leu Arg Ser Asp Phe Glu Ala Gly
145                 150                 155                 160

Phe Lys Val Arg Ala Glu Ala Ile Glu Glu Tyr Asp Gln Trp Arg Ser
                165                 170                 175

Arg Ser Glu Glu Asn Leu His Gln Leu Arg Asp Val Asp Met Glu Ile
            180                 185                 190

Met Lys Lys Asp Lys Glu Glu Leu Asp Leu Arg Leu Thr Thr Ala Lys
        195                 200                 205

Leu Thr Phe Ala Arg Asp Trp Ile Ser Ser Val Met Asp Ile Thr Ser
    210                 215                 220

Leu Met Ser Thr Asn Glu His Gln Pro Ser Leu Lys Gly Met Leu Ile
225                 230                 235                 240

Met Asp Glu Met Glu Thr Val Ser Phe Ile Leu Ser Leu Cys Met Leu
                245                 250                 255

Ser Ala Glu Ile Ser Ala Gln Asn Leu Val Asn Gly Arg Cys Leu Ala
            260                 265                 270
```

```
Leu Asp Leu Ala Ser Leu Asp Leu Gly Ile Ile Trp Asp His Ser Ser
        275                 280                 285

Asp Pro Met Pro Thr Phe Thr Leu Leu Asp Ser Glu Ser Lys Asp Ser
    290                 295                 300

Leu Ser Gln Tyr Ala Asp Ser Ile Leu Ser Arg Ile Glu Gly Lys Glu
305                 310                 315                 320

Ala Lys Lys Gly Pro Gln Ser Asn Ser Arg Arg Gly Gly Arg His Gly
                325                 330                 335

Arg Asn Asp Arg Pro Pro Pro Pro Asp Val Ser Ser Gly Asp Asp Pro
            340                 345                 350

Tyr Gly Asp Asp Trp Glu Asp Asn Asp His Asp Asp Asp Glu Asp Ile
        355                 360                 365

Glu Ser Pro His Gln Asp Gly Glu Leu Glu Ser Ser Asp Gly Asp Ser
    370                 375                 380

Gly Val Glu Ser Pro Lys Ser Ser Ile Glu Asn Ile Val Glu Glu Leu
385                 390                 395                 400

Met Asp Ser Leu Pro His Asp Arg Ser Leu Phe Arg Lys Gln Thr Ser
                405                 410                 415

Leu Val Leu Asn Tyr Ser Pro Pro Leu Ser Gly Lys Lys Gln Thr Lys
            420                 425                 430

Thr Glu Glu Ile Asp Asp Ile Val Pro Glu Asp Ser Pro Glu Gly Ala
        435                 440                 445

Ala Glu Ser Glu Glu Glu Glu Gln Glu Asn Glu His Glu Val Asp Pro
    450                 455                 460
```

```
Met Ala Leu Lys Glu Val Lys Leu Ala Leu Gly Arg Leu Ser Gly Ser
465                 470                 475                 480

Val Asp Arg Gly Glu Ile Ser Ala Lys Ser Ala Ala Arg Tyr Ile Val
                485                 490                 495

Ala Met His Ala Ser Glu Thr Val Leu Asp Val Glu Leu Leu Ala Leu
            500                 505                 510

Met Val Leu Tyr His Ser Lys Ile Ser Ala Ser Asp Val Ala Glu Leu
        515                 520                 525

Ile Tyr Met Ile Ser Ser Glu Phe Lys Val Lys Glu Asp Glu Ala Thr
    530                 535                 540

Cys Ser Ala Pro Trp Ala Ala Met Cys Pro Pro Arg Thr Lys Ala Gly
545                 550                 555                 560

Glu Gly Gly Arg Thr Tyr Pro Pro Thr Val Ile Val Glu Ala Ala Gln
                565                 570                 575

Ala Val Cys Asp Gln Arg Glu Gly Ala Ala Tyr Val Cys Ser Ser Gln
            580                 585                 590

Ile Glu Glu Glu Leu Asn Leu Pro Thr Glu Val Ser Asp Gly Tyr Tyr
        595                 600                 605

Asn Tyr Tyr Glu Pro Arg Gly Arg Asp Val Asp Asp Gly Leu Ser Ala
    610                 615                 620

Tyr Phe Gln Asp Leu Asp Gly Met Gln Met Ile Pro Ala Asp Leu Ser
625                 630                 635                 640

Asp Leu Met Lys Gln Arg Asp Ser Val Glu Lys Glu Leu Lys Ser Leu
                645                 650                 655
```

```
Ser Ile Arg Ile Ser Ser Leu Glu Arg Glu Leu Gly Asp Asp Ser Asp
            660                 665                 670

Lys Ser Lys Tyr Gly Ala Asp Gly Glu Leu Tyr Thr Met Arg Asp Ser
        675                 680                 685

Cys His Lys Val Glu Gln Gly Lys Tyr Glu Tyr Glu Val Cys Ile Phe
    690                 695                 700

Gly Lys Ala Thr Gln Arg Asp Ile Gly Gln Arg Ser Gly Gly Thr Asn
705                 710                 715                 720

Leu Gly Gln Trp His Ser Ala Thr Val Asp Glu Asn Ser Gly Lys Arg
                725                 730                 735

Leu Leu Lys Trp Thr Gly Gly Thr Lys Cys Trp Asn Gly Pro Val Arg
            740                 745                 750

Ser Ala Glu Val Ser Ile Thr Cys Gly Ala Lys Thr Lys Leu Leu Ser
        755                 760                 765

Ala Asp Glu Pro Glu Thr Cys Arg Tyr Ile Leu Glu Met Glu Ser Pro
    770                 775                 780

Val Gly Cys Asp Glu Ser Phe Lys Gln Ser Asn Ala Leu
785                 790                 795
```

<210> 803
<211> 1006
<212> PRT
<213> Fragilariopsis cylindrus

<400> 803

```
Met Ile Tyr Arg Phe Thr Gln His Asn Asp Ala Gln Ile Glu Asn Lys
1               5                   10                  15
```

```
Ala Thr Ser Val Val Asp Phe Asn Leu Val Asn Asn Pro Ser Ala Ala
            20                  25                  30

Ala Ser Ser Leu Ser Ser Thr Thr Glu Asn Ala Ile Pro His Tyr Ile
        35                  40                  45

Pro Thr Ser Trp Ile Asn Asp Gly Tyr Cys Asp Cys Pro Phe Gly Asn
    50                  55                  60

Glu Asn Gly Met Thr Asp Glu Pro Asn Thr Asn Ala Cys Ser Gly Ser
65                  70                  75                  80

Lys Ser Trp Pro Gly Val Lys Gly Ser Ile Ile Ser Thr Ser Ser Leu
                85                  90                  95

Pro Glu Glu Thr Asn Thr Ile Thr Thr Thr Asp Val Tyr Tyr Val Cys
            100                 105                 110

Pro Glu Gln Ser Lys Leu Thr Leu Pro Leu Ser Arg Ile Gln Asp Gly
        115                 120                 125

Ile Cys Asp Cys Cys Asp Gly Ser Asp Glu Asp Gln Phe Thr Ile Cys
    130                 135                 140

Pro Asn Asn Cys Asp Glu Leu Leu Lys Glu Glu Arg Glu Leu Glu Ala
145                 150                 155                 160

Lys Ile Lys His Ala Tyr Ile Val Gly Ser Arg Gln Arg Asp Ser Asp
                165                 170                 175

Ile Gln Thr Phe Gln Thr Val Arg Thr Gln Lys Leu Leu Asn Ile Glu
            180                 185                 190

Asn Asn Phe Lys Pro Gln Ile Ile Glu Leu Glu Leu Asp Ile Ser Asn
        195                 200                 205
```

```
Ile Leu Asn Leu Ile Asn Asp Ser Lys Gln Lys Tyr Val Gln Ser Arg
    210                 215                 220

Ile Asn Thr Met Lys Asp Ser Val Val Ser His Gln Leu Ser Thr Glu
225                 230                 235                 240

Leu Leu Ser Gly Leu Leu Met Ser Ser Thr Ser Thr Ser Thr Thr Asn
                245                 250                 255

Leu Leu Glu Asn Phe Ile Ile His Leu Cys Gln Ile Ser Gly Glu Leu
            260                 265                 270

Met Met Asn Asp Asp Asn Glu Phe Ser Asn Lys Ile Pro Asn Asp Asp
        275                 280                 285

Leu His Arg Asn Ser Cys Ser Pro Leu Arg Val Ala Ala Leu Asp Ile
    290                 295                 300

Gly Leu Thr Trp Asn Asn Ala Ile Asp Thr Ala Ala Ala Ala Ala Ala
305                 310                 315                 320

Ala Ala Ile Thr Asp Asp Asn Asp Asp Asn Asn Asp Asn Glu Asp Lys
                325                 330                 335

Val Ala Val Leu Phe Ser Ile Pro Ser Leu Arg Trp Thr Asn Thr Lys
            340                 345                 350

Thr Lys Arg Lys Lys Pro Gln Pro Arg Lys Gly Gly Arg Arg Leu Ala
        355                 360                 365

Phe Glu Asp Glu Asp Ser Asn Tyr Asp Asp Asp Phe Met Met Asp Glu
    370                 375                 380

Glu Tyr Glu Arg Asp Asn Met Met Met Asp Asp Asp Asp Asp Leu Tyr
385                 390                 395                 400
```

```
Asn Asp Gln Asp Arg Asp Asp Tyr Asp Tyr Asp Asp Ser Ser Ser Ser
                405                 410                 415

Ser Arg Gly Trp Lys Asp Asn Glu Asp Asp Asp Asn Asn Asp Glu Asp
            420                 425                 430

Ile Asp Asn Asp Ala Thr Thr Thr Thr Asp Val Asp Val Asp Val Asp
        435                 440                 445

Val Asp Asp Glu Met Thr Ser Lys Glu Asp Glu Phe Ile Asn Asp Leu
    450                 455                 460

Leu Lys Asn Gln Leu Lys Leu Phe Ser Lys Ile Thr Gln Arg Ile Asn
465                 470                 475                 480

Tyr Leu Gln Glu Ser Glu Gln Met Ile Gln Lys Ile Asn Gln Ile Leu
                485                 490                 495

Asp Ser Pro Pro Pro Pro Leu Pro Pro Pro Pro Pro Pro Thr Ile Asp
            500                 505                 510

Val Asp Ile Asp Glu Glu Lys Lys Lys Glu Asn Asp Asn Asp Asn Asn
        515                 520                 525

Asn Asn Ile Glu Glu Glu Glu Glu Glu Gly Thr Thr Arg Glu Gly Glu
    530                 535                 540

Asp Glu Lys Asn Thr Val Ile Thr Glu Asn Asp Gly Asn Ala Ala Asp
545                 550                 555                 560

Val Val Leu Asp Glu Glu Thr Thr Ala Val Ala Asp Asp Glu Ile Asn
                565                 570                 575

Thr Ala Ala Thr Thr Thr Glu Asn Asp Asp Asn Glu Asn Glu Asn Ser
            580                 585                 590
```

```
Asn Lys Phe Asp Pro Thr Ser Tyr Thr Met Val Arg Gln Lys Leu Arg
        595                 600                 605

Gln Lys Gln Gln Ile Ile Gln Lys Gly Leu Arg Trp Gly Ala Ser Ala
    610                 615                 620

Lys Leu Leu Phe Asp Asp Ser Lys Asn Ile Ser Phe Ser Asn Glu Asp
625                 630                 635                 640

Leu Lys Arg Leu Ala Ile Gly Thr Leu Phe Tyr Gly Gln Ile Ser Ser
                645                 650                 655

Leu Gln Val Trp Gln Ile Ile Ile Ser Ile Leu Glu Ser Thr Ser Asn
            660                 665                 670

Asn Asn Asn Ser Ser Val Asp Asp Asp Asp Asp Asn Val Asp Asn His
        675                 680                 685

Asp Arg Met Leu Asn Thr Cys Ser Ser Pro Trp Ser Glu Tyr Cys Pro
    690                 695                 700

Pro Asn Gln Thr Val Phe Lys Tyr Gly Lys Asp Asn Asp Asn Asp Asp
705                 710                 715                 720

Glu Glu Leu Glu Leu Glu Ser Ile Leu Tyr Pro Pro Ser Phe Leu Met
                725                 730                 735

Asp Val Ala Lys Val Phe Cys Glu Glu Glu Gly Leu Lys Phe Ala Ala
            740                 745                 750

Gly Gly Ser Ser Thr Ser Ala Ala Ser Cys Gly Asn Asn Thr Asn Asn
        755                 760                 765

His Asn Asn Asp Asp Val Gly Asp Glu Asn Asp Asn Glu Lys Glu Asp
    770                 775                 780
```

```
Ile Ala Ile Phe Val Ser Lys Tyr Asn Asn Asn Asp Asp Asp Asp Met
785                 790                 795                 800


Lys Glu Asp Glu Glu Ser Phe Leu Tyr Asn Phe Gly Tyr Thr Val Pro
                805                 810                 815


Val Arg Arg Asn Pro Asp Gly Ser Asp Pro Leu Gln Ser Ile Phe Lys
            820                 825                 830


Ser Ile Ile Glu Leu Pro Ile Asp Val Asp Gly Leu His Gln Leu Glu
        835                 840                 845


Lys Ser Lys Lys Ser Lys Glu Asp Glu Ile Lys Asp Ile Asn Arg Ser
    850                 855                 860


Ile Asn Asp Thr Trp Lys Glu Ile Gly Gly Ile Asp Gly Asn Glu Leu
865                 870                 875                 880


Gly Arg Asp Gly Glu Ile Trp Lys Ile Ala Asp Lys Cys Phe Asp Ile
                885                 890                 895


Thr Ala Gly Lys Tyr Thr Tyr Glu Val Cys Leu Phe Gly Lys Ala Leu
            900                 905                 910


Gln Lys Glu Ser Ser Asp Lys Gly Gly Gly Thr Asn Leu Gly Gln Trp
        915                 920                 925


Thr Gly Ile Glu Tyr Glu Asn Asp Asp Asn Gly Asp Ala Ser Ile Arg
    930                 935                 940


Val Met Lys Trp Glu Asn Gly Ala Lys Cys Trp Asn Gly Pro Lys Arg
945                 950                 955                 960


Ser Ala Thr Val Tyr Met Lys Cys Gly Ile Glu His Arg Ile Ile Ser
                965                 970                 975
```

```
Ala Asn Glu Pro Asp Thr Cys Arg Tyr Val Phe Glu Met Glu Ser Tyr
            980                 985                 990


Leu Ala Cys Asp Asp Ser Tyr Lys  Leu Arg Ala Gly Leu  Leu
        995                 1000                1005


<210>  804
<211>  697
<212>  PRT
<213>  Aureococcus anophagereffens

<400>  804

Met Trp Arg Trp Arg Ile Ala Ala Leu Leu Ala Ala Leu Leu Arg Ala
1               5                   10                  15


Val Ala Asp Asp Ala Ala Pro Ala Cys Ala Val Pro Pro Asp Arg Val
            20                  25                  30


Asp Asp Asp Tyr Cys Asp Cys Pro Val Asp Gly Gly Asp Glu Pro His
        35                  40                  45


Thr Ser Ala Cys Ala Ser Ala Ala Leu Ala Ala Arg Pro Ser Phe Ala
    50                  55                  60


Cys Ala Gly Gly Gly Ala Gly Ser Ala Ala Phe Leu Pro Ala Ser Arg
65                  70                  75                  80


Val Gly Asp Gly Val Cys Asp Cys Cys Asp Gly Ala Asp Glu Pro Ala
                85                  90                  95


Gly Phe Cys Gly Asp Asp Cys Ala Ala Leu Arg Ala Arg Ala Glu Ala
            100                 105                 110


Asp Ala Ala Ala Ala Arg Ala Ala Ala Ala Ala Gly Val Ala Lys Met
        115                 120                 125
```

```
Arg Thr Met Ala Cys Glu Ala Arg Ala Gly Lys Ala Glu Ala Ala Arg
    130                 135                 140

Val Leu Ala Gly Ser Glu Gly Glu Leu Asp Gly Leu Arg Ala Lys Ile
145                 150                 155                 160

Asp Ala Ala Arg Ala Arg Val Asp Glu Ala Arg Glu Ala His Ala Ala
                165                 170                 175

Leu Lys Arg Ala Asp Gly Glu Arg Ala Ile Tyr Lys Glu Leu Arg Leu
            180                 185                 190

Asp Ala Leu Ser Gly Ser Glu Leu Arg Arg Leu Val Val Asp Leu Ala
        195                 200                 205

Arg Glu Ala Lys Ala Gly Asp Ala Leu Val Arg Leu Ala Arg Val Ala
    210                 215                 220

Asn Gly Leu Pro Ala Val Glu Pro Ala Glu Ala Glu Ala Glu Pro Ala
225                 230                 235                 240

Ala Asp Glu Pro Ala Thr Glu Ala Glu Ala Leu Glu Ala Glu Ala Ala
                245                 250                 255

Asp Glu Ala Ala Glu Pro Glu Pro Glu Gly Ala Glu Ala Ala Gly Ala
            260                 265                 270

Glu Ala Glu Ala Val Gly Ala Glu Pro Glu Ser Glu Ala Ala Pro Glu
        275                 280                 285

Pro Asp Ala Asp Ala Val Glu Ala Glu Gly Val Glu Ala Glu Gly Ala
    290                 295                 300

Glu Ala Glu Gly Ala Glu Ala Glu Ala Val Glu Ala Glu Ala Glu Ser
305                 310                 315                 320
```

```
Glu Ala Ala Pro Glu Pro Asp Ala Asp Ala Val Glu Ala Glu Gly Val
                325                 330                 335

Glu Ala Glu Gly Ala Glu Ala Glu Gly Ala Glu Ala Glu Ala Val Glu
            340                 345                 350

Ala Glu Ala Glu Ser Glu Ala Ala Pro Glu Pro Gly Thr Glu Ala Val
        355                 360                 365

Glu Ala Asp Ala Ala Ala Asp Ser Glu Ala Glu Pro Glu Arg Pro Asp
    370                 375                 380

Ala Asp Ala Asp Ala Asp Ala Asp Ala Ala Leu Asp Glu Pro Ala Pro
385                 390                 395                 400

Glu Tyr Glu Gln Thr Val Glu Leu Asp Gly Gly Gly Glu Asp Tyr Asp
                405                 410                 415

Ala Tyr Gly Asp Asp Tyr Asp Phe Arg Asp Asp Tyr Gly Asp Gly Asp
            420                 425                 430

Tyr Gly Ser Asn Ser Phe Ala Gly Leu Asp Asp Glu Asp Phe Pro Asp
        435                 440                 445

Asp Glu Tyr Gly Asp Ile Pro Asp Asp Val Phe Pro Asp Asp Asp Tyr
    450                 455                 460

Lys Ser Arg Arg Tyr Asp Asp Asp Asp Phe Asp Tyr Gly Lys Ser Tyr
465                 470                 475                 480

Glu Pro Ala Asp Pro Arg Leu Asp Val Asp Gly His Ala Asp Pro Asp
                485                 490                 495

Lys Gly Tyr Val Ser Ala Ala Gln Lys Lys Ala Leu Lys Lys Leu Glu
            500                 505                 510
```

```
Gly Ala Leu Arg Asp Leu Glu Glu Glu Gln Arg Arg Lys Glu Arg Arg
        515                 520                 525

Leu Asp Lys Ala Arg Asp Ala Leu Gly Asp Asp Asp Arg Tyr Gly Arg
    530                 535                 540

Asp Ser Ala Leu Trp Pro Leu Arg Glu Thr Cys Ile Ser Lys Lys Phe
545                 550                 555                 560

Ser Gly Tyr Lys Tyr Glu Val Cys Phe Phe Lys Gly Ala Lys Gln Gly
                565                 570                 575

Ser Thr Arg Leu Gly Asp Tyr Gln Arg Ser Thr Lys His Ala Asn Asn
            580                 585                 590

Val Thr Ala Thr Leu Val Tyr Glu His Gly Glu His Cys Trp Asn Gly
        595                 600                 605

Pro Ser Arg Ser Leu Ala Val Thr Leu Val Cys Gly Ala Glu Thr Gly
    610                 615                 620

Ile Leu Asp Val Asp Glu Pro Ser Thr Cys Val Tyr Ala Ala Thr Val
625                 630                 635                 640

Glu Thr Pro Ala Val Cys Val Asp Ala Asp Ala Pro Asp Val Asp Cys
                645                 650                 655

Ala Gly Tyr Lys Pro Ala Phe Ala Leu Phe Asp Gly Leu Asp Ser Pro
            660                 665                 670

Lys Lys Arg Lys Lys Gly Ala Arg Lys Leu Leu Lys Lys Ala Lys Ala
        675                 680                 685

Ala Leu Ala Ser Phe Phe Gly Arg Asp
    690                 695
```

<210> 805
<211> 525
<212> PRT
<213> Nannochloropsis gaditana

<400> 805

```
Met Met Ile Leu Trp Thr Leu Pro Val Tyr Thr Leu Val Ala Val Ile
1               5                  10                  15


Ala Ile Ser Ala Glu Ala Ser Pro Val Asp Ile Leu Gly Ile Pro Arg
            20                  25                  30


Ser Ala Asp Pro Leu Tyr Ala Ala Ala Lys Ala Lys Gly Lys Phe Thr
        35                  40                  45


Cys Gln Ser Asp Lys Lys Ile Val Ile Pro Phe Val Gln Val Asn Asp
    50                  55                  60


Asn Tyr Cys Asp Cys Pro Asp Gly Ser Asp Glu Pro Gly Thr Ser Ala
65                  70                  75                  80


Cys Ala Pro Gln Gly Arg Phe Tyr Cys Val Asn Glu Gly His Val Gly
                85                  90                  95


Ala Ser Ile Pro Ser Ser Lys Val Asn Asp Gly Ile Cys Glu Leu Ala
            100                 105                 110


Cys Cys Asp Gly Ser Asp Glu Ala Pro Gly Leu Cys Pro Asn Thr Cys
        115                 120                 125


Arg Glu Ile Ala Ala Gln Lys Ala Lys Glu Arg Ala Ala Trp Arg Gln
    130                 135                 140


Val Val Glu Glu Gly Met Ala Lys Lys Lys Gln Tyr Met Arg Asp Ala
145                 150                 155                 160


Ser Ala Met Met Glu Ala Arg Tyr Lys Glu Leu Ala Ser Leu Gln Ala
```

```
                165                 170                 175

Gln Lys Val Gly Leu Glu Lys Lys Val Ala Asp Ala Arg Ile Glu Lys
            180                 185                 190

Glu Ser Glu Glu Gly Lys Glu Asn Val Lys Arg Asp Glu Ala Met Glu
        195                 200                 205

Gln Ala Ala Thr Thr Leu Ile Ser Gly Leu Lys Ile Glu Ser Leu Gly
    210                 215                 220

Gln Glu Glu Leu Val Ser Leu His Arg Lys Leu Lys Gly Arg Pro Gly
225                 230                 235                 240

Lys Ala Leu Arg Arg Val Leu Glu Glu Ile Arg Gly Lys Ala Gly Ile
                245                 250                 255

Glu Glu Val Glu Gly Glu Glu Glu Gly Glu Gly Gly Glu Gln Arg Pro
            260                 265                 270

Leu Ser Asp Ile Ala Ala Lys Glu Glu Met Glu Lys Lys Met Lys Glu
        275                 280                 285

Val Lys Glu Gly Thr Phe His Asp Gln Leu Gly Pro Val Pro Ala Glu
    290                 295                 300

Asp Glu Asp Glu Asp Ala Glu Gly Asp Glu Asp Asp Asp Glu Glu Ile
305                 310                 315                 320

Glu Asp Asp Asp Tyr Ser Pro Pro Asp Ala Ala Gln Glu Pro Leu Asp
                325                 330                 335

Pro Ala Leu Val Ser Leu Leu Glu Ala Ala Glu Glu Gly Leu Asp Glu
            340                 345                 350

Pro Ser Ala Gly Ala Glu Ala Ala Arg Gln Ala Leu Lys Asp Ala Arg
```

```
        355                 360                 365

Asp Glu Glu Arg Thr Val Arg Glu Arg Ile Gln Glu Met Glu Ala Glu
    370                 375                 380

Ser Gln Asp Asp Tyr Gly Asp Gly Tyr Ala Phe Tyr Leu Leu Arg Gly
385                 390                 395                 400

Lys Cys Phe Ser Lys Thr Val Asn Lys Tyr Arg Tyr Glu Met Cys Pro
                405                 410                 415

Tyr Lys Glu Ala Gln Gln Val Glu Gly Ser Ala Ala Arg Gly Thr Ser
            420                 425                 430

Leu Gly Lys Trp Gly Gly Met Glu Gln Ser Asn Gly Thr Val Ala Gly
        435                 440                 445

Gly Ser Ser Phe Lys Phe Leu Phe Arg Lys Gly Gln Gln Cys Trp Asn
    450                 455                 460

Gly Pro Glu Arg Ser Leu Thr Val Thr Val Glu Cys Gly Val Glu Asp
465                 470                 475                 480

Gln Val Val Ser Val Glu Glu Pro Ser Met Cys Glu Tyr Ala Met Thr
                485                 490                 495

Phe Lys Thr Pro Ala Ala Cys Ser Pro Ala Leu Leu Glu Trp Asp Asp
            500                 505                 510

Gln Glu Ala Ala Gly Arg Glu Ala Phe His Ser Glu Leu
        515                 520                 525
```

<210> 806
<211> 527
<212> PRT
<213> Emiliania huxleyi

<400> 806

```
Met Thr Ile Ala Ala Leu Ala Thr Val Ser Ala Ala Phe Glu Cys Asp
1               5                   10                  15

Gly Arg Ala Leu Pro Gly Ala Tyr Leu Asn Asp Asp Tyr Cys Asp Cys
            20                  25                  30

Ala Asp Gly Ser Asp Glu Ala Ala Thr Gly Ala Cys Ala Asp Thr Ile
        35                  40                  45

Tyr Val Cys Arg Asn Leu Pro His Lys Pro Lys Gln Ile Phe Ser Ser
    50                  55                  60

Arg Val Asn Asp Gly Val Cys Asp Cys Cys Asp Gly Ser Asp Glu Ala
65                  70                  75                  80

Asn Ser Thr Asp Cys Pro Asn Gly Cys Ile Ala Leu Ala Thr Glu Ala
                85                  90                  95

Phe Gly Ala Leu Ser Arg Gly Cys Leu Arg Arg Ala Glu Leu Ala Ile
            100                 105                 110

Ala Ala Ala Lys Ala Ala Ser Ser Asp Ala Glu Arg Leu Ser Ala Ala
        115                 120                 125

Arg Ala Gln Leu Ala Thr Ala Thr Pro Thr Ile Asp Ala Leu His Asp
    130                 135                 140

Ala Lys Ala Ala Ala Glu Ala Asp Glu Ala Ser Lys Arg Asp Gly Arg
145                 150                 155                 160

Ala Ala Arg Leu Ala Ala Gly Glu Val Glu Thr Ser Leu Gly Val Glu
                165                 170                 175

Arg Leu Asp Ala Gly Met Thr Leu Arg Ala Leu Val Arg Val Ala Leu
            180                 185                 190
```

```
Trp Gly Gly Val Glu Gly Val Asp Arg Met Tyr Asp Leu Leu Val Glu
        195                 200                 205

Arg Pro Gly Leu Glu Glu Ala Ala Glu Glu Val Ala Met Lys Ala Arg
    210                 215                 220

Asp Glu Ala Ala Ala Glu Lys Gly Gln Ser Ala Gly Gly Gly Gly Gly
225                 230                 235                 240

Gly Gly Val Cys Asp Ala Ala Gly Ala Cys Gly His Ala Arg Glu His
                245                 250                 255

Glu Ala Ala Leu Leu Gln Leu Leu Glu Pro Leu Pro Glu Asp Gly Gly
            260                 265                 270

Ala Leu Arg Ala Val Leu Arg Val Leu His Ala Glu Leu Gly Ala Gly
        275                 280                 285

Ala Thr Ser Ala Leu Ala Gln Ala Ala Arg Glu Leu Leu Ala Glu Thr
    290                 295                 300

Glu Ser Pro Leu Asp Asp Ala Ala Val Ala Ala Ala Leu Glu Leu Leu
305                 310                 315                 320

Glu Pro Phe Arg His Asp Glu Ala Glu Ala Ala Arg Ala Ala His Lys
                325                 330                 335

Ala Ala Val Glu Ala Val Gln Glu Ala Ser Glu Ala Glu Arg Gln Leu
            340                 345                 350

Ala Pro Lys Glu Ala Ile Ala Ala Ser Gly Gly Tyr Gly Ala Gly Leu
        355                 360                 365

Glu Trp Arg Gln Leu His Gly Arg Cys Phe Glu Ala Glu Asp Arg Gly
    370                 375                 380
```

```
Phe Thr Tyr Lys Ala Cys Pro Phe Gln Glu Met Arg Gln Gly Ser Pro
385                 390                 395                 400


Gly Gly Arg Ala Ser Arg Gln Gln Thr Leu Leu Gly Asn Phe Thr Arg
                405                 410                 415


Trp Glu Pro Val Ser Gly Glu Arg Ala Ser Gln Leu Ala Arg Ala Gly
            420                 425                 430


Arg Thr Pro Ser Glu Leu Gly Thr Met Arg Phe Glu Gly Gly Ala Ala
        435                 440                 445


Cys Gly Gly Gly Ala Val Arg Arg Ala Thr Leu Tyr Phe Glu Cys Gly
    450                 455                 460


Glu Gln Asp Ala Leu Leu Glu Val Thr Glu Pro Glu Thr Cys Val Tyr
465                 470                 475                 480


Glu Ala Trp Met Ser Thr Pro Leu Ala Cys Ser Leu Ala Leu Leu Arg
                485                 490                 495


Glu Lys Val Ala Thr Leu Glu Glu Ala Ser Ala Ala Ala Ser Leu Glu
            500                 505                 510


Phe Arg Pro Ser Asp Glu Leu Arg Ala Leu Leu Ala Ala Pro Glu
        515                 520                 525


<210>  807
<211>  499
<212>  PRT
<213>  Guillardia theta

<400>  807

Met Ala Gly Ala Gly Arg Ala Leu Ala Met Val Ser Met Leu Ala Leu
1               5                   10                  15
```

```
Val Ala Met Ser Val Gln Ser Glu Glu Met Arg Gly Val Gln Pro Glu
            20                  25                  30

Asp Ala His Leu Tyr Ala Lys Lys Asp Met Phe Thr Cys Lys Asp Gly
        35                  40                  45

Ser Ser Thr Ile Ser Ile Asp Lys Val Asn Asp Glu Phe Cys Asp Cys
    50                  55                  60

Asn Asp Gly Ser Asp Glu Pro Gly Thr Ala Ala Cys Ser Asn Gly Val
65                  70                  75                  80

Phe Trp Cys Ala Asn Lys Gly Trp Lys Ala Lys Leu Leu Phe Ser Ser
                85                  90                  95

Arg Val Asn Asp Gly Val Cys Asp Cys Cys Asp Gly Ser Asp Glu His
            100                 105                 110

Ala Gly Ile Val Thr Cys Val Asn Arg Cys Gln Glu Glu Gly Ala Glu
        115                 120                 125

Gln Arg Asn Ile Leu Met Arg Ser Ile Gln Leu His Glu Gln Gly Val
    130                 135                 140

Ala Lys Arg Ser Asp Tyr Val Ala Arg Ala His Ala Phe Arg Glu Ala
145                 150                 155                 160

Val Phe Lys Arg Arg Asp Glu Leu Gly Asn Leu Ile Gln Glu Val Ser
                165                 170                 175

Gln Lys Leu Asp Gly Phe Gln Ala Gln Arg Asp Glu Leu Asn Lys Lys
            180                 185                 190

Ile Ser Glu Glu Thr Glu Glu Arg Leu Arg Gln Glu Gln Glu Ala Arg
        195                 200                 205
```

```
Glu Ala Glu Glu Lys Lys Arg Ala Glu Glu Glu Gln Lys Arg Ala Glu
    210                 215                 220

Glu Leu Ala Ala Gln Gln Ala Glu Met Ala Asn Gln Val Pro Ser Gly
225                 230                 235                 240

Glu Glu Ile Lys Ser Ser Gly Asp Glu Phe Gly Ser Pro Glu Val Pro
                245                 250                 255

Pro Met Ala Pro Gln Ala Val Asp Asp Leu Gly Glu Thr Gln Gln Val
            260                 265                 270

Val Gln Glu Gly Lys Gly Tyr Glu Asp Pro Tyr Tyr Ser Gly Lys His
        275                 280                 285

Val Asp Lys Arg Pro Ser Pro Thr Gly Asn Pro Asp Pro Asn Thr His
    290                 295                 300

Val Asp Asp Trp Tyr Ser Tyr Asp Asn Asp His Thr Asp Glu Glu Lys
305                 310                 315                 320

Pro Ser Glu Asp Glu Tyr Arg Pro Pro Glu Glu Glu Tyr Lys Pro Pro
                325                 330                 335

Glu Glu Arg Pro Lys Thr Glu Ala Glu Ser Glu Ser Glu Leu Ala Val
            340                 345                 350

Lys Val Leu Glu Tyr Asp Phe Gly Pro Asp Met Ala Phe Met Ala Leu
        355                 360                 365

Tyr Asp Lys Cys Tyr Glu Gln Gln Val Gln Gln Tyr Thr Tyr Glu Ile
    370                 375                 380

Cys Met Phe Arg His Ala Lys Gln Lys Asp Gly Gly Ser Glu Gln Asn
385                 390                 395                 400
```

```
Leu Gly Thr Trp Ser His Trp Thr His Glu Asn Gly His Asn Ser Val
                405                 410                 415


Met His Tyr Thr Asn Gly Gly Gly Cys Trp Asn Gly Pro Ala Arg Ser
            420                 425                 430


Met Lys Glu Gln Gln Ala Leu Pro Pro Ala Arg Ser Ala Asp Ile Leu
        435                 440                 445


Glu Gln Val Ser Met Ile Cys Gly Glu Asp Glu Phe Leu Val Ser Val
    450                 455                 460


Gln Glu Pro Ser Arg Cys Val Tyr Glu Met Glu Phe Met Thr Pro Leu
465                 470                 475                 480


Ala Cys Ser Ala His Arg Ala Gln Glu Ala Arg Glu Gln Leu Leu Ala
                485                 490                 495


Ile Ser His
```

<210> 808
<211> 815
<212> PRT
<213> Trichoderma reesei

<400> 808

```
Met Ala Lys Phe Ala Gln Leu Leu Ala Ser Ala Ala Ala Leu Ala Val
1               5                   10                  15


Gly Ala Ser Ala Thr Gly Ser Glu Thr Val Leu Ile Ser Glu Val Gly
            20                  25                  30


Arg Leu Asn Asn Gln Ser Leu Leu Trp Gly Pro Tyr Lys Pro Asn Leu
        35                  40                  45
```

```
Tyr Phe Gly Val Arg Pro Arg Leu Pro Gln Gly Leu Trp Thr Gly Leu
    50                  55                  60

Met Trp Gly Arg Ala Glu Gln Tyr Met Asp Ile Gln Ser Leu Phe Arg
65                  70                  75                  80

Tyr Thr Cys Glu Gln Gly Gln Asp Ile His Gly Tyr Gly Trp Asp Glu
                85                  90                  95

Tyr Asp Ala Arg Thr Gly Gly Val Gln Thr Ile His Asp Glu Gly Asn
            100                 105                 110

Gly Ile Asp Ile Thr Thr Ser Phe Ile Lys Val Pro Gly Gly Asn His
        115                 120                 125

Gly Gly Ser Trp Ala Ala Arg Ile Lys Gly Thr Val Arg Asp Asp Ala
    130                 135                 140

Pro Ala Asp Thr Lys Phe Leu Val His Tyr Tyr Ile Ala Gln Glu Gly
145                 150                 155                 160

Leu Gly Asp Leu Glu Val Glu Gly Ala Asp Glu Asp Asn Gly Leu Gly
                165                 170                 175

Phe Glu Gly Asp Val Arg Leu Lys Gly Ser Ser Asn Ser Leu Gly Asp
            180                 185                 190

Tyr Ser Ile Val Val Thr Lys Gly Ser Gly Asn His Pro Thr Ser Asp
        195                 200                 205

His Glu Ile Ser Ala Ser Arg Arg Gly Asp Thr Thr Val Val Arg Ser
    210                 215                 220

Leu Gly Leu Pro Glu Glu His Leu Trp Gln Ala Lys Pro Ala Thr Phe
225                 230                 235                 240
```

```
Arg Glu Leu Gln Glu Ser Ile Gln Glu Ile Gln Gln Ser Tyr Thr Asp
                245                 250                 255

Glu Thr Leu Pro Pro Pro Trp Gln Met Phe Arg Leu Thr Ser Lys Pro
            260                 265                 270

Gly Gly Gly Asn Ala His Val Ile Gln Lys Thr Phe Glu Gly Ser Phe
        275                 280                 285

Glu Phe Asp Val Ile Phe Ser Ser Ala Ser Ala Gly Arg Glu Leu Thr
    290                 295                 300

Ser His Asp Val Thr Arg Glu Ile Lys Glu Thr Ser Glu Ala Phe Gly
305                 310                 315                 320

Glu Arg Phe Ser Ser Val Phe Asp Leu Lys Ala Pro Tyr Thr Asp Asp
                325                 330                 335

Lys Tyr Arg Lys Phe Gly Glu Ser Met Phe Ser Asn Leu Ile Gly Gly
            340                 345                 350

Ile Gly Tyr Phe His Gly His Gln Leu Ile Asp Arg Ser Tyr Ala Asp
        355                 360                 365

Glu Tyr Glu Glu Glu Asn Glu Gly Phe Trp Glu Asp Thr Ala Ala Ala
    370                 375                 380

Arg Ala Arg His Ala Glu Gln Leu Glu Gly Pro Tyr Glu Leu Phe Thr
385                 390                 395                 400

Ser Val Pro Ser Arg Pro Phe Phe Pro Arg Gly Phe Phe Trp Asp Glu
                405                 410                 415

Gly Phe His Leu Ile Pro Ile Ala Asp Trp Asp Ile Asp Leu Thr Leu
            420                 425                 430
```

```
Glu Val Val Lys Ser Trp Tyr Asn Thr Met Asp Ser Asp Gly Trp Ile
        435                 440                 445

Pro Arg Glu Gln Ile Leu Gly Pro Glu Ala Arg Ser Lys Val Pro Lys
    450                 455                 460

Glu Phe Gln Val Gln Tyr Pro His Tyr Ala Asn Pro Pro Thr Leu Phe
465                 470                 475                 480

Leu Ile Ile Glu Gly Phe Met Glu Arg Leu Arg Ser Ala Asn Val Ser
                485                 490                 495

Ala Pro Ala Gly Lys Glu Thr Leu Leu Gln Gly Gln Asp Leu Tyr Ser
            500                 505                 510

Ala His Leu Asp Asn Leu Glu Leu Gly Ser Asp Phe Leu Arg Lys Ile
        515                 520                 525

Tyr Pro Leu Leu Arg Arg Gln Tyr Asp Trp Phe Arg Lys Thr Gln Lys
    530                 535                 540

Gly Asn Ile Lys Ala Tyr Asp Arg Glu Ala Phe Ser Ser Lys Glu Ala
545                 550                 555                 560

Tyr Arg Trp Arg Gly Arg Thr Glu Thr His Cys Leu Thr Ser Gly Leu
                565                 570                 575

Asp Asp Tyr Pro Arg Pro Gln Pro Pro His Pro Gly Glu Leu His Val
            580                 585                 590

Asp Leu Met Ser Trp Val Gly Phe Met Thr Lys Ser Leu Ile Asn Ile
        595                 600                 605

Ala Asp Ala Leu Asn Leu Ala Asp Glu Ile Ser Glu Leu Lys Lys Asn
    610                 615                 620
```

```
Leu Phe Ala Ile Glu Arg Asn Leu Asp Asp Leu His Trp Ser Glu Lys
625                 630                 635                 640


Glu Gly Cys Tyr Cys Asp Ala Thr Ile Asp Glu Tyr Glu Glu His Ala
                645                 650                 655


Leu Val Cys His Lys Gly Tyr Ile Ser Leu Phe Pro Phe Leu Val Gly
            660                 665                 670


Leu Met Gln Pro Asp Asp Ala Lys Leu Gly Lys Ile Leu Asp Leu Val
        675                 680                 685


Gly Asp Glu Ser His Leu Phe Ser Pro His Gly Leu Arg Ser Leu Ser
    690                 695                 700


Lys Gln Asp Pro Leu Tyr Gly Thr Glu Glu Asn Tyr Trp Arg Ser Pro
705                 710                 715                 720


Val Trp Met Pro Ile Asn Tyr Met Ala Leu Thr Gln Leu His Arg Ile
                725                 730                 735


Ala Thr Gln Glu Gly Pro Phe Gln Ser Lys Ala Arg Gly Leu Tyr Asn
            740                 745                 750


Lys Leu Arg Thr Asn Leu Val Asp Thr Val Phe Lys Ser Trp Glu Glu
        755                 760                 765


Thr Gly Phe Ala Trp Glu Gln Tyr Asn Pro Glu Thr Gly Ala Gly Gln
    770                 775                 780


Arg Thr Gln His Phe Thr Gly Trp Thr Ser Leu Val Val Lys Ile Met
785                 790                 795                 800


Ala Met Ala Pro Leu Asp Glu Thr Val Pro Val Arg Asp Glu Leu
                805                 810                 815
```

<210> 809
<211> 814
<212> PRT
<213> Trichoderma virens

<400> 809

```
Met Ala Lys Ile Ala Gln Leu Leu Ala Ser Ala Ala Ala Leu Ala Ala
1               5                  10                  15


Gly Ala Ala Ala Thr Gly Ser Glu Thr Val Leu Ile Asn Glu Ile Gly
            20                  25                  30


Arg Leu Asn Asn Gln Ser Leu Leu Trp Gly Pro Tyr Lys Pro Asn Leu
        35                  40                  45


Tyr Phe Gly Val Arg Pro Arg Leu Pro Gln Gly Leu Trp Thr Gly Leu
    50                  55                  60


Met Trp Gly Lys Ala Asp Glu Tyr Met Asp Ile Gln Ser Leu Phe Arg
65                  70                  75                  80


Tyr Thr Cys Glu Gln Gly Gln Asp Ile His Gly Tyr Gly Trp Asp Glu
                85                  90                  95


Tyr Asp Ala Arg Thr Gly Gly Val Gln Thr Ile His Asp Glu Gly Asn
            100                 105                 110


Gly Ile Asp Ile Thr Thr Ser Phe Ile Lys Val Pro Gly Gly Asn His
        115                 120                 125


Gly Gly Ser Trp Ala Ala Arg Ile Lys Gly Thr Val Arg Asp Asp Ala
    130                 135                 140


Pro Asp Asp Thr Lys Tyr Leu Val His Tyr Tyr Ile Ala Gln Glu Gly
145                 150                 155                 160


Leu Gly Asp Leu Ala Val Gln Gly Glu Asp Asn Asp Gly Leu Gly Phe
```

```
                165                 170                 175

Glu Gly Asp Val Thr Leu Lys Gly Asn Ser Asn Ala Leu Gly Asp Tyr
            180                 185                 190

Thr Val Val Ile Thr Gln Gly Ser Gly Asn His Pro Thr Ser Asp His
        195                 200                 205

Glu Leu Ser Ala Ser Arg Arg Gly Asp Thr Thr Val Val Arg Ser Leu
    210                 215                 220

Ser Leu Pro Asn Glu His Ile Trp Gln Ala Lys Pro Ala Val Phe Gln
225                 230                 235                 240

Gln Leu Gln Glu Ser Ile Gln Glu Ile Gln Lys Asp Tyr Thr Asp Glu
                245                 250                 255

Thr Leu Pro Pro Pro Trp Gln Met Tyr Arg Leu Lys Ser Asn Ala Gly
            260                 265                 270

Gly Gly Asn Val His Leu Ile Gln Lys Ala Phe Glu Gly Ser Phe Glu
        275                 280                 285

Phe Asp Val Ile Phe Ser Ser Ala Ser Ala Gly Lys Glu Leu Thr Ser
    290                 295                 300

Gln Asp Val Thr Arg Glu Ile Lys Glu Thr Ser Glu Ala Phe Gly Gln
305                 310                 315                 320

Arg Phe Ser Ser Val Phe Asp Leu Lys Ala Pro Tyr Asn Ala Asp Lys
                325                 330                 335

Tyr Lys Glu Phe Gly Lys Ser Met Phe Ser Asn Leu Ile Gly Gly Ile
            340                 345                 350

Gly Tyr Phe His Gly His Gln Leu Ile Asp Arg Ser Tyr Ala Asp Glu
```

```
        355                 360                 365

Tyr Glu Glu Glu Asn Glu Gly Phe Trp Asp Asp Thr Ala Glu Ala Arg
    370                 375                 380

Ala Arg Lys Ala Gln Gln Leu Glu Gly Pro Tyr Glu Leu Phe Thr Ser
385                 390                 395                 400

Val Pro Ser Arg Pro Phe Phe Pro Arg Gly Phe Phe Trp Asp Glu Gly
                405                 410                 415

Phe His Leu Ile Pro Ile Ala Asp Trp Asp Ile Asp Leu Thr Leu Glu
            420                 425                 430

Val Val Lys Ser Trp Tyr Asn Thr Met Asp Ser Asp Gly Trp Ile Pro
        435                 440                 445

Arg Glu Gln Ile Leu Gly Pro Glu Ala Arg Ser Lys Val Pro Ala Glu
    450                 455                 460

Phe Gln Val Gln Tyr Pro His Tyr Ala Asn Pro Pro Thr Leu Phe Leu
465                 470                 475                 480

Ile Ile Glu Gly Phe Met Glu Arg Leu Arg Gly Ala Asn Val Ser Ala
                485                 490                 495

Pro Ala Glu Lys Glu Ser Leu Ser Gln Arg Gln Thr Leu Tyr Asn Ala
            500                 505                 510

His Leu Asp Asn Leu Glu Leu Gly Gly Asp Phe Leu Asn Lys Ile Tyr
        515                 520                 525

Pro Leu Leu Arg Arg Gln Tyr Asp Trp Phe Arg Lys Thr Gln Arg Gly
    530                 535                 540

Ser Ile Lys Ala Tyr Asp Arg Glu Ala Phe Ser Ser Lys Glu Ala Tyr
```

```
545                 550                 555                 560

Arg Trp Lys Gly Arg Ser Glu Thr His Cys Leu Thr Ser Gly Leu Asp
                565                 570                 575

Asp Tyr Pro Arg Pro Gln Pro Pro His Pro Gly Glu Leu His Val Asp
            580                 585                 590

Leu Met Ser Trp Val Gly Phe Met Thr Lys Ser Leu Ile Asn Ile Ala
        595                 600                 605

Asp Ala Leu Gly Met Ala Asp Glu Ile Ala Glu Leu Lys Lys Asn Leu
    610                 615                 620

Phe Ala Ile Glu Arg Asn Leu Asp Asp Leu His Trp Ser Glu Lys Asp
625                 630                 635                 640

Gly Cys Tyr Cys Asp Ala Thr Ile Asp Glu Tyr Glu Glu His Ala Leu
                645                 650                 655

Val Cys His Lys Gly Tyr Ile Ser Leu Phe Pro Phe Leu Val Gly Leu
            660                 665                 670

Met Gln Pro Asp Asp Ala Lys Leu Gly Lys Ile Leu Asp Leu Val Gly
        675                 680                 685

Asp Glu Ser His Leu Phe Ser Pro His Gly Leu Arg Ser Leu Ser Lys
    690                 695                 700

Gln Asp Pro Leu Tyr Gly Thr Glu Glu Asn Tyr Trp Arg Ser Pro Val
705                 710                 715                 720

Trp Met Pro Ile Asn Tyr Met Ala Leu Thr Gln Leu His Lys Ile Ala
                725                 730                 735

Thr Gln Glu Gly Pro Phe Gln Gly Lys Ala Arg Gly Leu Tyr Asn Lys
```

740 745 750

Leu Arg Thr Asn Leu Val Asp Thr Val Phe Lys Ser Trp Glu Lys Thr
755 760 765

Gly Phe Ala Trp Glu Gln Tyr Asn Pro Glu Thr Gly Ala Gly Gln Arg
770 775 780

Thr Gln His Phe Thr Gly Trp Thr Ser Leu Val Val Lys Ile Met Ala
785 790 795 800

Met Ala Ser Leu Asp Glu Ala Ala Pro Ile Arg Asp Glu Leu
805 810

<210> 810
<211> 893
<212> PRT
<213> Trichoderma harzianum

<400> 810

Met Ala Lys Phe Ala Gln Leu Leu Ala Ser Ala Ala Ala Leu Ala Val
1 5 10 15

Gly Ala Ser Ala Thr Gly Ser Glu Thr Val Leu Ile Asn Glu Ile Gly
20 25 30

Arg Leu Asn Asn Gln Ser Leu Leu Trp Gly Pro Tyr Lys Pro Asn Leu
35 40 45

Tyr Phe Gly Val Arg Pro Arg Met Pro Gln Gly Leu Trp Thr Gly Leu
50 55 60

Met Trp Gly Arg Ala Glu Thr Tyr Met Asp Ile Gln Gln Leu Phe Arg
65 70 75 80

Tyr Thr Cys Glu Gln Gly Gln Asp Ile His Gly Tyr Gly Trp Asp Glu
85 90 95

```
Tyr Asp Ala Arg Thr Gly Gly Val Gln Thr Ile His Asp Glu Gly Asn
            100                 105                 110

Gly Ile Asp Ile Thr Thr Ser Phe Ile Lys Val Pro Gly Gly Asn His
        115                 120                 125

Gly Gly Ser Trp Ala Ala Arg Ile Lys Gly Thr Val Arg Asp Asp Thr
    130                 135                 140

Pro Asp Asp Thr Lys Tyr Ile Val His Tyr Tyr Ile Ala Gln Glu Gly
145                 150                 155                 160

Leu Gly Asp Leu Ala Val Gln Gly Glu Asp Gly Asp Gly Leu Gly Phe
                165                 170                 175

Glu Gly Asp Val Thr Phe Lys Gly Ser Ser Ala Ala Leu Gly Asp Tyr
            180                 185                 190

Thr Val Val Ile Thr Glu Gly Ser Gly Asn His Pro Glu Ser Asp His
        195                 200                 205

Glu Ile Ser Ser Ser Arg Arg Gly Asp Arg Thr Val Val Arg Ser Leu
    210                 215                 220

Val Leu Pro Gly Glu His Ile Trp Gln Ala Lys Pro Ala Val Phe Gln
225                 230                 235                 240

Gln Leu Gln Glu Ser Ile Gln Glu Val Gln Gln Gln Tyr Thr Asp Glu
                245                 250                 255

Thr Leu Pro Pro Pro Trp Gln Ile Tyr Arg Leu Lys Pro Gln Val Gly
            260                 265                 270

Gly Gly Asn Val His Leu Ile Gln Lys Val Phe Glu Gly Ser Phe Glu
        275                 280                 285
```

```
Phe Asp Val Ile Phe Ser Ser Ala Ser Ala Gly Lys Gln Leu Thr Ser
    290                 295                 300

Gln Asp Val Thr Arg Glu Ile Lys Glu Thr Ser Glu Ala Phe Ala Gln
305                 310                 315                 320

Arg Phe Ser Ser Val Phe Asp Leu Lys Lys Pro Tyr Asn Thr Asp Lys
                325                 330                 335

Tyr Gln Lys Phe Gly Lys Ser Met Phe Ser Asn Leu Ile Gly Gly Ile
            340                 345                 350

Gly Tyr Phe Gln Gly His Gln Leu Ile Asp Arg Ser Tyr Ala Asp Glu
        355                 360                 365

Tyr Glu Glu Glu Asn Glu Gly Phe Trp Asp Asp Thr Ala Glu Ala Arg
    370                 375                 380

Ala Arg Lys Ala Gln Gln Leu Glu Gly Pro Tyr Glu Leu Phe Thr Ser
385                 390                 395                 400

Val Pro Ser Arg Pro Phe Phe Pro Arg Gly Phe Phe Trp Asp Glu Gly
                405                 410                 415

Phe His Leu Ile Pro Ile Ala Asp Trp Asp Ile Asp Leu Thr Leu Glu
            420                 425                 430

Val Val Lys Ser Trp Tyr Asn Thr Met Asp Ser Asp Gly Trp Ile Pro
        435                 440                 445

Arg Glu Gln Ile Leu Gly Pro Glu Ala Arg Ser Lys Val Pro Ala Glu
    450                 455                 460

Phe Gln Val Gln Tyr Pro His Tyr Ala Asn Pro Pro Thr Leu Phe Leu
465                 470                 475                 480
```

```
Ile Ile Glu Gly Phe Met Glu Arg Leu Arg Gly Ala Asn Gly Ser Ala
                485                 490                 495

Pro Ala Glu Lys Glu Thr Leu Ser Gln Gly Gln Thr Leu Tyr Asn Ala
            500                 505                 510

His Leu Asp Asn Leu Glu Leu Gly Gly Asp Phe Leu Arg Lys Ile Tyr
        515                 520                 525

Pro Leu Leu Arg Arg Gln Tyr Asp Trp Phe Arg Lys Thr Gln Lys Gly
    530                 535                 540

Asn Ile Lys Ala Tyr Asp Arg Glu Ala Phe Ser Ser Lys Glu Ala Tyr
545                 550                 555                 560

Arg Trp Lys Gly Arg Ser Glu Thr His Cys Leu Thr Ser Gly Leu Asp
                565                 570                 575

Asp Tyr Pro Arg Pro Gln Pro Pro His Pro Gly Glu Leu His Val Asp
            580                 585                 590

Leu Met Ser Trp Val Gly Phe Met Thr Lys Ser Leu Ile Asn Ile Ala
        595                 600                 605

Asp Ala Leu Gly Ile Ala Asp Glu Ile Ala Glu Leu Lys Lys Asn Leu
    610                 615                 620

Phe Ala Ile Glu Arg Asn Leu Asp Asp Leu His Trp Ser Glu Lys Asp
625                 630                 635                 640

Gly Cys Tyr Cys Asp Ala Thr Ile Asp Glu Tyr Glu Glu His Ala Leu
                645                 650                 655

Val Cys His Lys Gly Tyr Ile Ser Leu Phe Pro Phe Leu Val Gly Leu
            660                 665                 670
```

```
Met Lys Pro Asp Asp Ala Lys Leu Gly Lys Ile Leu Asp Leu Val Gly
        675                 680                 685

Asp Glu Ser His Leu Phe Ser Pro His Gly Leu Arg Ser Leu Ser Lys
    690                 695                 700

Gln Asp Pro Leu Tyr Gly Thr Glu Glu Asn Tyr Trp Arg Ser Pro Val
705                 710                 715                 720

Trp Met Pro Ile Asn Tyr Met Ala Leu Thr Gln Leu His Arg Ile Ala
                725                 730                 735

Thr Gln Glu Gly Pro Phe Gln Gly Lys Ala Arg Gly Leu Tyr Asn Lys
            740                 745                 750

Leu Arg Thr Asn Leu Val Asp Thr Val Phe Lys Ser Trp Glu Asp Thr
        755                 760                 765

Gly Phe Ala Trp Glu Gln Tyr Asn Pro Glu Thr Gly Ala Gly Gln Arg
    770                 775                 780

Thr Gln His Phe Thr Gly Trp Thr Ser Leu Val Val Lys Ile Met Ala
785                 790                 795                 800

Met Ala Pro Leu Asp Glu Ala Ala Pro Ile Arg Asp Glu Leu Pro Asp
                805                 810                 815

Asp Ser Pro Asp Asp Ser Pro Asp Phe Ala Lys Ile Glu Tyr Cys Ser
            820                 825                 830

Arg Arg Asp Trp Phe Arg Cys Met Asp Ala Thr Leu Val Gly Leu Gly
        835                 840                 845

Trp Ala Glu Ser Glu Ala Asp Val Ile Gly Met Ala Leu Leu Gly Leu
    850                 855                 860
```

```
Arg Gly Thr Cys Asp Ala Gln Ala Ala Ile Phe Gln Pro Pro Arg Lys
865                 870                 875                 880


Ala His Ala Tyr Ser Ser Ala Ala Leu Thr Arg Ile Pro
                885                 890


<210>  811
<211>  814
<212>  PRT
<213>  Trichoderma atroviride

<400>  811

Met Ala Arg Phe Ala Gln Leu Leu Ala Ser Ala Ala Ala Leu Val Ala
1               5                   10                  15


Gly Ala Ser Ala Ile Gly Asp Glu Ser Ile Leu Ile Asn Glu Ile Gly
            20                  25                  30


Arg Leu Asn Asn Gln Ser Leu Leu Trp Gly Pro Tyr Lys Pro Asn Leu
        35                  40                  45


Tyr Phe Gly Val Arg Pro Arg Leu Pro Gln Gly Leu Trp Thr Gly Leu
    50                  55                  60


Met Trp Gly Arg Ala Glu Gly Tyr Thr Asp Ile Gln Gln Leu Phe Arg
65                  70                  75                  80


Tyr Thr Cys Glu Gln Gly Gln Asp Ile His Gly Tyr Gly Trp Asp Glu
                85                  90                  95


Phe Asp Ala Arg Thr Gly Gly Val Gln Thr Ile His Asp Glu Gly Asn
            100                 105                 110


Gly Leu Asp Val Thr Ile Ser Phe Ile Lys Val Pro Gly Gly Ser His
        115                 120                 125
```

```
Gly Gly Ser Trp Gly Ala Arg Ile Lys Ala Thr Val Arg Asp Asp Ala
    130                 135                 140

Pro Pro Asp Ser Asn Tyr Leu Val His Tyr Tyr Val Ala Gln Glu Glu
145                 150                 155                 160

Leu Gly Asp Leu Ile Val Gln Gly Asp Asp Asn Gly Gly Leu Gly Phe
                165                 170                 175

Glu Gly Asp Val Thr Phe Lys Gly Ser Ser His Ser Leu Gly Asp Tyr
            180                 185                 190

Asn Val Val Ile Thr Lys Gly Thr Gly Asn His Pro Thr Ser Asp His
        195                 200                 205

Glu Ile Ser Ala Thr Arg Arg Gly Asp Thr Thr Val Val Arg Ser Val
    210                 215                 220

Ser Leu Ala Ala Asn Asp Val Trp Gln Ala Lys Pro Ala Val Phe Gln
225                 230                 235                 240

Phe Met Gln Asp Thr Ile Lys Asp Met Gln Gln Asp Tyr Asp Glu Glu
                245                 250                 255

Asn Phe Pro Pro Pro Trp Gln Ile Tyr Arg Ile Lys Ser Gln Ala Gly
            260                 265                 270

Gly Gly Asn Ala His Val Val Gln Lys Val Phe Glu Gly Gly Phe Glu
        275                 280                 285

Phe Asp Ile Ile Phe Ser Ser Ala Ser Ala Gly Lys Glu Met Thr Ser
    290                 295                 300

Lys Asp Ile Thr Arg Glu Ile Lys Val Ala Ser Glu Ser Phe Gly Glu
305                 310                 315                 320
```

```
Arg Phe Ser Ser Val Phe Asp Leu Lys Ala Pro Tyr Thr Ala Glu Lys
                325                 330                 335

Tyr Gln Lys Phe Gly Lys Ser Met Phe Ser Asn Leu Ile Gly Gly Ile
            340                 345                 350

Gly Tyr Phe His Gly His Gln Leu Ile Asp Arg Ser Tyr Ala Asp Glu
        355                 360                 365

Tyr Glu Glu Glu Asn Glu Gly Phe Trp Glu Asp Thr Ala Glu Ala Arg
    370                 375                 380

Ala Arg Lys Ala Gln Gln Leu Glu Gly Pro Tyr Glu Leu Phe Thr Ser
385                 390                 395                 400

Val Pro Ser Arg Pro Phe Phe Pro Arg Gly Phe Phe Trp Asp Glu Gly
                405                 410                 415

Phe His Leu Ile Pro Ile Ala Asp Trp Asp Ile Asp Leu Thr Leu Glu
            420                 425                 430

Ile Val Lys Ser Trp Tyr Asn Thr Met Asp Ser Asp Gly Trp Ile Pro
        435                 440                 445

Arg Glu Gln Ile Leu Gly Pro Glu Ala Arg Ser Lys Val Pro Pro Glu
    450                 455                 460

Phe Gln Val Gln Tyr Pro His Tyr Ala Asn Pro Pro Thr Leu Phe Leu
465                 470                 475                 480

Ile Ile Glu Asp Phe Met Glu Arg Leu Arg Ser Ala Asn Gly Ser Ala
                485                 490                 495

Pro Ala Glu Lys Glu Lys Leu Ser Gln Gly His Thr Leu Tyr Ser Ala
            500                 505                 510
```

```
His Leu Asp Asn Leu Glu Leu Gly Gly Asp Phe Leu Gln Lys Ile Tyr
        515                 520                 525

Pro Leu Leu Arg Arg Gln Tyr Asp Trp Phe Arg Lys Thr Gln Arg Gly
    530                 535                 540

Gln Ile Lys Ala Tyr Asp Arg Glu Ser Phe Ser Ser Lys Glu Ala Tyr
545                 550                 555                 560

Arg Trp Arg Gly Arg Thr Glu Thr His Cys Leu Thr Ser Gly Leu Asp
                565                 570                 575

Asp Tyr Pro Arg Pro Gln Pro Pro His Pro Gly Glu Leu His Val Asp
            580                 585                 590

Leu Met Ser Trp Val Gly Phe Met Thr Lys Ser Leu Ile Ser Ile Ala
        595                 600                 605

Asp Ala Leu Asn Leu Ala Asp Glu Ile Glu Glu Leu Lys Lys Asn Leu
    610                 615                 620

Phe Ala Ile Glu Arg Asn Leu Asp Asp Leu His Trp Ser Glu Lys Glu
625                 630                 635                 640

Gly Cys Tyr Cys Asp Ala Ser Ile Asp Glu Phe Glu Glu His Ala Leu
                645                 650                 655

Val Cys His Lys Gly Tyr Ile Ser Leu Phe Pro Phe Leu Val Gly Leu
            660                 665                 670

Met Gln Pro Asp Asp Ala Lys Leu Gly Lys Ile Leu Asp Leu Val Gly
        675                 680                 685

Asp Glu Asp His Leu Phe Ser Pro His Gly Leu Arg Ser Leu Ser Lys
    690                 695                 700
```

```
Gln Asp Ala Leu Tyr Gly Thr Glu Glu Asn Tyr Trp Arg Ser Pro Val
705                 710                 715                 720


Trp Met Pro Ile Asn Tyr Met Ala Leu Thr Gln Leu Tyr Lys Ile Gly
                725                 730                 735


Thr Gln Glu Gly Pro Phe Gln Arg Gln Ala Arg Gly Leu Tyr Asn Lys
            740                 745                 750


Leu Arg Thr Asn Leu Val Asp Thr Val Tyr Lys Ser Trp Glu Glu Thr
        755                 760                 765


Gly Phe Ala Trp Glu Gln Tyr Asn Pro Glu Thr Gly Ala Gly Gln Arg
    770                 775                 780


Thr Gln His Phe Thr Gly Trp Thr Ser Leu Val Val Lys Ile Met Ala
785                 790                 795                 800


Met Glu Pro Leu Asp Glu Ala Val His Ile Arg Asp Glu Leu
                805                 810


<210>  812
<211>  822
<212>  PRT
<213>  Aspergillus brasiliensis

<400>  812

Met His Leu Ser Lys Ile Ser Ala Phe Leu Thr Pro Val Leu Asn Ala
1               5                   10                  15


Ala Ala Val Leu Ser Ser Gln Ala Pro Ala Asp Asp Leu Ser Val Leu
            20                  25                  30


Ser Ser Glu Val Ala Arg Ala Asn Asn Gln Ser Leu Leu Trp Gly Pro
        35                  40                  45
```

```
Tyr Lys Pro Asn Leu Tyr Phe Gly Val Arg Pro Arg Ile Pro Asn Ser
    50                  55                  60

Leu Phe Ala Gly Leu Met Trp Ala Lys Val Asp Asn Tyr Ala Thr Ala
65                  70                  75                  80

Gln Gln Asn Phe Arg His Thr Cys Glu Gln Asn Glu Gly Met Ala Gly
                85                  90                  95

Tyr Gly Trp Asp Glu Tyr Asp Ile Arg Lys Gly Gly Arg Gln Thr Ile
            100                 105                 110

His Asp Ala Gly Asn Ser Leu Asp Leu Thr Ile Asp Phe Val Lys Val
        115                 120                 125

Pro Gly Gly Gln His Gly Gly Ser Trp Ala Ala Arg Val Lys Gly Val
    130                 135                 140

Pro Arg Glu Asp Ala Asp Pro Asp Gln Pro Thr Ala Val Val Phe Tyr
145                 150                 155                 160

Ala Gly Leu Glu Gly Leu Gly Asn Leu Gly Val Glu Gly Glu Pro Glu
                165                 170                 175

Asp Thr His Gly Phe Ala Gly Asp Val Lys Leu Gly Gly Phe Thr Thr
            180                 185                 190

Asp Leu Gly Asp Phe Ser Ile Asp Val Thr Ser Gly Pro Glu Ser Asn
        195                 200                 205

Glu Ser Pro Glu His Gly His Pro Thr Tyr Asp Glu Lys Pro Leu Asp
    210                 215                 220

Arg Thr Leu Val Ser Ser Leu Thr Met His Pro Glu Gln Leu Trp Gln
225                 230                 235                 240
```

```
Thr Lys Val Ile Met Phe Thr Gln Met Lys Lys Glu Val Asp Glu Met
                245                 250                 255

Val Glu Lys Tyr Gly Ser Glu Asn Pro Pro Pro Pro Tyr Gln Leu Phe
            260                 265                 270

Thr Ile Lys Asn Glu Pro Gly Asp Gly Asn Met His Leu Val Gln Lys
        275                 280                 285

Val Phe Lys Gly Ser Phe Glu Phe Asp Ile Leu Phe Ser Ser Lys Ser
    290                 295                 300

Ser Pro Gln Pro Met Thr Ser Glu Leu Leu Thr Glu Gln Ile Ser Ser
305                 310                 315                 320

Ala Ser Leu Glu Phe Ala Glu Arg Phe Glu Ser Val His Pro Pro Gln
                325                 330                 335

Ala Pro Phe Asp Thr Ala Glu Tyr Thr Glu Phe Ser Lys Ser Met Leu
            340                 345                 350

Ser Asn Leu Val Gly Gly Ile Gly Tyr Phe His Gly Thr Asp Ile Val
        355                 360                 365

Asp Arg Ser Ala Ala Pro Glu Tyr Asp Glu Glu Asn Glu Gly Phe Trp
    370                 375                 380

Glu Glu Thr Ala Glu Ala Arg Gly Arg Ala Gln Pro Ile Leu Glu Gly
385                 390                 395                 400

Pro Lys Asp Leu Phe Thr Cys Val Pro Ser Arg Pro Phe Phe Pro Arg
                405                 410                 415

Gly Phe Leu Trp Asp Glu Gly Phe His Leu Ile Pro Val Ile Asp Trp
            420                 425                 430
```

```
Asp Thr Asp Leu Ala Leu Glu Ile Val Arg Ser Trp Leu Asn Leu Met
        435                 440                 445

Asp Glu Asp Gly Trp Ile Ala Arg Glu Gln Ile Leu Gly Ser Glu Ala
    450                 455                 460

Arg Ser Lys Val Pro Pro Glu Phe Thr Ile Gln Tyr Pro His Tyr Ala
465                 470                 475                 480

Asn Pro Pro Thr Leu Phe Ile Ile Leu Glu Ala Phe Ile Asp Lys Leu
                485                 490                 495

Asp Ala Lys Lys Asn Ala Ser Met Gln Thr Tyr Ala Asp Ser Gly Ala
            500                 505                 510

Thr Asp Gly Leu Arg Ser Ile Phe Val Asp Gln Pro Glu Leu Gly Glu
        515                 520                 525

Ala Phe Ile Arg Ser Ile Tyr Pro Leu Ile Pro Lys His Tyr Tyr Trp
    530                 535                 540

Tyr Arg Ser Thr Gln Lys Gly Asp Ile Lys Ser Tyr Asp Arg Glu Ala
545                 550                 555                 560

Tyr Ser Thr Arg Glu Ala Tyr Arg Trp Arg Gly Arg Ser Val Gln His
                565                 570                 575

Ile Leu Thr Ser Gly Leu Asp Asp Tyr Pro Arg Pro Gln Pro Pro His
            580                 585                 590

Pro Gly Glu Leu His Val Asp Leu Met Ser Trp Met Gly Met Met Thr
        595                 600                 605

Arg Ala Leu Arg Arg Ile Ala Val Thr Ile Gly Glu Thr Glu Asp Ala
    610                 615                 620
```

```
Glu Val Phe Lys Thr Tyr Glu Thr Ala Ile Glu Arg Asn Ile Asp Asp
625                 630                 635                 640


Leu His Trp Asp Asp Asp Ala Ser Thr Tyr Cys Asp Ala Thr Ile Asp
                645                 650                 655


Glu Tyr Glu Glu His Val His Val Cys His Lys Gly Tyr Ile Ser Ile
            660                 665                 670


Phe Pro Phe Leu Thr Gly Met Leu Gly Pro Asp Ser Pro Arg Leu Lys
        675                 680                 685


Ala Ile Leu Asp Leu Ile Gly Asp Pro Glu Glu Leu Trp Ser Asp Tyr
    690                 695                 700


Gly Ile Arg Ser Leu Ser Lys Lys Asp Gln Phe Tyr Gly Thr Ala Glu
705                 710                 715                 720


Asn Tyr Trp Arg Ser Pro Ile Trp Val Asn Ile Asn Tyr Leu Val Leu
                725                 730                 735


Lys Asn Leu Tyr Asn Ile Ala Ile Val Ser Gly Pro His Arg Glu Gln
            740                 745                 750


Ala Arg Glu Leu Tyr Ser Asn Leu Arg Lys Asn Leu Val Glu Asn Val
        755                 760                 765


Phe Gln Glu Trp Lys Lys Thr Gly Phe Ala Trp Glu Gln Tyr Asn Pro
    770                 775                 780


Glu Thr Gly Ile Gly Arg Arg Thr Gln His Phe Thr Gly Trp Thr Ser
785                 790                 795                 800


Met Val Val Lys Met Met Ser Met Pro Asp Leu Pro Ala Ser Glu Gln
                805                 810                 815
```

```
Lys Gly His Asp Glu Leu
            820
```

<210> 813
<211> 902
<212> PRT
<213> Chlamydomonas reinhardtii

<400> 813

```
Met Ala Gln Ala Lys Lys Gly Asp Lys Gln Lys Gly Leu Gly Gly Val
1               5                   10                  15


Pro Ile Thr Tyr Ile Ala Gly Ala Leu Leu Ala Ala Ala Ala Ala Ala
            20                  25                  30


Phe Phe Ala Leu Arg Gly Arg Ala His Phe Thr Lys Gly Pro Ile Leu
        35                  40                  45


Thr Pro Leu Lys Ala Pro Lys Val Thr Asp Leu Leu Glu Phe Asp Ala
    50                  55                  60


Ala Tyr Lys Asp Arg Met Leu Trp Gly Ser Tyr Arg Ser Gly Leu Tyr
65                  70                  75                  80


Phe Gly Met Arg Thr Arg Thr Pro Lys Gly Leu Val Ser Gly Leu Met
                85                  90                  95


Trp Phe Asp Pro Asp Asp Phe Gln Thr Leu Gln Gln Tyr Arg Val Arg
            100                 105                 110


His Glu Ala Ser Gln Gly Asp Gly Leu Ala Ser Tyr Gly Trp Lys Arg
        115                 120                 125


His Asp Gly Arg Thr Tyr Gly Gln Gln Val Leu Val Asp Asn Asp Tyr
    130                 135                 140


Asn Ile Thr Leu Ser Met Leu Lys Ser Phe Gly Glu Gly Ser Gly Pro
```

```
145                 150                 155                 160

Gly Gly Asp Trp Ser Val Arg Leu Gln Leu Arg Arg Thr Ser Gly Met
                165                 170                 175

Pro Thr Gln Arg Arg Arg Ile Ser Val Val Ile Tyr Met Gly Asp Glu
            180                 185                 190

Asp Thr Pro Arg Glu Pro Trp Gln Val Leu Pro Asp Gly Glu Val Thr
        195                 200                 205

Asp Leu Arg Pro Gln Pro Ala Ala Leu Leu Thr Gly Gly Ser Ala Ala
    210                 215                 220

Leu Gly Arg Gly Gly Ala Arg Trp Ala Leu His Ala Met Glu Gln Ala
225                 230                 235                 240

Thr Glu Pro Pro Ala Ser Arg Arg Ser Arg Gly Cys Arg Val Asp Tyr
                245                 250                 255

Leu Gly Met Ser Thr Glu Gly His Lys Pro Asp Tyr Leu Leu Lys Val
            260                 265                 270

Arg Glu Leu Leu Leu Ser Thr Met Tyr Glu Arg Leu Gln Arg Gln Pro
        275                 280                 285

Pro Ser Asp Lys Phe Arg Leu Tyr Leu Pro Asn Gly Ala Thr Thr Asn
    290                 295                 300

Ser Asp Leu Ala Leu Phe Gln Val Thr Cys Val Ile Pro Ser Thr Val
305                 310                 315                 320

Asp Phe Ala Phe Thr Ser Ser Ser Gly Asp Val Ser Asp Ser Ser Glu
                325                 330                 335

Arg Leu Glu Gly Leu Leu Gly Pro Gly Leu Asp Gly Pro Leu Ala Ala
```

```
            340                 345                 350

Ala Glu Ala Ala Phe Asp Gln Arg Phe Asp Arg Val Phe Gly Glu Gly
        355                 360                 365

Ile Ala Arg Ala Leu Gln Pro Gln Gln Gln Pro Asp Ser Ala Ala Ser
    370                 375                 380

Pro Asp Ala Ser Thr Pro Asp Ala Pro Asp Ala Ala Ala Val Val Glu
385                 390                 395                 400

Thr Ala Lys Ala Ala Leu Ser Asn Leu Leu Gly Ser Met Gly Tyr Phe
                405                 410                 415

Tyr Gly Ser Ser Leu Val Arg Thr Gly Pro Pro Gly Ser Glu Pro Ala
            420                 425                 430

Pro Tyr Trp Pro Ala Pro Leu Phe Thr Ala Val Pro Ser Arg Ser Phe
        435                 440                 445

Phe Pro Arg Gly Phe Leu Trp Asp Glu Gly Phe His Gln Leu Leu Leu
    450                 455                 460

Gln Arg Trp Glu Pro Ala Leu Ser Arg Asp Val Ile Ala His Trp Leu
465                 470                 475                 480

Asp Leu Met Asn Ala Gln Gly Trp Ile Pro Arg Glu Gln Ile Leu Gly
                485                 490                 495

Glu Glu Ala Arg Ala Arg Val Pro Pro Glu Phe Val Val Gln Leu Pro
            500                 505                 510

Trp His Ala Asn Pro Pro Ser Leu Phe Leu Pro Ile Ala His Met Ala
        515                 520                 525

Ala Gln Leu Gly Arg Ala Gln Gln Gln Ala Thr Asp Gly Thr Ala Ala
```

```
    530                 535                 540

Ala Ser Asp Ala Glu Ser Ala Ala Glu Leu Glu Arg Val Arg Ala Phe
545                 550                 555                 560

Leu Arg Arg Ala Trp Pro Arg Leu Ala Ala Trp Tyr Asn Trp Phe Asn
                565                 570                 575

Thr Thr Gln Ala Gly Pro Leu Pro Ser Ser Phe Arg Trp His Gly Arg
            580                 585                 590

Asp Pro Leu Ala Ala Ser Glu Leu Asn Pro Lys Thr Leu Thr Ser Gly
        595                 600                 605

Leu Asp Asp Tyr Pro Arg Ala Ser His Pro Asp Asp Ser Glu Arg His
    610                 615                 620

Leu Asp Leu Arg Cys Trp Met Ala Leu Ala Ala Gln Ala Met Ala Asp
625                 630                 635                 640

Ile Gly Thr Ser Leu Gly Leu Pro Ala Ala Ala Val Ala Arg Tyr Ala
                645                 650                 655

Ala Ala Ala Glu Gln Leu Ser Asp Leu Arg Gln Leu Ala Ala Leu His
            660                 665                 670

Leu Asp Gln Gly Arg Gly Val Phe Ala Asp Trp Gly Thr His Thr Glu
        675                 680                 685

Glu Val Ala Leu Glu Val Lys Ser Ile Val Val Pro Gly Gly Glu Gly
    690                 695                 700

Gln Pro Pro Gln Arg Arg Asp Val Ser Glu Arg Val Thr Thr Gly Trp
705                 710                 715                 720

Pro Gln Pro Gln Phe Val Pro Gln Phe Gly Tyr Val Ser Leu Phe Pro
```

```
                725                 730                 735

Leu Ile Met Arg Leu Leu Pro Thr Gly Arg Glu Pro Asn Ala Thr Ala
            740                 745                 750

Ser Ala Ala Ala Thr Ala Ala Thr Ala Gly Ala Thr Ala Ala Ala Gly
        755                 760                 765

Gly Ala Ala Leu Thr Leu Gln Gln Leu Gln Leu Leu Thr Asp Pro Ser
    770                 775                 780

Leu Leu Trp Ser Glu His Gly Leu Arg Ser Leu Ala Lys Thr Ala Ser
785                 790                 795                 800

Leu Tyr Lys Lys Arg Asn Thr Ala Asp Asp Pro Pro Tyr Trp Arg Gly
                805                 810                 815

Gln Ile Trp Ile Asn Val Asn Tyr Leu Val Leu Arg Ser Leu Ser Tyr
            820                 825                 830

Tyr Ala Arg His Gly Ser Pro Glu Val Ala Ala Ala Ala Ala Ala Ala
        835                 840                 845

His Asp Glu Leu Arg Arg Arg Leu Leu Arg Thr Leu Val Gly Gly Tyr
    850                 855                 860

Lys Arg Gln Gly Tyr Leu Tyr Glu Gln Tyr Asp Asp Glu Ser Gly Arg
865                 870                 875                 880

Gly Thr Ser Ser His Pro Phe Thr Gly Trp Thr Ala Leu Val Thr Leu
                885                 890                 895

Ile Ala Ala Gln Glu Tyr
            900
```

<210> 814

<211> 933
<212> PRT
<213> Volvox carteri

<400> 814

```
Met Ala Pro Gly Lys Gly Val Lys Ser Lys Gly Lys Gly Gly Phe Ser
1               5                   10                  15


Val Gln Ile Leu Leu Thr Ala Ile Leu Pro Gln Val Leu Ser Pro Leu
            20                  25                  30


Lys Ala Pro Lys Leu Thr Glu Leu Arg Glu Phe Asp Ala Ser Tyr Lys
        35                  40                  45


Asp Arg Leu Leu Trp Gly Ser Tyr Arg Ser Gly Leu Tyr Phe Gly Met
    50                  55                  60


Arg Thr Arg Thr Pro Lys Ala Leu Leu Ser Gly Leu Leu Trp Phe Asp
65                  70                  75                  80


Pro Asp Asp Pro Asn Thr Leu Asn Gln Met Arg Ala Arg His Glu Ala
                85                  90                  95


Ser Gln Gly Asp Gly Leu Thr Thr Tyr Gly Trp Lys Arg His Asp Gly
            100                 105                 110


Arg Leu Tyr Gly Thr Gln Glu Leu Ile Asp Gly Glu Tyr Asn Ile Thr
        115                 120                 125


Leu Ser Met Leu Lys Ser Phe Ser Pro Glu Ser Gly Pro Gly Gly Asp
    130                 135                 140


Trp Ser Val Arg Leu Gln Leu Ala Arg Thr Ala Gly Thr Pro Pro Arg
145                 150                 155                 160


Arg Arg Arg Ile Ser Ile Val Met Val Arg Thr Ala Gly Val Ala Cys
                165                 170                 175
```

```
Ala Ser Pro Phe Gly Gly Ser Cys Ser Ser Pro Ser His Phe Pro His
            180                 185                 190

Ser Pro Cys Leu Pro Gln Val Leu Pro Asp Gly Glu Val Ala Asp Leu
        195                 200                 205

Arg Ser Gly Pro Ala Thr Leu Leu Thr Gly Ala Ser Ser Ala Leu Gly
    210                 215                 220

Arg Ser Gly Ala Arg Leu Ala Leu His Ala Met Glu Thr Thr Asp Gly
225                 230                 235                 240

Glu Glu Arg Pro Arg Gln Leu Ala Pro Trp Gly Gly Arg Arg Ile Ser
                245                 250                 255

Val Cys Asp Arg Leu Ala Cys Leu Pro Phe His Asn Met Leu Ala Ser
            260                 265                 270

Pro Pro Ala Ala Ala Ala Val Ser Asn Ser Arg Ser Arg Gly Cys Arg
        275                 280                 285

Leu Asp Tyr Leu Ser Leu Gly Met Glu His Lys Asn Tyr Leu Leu Arg
    290                 295                 300

Ile Lys Glu Leu Met Leu Ser Thr Met Tyr Glu Arg Leu Glu Arg Trp
305                 310                 315                 320

Ala Cys Arg Gly Gly Pro Gly Asp Ala Arg Arg Arg Arg Arg Ser Trp
                325                 330                 335

Arg Ser Val Ser Gly Gly Phe Gly Gly Gln Gly Gly Val Ser Glu Gly
            340                 345                 350

Gly Thr Glu Val Val Gly Arg Val Gln Pro Ser Ser Asn Arg Phe Arg
        355                 360                 365
```

```
Leu Tyr Leu Pro Asn Gly Ala Thr Thr Ser Ala Asp Leu Ala Leu Phe
    370                 375                 380

Gln Val Thr Cys Val Leu Pro Ser Ala Val Asp Phe Ala Phe Thr Ser
385                 390                 395                 400

Ser Ala Gly Gly Asp Arg Leu Gly Pro Leu Leu Gly Ser Gly Leu Ser
                405                 410                 415

Glu Ala Leu Ala Ala Lys Gln Ala Glu Phe Asp Gln Arg Arg Arg Val
            420                 425                 430

Phe Gly Ser Gly Leu Arg Ala Pro Leu Ser Gly Gly Arg Thr Val Thr
        435                 440                 445

Ser Glu Gly Gly Glu Gly Ser Leu Pro Asp Gly Ala Leu Glu Val Ser
    450                 455                 460

Arg Ala Ala Leu Ser Asn Leu Leu Gly Ser Val Gly Tyr Phe Tyr Gly
465                 470                 475                 480

Ser Ser Leu Val Gly Gly Trp Val Val Leu Ala Ile Ala Lys Arg Arg
                485                 490                 495

Met Gly Gly Trp Val Arg Thr Asp Pro Pro Gly Ser Glu Pro Arg Gln
            500                 505                 510

Tyr Trp Pro Ala Pro Leu Phe Thr Ala Val Pro Ser Arg Ser Phe Phe
        515                 520                 525

Pro Arg Gly Phe Leu Trp Asp Glu Gly Phe His Gln Leu Leu Val Gln
    530                 535                 540

Arg Trp Asp Pro Gln Leu Cys Arg Asp Met Ile Ala His Trp Leu Asp
545                 550                 555                 560
```

```
Leu Met Asn Ala His Gly Trp Ile Pro Arg Glu Gln Ile Leu Gly Glu
                565                 570                 575

Glu Ala Arg Thr Arg Val Pro Ala Glu Phe Val Val Gln Asn Pro Asn
            580                 585                 590

His Ala Asn Pro Pro Ser Leu Phe Leu Pro Ile Ala Lys Met Ala Ser
        595                 600                 605

Gln Leu Glu Glu Gln Glu Glu Glu Glu Glu Leu Gln Arg Val Ser Ala
    610                 615                 620

Phe Leu Arg Arg Ala Trp Pro Arg Leu Glu Ala Trp Tyr Arg Trp Phe
625                 630                 635                 640

Asn Val Thr Gln Ala Gly Pro Leu Pro Thr Ser Tyr Arg Trp His Gly
                645                 650                 655

Arg Asp Pro Leu Ala Ala Gly Glu Leu Asn Pro Lys Thr Leu Thr Ser
            660                 665                 670

Gly Leu Asp Asp Tyr Pro Arg Ala Ser His Pro Asp Asp Ser Glu Arg
        675                 680                 685

His Leu Asp Leu Arg Cys Trp Met Ala Leu Ala Ser Gln Arg Tyr Arg
    690                 695                 700

Ala Ala Ala Ala Ser Leu Ser Asp Arg Gly Glu Leu Gln Arg Leu His
705                 710                 715                 720

Phe Asp Ser Thr Leu Gly Arg Phe Ala Asp Trp Gly Met His Thr Glu
                725                 730                 735

Asp Val His Leu Gly Arg Arg Val Arg Glu Arg Ile Leu Ser Gln Ser
            740                 745                 750
```

```
Val Ser Gln Arg Val Thr Ser Thr Pro Pro Thr Pro Gln Phe Val Pro
        755                 760                 765

Gln Phe Gly Tyr Val Ser Leu Phe Pro Leu Ile Met Lys Leu Leu Pro
    770                 775                 780

Thr Gly Thr Ser Thr Ser Ala Asp Asp Asn Asp Pro Ala Ala Ala Glu
785                 790                 795                 800

Leu Thr Leu Gln Gln Leu Gln Leu Leu Gln Asp Pro Ala Leu Leu Trp
                805                 810                 815

Ser Pro His Gly Leu Arg Ser Leu Ala Thr Thr Ala Ser Leu Tyr Lys
            820                 825                 830

Lys Arg Asn Thr Ala Asp Asp Pro Pro Tyr Trp Arg Gly Gln Ile Trp
        835                 840                 845

Val Asn Met Asn Tyr Leu Val Leu Arg Ser Leu Ser Tyr Tyr Ala Lys
    850                 855                 860

Thr Ala Gly Ser Gly Ser Glu Val Gly Arg Val Ala Ala Ala Ala His
865                 870                 875                 880

Asp Glu Leu Arg Leu Arg Leu Leu Lys Thr Leu Val Glu Asn Tyr Lys
                885                 890                 895

Arg Asn Gly Tyr Leu Tyr Glu Gln Tyr Asp Asp Glu Thr Gly Arg Gly
            900                 905                 910

Ile Ser Ser His Pro Phe Thr Gly Trp Thr Ala Leu Val Thr Leu Ile
        915                 920                 925

Met Ala Gln Asp Tyr
    930
```

<210> 815
<211> 738
<212> PRT
<213> Coccomyxa subellipsoidea

<400> 815

Met Trp Phe Asp Pro Asp Gln Pro Gln Pro Leu Glu Lys Ile Arg His
1 5 10 15

Leu Ala Gln Glu Arg Asp Gly Leu Gln Lys Tyr Gly Trp Glu Ala His
20 25 30

Asp Gly Glu Ser Phe Gly Arg Gln Glu Leu Tyr Asp Gly Asn Val His
35 40 45

Leu Thr Thr Ser Phe Ala Lys Lys Phe Cys Glu Ala Gly Ile Ser Thr
50 55 60

Leu Asn Val Leu Pro Asp Gly Leu Pro Ser Gly Ala Asp Met Gln Leu
65 70 75 80

Ala Ala Gly Glu Ser Glu Val Val Gly Ser Trp Ala Leu His Met His
85 90 95

Asp Val Ser Gly Lys Gly Arg Asn Thr Ala Lys Leu Arg His Leu Gly
100 105 110

Ala Gln Thr Ala His Phe His Asn Leu Thr Thr Thr Leu Val Asp Glu
115 120 125

Leu Ala Glu Ser Val Thr Val Glu Val Pro Ala Lys Arg Arg Gly Gly
130 135 140

Ser Asn Gly Lys Arg Glu Arg His Gln Leu Ser Asp Thr Val Asp Ala
145 150 155 160

```
Val Pro Asn Leu Ala Val Phe Gln Val Thr Ala Glu Leu Pro Leu Ser
                165                 170                 175

Leu Asp Phe Val Phe Thr Gly Ser Leu Pro Pro Ser Ser Gln Gly Val
            180                 185                 190

Ser Gln Met Leu Gly Thr Ala Ala Ser Gly Leu Trp Arg Ser Leu Gly
        195                 200                 205

Ser Leu Arg Arg Ser Leu Pro Tyr Cys Ile Thr Asp Leu Pro Val Ser
    210                 215                 220

Ile Ala Lys Glu Pro Leu Leu Gln Arg Val Ala Ala Leu Ser Gly Ser
225                 230                 235                 240

Arg Leu Thr Gln Leu Leu Arg Glu Arg Glu Asp Ala Phe Asp Ala Arg
                245                 250                 255

Phe Arg Lys Thr Phe Gly Ser Phe Thr Ser Gly Ala Pro Ala Gly Thr
            260                 265                 270

Asp Val Val Ser Lys Ala Ala Leu Ser Asn Thr Leu Gly Gly Ile Gly
        275                 280                 285

Tyr Phe Phe Gly Ser Ser Glu Val Lys Leu Pro Asp Gln Gly Asn Lys
    290                 295                 300

Ile Val Arg Ser Trp Pro Ala Ala Leu Phe Thr Ala Val Pro Ser Arg
305                 310                 315                 320

Ser Phe Phe Pro Arg Gly Phe Ile Trp Asp Glu Gly Phe His Gln Leu
                325                 330                 335

Leu Ile Arg Arg Trp Asn Glu Arg Leu Ser Arg Asp Ile Leu Gly His
            340                 345                 350
```

```
Trp Leu Asp Leu Leu Ser Glu Glu Gly Trp Ile Ala Arg Glu Gln Ile
        355                 360                 365


Leu Gly Glu Glu Ala Arg Ala Arg Val Pro Ala Asp Phe Ile Val Gln
    370                 375                 380


Ser Pro Asp Val Ala Asn Pro Pro Thr Leu Phe Leu Ser Leu Ala Asp
385                 390                 395                 400


Met Ala Arg Arg Ile Ala Gln Ser Gly Val Asn Trp Asp Asn Ala Gly
                405                 410                 415


Ser Arg Glu Asp Leu Glu Phe Leu Thr Ala Ala Tyr Pro Arg Met Glu
            420                 425                 430


Ala Trp Phe Lys Trp Phe Gln Arg Thr Gln Ala Gly Gln Leu Pro Gly
        435                 440                 445


Thr Phe Arg Trp Arg Gly Arg Gly Thr Ala Pro Glu Trp Asp Thr Glu
    450                 455                 460


Leu Asn Arg Lys Thr Phe Ala Ser Gly Leu Asp Asp Tyr Pro Arg Ser
465                 470                 475                 480


Ser His Pro Ser Asp Ala Glu Arg His Val Asp Leu Tyr Cys Trp Met
                485                 490                 495


Thr Leu Ala Ser Arg Ala Leu Ala Ser Ile Gly Ser Thr Ile Gly Val
            500                 505                 510


Thr Ala Asp Lys Val Ala Pro Ile Arg Lys Val His Thr Gln Leu Ser
        515                 520                 525


Asp Val Ala Phe Leu Asp Arg Met His Leu Asp Leu Gly Ala Gln Gln
    530                 535                 540
```

```
Tyr Arg Asp Trp Gly Asn His Thr Glu Ala Trp Ala Glu Met Arg Thr
545                 550                 555                 560

Pro Glu Gly Tyr Val Val Arg Arg Thr Tyr Val Arg Met Val Gly Gln
                565                 570                 575

Pro Gly Pro Leu Pro Gln Phe Val Pro His Phe Gly Tyr Val Gly Leu
            580                 585                 590

Phe Pro Leu Leu Leu Arg Met Leu Pro Gly Asp Ser Arg Gln Leu Gly
        595                 600                 605

Ala Met Leu Ala Gln Leu Arg Asp Glu Ser Gln Leu Trp Thr Ala Ala
    610                 615                 620

Gly Leu Arg Ser Leu Ser Lys Ala Ser Ser Leu Tyr Asn Lys Tyr Asn
625                 630                 635                 640

Thr Glu His Asp Ala Pro Tyr Trp Arg Ala Pro Ile Trp Leu Asn Val
                645                 650                 655

Asn Tyr Leu Ala Leu Ala Ala Leu Lys His Tyr Ser Arg Val Pro Gly
            660                 665                 670

Glu Ser Arg Glu Leu Ala Gly Arg Ile His Asp Glu Leu Arg Glu Asn
        675                 680                 685

Ile Leu Arg Asn Leu Val Glu Gln Tyr Asn Lys Thr Gly Tyr Leu Trp
    690                 695                 700

Glu Asn Tyr Arg Asp Glu Asn Gly Arg Gly Gln Gly Ser His Pro Phe
705                 710                 715                 720

Thr Gly Trp Thr Ala Leu Val Val Leu Ile Ala Gly Glu Thr Tyr Phe
                725                 730                 735
```

Asp Ile

<210> 816
<211> 809
<212> PRT
<213> Chlorella variabilis

<400> 816

```
Lys Pro Ala Val Leu Gln Pro Phe Pro Ser Arg Gln Leu Lys Gln Leu
1               5                   10                  15


Pro Gln Phe Glu Gly Gln His Ala Glu Gln Leu Leu Trp Gly Thr Tyr
            20                  25                  30


Arg Pro Gly Tyr Tyr Phe Gly Met Arg Met Arg Arg Pro Gln Ser Leu
        35                  40                  45


Leu Met Gly Leu Met Trp Val Asp Pro Gln Arg Gln Asp Pro Leu Gly
    50                  55                  60


Asn Ile Arg His Glu Ala Gln Gln Arg Asp Gly Leu Ala Lys Tyr Gly
65                  70                  75                  80


Trp Leu Gln His Asp Gly Gln Gly Tyr Gly Leu Gln Gln Leu Trp Asp
                85                  90                  95


Glu Gln Phe Asn Ile Thr Thr Ala Trp Ala Lys His Leu Cys Pro Asp
            100                 105                 110


Cys Gly Leu Gly Gly Asp Trp Gly Ala Ser Val Ser Ile Glu Glu Arg
        115                 120                 125


His Ile Gly Ala Ser Asp Gln Pro Arg Arg Arg Leu Leu Glu Asp Glu
    130                 135                 140
```

```
Tyr Ala Glu Pro Asp Gly Asp Glu Gly Gly Glu Gln Leu Glu Glu Gln
145                 150                 155                 160


Gln Gln Arg Pro Gln Val Ala Ser Leu Arg Pro Val Ile Ser Gly Arg
                165                 170                 175


Thr Ala Pro Val Gly Asn Trp Gln Leu His Leu Gln Arg Gly Thr Ser
            180                 185                 190


Pro Ser Gly Ala Thr Pro Gly Ala Ile Leu Ala Val Asn Tyr Leu Ala
        195                 200                 205


Val Ala Thr Pro His Met His Asn Leu Thr Asn Leu Val Arg Glu Gly
    210                 215                 220


Val Met Ala Ser Val Arg Gln Gln His Ala Ala Gly Gln Gln Gln Tyr
225                 230                 235                 240


Arg Leu Val Leu Pro Asp Thr Thr Gln Pro Gly Ser Asn Leu Ala Ile
                245                 250                 255


Phe Gln Val Thr Ala Val Leu Pro Leu Ala Ile Asp Leu Ser Phe Val
            260                 265                 270


Ser Gly Leu Lys Ala Gly Ser Thr Gly Gln His Leu Ala Gly Arg Val
        275                 280                 285


Ala Ala Val Ser Gly Ser Gly Leu Lys Gln Arg Leu Ala Ala Gly Ala
    290                 295                 300


Ala Ala Phe Glu Gln Arg Phe Ala Gly Thr Phe Gly Ser Leu Ala Gly
305                 310                 315                 320


Gly Ser Ala Ala Ala Arg Ala Leu Ala Gln Leu Pro Gly Gly Ala Gly
                325                 330                 335
```

```
Ala Val Ala Arg Ala Ala Leu Ser Asn Met Leu Gly Gly Ile Gly Tyr
            340                 345                 350

Phe Phe Gly His Ser Leu Val Arg Val Arg Gln Arg Arg Gln Gly Gln
        355                 360                 365

Val Val Glu Thr Thr Ala Lys Leu Trp Asp Thr Gly Val Tyr Thr Ala
    370                 375                 380

Val Pro Ser Arg Ser Phe Phe Pro Arg Gly Phe Leu Trp Asp Glu Gly
385                 390                 395                 400

Phe His Gln Leu Leu Ile Arg Gln Ala Ala Gln Trp Asp Ala Ala Ile
                405                 410                 415

Ser Arg Asp Ile Leu Gly His Trp Phe Asp Leu Met Asn Thr Gln Gly
            420                 425                 430

Trp Ile Ala Arg Glu Gln Ile Leu Gly Glu Glu Ala Arg Ala Arg Val
        435                 440                 445

Pro Ala Glu Phe Val Arg Gln Ser Pro Asp Ala Ala Asn Pro Pro Thr
    450                 455                 460

Phe Phe Leu Leu Leu Ser Asp Met Ser Gln Arg Val Ala Ala Ala Ala
465                 470                 475                 480

Lys Trp Asp Asp Ala Asp Arg Ala Asp Ala Glu Leu Leu Lys Ala Ala
                485                 490                 495

Trp Pro Arg Leu Arg Ala Trp Tyr Leu Trp Phe Asn Ser Thr Gln Ala
            500                 505                 510

Gly Pro Val Pro Gly Ser Tyr Arg Trp Arg Gly Arg Asp Ala Asn Asn
        515                 520                 525
```

```
Gln Gln Glu Leu Asn Pro Lys Thr Leu Thr Ser Gly Leu Asp Asp Ala
    530                 535                 540

Pro Arg Ala Ser His Pro Ser Gly Lys Asp Ser Leu Arg Pro Ala Arg
545                 550                 555                 560

His Val Asp Leu Arg Cys Trp Met Ala Leu Ala Thr Arg Ala Leu Ala
                565                 570                 575

Thr Ile Gly Ser Asn Leu Gly Leu Pro His Lys Gln Val Gln Pro Phe
            580                 585                 590

Leu Glu Ser Ala Ala Trp Leu Glu Asp Phe Glu Arg Leu Asn Ala Leu
        595                 600                 605

His Leu Asp Glu Ala Ser Gly Glu Tyr Arg Asp Trp Gly Ser His Thr
    610                 615                 620

Glu Asp Val Glu Leu Arg Arg Pro Met Ala Thr Leu Ser Asp Gly Arg
625                 630                 635                 640

Gln Val Pro Thr Gly Asp Met Gln Arg Val Val Ile Gly Gln Pro Pro
                645                 650                 655

Arg Leu Gln Leu Val Pro Gln Phe Gly Tyr Ile Ser Leu Phe Pro Leu
            660                 665                 670

Leu Met Arg Leu Ile Pro Pro Asp Ser Pro Ala Leu Gly Arg Gln Leu
        675                 680                 685

Val Leu Leu Arg Glu Pro Glu Arg Leu Trp Thr Asp Tyr Gly Leu Arg
    690                 695                 700

Ser Leu Ser Arg Ser Ala Ser Ile Tyr Gln Gln Arg Asn Thr Glu His
705                 710                 715                 720
```

Asp Pro Pro Tyr Trp Arg Gly Ala Ile Trp Ile Asn Ile Asn Tyr Leu
725 730 735

Ala Ala Leu Gln His Tyr Gly Asp Thr Val Gly Pro Tyr Gln Ser Gln
740 745 750

Ala Ala Gly Leu His Gln Glu Leu Arg Arg Asn Leu Leu Gln Asn Ile
755 760 765

Val Arg Glu Tyr Glu Arg Thr Gly Tyr Leu Trp Glu Gln Tyr Asp Asp
770 775 780

Ala Thr Gly Gln Gly Lys Gly Ser His Pro Phe Thr Gly Trp Thr Ala
785 790 795 800

Leu Val Ala Leu Leu Ala Ala Asn His
805

<210> 817
<211> 960
<212> PRT
<213> Cyanidioschyzon merolae

<400> 817

Met Arg Lys Arg Leu Leu Ser Arg Arg Gln Ser Arg Cys Cys Ala Arg
1 5 10 15

Arg Tyr Ala Ala Tyr Leu Val Ala Leu Ala Leu Val Leu Val Phe Gly
20 25 30

Ala Phe Gln Gln Ile Glu Thr Ala Val Ala Arg Ala Thr Ala His Arg
35 40 45

Asn Gly Thr Ser Leu Arg Thr Ser Ser Glu Arg Glu Pro Val Gln Thr
50 55 60

Lys Pro Thr Leu Asp Pro His Thr Met Ser Ser Leu Val Pro Gly Val

65 70 75 80

Phe Ala Gly Tyr Arg Arg Pro Val Pro His Ser Pro Val Leu Gly Ile
85 90 95

Met Trp Tyr Pro Ala Asp Glu Pro Phe Glu Ser Val Arg Leu Arg Leu
100 105 110

Glu Cys Gly Thr Glu Leu Asp Ala Ala Gly Pro Leu Arg Tyr Gly Trp
115 120 125

Leu Gln His Asn Gly Arg Asn Tyr Gly Val Arg His Ile Glu Glu Arg
130 135 140

Gly Trp His Leu Asn Ile Thr His Val Ala His Thr Glu Asn Leu Asn
145 150 155 160

Leu Leu Gln Pro Asp Ala Gln Leu Ser Ser Glu Gln Gln Pro Leu Arg
165 170 175

Ser Pro Glu Phe Ser Val Arg Ile Gln Gly Thr Gly Gln Glu Arg Arg
180 185 190

Thr Val Ser Phe Ile Val Tyr Trp Thr Ala Gln His Asp Glu Ile Asp
195 200 205

Pro Glu Arg Leu Gln Glu Ser Ala Ala Arg Gly Met Glu Pro Pro Thr
210 215 220

Leu Gln His Cys Ser Ser Pro Ser Ile Thr Val Ala Ser Ser Asn Glu
225 230 235 240

Val His Leu Glu Cys Gly Pro Asp His Asp His Arg Trp Arg Ile Val
245 250 255

Ala Val Gln Gly Leu Pro Glu Arg Ser Gln Trp Arg Gln Arg Arg His

```
            260                 265                 270

Arg Arg Arg Arg Gln Arg Ala Ser Ala Ser Arg Pro Val Ser Ala Glu
        275                 280                 285

Ile Leu Arg Glu Leu Pro Asp Pro Gly Arg Ile Tyr Tyr Arg Lys Gly
    290                 295                 300

Arg Val Asn Val Gly Ala Thr Thr Glu Val Lys Ser Met Val Glu Ser
305                 310                 315                 320

Trp Leu Arg Glu Ser Tyr Asp His Gln Arg Thr Arg Leu Arg Glu Phe
                325                 330                 335

Tyr Glu Lys His Glu Gln Leu Pro Asp Thr Ala Phe Arg Gly Ala Asp
            340                 345                 350

Val Phe Lys Asp Ala Ala His Ala Arg Glu Thr Pro Thr Ala Ala Pro
        355                 360                 365

Phe Pro Ile Ile Thr Arg Ile Glu Asp Val Asp Ala Arg Ala Arg Arg
    370                 375                 380

Glu Val Asn Ala Asp Ala Glu Leu Glu Pro Asp Ala Gln His His Ser
385                 390                 395                 400

Gly Ile Asp Asp Gly Leu Pro Ser Asn Leu Leu Val Val Gln Ile Thr
                405                 410                 415

Val Gln Thr Pro Phe Asp Ile Met Ile Thr Ser Ser Ala Arg Met Asp
            420                 425                 430

Ala Ser Ala Leu Ser Val Leu Leu Glu Gln Ala Asp Ser Arg Phe Arg
        435                 440                 445

Glu Arg Phe Gln Gln Leu Phe Pro Arg Met His Arg Gly Asp Phe Gly
```

```
    450                 455                 460

Ser Ala Gln Ile Ala Gln Ala Arg Ala Ala Leu Ala Gly Leu Leu Gly
465                 470                 475                 480

Gly Val Ser Tyr Phe Tyr Gly Ser Phe Ile Ala Gly Glu Asn Thr Gln
                485                 490                 495

Asp Arg Gly Ser Asp Gln Leu Arg Val Ser Pro Pro Arg Ala Leu Val
            500                 505                 510

Ser Ala Val Pro Ser Glu Asn Lys Phe Pro Arg Gly Phe Leu Trp Asp
        515                 520                 525

Glu Gly Phe His Gln Leu Leu Ile Gln Arg Trp Asp Pro Glu Leu Ser
    530                 535                 540

Leu Ile Cys Leu Asp Ser Trp Leu Gly Phe Met Gln Pro Ser Gly Trp
545                 550                 555                 560

Ile Pro Arg Glu Leu Ala Leu Gly Ile Glu Ala Arg Asn Arg Phe Pro
                565                 570                 575

Arg Glu Leu Ala Ser Leu Leu Val Gln Ser Glu Lys Val Ala Asn Pro
            580                 585                 590

Pro Thr Leu Met Leu Pro Leu Tyr Arg His Trp Gln Leu Leu Gln Asp
        595                 600                 605

Thr Phe Pro Val Leu Glu Leu Glu Thr Phe Ser Ser Leu Cys Ser Gln
    610                 615                 620

Gly Gly Asp Gly Ser Leu Ser Asp Tyr Ala Ala Met Val Leu Asn Gln
625                 630                 635                 640

Ser Val Gly Asp Cys Lys Ala Val Ala Gln Thr Thr Asn Thr Ala Arg
```

645 650 655

Leu Val Ser His Leu Gly Phe Arg Lys Met Lys Gln Tyr Ile Arg Trp
660 665 670

Leu Asn Ala Thr Gln Lys Asn His Gly Trp Phe Gly Arg His Leu Thr
675 680 685

Thr Leu Leu Ala Gln Asp Gly Gly Tyr Pro Leu Thr Leu Ala Ser Gly
690 695 700

Phe Asp Asp Phe Pro Arg Ser Thr Asp Pro Ser Pro Tyr Asp Ala His
705 710 715 720

Val Asp Leu Leu Ser Trp Ile Leu Asp Gly Val Arg Arg Leu Leu Val
725 730 735

Trp Arg Arg Thr Ala Gly Asp Leu Ala Glu Ala Ser Ala Val Ser Pro
740 745 750

Pro Glu Leu Gly Ala Leu Glu Ala Val Leu Gln Gln Arg Leu Tyr Glu
755 760 765

Val His Trp Asn Ala Asp Ala Gly Met Phe Cys Asp Ala Gly Pro Arg
770 775 780

Gly Asn Ser Ser Thr Ser Ile Val Asp Thr Trp Arg His His Cys His
785 790 795 800

Leu Gly Tyr Pro Thr Leu Leu Pro Leu Ser Leu Gly Leu Leu Pro Val
805 810 815

Asn Ala Thr Ser Thr Gly Ala Leu Leu Lys Ala Val Ala Asp Pro Arg
820 825 830

Gln Met Tyr Ser Asp Phe Gly Leu Arg Ser Leu Ser Ala Ala Asp Pro

```
        835                 840                 845

Phe Tyr Met Arg Gly Asp Arg Tyr Trp Thr Gly Pro Ile Trp Val Pro
    850                 855                 860

Met Asn Tyr Leu Ile Leu Ala Ala Leu Arg Glu Lys Tyr Ala Arg Met
865                 870                 875                 880

Pro Gly Pro Tyr Gln Lys Leu Ala Gln Gln Leu Tyr Glu Arg Thr Arg
                885                 890                 895

Asn Ala Met Ile Gln Thr Ile Leu Arg Glu His Gln Arg Thr Gly Phe
            900                 905                 910

Phe Trp Glu His Tyr Asp Pro Glu Thr Gly Lys Gly Gly Gly Gly His
        915                 920                 925

Ala Phe Thr Gly Trp Thr Ser Leu Leu Val Leu Leu Met Glu Glu Asp
    930                 935                 940

Phe Arg Gly Val Ile Val Ile Asp Glu Thr Gly Thr Val Leu Lys Ser
945                 950                 955                 960
```

<210> 818
<211> 865
<212> PRT
<213> Galdieria sulphuraria

<400> 818

```
Met Gly Gly Val Asp Cys Asn Lys Phe Asp Phe Leu Cys Val Val Leu
1               5                   10                  15

Phe Val Ile Cys Ile Ser Ile Glu Ser His Val Val Leu Gly Ser Asp
            20                  25                  30

Ile Leu Tyr Leu Leu Ser Gly Asn Ala Ser Gln Val Asp Leu Trp Gly
        35                  40                  45
```

```
Thr Phe Arg Pro Gln Thr Tyr Phe Gly Met Arg Ala Lys Val Pro Asn
    50                  55                  60

Ser Leu Gln Phe Gly Phe Thr Trp Phe Val Ala Ser Lys Glu Asn Asp
65                  70                  75                  80

Tyr Glu Arg Leu Arg Asn Tyr Val Ser Ser Gly Asp Asp Gly Val Thr
                85                  90                  95

Arg Phe Ser Trp Leu Ala His Asp Gly Arg Asn Tyr Gly His Glu Ile
            100                 105                 110

Val Glu Glu Glu Arg Asn Gly Val Arg Ile His Phe Glu Trp Ile Lys
        115                 120                 125

Glu Ser Asp Val Gly Ile Gly Ile Arg Ile Lys Gly Glu Ser Leu Ser
    130                 135                 140

Ala Gly Ser Asn Asn Val Glu Thr Gln Met Ile Ser Ile Leu Pro Tyr
145                 150                 155                 160

Leu Phe Val Ala Arg Asp Glu Ser Phe Val Glu Arg Leu Ser Glu Leu
                165                 170                 175

Asn Glu Gln Gly Lys His Arg Lys Ser Ala Ser Asn Glu Asp Ser Leu
            180                 185                 190

Gly Phe Ile Gln Gln Leu Asp Asp Ile Ser Phe Gln Ser Arg Asp Thr
        195                 200                 205

Gln Thr Asp Ile His Trp Thr Gly Asn Thr Lys Ala Asn Gly Pro Phe
    210                 215                 220

Tyr Ala Ser Leu Arg Gln Pro Lys Ser Gly Leu Leu His Leu Thr Arg
225                 230                 235                 240
```

```
Ala Ser Arg Arg Thr Lys Leu Arg Lys Gly Phe Gly Ser Ile Leu Ser
                245                 250                 255

Gln Asp Leu Ser His Ser Tyr Ser Val Ser Leu Ser Leu Pro Leu Thr
            260                 265                 270

Glu Ser Trp Lys Tyr Glu Ala Ala Ile Lys Thr Ile Leu Asp Glu Val
        275                 280                 285

Lys Ala Val Gln Glu Lys Glu Asp Asn Gln Pro Glu Ile Tyr Asp Glu
    290                 295                 300

Glu Val Glu Glu Ala Phe Gln Thr Arg Thr Gly Thr Ile Pro Ile Leu
305                 310                 315                 320

Lys Glu His Arg Asp Asp Lys Ala Thr Leu Ser Ile Ala Gln Arg Ile
                325                 330                 335

Leu Ser Val Pro Phe Glu Leu Glu Phe Val Phe Ile Pro Thr Met Thr
            340                 345                 350

Gln Ile Asp Phe Gly Ser Glu Trp Leu Thr Ser Arg Ile Thr Ala Leu
        355                 360                 365

Thr Gly Asp Lys Leu Thr Glu Lys Phe Met His Lys Lys Met Ala Phe
    370                 375                 380

Glu Arg Asn Phe Gln Glu Thr Tyr Gln Leu Asp Lys Lys Gly Tyr Ser
385                 390                 395                 400

Leu Glu Ser Ile Gln Ile Ala Gln Tyr Ala Leu Ala Asn Val Leu Gly
                405                 410                 415

Gly Ile Gly Phe Phe His Gly Ser Thr Leu Leu Ser Glu Pro Leu Gln
            420                 425                 430
```

```
Asn Ser Gln Arg Ala Lys Asp Asp Ile Asn Asn Leu Ile Leu Pro Asn
        435                 440                 445

Val Ser Leu Leu Thr Ala Thr Pro Ser Arg His Ser Phe Ala Arg Gly
    450                 455                 460

Phe Leu Trp Asp Glu Gly Phe His Gln Leu Leu Ile Ala Ser Trp Asp
465                 470                 475                 480

Pro Leu Leu Ser Phe Glu Cys Leu Ser Tyr Trp Phe Ser Ser Cys Ala
                485                 490                 495

Ser Thr Gly Trp Ile Pro Arg Glu Gln Ala Leu Gly Asp Glu Ile Arg
            500                 505                 510

Asn Leu Phe Pro Ser His Val Lys Gln Phe Ile Met Gln Asp Pro Asn
        515                 520                 525

Ile Ala Asn Pro Pro Thr Leu Leu Leu Pro Leu Arg Arg Leu Ala Lys
    530                 535                 540

Glu Leu Gln Arg Val Asn Ser Asn Lys Phe Thr Gln Glu Asn Ala Tyr
545                 550                 555                 560

Ser Gln Phe Ser Leu Val Ser Ser Arg Val Ser Cys Gly His Phe Leu
                565                 570                 575

Trp Lys Val Leu Ser Gln Arg Leu Gln Gln Ile Leu Ser Trp Phe Glu
            580                 585                 590

Asn Thr Gln Ile Ser Tyr Ser Ser Asn Gly Asp Trp Asn Gly Tyr Arg
        595                 600                 605

Trp Ile Gly Arg His Thr Ser Lys Val Ala Ser Asn Gly Asn Met Pro
    610                 615                 620
```

```
Leu Thr Phe Ala Ser Gly Leu Asp Asp Tyr Pro Arg Ala Leu Val Pro
625                 630                 635                 640

Asn Glu Arg Glu Arg His Leu Asp Leu His Cys Trp Met Ser Trp Ala
                645                 650                 655

Trp Asn Ala Ser Thr Asp Ile Leu Pro Cys Ala Gly Glu Glu Thr Ile
            660                 665                 670

Ser Ala Ser Lys Arg Ala Glu Arg Leu Val Ser Leu Leu Glu Pro Leu
        675                 680                 685

His Arg Pro Ser Lys Asn Met Gly Asp Ile Gly Ser Val Gly Asn Leu
    690                 695                 700

Leu Cys Asp Phe Asp Gly Gln Gly Gln Ser Val Cys His Glu Gly Tyr
705                 710                 715                 720

Val Thr Leu Tyr Pro Leu Ala Leu Ala Leu Leu Pro Val Asp Ser Pro
                725                 730                 735

Tyr Val Gly Ser Ile Leu Lys Leu Ile Asp Asp Asp Asn Lys Leu His
            740                 745                 750

Ser Gly Tyr Gly Leu Arg Ser Leu Ser Lys Asn Asp Pro Phe Tyr Gln
        755                 760                 765

Arg Gly Asp Gly Tyr Trp Thr Gly Pro Ile Trp Val Pro Ile Asn Tyr
    770                 775                 780

Leu Val Leu Ala Ser Leu His Glu Lys Tyr Met Lys Glu Gly Pro Tyr
785                 790                 795                 800

Met Glu Ile Ala Lys Gln Leu Tyr Ser Thr Ile Arg Glu Gln Leu Val
                805                 810                 815
```

```
Ser Asn Ile Val Met Glu Tyr Gln Arg Thr Gly Phe Phe Trp Glu Gln
            820                 825                 830

Tyr Ser Asp Val Asp Gly His Gly Gln Arg Thr Arg Gly Phe Ser Gly
        835                 840                 845

Trp Ser Ser Leu Ile Leu Leu Ile Met Ala Glu Asp Tyr Ser Gly Val
    850                 855                 860

Val
865
```

<210> 819
<211> 966
<212> PRT
<213> Nannochloropsis gaditana

<400> 819

```
Met Arg Gln Met Phe Trp Leu Phe Arg Ile Leu Gly Leu Ser Leu Leu
1               5                   10                  15

Leu Leu His Val Ile Arg Ala Phe Asn Ala Pro Ile Leu Gly Thr Leu
            20                  25                  30

Ile Asn Pro Gly Ile Asp Ala Cys Ala Thr Asp Pro Glu Gly Trp Ile
        35                  40                  45

Lys Gly Pro Val Ile Ser Asp Ala Gln Glu Asp Ala Val Ser Lys Val
    50                  55                  60

Leu Thr Ala Gln His Asn Val Thr Phe Leu Trp Gly Thr Tyr Gln Pro
65                  70                  75                  80

Gly Gln Tyr Phe Gly Val Lys Ser Arg Thr Thr Pro Ala Thr Val Ala
                85                  90                  95
```

```
Val Gly Leu Leu Trp His Gly Pro Glu His Gly Ile Ala Asp Ala Arg
            100                 105                 110

Ser Glu Cys Arg Gln Glu Asp Arg Ile Lys Lys Tyr Gly Trp Thr Gln
        115                 120                 125

His Asp Gly Arg His Tyr Gly Arg Gln Val Ile Asn Asp Ala Ala Gln
    130                 135                 140

Asn Val Asn Leu Val Thr Glu Tyr Val Arg Leu Arg Ser Glu Glu Glu
145                 150                 155                 160

Gly Tyr Trp Gly Ala Arg Ile Leu Val His Pro Asp Arg Gln Ala Thr
                165                 170                 175

Asp Gly Val Val Asp Arg Glu Val Ala Thr Lys Gly Lys Lys Ala Gln
            180                 185                 190

Ser Lys Lys Ser Glu Gly Leu Ser Gly Lys Asp Gln Arg Ala Val Phe
        195                 200                 205

Leu Tyr Val Ala Ile Asp Cys Asp Gly Ala Val Ser Ala Ser Asn Cys
    210                 215                 220

Leu Glu Asn Gly Ala Glu Gly Leu Asp Ile Leu Ile Asp Arg Arg Lys
225                 230                 235                 240

Arg Ser Gly Ala Ala Phe Ile Arg Gly Lys Thr Ser Asp Leu Gly Asp
                245                 250                 255

Phe Thr Leu Glu Val Gly Val Thr Ser Leu Thr Ala Thr Val Asp Ile
            260                 265                 270

Gln Arg Asp Ile Ser Gly Ser Gly Ala Asp Gly Ala Lys Asp Thr Ser
        275                 280                 285
```

```
Pro Asp Ser Pro Pro Ala Leu Ser Ile Thr Tyr Trp Gly Gly Ala Asn
    290                 295                 300

Val Leu Leu Ala Asp Leu Lys Ala Arg Leu Val Gly Glu Ala Arg Pro
305                 310                 315                 320

Ala Pro Leu Lys Gly Asn Arg Gln Ala Gln His Asn Arg Gly Lys Ser
                325                 330                 335

Ser Val Leu Pro Asp Glu Ile Pro Ala Asn Ser Asn Val Val Val Leu
            340                 345                 350

Arg Val Ala Ser Ser Gly Ser Phe Gln Ile Asp Ala Arg Leu Arg Pro
        355                 360                 365

Arg Thr Pro Gln Glu Arg Glu Lys Gly Gly Asp Asp Asp Asp Asp Glu
    370                 375                 380

Pro Gly Ser Glu Asp Val Ala Glu Ile Glu Ser Leu Leu Asp Arg Thr
385                 390                 395                 400

Thr Arg Arg Gly Leu Glu Glu Phe Lys Glu Arg Phe Ala Ser Val Phe
                405                 410                 415

Pro Leu Ser Gln His Gly Tyr Arg Gly Arg Asn Phe Thr Ser Glu Glu
            420                 425                 430

Ile Glu Ala Ala Glu Ala Ala Phe Ser Asn Leu Ile Gly Gly Val Gly
        435                 440                 445

Phe Phe His Gly Arg Thr Pro Ile Arg Gly Gln Phe Glu Trp Glu Glu
    450                 455                 460

Gly Gly Ser Gly Gly Thr Arg Val Leu Asp Ser Phe Pro Thr Ser Leu
465                 470                 475                 480
```

```
Phe Ser Ala Val Pro Ser Arg Ser Phe Phe Pro Arg Gly Phe Leu Trp
                485                 490                 495

Asp Glu Gly Phe His Gln Leu Ile Leu His Lys Trp Asp Ser Glu Leu
            500                 505                 510

Thr Tyr Asp Val Phe Leu His Trp Leu Ser Asn Met His Ala His Glu
        515                 520                 525

Lys Cys Gln Asp Leu Gly Trp Ile Pro Arg Glu Ile Ala Leu Gly Glu
    530                 535                 540

Gln Ala Arg Arg Arg Ile Pro Ala Glu Phe Leu Pro Gln Asp Val Ala
545                 550                 555                 560

Val Ala Asn Pro Pro Ser Phe Leu Leu Thr Leu Glu Asp Met Leu Thr
                565                 570                 575

Leu Ser Gly Ala Ser Ala Asp Gln Cys Glu Val Lys Asp Glu Asp Gly
            580                 585                 590

Arg Arg Ser Gln Ile Ser Ser Met Ser Arg Gln Ser Asp Phe Leu Glu
        595                 600                 605

Ala Ile Gln Asp Arg Leu Glu Arg Trp Leu Leu Trp Leu Leu Ser Ser
    610                 615                 620

Gln Arg Gly Glu Asn Leu Gly Ser Phe Arg Trp Arg Gly Arg Gly Asp
625                 630                 635                 640

Pro Lys Glu Lys Leu Met Ala Thr Thr Phe Ala Ser Gly Leu Asp Asp
                645                 650                 655

Phe Pro Arg Ala Ser Glu Pro Gly Pro Glu Glu Arg His Val Asp Leu
            660                 665                 670
```

```
Leu Cys Trp Ile Ile Lys Gly Cys Gln Ile Leu Ser Gln Leu Ala Phe
        675                 680                 685

Glu Arg Ala Ala His Ser Leu Gly Glu Ala Glu Lys Val Gln Gln Lys
    690                 695                 700

Arg Gly Lys Lys Tyr Ala Thr Val Ala Glu Glu Leu Leu Gly Ala Leu
705                 710                 715                 720

Asp Asp Leu His Trp Asn Glu Thr Leu Gly Gly Tyr Phe Asp Tyr Gly
                725                 730                 735

Met His Ser Glu Asp Gly Tyr Ile Gly Glu Thr Tyr Pro Val Arg Cys
            740                 745                 750

Gly Asn Pro Thr Ser Lys Thr Val Thr Asn Val Arg Val Glu Arg Ser
        755                 760                 765

Ile Leu Met Gln Trp Asp Asp Glu Gly Gly Glu Gly Glu Thr Lys Ile
    770                 775                 780

Cys Pro Pro Asp Phe Pro Thr Pro Leu Gly Met Leu Ser Gln Glu Ala
785                 790                 795                 800

Thr Leu Glu Tyr Phe Arg Gly Pro Glu Ile Ala Ala Gln His Val Pro
                805                 810                 815

Arg Arg Gly Tyr Val Thr Leu Phe Pro Leu Leu Leu Gly Leu Leu Pro
            820                 825                 830

Ala Asp Ser His Arg Ile Arg Pro Leu Leu Asp Ser Leu Lys Asp Pro
        835                 840                 845

Ala Gln Leu Trp Ser Pro Tyr Gly Ile Arg Ser Leu Ser Ala Ser Asp
    850                 855                 860
```

```
Pro Phe Tyr His Lys Glu Asn Ala Pro Gly Asp Ala Pro Tyr Trp Arg
865                 870                 875                 880


Gly Tyr Val Trp Ile Asn Ala Asn Tyr Leu Ile Leu Arg Ser Leu Trp
                885                 890                 895


His Leu Thr Arg Thr Val Gly Pro Tyr Gln Ser Glu Ala Lys Glu Leu
            900                 905                 910


Tyr Thr Arg Leu Arg Asp Ala Leu Leu Arg Thr Ile Leu Gly Gln Tyr
        915                 920                 925


Gln Thr Thr Gly Tyr Phe Trp Glu Gln Tyr Ser Asp Val Asp Gly Gln
    930                 935                 940


Gly Met Arg Cys His Pro Phe Thr Gly Trp Thr Ala Leu Val Leu Asn
945                 950                 955                 960


Ile Met Ala Glu Asp Phe
                965


<210>  820
<211>  748
<212>  PRT
<213>  Emiliania huxley

<400>  820

Met Pro Pro Lys His Ala Ser Arg Pro Pro Ala Ser Arg Gln Ala Gln
1               5                   10                  15


Arg Trp Ala Lys Asp Leu Lys Leu Ile Gly Ala Ala Ala Ala Leu Val
            20                  25                  30


Ala Ala Phe Leu Leu Gly Ser Ala Phe Leu Ser Pro Arg Ser His Arg
        35                  40                  45
```

```
Val Ser Ser Ser Ala Pro Lys Arg Pro Gln Ser Ala Ser Pro Pro Thr
    50                  55                  60

Ala Pro Val Pro Ile Ala Leu Ala Gly Gly Thr Leu Ser Arg Phe Thr
65                  70                  75                  80

Ala Glu His Asn Ala Ser Leu Leu Trp Gly Thr Tyr Arg Pro Gly Val
                85                  90                  95

Tyr Phe Gly Met Arg Ser Arg Thr Ala Pro Thr Ala Leu Val Ala Gly
            100                 105                 110

Leu Met Trp Thr Arg Ala Arg Pro Asp Gly Gly Val Asp Ala Thr Thr
        115                 120                 125

Leu Arg His Gln Cys Glu Gln Asp Gly Leu Glu Arg Tyr Gly Phe Thr
    130                 135                 140

Ala His Asp Gly Arg Gly Phe Gly Ser Gln Pro Ile Val Asp Arg Ala
145                 150                 155                 160

Asn Gly Val His Leu Thr Thr Thr Phe Pro Ile Ala Gly Ala Ala Pro
                165                 170                 175

Lys Gln His Leu Phe Leu Tyr Leu Ser Leu Asp Thr Glu Phe Ala Pro
            180                 185                 190

Arg Leu Ser Arg Gly Ala Ala Leu Gly Lys Leu Glu Val Leu Ser Phe
        195                 200                 205

Gln Pro Glu Glu Gly Val His Val Gly Gly Gln Val Glu Glu Val Gly
    210                 215                 220

Arg Phe Ser Leu Leu Ala Ala Ala Arg Thr Gln Gly Gly Asp Pro Leu
225                 230                 235                 240
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Pro Leu Arg Ala Trp Gly Ser Ala Ala Arg His His Ser His Leu Asn
               245                 250                 255

Val Ala Glu Leu Ile Arg Ser Arg Thr Asp Ala Phe His Ala Arg Leu
            260                 265                 270

Ala Ser Thr Phe Gly Leu Asp Glu Gln Arg Glu Gly Gly Ala Leu Arg
        275                 280                 285

Leu Gly Gly Ser Pro Leu Gly Glu Arg Glu Lys Gly Phe Ala Ala Ala
    290                 295                 300

Ala Leu Ala Ala Gln Leu Gly Ser Leu Gly Phe Phe Tyr Gly Lys Thr
305                 310                 315                 320

Val Val Ala Pro Pro Pro Gly Ser Phe Ser Pro Pro Pro Pro Pro Gln
               325                 330                 335

Glu Thr Glu Ala Ala Pro Leu Phe Ala Val Val Pro Ser Arg Pro Phe
            340                 345                 350

Phe Pro Arg Gly Phe Leu Trp Asp Asp Gly Phe His Ser Leu Val Val
        355                 360                 365

Gly Glu Trp Asp Gly Pro Leu Ala Asp Asp Ile Ala Ala His Trp Leu
    370                 375                 380

Gly Leu Met His Glu Asp Gly Trp Ile Pro Arg Glu Gln Ile Leu Gly
385                 390                 395                 400

Ala Glu Ala Ala Ala Arg Val Pro Ala Glu Phe Leu Pro Gln Arg Arg
               405                 410                 415

Leu His Ala Asn Pro Pro Thr Leu Ala Gly Ser Arg Pro His Thr Tyr
            420                 425                 430
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Arg Trp Arg Gly Arg Asp Lys Ser Asp Gly Arg Leu Asn Ala Met Thr
        435                 440                 445

Leu Ala Ser Gly Leu Asp Asp Tyr Pro Arg Ala Thr Val Pro Gly Glu
    450                 455                 460

Gly Glu Arg His Leu Asp Leu Leu Cys Trp Leu Ala Phe Phe Ser Arg
465                 470                 475                 480

Phe Leu Ala Gln Leu Ser Glu Arg Thr Gly Asp Gly Gly Glu Ala Ala
                485                 490                 495

Arg Tyr Arg Glu Glu His Arg Ala Gln Leu Ala Ser Leu Glu Gln His
            500                 505                 510

His Trp Ser Pro Gly Leu Arg Ala Tyr Cys Asp Trp Gly Arg His Ala
        515                 520                 525

Asn Ala Gly Arg Phe Val Gln Leu Val Val Val Lys Cys Gly Thr Ala
    530                 535                 540

Asp Gly Gly Ser Ala Val Glu His Thr Val Ser Asp Pro Glu Arg Pro
545                 550                 555                 560

Asp Cys Pro Arg Ser His Pro Arg Phe Leu Phe Pro Leu Gly Asp Gly
                565                 570                 575

Lys Gly Gly Leu Leu Thr Arg Ala Lys Leu Gln Pro Arg Gly Leu Lys
            580                 585                 590

Asp Gln His Val Glu His Leu Gly Tyr Val Ser Leu Phe Pro Leu Leu
        595                 600                 605

Leu Arg Leu Leu Pro Pro Asp Ser Pro Ser Leu Pro His Val Leu Asp
    610                 615                 620
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Leu Leu Arg Asp Pro Asp Arg Leu Trp Ser Pro His Gly Leu Arg Ser
625                 630                 635                 640


Leu Ser Lys Ala Asp Ala Met Trp Tyr Gly Arg Glu Asn Ala Pro Gly
                645                 650                 655


Asp Ala Pro Tyr Trp Arg Gly Pro Ile Trp Val Asn Leu Asn Tyr Leu
            660                 665                 670


Cys Leu Ala Ala Leu Arg His Tyr Ala Gln Ala Ala Gly Pro Gln Lys
        675                 680                 685


Glu Arg Ser Ala Ala Leu Tyr Ala Glu Leu Arg Glu Ala Leu Val Gly
    690                 695                 700


Thr Met Val Ser Glu Trp Glu Arg Thr Gly Tyr Phe Trp Glu Gln Tyr
705                 710                 715                 720


Asp Pro Asp Thr Gly Arg Gly Gln Arg Thr His Pro Phe Asn Gly Trp
                725                 730                 735


Ser Ser Leu Gly Leu Leu Ala Leu Ala Glu Val Tyr
            740                 745
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