SEQUENCE LISTING

<110> Impossible Foods Inc.

<120> MATERIALS AND METHODS FOR PROTEIN PRODUCTION

<130> 38767-0158WO1

<150> 62/838,770
<151> 2019-04-25

<160> 66

<170> PatentIn version 3.5

<210> 1
<211> 161
<212> PRT
<213> Vigna radiata

<400> 1

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Met Thr Thr Thr Leu Glu Arg Gly Phe Thr Glu Glu Gln Glu Ala Leu
1               5                  10                  15


Val Val Lys Ser Trp Asn Val Met Lys Lys Asn Ser Gly Glu Leu Gly
            20                  25                  30


Leu Lys Phe Phe Leu Lys Ile Phe Glu Ile Ala Pro Ser Ala Gln Lys
        35                  40                  45


Leu Phe Ser Phe Leu Arg Asp Ser Thr Val Pro Leu Glu Gln Asn Pro
    50                  55                  60


Lys Leu Lys Pro His Ala Val Ser Val Phe Val Met Thr Cys Asp Ser
65                  70                  75                  80


Ala Val Gln Leu Arg Lys Ala Gly Lys Val Thr Val Arg Glu Ser Asn
                85                  90                  95


Leu Lys Lys Leu Gly Ala Thr His Phe Arg Thr Gly Val Ala Asn Glu
            100                 105                 110


His Phe Glu Val Thr Lys Phe Ala Leu Leu Glu Thr Ile Lys Glu Ala
        115                 120                 125
```

Val Pro Glu Met Trp Ser Pro Ala Met Lys Asn Ala Trp Gly Glu Ala
    130   135   140

Tyr Asp Gln Leu Val Asp Ala Ile Lys Tyr Glu Met Lys Pro Pro Ser
145   150   155   160

Ser

<210> 2
<211> 133
<212> PRT
<213> Methylacidiphilum infernorum

<400> 2

Met Ile Asp Gln Lys Glu Lys Glu Leu Ile Lys Glu Ser Trp Lys Arg
1   5   10   15

Ile Glu Pro Asn Lys Asn Glu Ile Gly Leu Leu Phe Tyr Ala Asn Leu
            20   25   30

Phe Lys Glu Glu Pro Thr Val Ser Val Leu Phe Gln Asn Pro Ile Ser
        35   40   45

Ser Gln Ser Arg Lys Leu Met Gln Val Leu Gly Ile Leu Val Gln Gly
    50   55   60

Ile Asp Asn Leu Glu Gly Leu Ile Pro Thr Leu Gln Asp Leu Gly Arg
65   70   75   80

Arg His Lys Gln Tyr Gly Val Val Asp Ser His Tyr Pro Leu Val Gly
                85   90   95

Asp Cys Leu Leu Lys Ser Ile Gln Glu Tyr Leu Gly Gln Gly Phe Thr
            100   105   110

Glu Glu Ala Lys Ala Ala Trp Thr Lys Val Tyr Gly Ile Ala Ala Gln
        115   120   125

Val Met Thr Ala Glu
    130

<210> 3
<211> 139
<212> PRT
<213> Aquifex aeolicus

<400> 3

```
Met Leu Ser Glu Glu Thr Ile Arg Val Ile Lys Ser Thr Val Pro Leu
1               5                  10                  15


Leu Lys Glu His Gly Thr Glu Ile Thr Ala Arg Met Tyr Glu Leu Leu
            20                  25                  30


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


Glu Gln Pro Lys Lys Leu Ala Asn Ala Ile Ile Ala Tyr Ala Thr Tyr
    50                  55                  60


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


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


Glu Cys Leu Leu Gln Ala Ile Glu Glu Val Leu Asn Pro Gly Glu Glu
            100                 105                 110


Val Leu Lys Ala Trp Glu Glu Ala Tyr Asp Phe Leu Ala Lys Thr Leu
        115                 120                 125


Ile Thr Leu Glu Lys Lys Leu Tyr Ser Gln Pro
    130                 135
```

<210> 4
<211> 145
<212> PRT
<213> Glycine max

<400> 4

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

```
Glu Ala Phe Lys Ala Asn Ile Pro Gln Tyr Ser Val Val Phe Tyr Thr
            20                  25                  30

Ser Ile Leu Glu Lys Ala Pro Ala Ala Lys Asp Leu Phe Ser Phe Leu
        35                  40                  45

Ser Asn Gly Val Asp Pro Ser Asn Pro Lys Leu Thr Gly His Ala Glu
    50                  55                  60

Lys Leu Phe Gly Leu Val Arg Asp Ser Ala Gly Gln Leu Lys Ala Asn
65                  70                  75                  80

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

Ala Ile Thr Asp Pro Gln Phe Val Val Val Lys Glu Ala Leu Leu Lys
            100                 105                 110

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

Ala Trp Glu Val Ala Tyr Asp Glu Leu Ala Ala Ala Ile Lys Lys Ala
    130                 135                 140

Phe
145


<210>  5
<211>  162
<212>  PRT
<213>  Hordeum vulgare

<400>  5

Met Ser Ala Ala Glu Gly Ala Val Val Phe Ser Glu Glu Lys Glu Ala
1               5                   10                  15

Leu Val Leu Lys Ser Trp Ala Ile Met Lys Lys Asp Ser Ala Asn Leu
            20                  25                  30

Gly Leu Arg Phe Phe Leu Lys Ile Phe Glu Ile Ala Pro Ser Ala Arg
        35                  40                  45
```

```
Gln Met Phe Pro Phe Leu Arg Asp Ser Asp Val Pro Leu Glu Thr Asn
    50                  55                  60

Pro Lys Leu Lys Thr His Ala Val Ser Val Phe Val Met Thr Cys Glu
65                  70                  75                  80

Ala Ala Ala Gln Leu Arg Lys Ala Gly Lys Ile Thr Val Arg Glu Thr
                85                  90                  95

Thr Leu Lys Arg Leu Gly Gly Thr His Leu Lys Tyr Gly Val Ala Asp
            100                 105                 110

Gly His Phe Glu Val Thr Arg Phe Ala Leu Leu Glu Thr Ile Lys Glu
        115                 120                 125

Ala Leu Pro Ala Asp Met Trp Gly Pro Glu Met Arg Asn Ala Trp Gly
    130                 135                 140

Glu Ala Tyr Asp Gln Leu Val Ala Ala Ile Lys Gln Glu Met Lys Pro
145                 150                 155                 160

Ala Glu
```

<210> 6
<211> 1153
<212> PRT
<213> Magnaporthe oryzae

<400> 6

```
Met Asp Gly Ala Val Arg Leu Asp Trp Thr Gly Leu Asp Leu Thr Gly
1               5                   10                  15

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

Val Ser Phe Pro Leu Phe Lys Asp Gln His Ile Ile Met Ser Ser Lys
        35                  40                  45

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

```
    50                  55                  60

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

Glu Lys Pro Lys Pro Val Lys Glu Asn Pro Met Lys Lys Leu Lys Glu
                85                  90                  95

Met Ser Gln Arg Pro Leu Pro Thr Gln His Gly Asp Gly Thr Tyr Pro
            100                 105                 110

Thr Glu Lys Lys Leu Thr Gly Ile Gly Glu Asp Leu Lys His Ile Arg
        115                 120                 125

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

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

Gln Leu Val Ala Arg Leu Pro Thr Glu Ser Lys Lys Arg Ala Glu Leu
                165                 170                 175

Thr Asp Ser Leu Ile Asn Glu Leu Trp Glu Ser Leu Asp His Pro Pro
            180                 185                 190

Leu Asn Tyr Leu Gly Pro Glu His Ser Tyr Arg Thr Pro Asp Gly Ser
        195                 200                 205

Tyr Asn His Pro Phe Asn Pro Gln Leu Gly Ala Ala Gly Ser Arg Tyr
    210                 215                 220

Ala Arg Ser Val Ile Pro Thr Val Thr Pro Pro Gly Ala Leu Pro Asp
225                 230                 235                 240

Pro Gly Leu Ile Phe Asp Ser Ile Met Gly Arg Thr Pro Asn Ser Tyr
                245                 250                 255

Arg Lys His Pro Asn Asn Val Ser Ser Ile Leu Trp Tyr Trp Ala Thr
            260                 265                 270
```

```
Ile Ile Ile His Asp Ile Phe Trp Thr Asp Pro Arg Asp Ile Asn Thr
        275                 280                 285

Asn Lys Ser Ser Ser Tyr Leu Asp Leu Ala Pro Leu Tyr Gly Asn Ser
    290                 295                 300

Gln Glu Met Gln Asp Ser Ile Arg Thr Phe Lys Asp Gly Arg Met Lys
305                 310                 315                 320

Pro Asp Cys Tyr Ala Asp Lys Arg Leu Ala Gly Met Pro Pro Gly Val
                325                 330                 335

Ser Val Leu Leu Ile Met Phe Asn Arg Phe His Asn His Val Ala Glu
            340                 345                 350

Asn Leu Ala Leu Ile Asn Glu Gly Gly Arg Phe Asn Lys Pro Ser Asp
        355                 360                 365

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

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

Ile Thr Leu Val Asp Tyr Val Arg Asn Ile Val Asn Leu Asn Arg Val
                405                 410                 415

Asp Thr Thr Trp Thr Leu Asp Pro Arg Gln Asp Ala Gly Ala His Val
            420                 425                 430

Gly Thr Ala Asp Gly Ala Glu Arg Gly Thr Gly Asn Ala Val Ser Ala
        435                 440                 445

Glu Phe Asn Leu Cys Tyr Arg Trp His Ser Cys Ile Ser Glu Lys Asp
    450                 455                 460

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

Ser Glu Val Arg Pro Asp Glu Met Trp Lys Gly Phe Ala Lys Met Glu
```

```
               485                 490                 495

Gln Asn Thr Pro Ala Asp Pro Gly Gln Arg Thr Phe Gly Gly Phe Lys
            500                 505                 510

Arg Gly Pro Asp Gly Lys Phe Asp Asp Asp Asp Leu Val Arg Cys Ile
        515                 520                 525

Ser Glu Ala Val Glu Asp Val Ala Gly Ala Phe Gly Ala Arg Asn Val
    530                 535                 540

Pro Gln Ala Met Lys Val Val Glu Thr Met Gly Ile Ile Gln Gly Arg
545                 550                 555                 560

Lys Trp Asn Val Ala Gly Leu Asn Glu Phe Arg Lys His Phe His Leu
                565                 570                 575

Lys Pro Tyr Ser Thr Phe Glu Asp Ile Asn Ser Asp Pro Gly Val Ala
            580                 585                 590

Glu Ala Leu Arg Arg Leu Tyr Asp His Pro Asp Asn Val Glu Leu Tyr
        595                 600                 605

Pro Gly Leu Val Ala Glu Glu Asp Lys Gln Pro Met Val Pro Gly Val
    610                 615                 620

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

Val Cys Leu Val Arg Gly Asp Arg Phe Tyr Thr Thr Asp Phe Thr Pro
                645                 650                 655

Arg Asn Leu Thr Asn Trp Gly Tyr Lys Glu Val Asp Tyr Asp Leu Ser
            660                 665                 670

Val Asn His Gly Cys Val Phe Tyr Lys Leu Phe Ile Arg Ala Phe Pro
        675                 680                 685

Asn His Phe Lys Gln Asn Ser Val Tyr Ala His Tyr Pro Met Val Val
    690                 695                 700
```

```
Pro Ser Glu Asn Lys Arg Ile Leu Glu Ala Leu Gly Arg Ala Asp Leu
705                 710                 715                 720

Phe Asp Phe Glu Ala Pro Lys Tyr Ile Pro Pro Arg Val Asn Ile Thr
                725                 730                 735

Ser Tyr Gly Gly Ala Glu Tyr Ile Leu Glu Thr Gln Glu Lys Tyr Lys
            740                 745                 750

Val Thr Trp His Glu Gly Leu Gly Phe Leu Met Gly Glu Gly Gly Leu
        755                 760                 765

Lys Phe Met Leu Ser Gly Asp Asp Pro Leu His Ala Gln Gln Arg Lys
    770                 775                 780

Cys Met Ala Ala Gln Leu Tyr Lys Asp Gly Trp Thr Glu Ala Val Lys
785                 790                 795                 800

Ala Phe Tyr Ala Gly Met Met Glu Glu Leu Leu Val Ser Lys Ser Tyr
                805                 810                 815

Phe Leu Gly Asn Asn Lys His Arg His Val Asp Ile Ile Arg Asp Val
            820                 825                 830

Gly Asn Met Val His Val His Phe Ala Ser Gln Val Phe Gly Leu Pro
        835                 840                 845

Leu Lys Thr Ala Lys Asn Pro Thr Gly Val Phe Thr Glu Gln Glu Met
    850                 855                 860

Tyr Gly Ile Leu Ala Ala Ile Phe Thr Thr Ile Phe Phe Asp Leu Asp
865                 870                 875                 880

Pro Ser Lys Ser Phe Pro Leu Arg Thr Lys Thr Arg Glu Val Cys Gln
                885                 890                 895

Lys Leu Ala Lys Leu Val Glu Ala Asn Val Lys Leu Ile Asn Lys Ile
            900                 905                 910

Pro Trp Ser Arg Gly Met Phe Val Gly Lys Pro Ala Lys Asp Glu Pro
```

```
        915                 920                 925

Leu Ser Ile Tyr Gly Lys Thr Met Ile Lys Gly Leu Lys Ala His Gly
    930                 935                 940

Leu Ser Asp Tyr Asp Ile Ala Trp Ser His Val Val Pro Thr Ser Gly
945                 950                 955                 960

Ala Met Val Pro Asn Gln Ala Gln Val Phe Ala Gln Ala Val Asp Tyr
                965                 970                 975

Tyr Leu Ser Pro Ala Gly Met His Tyr Ile Pro Glu Ile His Met Val
            980                 985                 990

Ala Leu Gln Pro Ser Thr Pro Glu  Thr Asp Ala Leu Leu  Leu Gly Tyr
        995                 1000                1005

Ala Met  Glu Gly Ile Arg Leu  Ala Gly Thr Phe Gly  Ser Tyr Arg
    1010                1015                1020

Glu Ala  Ala Val Asp Asp Val  Val Lys Glu Asp Asn  Gly Arg Gln
    1025                1030                1035

Val Pro  Val Lys Ala Gly Asp  Arg Val Phe Val Ser  Phe Val Asp
    1040                1045                1050

Ala Ala  Arg Asp Pro Lys His  Phe Pro Asp Pro Glu  Val Val Asn
    1055                1060                1065

Pro Arg  Arg Pro Ala Lys Lys  Tyr Ile His Tyr Gly  Val Gly Pro
    1070                1075                1080

His Ala  Cys Leu Gly Arg Asp  Ala Ser Gln Ile Ala  Ile Thr Glu
    1085                1090                1095

Met Phe  Arg Cys Leu Phe Arg  Arg Arg Asn Val Arg  Arg Val Pro
    1100                1105                1110

Gly Pro  Gln Gly Glu Leu Lys  Lys Val Pro Arg Pro  Gly Gly Phe
    1115                1120                1125
```

Tyr Val Tyr Met Arg Glu Asp Trp Gly Gly Leu Phe Pro Phe Pro
    1130   1135   1140

Val Thr Met Arg Val Met Trp Asp Asp Glu
    1145   1150

<210> 7
<211> 530
<212> PRT
<213> Fusarium oxysporum

<400> 7

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

Ala Ser Gln Leu Val Trp Pro Ser Lys Trp Asp Glu Val Glu Asp Leu
            20   25   30

Leu Tyr Met Gln Gly Gly Phe Asn Lys Arg Gly Phe Ala Asp Ala Leu
        35   40   45

Arg Thr Cys Glu Phe Gly Ser Asn Val Pro Gly Thr Gln Asn Thr Ala
    50   55   60

Glu Trp Leu Arg Thr Ala Phe His Asp Ala Ile Thr His Asp Ala Lys
65   70   75   80

Ala Gly Thr Gly Gly Leu Asp Ala Ser Ile Tyr Trp Glu Ser Ser Arg
                85   90   95

Pro Glu Asn Pro Gly Lys Ala Phe Asn Asn Thr Phe Gly Phe Phe Ser
            100   105   110

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

Thr Val Leu Ala Val Gly Ala Cys Asn Gly Pro Arg Ile Pro Phe Arg
    130   135   140

Ala Gly Arg Ile Asp Ala Tyr Lys Ala Gly Pro Ala Gly Val Pro Glu
145   150   155   160

```
Pro Ser Thr Asn Leu Lys Asp Thr Phe Ala Ala Phe Thr Lys Ala Gly
                165                 170                 175

Phe Thr Lys Glu Glu Met Thr Ala Met Val Ala Cys Gly His Ala Ile
            180                 185                 190

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

Asp Pro Asn Asn Asp Thr Asn Val Pro Phe Gln Lys Asp Val Ser Ser
    210                 215                 220

Phe His Asn Gly Ile Val Thr Glu Tyr Leu Ala Gly Thr Ser Lys Asn
225                 230                 235                 240

Pro Leu Val Ala Ser Lys Asn Ala Thr Phe His Ser Asp Lys Arg Ile
                245                 250                 255

Phe Asp Asn Asp Lys Ala Thr Met Lys Lys Leu Ser Thr Lys Ala Gly
            260                 265                 270

Phe Asn Ser Met Cys Ala Asp Ile Leu Thr Arg Met Ile Asp Thr Val
        275                 280                 285

Pro Lys Ser Val Gln Leu Thr Pro Val Leu Glu Ala Tyr Asp Val Arg
    290                 295                 300

Pro Tyr Ile Thr Glu Leu Ser Leu Asn Asn Lys Asn Lys Ile His Phe
305                 310                 315                 320

Thr Gly Ser Val Arg Val Arg Ile Thr Asn Asn Ile Arg Asp Asn Asn
                325                 330                 335

Asp Leu Ala Ile Asn Leu Ile Tyr Val Gly Arg Asp Gly Lys Lys Val
            340                 345                 350

Thr Val Pro Thr Gln Gln Val Thr Phe Gln Gly Gly Thr Ser Phe Gly
        355                 360                 365
```

```
Ala Gly Glu Val Phe Ala Asn Phe Glu Phe Asp Thr Thr Met Asp Ala
    370                 375                 380

Lys Asn Gly Ile Thr Lys Phe Phe Ile Gln Glu Val Lys Pro Ser Thr
385                 390                 395                 400

Lys Ala Thr Val Thr His Asp Asn Gln Lys Thr Gly Gly Tyr Lys Val
                405                 410                 415

Asp Asp Thr Val Leu Tyr Gln Leu Gln Gln Ser Cys Ala Val Leu Glu
            420                 425                 430

Lys Leu Pro Asn Ala Pro Leu Val Val Thr Ala Met Val Arg Asp Ala
        435                 440                 445

Arg Ala Lys Asp Ala Leu Thr Leu Arg Val Ala His Lys Lys Pro Val
    450                 455                 460

Lys Gly Ser Ile Val Pro Arg Phe Gln Thr Ala Ile Thr Asn Phe Lys
465                 470                 475                 480

Ala Thr Gly Lys Lys Ser Ser Gly Tyr Thr Gly Phe Gln Ala Lys Thr
                485                 490                 495

Met Phe Glu Glu Gln Ser Thr Tyr Phe Asp Ile Val Leu Gly Gly Ser
            500                 505                 510

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

Cys Ser
    530
```

<210> 8
<211> 358
<212> PRT
<213> Fusarium graminearum

<400> 8

```
Met Ala Ser Ala Thr Arg Gln Phe Ala Arg Ala Ala Thr Arg Ala Thr
1               5                   10                  15
```

```
Arg Asn Gly Phe Ala Ile Ala Pro Arg Gln Val Ile Arg Gln Gln Gly
            20                  25                  30

Arg Arg Tyr Tyr Ser Ser Glu Pro Ala Gln Lys Ser Ser Ser Ala Trp
        35                  40                  45

Ile Trp Leu Thr Gly Ala Ala Val Ala Gly Gly Ala Gly Tyr Tyr Phe
    50                  55                  60

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

Lys Glu Asp Tyr Gln Lys Val Tyr Asn Glu Ile Ala Ala Arg Leu Glu
                85                  90                  95

Glu Lys Asp Asp Tyr Asp Asp Gly Ser Tyr Gly Pro Val Leu Val Arg
            100                 105                 110

Leu Ala Trp His Ala Ser Gly Thr Tyr Asp Lys Glu Thr Gly Thr Gly
        115                 120                 125

Gly Ser Asn Gly Ala Thr Met Arg Phe Ala Pro Glu Ser Asp His Gly
    130                 135                 140

Ala Asn Ala Gly Leu Ala Ala Ala Arg Asp Phe Leu Gln Pro Val Lys
145                 150                 155                 160

Glu Lys Phe Pro Trp Ile Thr Tyr Ser Asp Leu Trp Ile Leu Ala Gly
                165                 170                 175

Val Cys Ala Ile Gln Glu Met Leu Gly Pro Ala Ile Pro Tyr Arg Pro
            180                 185                 190

Gly Arg Ser Asp Arg Asp Val Ser Gly Cys Thr Pro Asp Gly Arg Leu
        195                 200                 205

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

Met Gly Phe Asn Asp Gln Glu Ile Val Ala Leu Ser Gly Ala His Ala
```

225 230 235 240

Leu Gly Arg Cys His Thr Asp Arg Ser Gly Tyr Ser Gly Pro Trp Thr
245 250 255

Phe Ser Pro Thr Val Leu Thr Asn Asp Tyr Phe Arg Leu Leu Val Glu
260 265 270

Glu Lys Trp Gln Trp Lys Lys Trp Asn Gly Pro Ala Gln Tyr Glu Asp
275 280 285

Lys Ser Thr Lys Ser Leu Met Met Leu Pro Ser Asp Ile Ala Leu Ile
290 295 300

Glu Asp Lys Lys Phe Lys Pro Trp Val Glu Lys Tyr Ala Lys Asp Asn
305 310 315 320

Asp Ala Phe Phe Lys Asp Phe Ser Asn Val Val Leu Arg Leu Phe Glu
325 330 335

Leu Gly Val Pro Phe Ala Gln Gly Thr Glu Asn Gln Arg Trp Thr Phe
340 345 350

Lys Pro Thr His Gln Glu
355

<210> 9
<211> 122
<212> PRT
<213> Chlamydomonas eugametos

<400> 9

Met Ser Leu Phe Ala Lys Leu Gly Gly Arg Glu Ala Val Glu Ala Ala
1 5 10 15

Val Asp Lys Phe Tyr Asn Lys Ile Val Ala Asp Pro Thr Val Ser Thr
20 25 30

Tyr Phe Ser Asn Thr Asp Met Lys Val Gln Arg Ser Lys Gln Phe Ala
35 40 45

```
Phe Leu Ala Tyr Ala Leu Gly Gly Ala Ser Glu Trp Lys Gly Lys Asp
    50                  55                  60

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

Phe Gln Ala Val Ala Arg His Leu Ser Asp Thr Leu Thr Glu Leu Gly
                85                  90                  95

Val Pro Pro Glu Asp Ile Thr Asp Ala Met Ala Val Val Ala Ser Thr
            100                 105                 110

Arg Thr Glu Val Leu Asn Met Pro Gln Gln
        115                 120
```

<210> 10
<211> 121
<212> PRT
<213> Tetrahymena pyriformis

<400> 10

```
Met Asn Lys Pro Gln Thr Ile Tyr Glu Lys Leu Gly Gly Glu Asn Ala
1               5                   10                  15

Met Lys Ala Ala Val Pro Leu Phe Tyr Lys Lys Val Leu Ala Asp Glu
            20                  25                  30

Arg Val Lys His Phe Phe Lys Asn Thr Asp Met Asp His Gln Thr Lys
        35                  40                  45

Gln Gln Thr Asp Phe Leu Thr Met Leu Leu Gly Gly Pro Asn His Tyr
    50                  55                  60

Lys Gly Lys Asn Met Thr Glu Ala His Lys Gly Met Asn Leu Gln Asn
65                  70                  75                  80

Leu His Phe Asp Ala Ile Ile Glu Asn Leu Ala Ala Thr Leu Lys Glu
                85                  90                  95

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

```
His Thr Arg Lys Asp Met Leu Gly Lys
        115                 120


<210>  11
<211>  117
<212>  PRT
<213>  Paramecium caudatum

<400>  11

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


Thr Ala Gln Phe Tyr Ala Asn Ile Gln Ala Asp Ala Thr Val Ala Thr
            20                  25                  30


Phe Phe Asn Gly Ile Asp Met Pro Asn Gln Thr Asn Lys Thr Ala Ala
        35                  40                  45


Phe Leu Cys Ala Ala Leu Gly Gly Pro Asn Ala Trp Thr Gly Arg Asn
    50                  55                  60


Leu Lys Glu Val His Ala Asn Met Gly Val Ser Asn Ala Gln Phe Thr
65                  70                  75                  80


Thr Val Ile Gly His Leu Arg Ser Ala Leu Thr Gly Ala Gly Val Ala
                85                  90                  95


Ala Ala Leu Val Glu Gln Thr Val Ala Val Ala Glu Thr Val Arg Gly
            100                 105                 110


Asp Val Val Thr Val
        115


<210>  12
<211>  147
<212>  PRT
<213>  Aspergillus niger

<400>  12

Met Pro Leu Thr Pro Glu Gln Ile Lys Ile Ile Lys Ala Thr Val Pro
1               5                   10                  15
```

```
Val Leu Gln Glu Tyr Gly Thr Lys Ile Thr Thr Ala Phe Tyr Met Asn
            20                  25                  30

Met Ser Thr Val His Pro Glu Leu Asn Ala Val Phe Asn Thr Ala Asn
        35                  40                  45

Gln Val Lys Gly His Gln Ala Arg Ala Leu Ala Gly Ala Leu Phe Ala
    50                  55                  60

Tyr Ala Ser His Ile Asp Asp Leu Gly Ala Leu Gly Pro Ala Val Glu
65                  70                  75                  80

Leu Ile Cys Asn Lys His Ala Ser Leu Tyr Ile Gln Ala Asp Glu Tyr
                85                  90                  95

Lys Ile Val Gly Lys Tyr Leu Leu Glu Ala Met Lys Glu Val Leu Gly
            100                 105                 110

Asp Ala Cys Thr Asp Asp Ile Leu Asp Ala Trp Gly Ala Ala Tyr Trp
        115                 120                 125

Ala Leu Ala Asp Ile Met Ile Asn Arg Glu Ala Ala Leu Tyr Lys Gln
    130                 135                 140

Ser Gln Gly
145
```

<210> 13
<211> 165
<212> PRT
<213> Zea mays

<400> 13

```
Met Ala Leu Ala Glu Ala Asp Asp Gly Ala Val Val Phe Gly Glu Glu
1               5                   10                  15

Gln Glu Ala Leu Val Leu Lys Ser Trp Ala Val Met Lys Lys Asp Ala
            20                  25                  30

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

```
Ser Ala Glu Gln Met Phe Ser Phe Leu Arg Asp Ser Asp Val Pro Leu
    50                  55                  60

Glu Lys Asn Pro Lys Leu Lys Thr His Ala Met Ser Val Phe Val Met
65                  70                  75                  80

Thr Cys Glu Ala Ala Ala Gln Leu Arg Lys Ala Gly Lys Val Thr Val
                85                  90                  95

Arg Glu Thr Thr Leu Lys Arg Leu Gly Ala Thr His Leu Arg Tyr Gly
            100                 105                 110

Val Ala Asp Gly His Phe Glu Val Thr Gly Phe Ala Leu Leu Glu Thr
        115                 120                 125

Ile Lys Glu Ala Leu Pro Ala Asp Met Trp Ser Leu Glu Met Lys Lys
    130                 135                 140

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

Met Lys Pro Asp Ala
                165
```

<210> 14
<211> 169
<212> PRT
<213> Oryza sativa subsp. japonica

<400> 14

```
Met Ala Leu Val Glu Gly Asn Asn Gly Val Ser Gly Gly Ala Val Ser
1               5                   10                  15

Phe Ser Glu Glu Gln Glu Ala Leu Val Leu Lys Ser Trp Ala Ile Met
            20                  25                  30

Lys Lys Asp Ser Ala Asn Ile Gly Leu Arg Phe Phe Leu Lys Ile Phe
        35                  40                  45

Glu Val Ala Pro Ser Ala Ser Gln Met Phe Ser Phe Leu Arg Asn Ser
```

50 55 60

Asp Val Pro Leu Glu Lys Asn Pro Lys Leu Lys Thr His Ala Met Ser
65 70 75 80

Val Phe Val Met Thr Cys Glu Ala Ala Ala Gln Leu Arg Lys Ala Gly
85 90 95

Lys Val Thr Val Arg Asp Thr Thr Leu Lys Arg Leu Gly Ala Thr His
100 105 110

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

Leu Leu Glu Thr Ile Lys Glu Ala Val Pro Val Asp Met Trp Ser Pro
130 135 140

Ala Met Lys Ser Ala Trp Ser Glu Ala Tyr Asn Gln Leu Val Ala Ala
145 150 155 160

Ile Lys Gln Glu Met Lys Pro Ala Glu
165

<210> 15
<211> 160
<212> PRT
<213> Arabidopsis thaliana

<400> 15

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

Val Val Lys Ser Trp Ser Val Met Lys Lys Asn Ser Ala Glu Leu Gly
20 25 30

Leu Lys Leu Phe Ile Lys Ile Phe Glu Ile Ala Pro Thr Thr Lys Lys
35 40 45

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

```
Lys Leu Lys Pro His Ala Met Ser Val Phe Val Met Cys Cys Glu Ser
65                  70                  75                  80


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


Leu Lys Arg Leu Gly Ala Ser His Ser Lys Tyr Gly Val Val Asp Glu
            100                 105                 110


His Phe Glu Val Ala Lys Tyr Ala Leu Leu Glu Thr Ile Lys Glu Ala
        115                 120                 125


Val Pro Glu Met Trp Ser Pro Glu Met Lys Val Ala Trp Gly Gln Ala
    130                 135                 140


Tyr Asp His Leu Val Ala Ala Ile Lys Ala Glu Met Asn Leu Ser Asn
145                 150                 155                 160


<210>  16
<211>  147
<212>  PRT
<213>  Pisum sativum

<400>  16

Met Gly Phe Thr Asp Lys Gln Glu Ala Leu Val Asn Ser Ser Trp Glu
1               5                   10                  15


Ser Phe Lys Gln Asn Leu Ser Gly Asn Ser Ile Leu Phe Tyr Thr Ile
            20                  25                  30


Ile Leu Glu Lys Ala Pro Ala Ala Lys Gly Leu Phe Ser Phe Leu Lys
        35                  40                  45


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


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


Gly Glu Val Val Leu Gly Asn Ala Thr Leu Gly Ala Ile His Val Gln
                85                  90                  95
```

Arg Gly Val Thr Asp Pro His Phe Val Val Val Lys Glu Ala Leu Leu
100 105 110

Gln Thr Ile Lys Lys Ala Ser Gly Asn Asn Trp Ser Glu Glu Leu Asn
115 120 125

Thr Ala Trp Glu Val Ala Tyr Asp Gly Leu Ala Thr Ala Ile Lys Lys
130 135 140

Ala Met Thr
145

<210> 17
<211> 145
<212> PRT
<213> Vigna unguiculata

<400> 17

Met Val Ala Phe Ser Asp Lys Gln Glu Ala Leu Val Asn Gly Ala Tyr
1 5 10 15

Glu Ala Phe Lys Ala Asn Ile Pro Lys Tyr Ser Val Val Phe Tyr Thr
20 25 30

Thr Ile Leu Glu Lys Ala Pro Ala Ala Lys Asn Leu Phe Ser Phe Leu
35 40 45

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

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

Gly Gly Val Val Ala Asp Ala Ala Leu Gly Ala Val His Ser Gln Lys
85 90 95

Ala Val Asn Asp Ala Gln Phe Val Val Val Lys Glu Ala Leu Val Lys
100 105 110

Thr Leu Lys Glu Ala Val Gly Asp Lys Trp Ser Asp Glu Leu Gly Thr
115 120 125

Ala Val Glu Leu Ala Tyr Asp Glu Leu Ala Ala Ala Ile Lys Lys Ala
    130   135   140

Tyr
145

<210> 18
<211> 154
<212> PRT
<213> Bos taurus

<400> 18

Met Gly Leu Ser Asp Gly Glu Trp Gln Leu Val Leu Asn Ala Trp Gly
1   5   10   15

Lys Val Glu Ala Asp Val Ala Gly His Gly Gln Glu Val Leu Ile Arg
            20   25   30

Leu Phe Thr Gly His Pro Glu Thr Leu Glu Lys Phe Asp Lys Phe Lys
        35   40   45

His Leu Lys Thr Glu Ala Glu Met Lys Ala Ser Glu Asp Leu Lys Lys
    50   55   60

His Gly Asn Thr Val Leu Thr Ala Leu Gly Gly Ile Leu Lys Lys Lys
65   70   75   80

Gly His His Glu Ala Glu Val Lys His Leu Ala Glu Ser His Ala Asn
                85   90   95

Lys His Lys Ile Pro Val Lys Tyr Leu Glu Phe Ile Ser Asp Ala Ile
            100   105   110

Ile His Val Leu His Ala Lys His Pro Ser Asp Phe Gly Ala Asp Ala
        115   120   125

Gln Ala Ala Met Ser Lys Ala Leu Glu Leu Phe Arg Asn Asp Met Ala
    130   135   140

Ala Gln Tyr Lys Val Leu Gly Phe His Gly

145 150

<210> 19
<211> 154
<212> PRT
<213> Sus scrofa

<400> 19

Met Gly Leu Ser Asp Gly Glu Trp Gln Leu Val Leu Asn Val Trp Gly
1 5 10 15

Lys Val Glu Ala Asp Val Ala Gly His Gly Gln Glu Val Leu Ile Arg
20 25 30

Leu Phe Lys Gly His Pro Glu Thr Leu Glu Lys Phe Asp Lys Phe Lys
35 40 45

His Leu Lys Ser Glu Asp Glu Met Lys Ala Ser Glu Asp Leu Lys Lys
50 55 60

His Gly Asn Thr Val Leu Thr Ala Leu Gly Gly Ile Leu Lys Lys Lys
65 70 75 80

Gly His His Glu Ala Glu Leu Thr Pro Leu Ala Gln Ser His Ala Thr
85 90 95

Lys His Lys Ile Pro Val Lys Tyr Leu Glu Phe Ile Ser Glu Ala Ile
100 105 110

Ile Gln Val Leu Gln Ser Lys His Pro Gly Asp Phe Gly Ala Asp Ala
115 120 125

Gln Gly Ala Met Ser Lys Ala Leu Glu Leu Phe Arg Asn Asp Met Ala
130 135 140

Ala Lys Tyr Lys Glu Leu Gly Phe Gln Gly
145 150

<210> 20
<211> 154
<212> PRT
<213> Equus caballus

<400> 20

Met Gly Leu Ser Asp Gly Glu Trp Gln Gln Val Leu Asn Val Trp Gly
1 5 10 15

Lys Val Glu Ala Asp Ile Ala Gly His Gly Gln Glu Val Leu Ile Arg
20 25 30

Leu Phe Thr Gly His Pro Glu Thr Leu Glu Lys Phe Asp Lys Phe Lys
35 40 45

His Leu Lys Thr Glu Ala Glu Met Lys Ala Ser Glu Asp Leu Lys Lys
50 55 60

His Gly Thr Val Val Leu Thr Ala Leu Gly Gly Ile Leu Lys Lys Lys
65 70 75 80

Gly His His Glu Ala Glu Leu Lys Pro Leu Ala Gln Ser His Ala Thr
85 90 95

Lys His Lys Ile Pro Ile Lys Tyr Leu Glu Phe Ile Ser Asp Ala Ile
100 105 110

Ile His Val Leu His Ser Lys His Pro Gly Asp Phe Gly Ala Asp Ala
115 120 125

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

Ala Lys Tyr Lys Glu Leu Gly Phe Gln Gly
145 150

<210> 21
<211> 152
<212> PRT
<213> Nicotiana benthamiana

<400> 21

Met Ser Ser Phe Thr Glu Glu Gln Glu Ala Leu Val Val Lys Ser Trp
1 5 10 15

```
Asp Ser Met Lys Lys Asn Ala Gly Glu Trp Gly Leu Lys Leu Phe Leu
            20                  25                  30

Lys Ile Phe Glu Ile Ala Pro Ser Ala Lys Lys Leu Phe Ser Phe Leu
        35                  40                  45

Lys Asp Ser Asn Val Pro Leu Glu Gln Asn Ala Lys Leu Lys Pro His
    50                  55                  60

Ser Lys Ser Val Phe Val Met Thr Cys Glu Ala Ala Val Gln Leu Arg
65                  70                  75                  80

Lys Ala Gly Lys Val Val Val Arg Asp Ser Thr Leu Lys Lys Leu Gly
                85                  90                  95

Ala Thr His Phe Lys Tyr Gly Val Ala Asp Glu His Phe Glu Val Thr
            100                 105                 110

Lys Phe Ala Leu Leu Glu Thr Ile Lys Glu Ala Val Pro Glu Met Trp
        115                 120                 125

Ser Val Asp Met Lys Asn Ala Trp Gly Glu Ala Phe Asp Gln Leu Val
    130                 135                 140

Asn Ala Ile Lys Thr Glu Met Lys
145                 150
```

<210> 22
<211> 132
<212> PRT
<213> Bacillus subtilis

<400> 22

```
Met Gly Gln Ser Phe Asn Ala Pro Tyr Glu Ala Ile Gly Glu Glu Leu
1               5                   10                  15

Leu Ser Gln Leu Val Asp Thr Phe Tyr Glu Arg Val Ala Ser His Pro
            20                  25                  30

Leu Leu Lys Pro Ile Phe Pro Ser Asp Leu Thr Glu Thr Ala Arg Lys
        35                  40                  45
```

```
Gln Lys Gln Phe Leu Thr Gln Tyr Leu Gly Gly Pro Pro Leu Tyr Thr
    50                  55                  60

Glu Glu His Gly His Pro Met Leu Arg Ala Arg His Leu Pro Phe Pro
65                  70                  75                  80

Ile Thr Asn Glu Arg Ala Asp Ala Trp Leu Ser Cys Met Lys Asp Ala
                85                  90                  95

Met Asp His Val Gly Leu Glu Gly Glu Ile Arg Glu Phe Leu Phe Gly
            100                 105                 110

Arg Leu Glu Leu Thr Ala Arg His Met Val Asn Gln Thr Glu Ala Glu
        115                 120                 125

Asp Arg Ser Ser
    130
```

<210> 23
<211> 131
<212> PRT
<213> Corynebacterium glutamicum

<400> 23

```
Met Thr Thr Ser Glu Asn Phe Tyr Asp Ser Val Gly Gly Glu Glu Thr
1               5                   10                  15

Phe Ser Leu Ile Val His Arg Phe Tyr Glu Gln Val Pro Asn Asp Asp
            20                  25                  30

Ile Leu Gly Pro Met Tyr Pro Pro Asp Asp Phe Glu Gly Ala Glu Gln
        35                  40                  45

Arg Leu Lys Met Phe Leu Ser Gln Tyr Trp Gly Gly Pro Lys Asp Tyr
    50                  55                  60

Gln Glu Gln Arg Gly His Pro Arg Leu Arg Met Arg His Val Asn Tyr
65                  70                  75                  80

Pro Ile Gly Val Thr Ala Ala Glu Arg Trp Leu Gln Leu Met Ser Asn
                85                  90                  95
```

```
Ala Leu Asp Gly Val Asp Leu Thr Ala Glu Gln Arg Glu Ala Ile Trp
            100                 105                 110


Glu His Met Val Arg Ala Ala Asp Met Leu Ile Asn Ser Asn Pro Asp
        115                 120                 125


Pro His Ala
    130


<210>  24
<211>  124
<212>  PRT
<213>  Synechocystis sp.

<400>  24

Met Ser Thr Leu Tyr Glu Lys Leu Gly Gly Thr Thr Ala Val Asp Leu
1               5                   10                  15


Ala Val Asp Lys Phe Tyr Glu Arg Val Leu Gln Asp Asp Arg Ile Lys
            20                  25                  30


His Phe Phe Ala Asp Val Asp Met Ala Lys Gln Arg Ala His Gln Lys
        35                  40                  45


Ala Phe Leu Thr Tyr Ala Phe Gly Gly Thr Asp Lys Tyr Asp Gly Arg
    50                  55                  60


Tyr Met Arg Glu Ala His Lys Glu Leu Val Glu Asn His Gly Leu Asn
65                  70                  75                  80


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


Glu Met Gly Val Pro Glu Asp Leu Ile Ala Glu Val Ala Ala Val Ala
            100                 105                 110


Gly Ala Pro Ala His Lys Arg Asp Val Leu Asn Gln
        115                 120


<210>  25
```

<211> 183
<212> PRT
<213> Synechococcus sp.

<400> 25

Met Asp Val Ala Leu Leu Glu Lys Ser Phe Glu Gln Ile Ser Pro Arg
1 5 10 15

Ala Ile Glu Phe Ser Ala Ser Phe Tyr Gln Asn Leu Phe His His His
20 25 30

Pro Glu Leu Lys Pro Leu Phe Ala Glu Thr Ser Gln Thr Ile Gln Glu
35 40 45

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

Pro Asp Ile Leu Gln Pro Ala Leu Lys Ser Leu Gly Ala Arg His Ala
65 70 75 80

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

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

Ala Thr Ala Trp Val Glu Ala Tyr Asp Val Ile Ala Ser Thr Met Ile
115 120 125

Glu Gly Ala Asp Asn Pro Ala Ala Tyr Leu Glu Pro Glu Leu Thr Phe
130 135 140

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

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

Val Gln Arg Asp Ser Arg Gly
180

<210> 26
<211> 118
<212> PRT
<213> Nostoc commune

<400> 26

Met Ser Thr Leu Tyr Asp Asn Ile Gly Gly Gln Pro Ala Ile Glu Gln
1 5 10 15

Val Val Asp Glu Leu His Lys Arg Ile Ala Thr Asp Ser Leu Leu Ala
20 25 30

Pro Val Phe Ala Gly Thr Asp Met Val Lys Gln Arg Asn His Leu Val
35 40 45

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

Pro Met Asp Lys Thr His Ala Gly Leu Asn Leu Gln Gln Pro His Phe
65 70 75 80

Asp Ala Ile Ala Lys His Leu Gly Glu Arg Met Ala Val Arg Gly Val
85 90 95

Ser Ala Glu Asn Thr Lys Ala Ala Leu Asp Arg Val Thr Asn Met Lys
100 105 110

Gly Ala Ile Leu Asn Lys
115

<210> 27
<211> 136
<212> PRT
<213> Bacillus megaterium

<400> 27

Met Arg Glu Lys Ile His Ser Pro Tyr Glu Leu Leu Gly Gly Glu His
1 5 10 15

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

```
Pro Glu Leu Ala Pro Ile Phe Pro Asp Asn Leu Thr Glu Thr Ala Arg
        35                  40                  45

Lys Gln Lys Gln Phe Leu Thr Gln Tyr Leu Gly Gly Pro Ser Leu Tyr
    50                  55                  60

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

Glu Ile Thr Pro Ser Arg Ala Lys Ala Trp Leu Thr Cys Met His Glu
                85                  90                  95

Ala Met Asp Glu Ile Asn Leu Glu Gly Pro Glu Arg Asp Glu Leu Tyr
            100                 105                 110

His Arg Leu Ile Leu Thr Ala Gln His Met Ile Asn Ser Pro Glu Gln
        115                 120                 125

Thr Asp Glu Lys Gly Phe Ser His
    130                 135
```

<210> 28
<211> 1683
<212> DNA
<213> Pichia pastoris

<400> 28

```
atggagtttg tcgcccgtca gtccatgaat gcctgtccct ttgtcaggtc aacttctacc       60

caccatttga agaagttggc agcaaacagt tctctagctg ctactgctag tcattgtccc      120

gtggttggcc ctgctctcca acagcagaga tactactctc aaccttccaa gccagcccaa      180

gcccaaacct ccgacattgc tactgggatc aagaaggatg tttctccgat ccgtatggac      240

tctaatgaaa ccgcctttga ttacaatgga atgtatgagt ctgatcttgc gaataaacgt      300

aaagataact cgtatcgtta tttcaataac atcaaccgtc tagccaagga gtttcccaag      360

gcacatcgcc agaccgaaga tgacaaggtg accgtctggt gctctaacga ctacttagga      420

atgggtaggc atcctgagat tatcaaaacc atgaaggcta ccatggacaa gtacggttcc      480

ggagcaggag gaactaggaa cattgcaggt cataaccacg ccgctatcaa tttggaaagc      540

gagttggctt gcttgaacaa gaaggaagcg gctctggtgt tttcatcatg tttcatagct      600
```

aacgatgcaa tcatctcgtt gttgggacaa aaaatcaaaa atttggtcat tttctctgac 660

cagtcgaatc atgcttccat gatattgggt gtgcgtaact ccaaagcgaa gaagcacatc 720

ttcaagcaca acaatttgaa ggatctggag tcgcagttag ctcagtaccc caagtcgact 780

cctaaactga tcgccttcga gtcagtttac tctatgtgtg gatctgtggc tcccattgag 840

aagatttgcg atttggctaa aaggtacggt gccctcacct tcttggatga agttcatgct 900

gttggaatgt atggtcctca tggacagggt gtagctgagc atttggactt tgatctgcat 960

ttacagtctg gaatcgccag tcctagcgtg gtggacaaac gcaccatatt ggatcgtgtc 1020

gacatgatta ctggtacttg cggaaagtca tttggtactg ttggaggtta cgttgctggt 1080

agtgccaacc taattgattg gttaagatcc tatgcgccag gtttcatttt cactaccaca 1140

cttcctcctg ctatcatggc tggtacagcc acttctgttc gtattgttag ggccgacatt 1200

gaggcccgta tcaagcaaca gcttaatact cgctacgtca aagactcatt tgaaaacctt 1260

ggtattccag tcattccaaa cccaagtcac attgttcctg ttctagttgg aaatgctgca 1320

gatgccaaga aggcatccga tatgttaatg aacaaacacc gtatttatgt tcaagctatt 1380

aactacccta ctgtgcctgt cggtgaagaa cgactaagga ttactcctac tccaggtcat 1440

ggaaaggaga tttgtgacca gctgatcagc gctgtcgacg atgtttttac tgagcttaat 1500

ttaccaagaa tcaacaaatg gcagtcccaa ggtggtcatt gcggtgttgg tgatgctaat 1560

tacgtaccag aacccaatct gtggactcag gaccagctca gcttgacaaa ccaagacttg 1620

cactccaatg tgcacaaccc agtgattgag cagatcgaaa cctcatcagg agtcagattg 1680

tag 1683

<210> 29
<211> 560
<212> PRT
<213> Pichia pastoris

<400> 29

Met Glu Phe Val Ala Arg Gln Ser Met Asn Ala Cys Pro Phe Val Arg
1 5 10 15

Ser Thr Ser Thr His His Leu Lys Lys Leu Ala Ala Asn Ser Ser Leu
20 25 30

```
Ala Ala Thr Ala Ser His Cys Pro Val Val Gly Pro Ala Leu Gln Gln
        35                  40                  45

Gln Arg Tyr Tyr Ser Gln Pro Ser Lys Pro Ala Gln Ala Gln Thr Ser
    50                  55                  60

Asp Ile Ala Thr Gly Ile Lys Lys Asp Val Ser Pro Ile Arg Met Asp
65                  70                  75                  80

Ser Asn Glu Thr Ala Phe Asp Tyr Asn Gly Met Tyr Glu Ser Asp Leu
                85                  90                  95

Ala Asn Lys Arg Lys Asp Asn Ser Tyr Arg Tyr Phe Asn Asn Ile Asn
            100                 105                 110

Arg Leu Ala Lys Glu Phe Pro Lys Ala His Arg Gln Thr Glu Asp Asp
        115                 120                 125

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

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

Gly Ala Gly Gly Thr Arg Asn Ile Ala Gly His Asn His Ala Ala Ile
                165                 170                 175

Asn Leu Glu Ser Glu Leu Ala Cys Leu Asn Lys Lys Glu Ala Ala Leu
            180                 185                 190

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

Gly Gln Lys Ile Lys Asn Leu Val Ile Phe Ser Asp Gln Ser Asn His
    210                 215                 220

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

Phe Lys His Asn Asn Leu Lys Asp Leu Glu Ser Gln Leu Ala Gln Tyr
                245                 250                 255
```

```
Pro Lys Ser Thr Pro Lys Leu Ile Ala Phe Glu Ser Val Tyr Ser Met
            260                 265                 270

Cys Gly Ser Val Ala Pro Ile Glu Lys Ile Cys Asp Leu Ala Lys Arg
        275                 280                 285

Tyr Gly Ala Leu Thr Phe Leu Asp Glu Val His Ala Val Gly Met Tyr
    290                 295                 300

Gly Pro His Gly Gln Gly Val Ala Glu His Leu Asp Phe Asp Leu His
305                 310                 315                 320

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

Leu Asp Arg Val Asp Met Ile Thr Gly Thr Cys Gly Lys Ser Phe Gly
            340                 345                 350

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

Arg Ser Tyr Ala Pro Gly Phe Ile Phe Thr Thr Thr Leu Pro Pro Ala
    370                 375                 380

Ile Met Ala Gly Thr Ala Thr Ser Val Arg Ile Val Arg Ala Asp Ile
385                 390                 395                 400

Glu Ala Arg Ile Lys Gln Gln Leu Asn Thr Arg Tyr Val Lys Asp Ser
                405                 410                 415

Phe Glu Asn Leu Gly Ile Pro Val Ile Pro Asn Pro Ser His Ile Val
            420                 425                 430

Pro Val Leu Val Gly Asn Ala Ala Asp Ala Lys Lys Ala Ser Asp Met
        435                 440                 445

Leu Met Asn Lys His Arg Ile Tyr Val Gln Ala Ile Asn Tyr Pro Thr
    450                 455                 460
```

Val Pro Val Gly Glu Glu Arg Leu Arg Ile Thr Pro Thr Pro Gly His
465 470 475 480

Gly Lys Glu Ile Cys Asp Gln Leu Ile Ser Ala Val Asp Asp Val Phe
485 490 495

Thr Glu Leu Asn Leu Pro Arg Ile Asn Lys Trp Gln Ser Gln Gly Gly
500 505 510

His Cys Gly Val Gly Asp Ala Asn Tyr Val Pro Glu Pro Asn Leu Trp
515 520 525

Thr Gln Asp Gln Leu Ser Leu Thr Asn Gln Asp Leu His Ser Asn Val
530 535 540

His Asn Pro Val Ile Glu Gln Ile Glu Thr Ser Ser Gly Val Arg Leu
545 550 555 560

<210> 30
<211> 1683
<212> DNA
<213> Artificial

<220>
<223> Mutated sequence

<400> 30
atggagtttg tcgcccgtca gtccatgaat gcctctccct ttgtcaggtc aacttctacc 60

caccatttga agaagttggc agcaaacagt tctctagctg ctactgctag tcattctccc 120

gtggttggcc ctgctctcca acagcagaga tactactctc aaccttccaa gccagcccaa 180

gcccaaacct ccgacattgc tactgggatc aagaaggatg tttctccgat ccgtatggac 240

tctaatgaaa ccgcctttga ttacaatgga atgtatgagt ctgatcttgc gaataaacgt 300

aaagataact cgtatcgtta tttcaataac atcaaccgtc tagccaagga gtttcccaag 360

gcacatcgcc agaccgaaga tgacaaggtg accgtctggt gctctaacga ctacttagga 420

atgggtaggc atcctgagat tatcaaaacc atgaaggcta ccatggacaa gtacggttcc 480

ggagcaggag gaactaggaa cattgcaggt cataaccacg ccgctatcaa tttggaaagc 540

gagttggctt gcttgaacaa gaaggaagcg gctctggtgt tttcatcatg tttcatagct 600

aacgatgcaa tcatctcgtt gttgggacaa aaaatcaaaa atttggtcat tttctctgac 660

cagtcgaatc atgcttccat gatattgggt gtgcgtaact ccaaagcgaa gaagcacatc 720

ttcaagcaca acaatttgaa ggatctggag tcgcagttag ctcagtaccc caagtcgact 780

cctaaactga tcgccttcga gtcagtttac tctatgtgtg gatctgtggc tcccattgag 840

aagatttgcg atttggctaa aaggtacggt gccctcacct tcttggatga agttcatgct 900

gttggaatgt atggtcctca tggacagggt gtagctgagc atttggactt tgatctgcat 960

ttacagtctg gaatcgccag tcctagcgtg gtggacaaac gcaccatatt ggatcgtgtc 1020

gacatgatta ctggtacttg cggaaagtca tttggtactg ttggaggtta cgttgctggt 1080

agtgccaacc taattgattg gttaagatcc tatgcgccag gtttcatttt cactaccaca 1140

cttcctcctg ctatcatggc tggtacagcc acttctgttc gtattgttag ggccgacatt 1200

gaggcccgta tcaagcaaca gcttaatact cgctacgtca aagactcatt tgaaaacctt 1260

ggtattccag tcattccaaa cccaagtcac attgttcctg ttctagttgg aaatgctgca 1320

gatgccaaga aggcatccga tatgttaatg aacaaacacc gtatttatgt tcaagctatt 1380

aactacccta ctgtgcctgt cggtgaagaa cgactaagga ttactcctac tccaggtcat 1440

ggaaaggaga tttgtgacca gctgatcagc gctgtcgacg atgtttttac tgagcttaat 1500

ttaccaagaa tcaacaaatg gcagtcccaa ggtggtcatt gcggtgttgg tgatgctaat 1560

tacgtaccag aacccaatct gtggactcag gaccagctca gcttgacaaa ccaagacttg 1620

cactccaatg tgcacaaccc agtgattgag cagatcgaaa cctcatcagg agtcagattg 1680

tag 1683

<210> 31
<211> 560
<212> PRT
<213> Artificial

<220>
<223> Mutated sequence

<400> 31

Met Glu Phe Val Ala Arg Gln Ser Met Asn Ala Ser Pro Phe Val Arg
1 5 10 15

Ser Thr Ser Thr His His Leu Lys Lys Leu Ala Ala Asn Ser Ser Leu
20 25 30

```
Ala Ala Thr Ala Ser His Ser Pro Val Val Gly Pro Ala Leu Gln Gln
        35                  40                  45

Gln Arg Tyr Tyr Ser Gln Pro Ser Lys Pro Ala Gln Ala Gln Thr Ser
    50                  55                  60

Asp Ile Ala Thr Gly Ile Lys Lys Asp Val Ser Pro Ile Arg Met Asp
65                  70                  75                  80

Ser Asn Glu Thr Ala Phe Asp Tyr Asn Gly Met Tyr Glu Ser Asp Leu
                85                  90                  95

Ala Asn Lys Arg Lys Asp Asn Ser Tyr Arg Tyr Phe Asn Asn Ile Asn
            100                 105                 110

Arg Leu Ala Lys Glu Phe Pro Lys Ala His Arg Gln Thr Glu Asp Asp
        115                 120                 125

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

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

Gly Ala Gly Gly Thr Arg Asn Ile Ala Gly His Asn His Ala Ala Ile
                165                 170                 175

Asn Leu Glu Ser Glu Leu Ala Cys Leu Asn Lys Lys Glu Ala Ala Leu
            180                 185                 190

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

Gly Gln Lys Ile Lys Asn Leu Val Ile Phe Ser Asp Gln Ser Asn His
    210                 215                 220

Ala Ser Met Ile Leu Gly Val Arg Asn Ser Lys Ala Lys Lys His Ile
225                 230                 235                 240
```

```
Phe Lys His Asn Asn Leu Lys Asp Leu Glu Ser Gln Leu Ala Gln Tyr
                245                 250                 255

Pro Lys Ser Thr Pro Lys Leu Ile Ala Phe Glu Ser Val Tyr Ser Met
            260                 265                 270

Cys Gly Ser Val Ala Pro Ile Glu Lys Ile Cys Asp Leu Ala Lys Arg
        275                 280                 285

Tyr Gly Ala Leu Thr Phe Leu Asp Glu Val His Ala Val Gly Met Tyr
    290                 295                 300

Gly Pro His Gly Gln Gly Val Ala Glu His Leu Asp Phe Asp Leu His
305                 310                 315                 320

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

Leu Asp Arg Val Asp Met Ile Thr Gly Thr Cys Gly Lys Ser Phe Gly
            340                 345                 350

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

Arg Ser Tyr Ala Pro Gly Phe Ile Phe Thr Thr Thr Leu Pro Pro Ala
    370                 375                 380

Ile Met Ala Gly Thr Ala Thr Ser Val Arg Ile Val Arg Ala Asp Ile
385                 390                 395                 400

Glu Ala Arg Ile Lys Gln Gln Leu Asn Thr Arg Tyr Val Lys Asp Ser
                405                 410                 415

Phe Glu Asn Leu Gly Ile Pro Val Ile Pro Asn Pro Ser His Ile Val
            420                 425                 430

Pro Val Leu Val Gly Asn Ala Ala Asp Ala Lys Lys Ala Ser Asp Met
        435                 440                 445

Leu Met Asn Lys His Arg Ile Tyr Val Gln Ala Ile Asn Tyr Pro Thr
    450                 455                 460
```

```
Val Pro Val Gly Glu Glu Arg Leu Arg Ile Thr Pro Thr Pro Gly His
465                 470                 475                 480


Gly Lys Glu Ile Cys Asp Gln Leu Ile Ser Ala Val Asp Asp Val Phe
                485                 490                 495


Thr Glu Leu Asn Leu Pro Arg Ile Asn Lys Trp Gln Ser Gln Gly Gly
            500                 505                 510


His Cys Gly Val Gly Asp Ala Asn Tyr Val Pro Glu Pro Asn Leu Trp
        515                 520                 525


Thr Gln Asp Gln Leu Ser Leu Thr Asn Gln Asp Leu His Ser Asn Val
    530                 535                 540


His Asn Pro Val Ile Glu Gln Ile Glu Thr Ser Ser Gly Val Arg Leu
545                 550                 555                 560


<210>  32
<211>  5
<212>  PRT
<213>  Artificial

<220>
<223>  Exemplary HRM sequence


<220>
<221>  misc_feature
<222>  (1)..(1)
<223>  Xaa can be R/L/N/A/C/S/H/I/G/Q

<220>
<221>  misc_feature
<222>  (4)..(4)
<223>  Xaa can be L/V/I/F/C

<220>
<221>  misc_feature
<222>  (5)..(5)
<223>  Xaa can be L/M/P/V

<400>  32

Xaa Cys Pro Xaa Xaa
1               5
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<210> 33
<211> 5
<212> PRT
<213> Artificial

<220>
<223> Exemplary HRM sequence.

<400> 33

Ala Cys Pro Phe Val
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<400> 34

His Cys Pro Val Val
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Ile Cys Pro Phe Met
1   5

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Gly Cys Pro Val Val
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<400> 38
gaagttgacc tgacaaaggg agaggcattc atggactgac g 41

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<400> 39
gctgctactg ctagtcattc tcccgtggtt ggccctg 37

<210> 40
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<212> DNA
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caactaatta ttcgaaacga tggagtttgt cgcccgtcag 40

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<400> 46
aaactgtcag ttttgggcca tttg 24

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gctctccaac agcagagata c 21

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<400> 48
gtccatacgg atcggagaaa c 21

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<400> 49
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<210> 51
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<210> 52
<211> 28
<212> DNA
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<220>
<223> PCR probe. T1 labeled with HEX. A9 labeled with Zen. C28 labeled with 3IABkFQ

<400> 52
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gcatgtctca ataacagatc tcgacgg 27

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tgatggcgtc cgagatgaac tc 22

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<400> 65
atggagtttg tcgcccgtca g 21

<210> 66
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<400> 66
ctacaatctg actcctgatg aggtttc 27