SEQUENCE LISTING

<110> OTTAWA HOSPITAL RESEARCH INSTITUTE
TURNSTONE BIOLOGICS CORP

<120> MODIFIED ORTHOPOXVIRUS VECTORS

<130> 14596-050-228

<140>
<141>

<150> 62/930,524
<151> 2019-11-04

<150> 62/872,699
<151> 2019-07-10

<150> 62/784,372
<151> 2018-12-21

<160> 632

<170> PatentIn version 3.5

<210> 1
<211> 272
<212> PRT
<213> Vaccinia virus

<400> 1
Met Arg Tyr Ile Ile Ile Leu Ala Val Leu Phe Ile Asn Ser Ile His
1 5 10 15

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

Ile Glu Trp Thr Gly Asp Gly Leu Tyr Asn Ile Ser Leu Lys Asn Tyr
35 40 45

Gly Ile Lys Thr Trp Gln Thr Met Tyr Thr Asn Val Pro Glu Gly Thr
50 55 60

Tyr Asp Ile Ser Ala Phe Pro Lys Asn Asp Phe Val Ser Phe Trp Val
65 70 75 80

Lys Phe Glu Gln Gly Asp Tyr Lys Val Glu Glu Tyr Cys Thr Gly Leu
85 90 95

```
Cys Val Glu Val Lys Ile Gly Pro Pro Thr Val Thr Leu Thr Glu Tyr
            100                 105                 110

Asp Asp His Ile Asn Leu Tyr Ile Glu His Pro Tyr Ala Thr Arg Gly
        115                 120                 125

Ser Lys Lys Ile Pro Ile Tyr Lys Arg Gly Asp Met Cys Asp Ile Tyr
    130                 135                 140

Leu Leu Tyr Thr Ala Asn Phe Thr Phe Gly Asp Ser Glu Glu Pro Val
145                 150                 155                 160

Thr Tyr Asp Ile Asp Asp Tyr Asp Cys Thr Ser Thr Gly Cys Ser Ile
                165                 170                 175

Asp Phe Ala Thr Thr Glu Lys Val Cys Val Thr Ala Gln Gly Ala Thr
            180                 185                 190

Glu Gly Phe Leu Glu Lys Ile Thr Pro Trp Ser Ser Glu Val Cys Leu
        195                 200                 205

Thr Pro Lys Lys Asn Val Tyr Thr Cys Ala Ile Arg Ser Lys Glu Asp
    210                 215                 220

Val Pro Asn Phe Lys Asp Lys Met Ala Arg Val Ile Lys Arg Lys Phe
225                 230                 235                 240

Asn Lys Gln Ser Gln Ser Tyr Leu Thr Lys Phe Leu Gly Ser Thr Ser
                245                 250                 255

Asn Asp Val Thr Thr Phe Leu Ser Met Leu Asn Leu Thr Lys Tyr Ser
            260                 265                 270
```

<210> 2
<211> 222
<212> PRT
<213> Vaccinia virus

<400> 2

```
Met Asn His Cys Leu Leu Ala Ile Ser Ala Val Tyr Phe Lys Ala Lys
```

```
1               5                   10                  15

Trp Leu Thr Pro Phe Glu Lys Glu Phe Thr Ser Asp Tyr Pro Phe Tyr
            20                  25                  30

Val Ser Pro Thr Glu Met Val Asp Val Ser Met Met Ser Met Tyr Gly
        35                  40                  45

Glu Leu Phe Asn His Ala Ser Val Lys Glu Ser Phe Gly Asn Phe Ser
    50                  55                  60

Ile Ile Glu Leu Pro Tyr Val Gly Asp Thr Ser Met Met Val Ile Leu
65                  70                  75                  80

Pro Asp Lys Ile Asp Gly Leu Glu Ser Ile Glu Gln Asn Leu Thr Asp
                85                  90                  95

Thr Asn Phe Lys Lys Trp Cys Asn Ser Leu Asp Ala Met Phe Ile Asp
            100                 105                 110

Val His Ile Pro Lys Phe Lys Val Thr Gly Ser Tyr Asn Leu Val Asp
        115                 120                 125

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

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

Lys Thr Tyr Ile Asp Val Asn Glu Glu Tyr Thr Glu Ala Ala Ala Ala
                165                 170                 175

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

Cys Val Asp His Pro Phe Ile Tyr Val Ile Arg His Val Asp Gly Lys
        195                 200                 205

Ile Leu Phe Val Gly Arg Tyr Cys Ser Pro Thr Thr Asn Cys
    210                 215                 220
```

<210> 3
<211> 149
<212> PRT
<213> Vaccinia virus

<400> 3
Met Thr Ala Asn Phe Ser Thr His Val Phe Ser Pro Gln His Cys Gly
1   5   10   15

Cys Asp Arg Leu Thr Ser Ile Asp Asp Val Lys Gln Cys Leu Thr Glu
            20   25   30

Tyr Ile Tyr Trp Ser Ser Tyr Ala Tyr Arg Asn Arg Gln Cys Ala Gly
        35   40   45

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

Phe Ile Asp Ile Arg Glu Leu Val Lys Asn Met Pro Trp Asp Asp Val
65   70   75   80

Lys Asp Cys Thr Glu Ile Ile Arg Cys Tyr Ile Pro Asp Glu Gln Lys
                85   90   95

Thr Ile Arg Glu Ile Ser Ala Ile Ile Gly Leu Cys Ala Tyr Ala Ala
            100   105   110

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

Leu Phe Val Met Leu Glu Met Leu Asn Tyr Val Asp Tyr Asn Ile Ile
    130   135   140

Phe Arg Arg Met Asn
145

<210> 4
<211> 30
<212> PRT
<213> Vaccinia virus

<400> 4
Met Ser Ile Leu Pro Val Ile Phe Leu Pro Ile Phe Phe Tyr Ser Ser
1 5 10 15

Phe Val Gln Thr Phe Asn Ala Ser Glu Cys Ile Asp Lys Gly
20 25 30

<210> 5
<211> 340
<212> PRT
<213> Vaccinia virus

<400> 5
Met Ser Arg Lys Phe Met Gln Val Tyr Glu Tyr Asp Arg Glu Gln Tyr
1 5 10 15

Leu Asp Glu Phe Ile Glu Asp Arg Tyr Asn Asp Ser Phe Ile Thr Ser
20 25 30

Pro Glu Tyr Tyr Ser Ala Glu Lys Tyr Met Cys Arg Tyr Thr Thr Leu
35 40 45

Asn His Asn Cys Val Asn Val Arg Arg Cys Ala Leu Asp Ser Lys Leu
50 55 60

Leu His Asp Ile Ile Thr Asn Cys Lys Ile Tyr Asn Asn Ile Glu Leu
65 70 75 80

Val Arg Ala Thr Lys Phe Val Tyr Tyr Leu Asp Leu Ile Lys Cys Asn
85 90 95

Trp Val Ser Lys Val Gly Asp Ser Val Leu Tyr Pro Val Ile Phe Ile
100 105 110

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

Lys Gly Val Lys Val Lys Lys Leu Asn Arg Cys Ala Asp His Ala Ile
130 135 140

Val Ile Asn Pro Phe Val Lys Phe Lys Leu Thr Leu Pro Asn Lys Thr
145 150 155 160

```
Ser His Ala Lys Val Leu Val Thr Phe Cys Lys Leu Arg Thr Asp Ile
                165                 170                 175

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

Pro Asp Ile Asn Lys Arg Ile Pro Gly Tyr Ile His Val Asn Ile Glu
        195                 200                 205

Gly Cys Ile Asp Gly Met Ile Tyr Ile Asn Ser Ser Lys Phe Ala Cys
    210                 215                 220

Val Leu Lys Leu His Arg Ser Met Tyr Arg Ile Pro Pro Phe Pro Ile
225                 230                 235                 240

Asp Ile Cys Ser Cys Cys Ser Gln Tyr Thr Asn Asp Asp Ile Glu Ile
                245                 250                 255

Pro Ile His Asp Leu Ile Lys Asp Val Ala Ile Phe Lys Asn Lys Glu
            260                 265                 270

Thr Val Tyr Tyr Leu Lys Leu Asn Asn Lys Thr Ile Ala Arg Phe Thr
        275                 280                 285

Tyr Phe Asn Asn Ile Asp Thr Ala Ile Thr Gln Glu His Glu Tyr Val
    290                 295                 300

Lys Ile Ala Leu Gly Ile Val Cys Lys Leu Met Ile Asn Asn Met His
305                 310                 315                 320

Ser Ile Val Gly Val Asn His Ser Asn Thr Phe Val Asn Cys Leu Leu
                325                 330                 335

Glu Asp Asn Val
            340
```

<210> 6
<211> 574
<212> PRT

<213> Vaccinia virus

<400> 6

```
Met Ser Arg Arg Leu Ile Tyr Val Leu Asn Ile Asn Arg Lys Ser Thr
1               5                  10                  15

His Lys Ile Gln Glu Asn Glu Ile Tyr Thr Tyr Phe Ser His Cys Asn
            20                  25                  30

Ile Asp His Thr Ser Thr Glu Leu Asp Phe Val Val Lys Asn Tyr Asp
        35                  40                  45

Leu Asn Arg Arg Gln His Val Thr Gly Tyr Thr Ala Leu His Cys Tyr
    50                  55                  60

Leu Tyr Asn Asn Tyr Phe Thr Asn Asp Val Leu Lys Ile Leu Leu Asn
65                  70                  75                  80

His Asp Val Asn Val Thr Met Lys Thr Ser Ser Gly Arg Met Pro Val
                85                  90                  95

Tyr Ile Leu Leu Thr Arg Cys Cys Asn Ile Ser His Asp Val Val Ile
            100                 105                 110

Asp Met Ile Asp Lys Asp Lys Asn His Leu Ser His Arg Asp Tyr Ser
        115                 120                 125

Asn Leu Leu Leu Glu Tyr Ile Lys Ser Arg Tyr Met Leu Leu Lys Glu
    130                 135                 140

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

Asp Pro Asn Phe Lys Gln Asp Gly Tyr Thr Ala Leu His Tyr Tyr Tyr
                165                 170                 175

Leu Cys Leu Ala His Val Tyr Lys Pro Gly Glu Cys Arg Lys Pro Ile
            180                 185                 190

Thr Ile Lys Lys Ala Lys Arg Ile Ile Ser Leu Phe Ile Gln His Gly
        195                 200                 205
```

```
Ala Asn Leu Asn Ala Leu Asp Asn Cys Gly Asn Thr Pro Phe His Leu
    210                 215                 220

Tyr Leu Ser Ile Glu Met Cys Asn Asn Ile His Met Thr Lys Met Leu
225                 230                 235                 240

Leu Thr Phe Asn Pro Asn Phe Lys Ile Cys Asn Asn His Gly Leu Thr
                245                 250                 255

Pro Ile Leu Cys Tyr Ile Thr Ser Asp Tyr Ile Gln His Asp Ile Leu
            260                 265                 270

Val Met Leu Ile His His Tyr Glu Thr Asn Val Gly Glu Met Pro Ile
        275                 280                 285

Asp Glu Arg Arg Met Ile Val Phe Glu Phe Ile Lys Thr Tyr Ser Thr
    290                 295                 300

Arg Pro Ala Asp Ser Ile Thr Tyr Leu Met Asn Arg Phe Lys Asn Ile
305                 310                 315                 320

Asn Ile Tyr Thr Arg Tyr Glu Gly Lys Thr Leu Leu His Val Ala Cys
                325                 330                 335

Glu Tyr Asn Asn Thr Gln Val Ile Asp Tyr Leu Ile Arg Ile Asn Gly
            340                 345                 350

Asp Ile Asn Ala Leu Thr Asp Asn Asn Lys His Ala Thr Gln Leu Ile
        355                 360                 365

Ile Asp Asn Lys Glu Asn Ser Pro Tyr Thr Ile Asn Cys Leu Leu Tyr
    370                 375                 380

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

Gln Leu Pro Ser Leu Pro Ile Phe Asp Ile Lys Ser Phe Glu Lys Phe
                405                 410                 415
```

```
Ile Ser Tyr Cys Ile Leu Leu Asp Asp Thr Phe Tyr Asp Arg His Val
            420                 425                 430

Lys Asn Arg Asp Ser Lys Thr Tyr Arg Tyr Ala Phe Ser Lys Tyr Met
        435                 440                 445

Ser Phe Asp Lys Tyr Asp Gly Ile Ile Thr Lys Cys His Asp Glu Thr
    450                 455                 460

Met Leu Leu Lys Leu Ser Thr Val Leu Asp Thr Thr Leu Tyr Ala Val
465                 470                 475                 480

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

Lys Lys Tyr Asn Asn Asp Lys Ser Phe Lys Ile Tyr Ser Asn Ile Met
            500                 505                 510

Asn Glu Arg Tyr Leu Asn Val Tyr Tyr Lys Asp Met Tyr Val Ser Lys
        515                 520                 525

Val Tyr Asp Lys Leu Phe Pro Val Phe Thr Asp Lys Asn Cys Leu Leu
    530                 535                 540

Thr Leu Leu Pro Ser Glu Ile Ile Tyr Glu Ile Leu Tyr Met Leu Thr
545                 550                 555                 560

Ile Asn Asp Leu Tyr Asn Ile Ser Tyr Pro Pro Thr Lys Val
                565                 570


<210> 7
<211> 353
<212> PRT
<213> Vaccinia virus

<400> 7
Met Thr Met Lys Met Met Val His Ile Tyr Phe Val Ser Leu Ser Leu
1               5                   10                  15

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

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

Lys Trp Leu Asn Pro Ala Cys Met Phe Gly Gly Thr Met Asn Asp Met
    50                  55                  60

Ala Thr Leu Gly Glu Pro Phe Ser Ala Lys Cys Pro Pro Ile Glu Asp
65                  70                  75                  80

Ser Leu Leu Ser His Arg Tyr Lys Asp Tyr Val Val Lys Trp Glu Arg
                85                  90                  95

Leu Glu Lys Asn Arg Arg Arg Gln Val Ser Asn Lys Arg Val Lys His
            100                 105                 110

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

Tyr Leu Cys Thr Val Thr Thr Lys Asn Gly Asp Cys Val Gln Gly Ile
    130                 135                 140

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

Glu Leu Gly Thr His Asp Lys Tyr Gly Ile Asp Leu Tyr Cys Gly Ile
                165                 170                 175

Leu Tyr Ala Lys His Tyr Asn Asn Ile Thr Trp Tyr Lys Asp Asn Lys
            180                 185                 190

Glu Ile Asn Ile Asp Asp Ile Lys Tyr Ser Gln Thr Gly Lys Glu Leu
        195                 200                 205

Ile Ile His Asn Pro Glu Leu Glu Asp Ser Gly Arg Tyr Asp Cys Tyr
    210                 215                 220

Val His Tyr Asp Asp Val Arg Ile Lys Asn Asp Ile Val Val Ser Arg
225                 230                 235                 240
```

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

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

Thr Cys Thr Ala Val Ser Thr Ser Leu Leu Ile Asp Asp Val Leu Ile
        275                 280                 285

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

Tyr Ser Val Leu Thr Ser Arg Gly Gly Ile Thr Glu Ala Thr Leu Tyr
305                 310                 315                 320

Phe Glu Asn Val Thr Glu Glu Tyr Ile Gly Asn Thr Tyr Lys Cys Arg
                325                 330                 335

Gly His Asn Tyr Tyr Phe Glu Lys Thr Leu Thr Thr Thr Val Val Leu
            340                 345                 350

Glu
```

<210> 8
<211> 127
<212> PRT
<213> Vaccinia virus

<400> 8

```
Met Asp Glu Asp Thr Arg Leu Ser Arg Tyr Leu Tyr Leu Thr Asp Arg
1               5                   10                  15

Glu His Ile Asn Val Asp Ser Ile Lys Gln Leu Cys Lys Ile Ser Asp
            20                  25                  30

Pro Asn Ala Cys Tyr Arg Cys Gly Cys Thr Ala Leu His Glu Tyr Phe
        35                  40                  45

Tyr Asn Tyr Arg Ser Val Asn Gly Lys Tyr Lys Tyr Arg Tyr Asn Gly
    50                  55                  60
```

Tyr Tyr Gln Tyr Tyr Ser Ser Ser Asp Tyr Glu Asn Tyr Asn Glu Tyr
65 70 75 80

Tyr Tyr Asp Asp Tyr Asp Arg Thr Gly Met Asn Ser Glu Ser Asp Ser
85 90 95

Glu Ser Asp Asn Ile Ser Ile Lys Thr Glu Tyr Glu Asn Glu Tyr Glu
100 105 110

Phe Tyr Asp Glu Thr Gln Asp Gln Ser Thr Gln His Asn Asp Leu
115 120 125

<210> 9
<211> 224
<212> PRT
<213> Vaccinia virus

<400> 9
Met Val Lys Asn Asn Lys Ile Ser Asn Ser Cys Arg Met Ile Met Ser
1 5 10 15

Thr Asn Pro Asn Asn Ile Leu Met Arg His Leu Lys Asn Leu Thr Asp
20 25 30

Asp Glu Phe Lys Cys Ile Ile His Arg Ser Ser Asp Phe Leu Tyr Leu
35 40 45

Ser Asp Ser Asp Tyr Thr Ser Ile Thr Lys Glu Thr Leu Val Ser Glu
50 55 60

Ile Val Glu Glu Tyr Pro Asp Asp Cys Asn Lys Ile Leu Ala Ile Ile
65 70 75 80

Phe Leu Val Leu Asp Lys Asp Ile Asp Val Asp Ile Glu Thr Lys Leu
85 90 95

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

Asp Ile Lys Leu Thr Asp Leu Val Arg His Tyr Phe Arg Tyr Ile Glu

```
        115                 120                 125

Gln Asp Ile Pro Leu Gly Pro Leu Phe Lys Lys Ile Asp Ser Tyr Arg
    130                 135                 140

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

Tyr Phe Asn Lys Tyr Gly His Leu Met Phe Tyr Thr Leu Pro Ile Pro
                165                 170                 175

Tyr Asn Arg Phe Phe Cys Arg Asn Ser Ile Gly Phe Leu Ala Val Leu
            180                 185                 190

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

Val Ser Ile Asp Asp Arg Arg Lys Phe Lys Lys Glu Leu Met Ser Lys
    210                 215                 220
```

<210> 10
<211> 512
<212> PRT
<213> Vaccinia virus

<400> 10

```
Met Glu Ser Val Ile Phe Ser Ile Asn Gly Glu Ile Ile Gln Val Asn
1               5                   10                  15

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

Asp His His Leu Lys Asp Glu Ala Ile Ile Leu Asn Gly Ile Asn Tyr
        35                  40                  45

His Ala Phe Glu Ser Leu Leu Asp Tyr Met Arg Trp Lys Lys Ile Asn
    50                  55                  60

Ile Thr Ile Asn Asn Val Glu Met Ile Leu Val Ala Ala Val Ile Ile
65                  70                  75                  80
```

```
Asp Val Pro Pro Val Val Asp Leu Cys Val Lys Thr Met Ile His Asn
                85                  90                  95

Ile Asn Ser Thr Asn Cys Ile Arg Met Phe Asn Phe Ser Lys Arg Tyr
            100                 105                 110

Gly Ile Lys Lys Leu Tyr Asn Ala Ser Met Ser Glu Ile Ile Asn Asn
        115                 120                 125

Ile Thr Ala Val Thr Ser Asp Pro Glu Phe Gly Lys Leu Ser Lys Asp
    130                 135                 140

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

Asp Val Thr Ala Met Ile Leu Leu Lys Trp Ile His Lys Asn Pro Asn
                165                 170                 175

Asp Val Asp Ile Ile Asn Ile Leu His Pro Lys Phe Met Thr Asn Thr
            180                 185                 190

Met Arg Asn Ala Ile Ser Leu Leu Gly Leu Thr Ile Ser Lys Ser Thr
        195                 200                 205

Lys Pro Val Thr Arg Asn Gly Ile Lys His Asn Ile Val Val Ile Lys
    210                 215                 220

Asn Ser Asp Tyr Ile Ser Thr Ile Thr His Tyr Ser Pro Arg Thr Glu
225                 230                 235                 240

Tyr Trp Thr Ile Val Gly Asn Thr Asp Arg Gln Phe Tyr Asn Ala Asn
                245                 250                 255

Val Leu His Asn Cys Leu Tyr Ile Ile Gly Gly Met Ile Asn Asn Arg
            260                 265                 270

His Val Tyr Ser Val Ser Arg Val Asp Leu Glu Thr Lys Lys Trp Lys
        275                 280                 285

Thr Val Thr Asn Met Ser Ser Leu Lys Ser Glu Val Ser Thr Cys Val
```

```
    290                 295                 300

Asn Asp Gly Lys Leu Tyr Val Ile Gly Gly Leu Glu Phe Ser Ile Ser
305                 310                 315                 320

Thr Gly Val Ala Glu Tyr Leu Lys His Gly Thr Ser Lys Trp Ile Arg
                325                 330                 335

Leu Pro Asn Leu Ile Thr Pro Arg Tyr Ser Gly Ala Ser Val Phe Val
            340                 345                 350

Asn Asp Asp Ile Tyr Val Met Gly Gly Val Tyr Thr Thr Tyr Glu Lys
        355                 360                 365

Tyr Val Val Leu Asn Asp Val Glu Cys Phe Thr Lys Asn Arg Trp Ile
    370                 375                 380

Lys Lys Ser Pro Met Pro Arg His His Ser Ile Val Tyr Ala Val Glu
385                 390                 395                 400

Tyr Asp Gly Asp Ile Tyr Val Ile Thr Gly Ile Thr His Glu Thr Arg
                405                 410                 415

Asn Tyr Leu Tyr Lys Tyr Ile Val Lys Glu Asp Lys Trp Ile Glu Leu
            420                 425                 430

Tyr Met Tyr Phe Asn His Val Gly Lys Met Phe Val Cys Ser Cys Gly
        435                 440                 445

Asp Tyr Ile Leu Ile Ile Ala Asp Ala Lys Tyr Glu Tyr Tyr Pro Lys
    450                 455                 460

Ser Asn Thr Trp Asn Leu Phe Asp Met Ser Thr Arg Asn Ile Glu Tyr
465                 470                 475                 480

Tyr Asp Met Phe Thr Lys Asp Glu Thr Pro Lys Cys Asn Val Thr His
                485                 490                 495

Lys Ser Leu Pro Ser Phe Leu Ser Asn Cys Glu Lys Gln Phe Leu Gln
            500                 505                 510
```

<210> 11
<211> 226
<212> PRT
<213> Vaccinia virus

<400> 11
Met Leu Ser Met Phe Met Cys Asn Asn Ile Val Asp Tyr Val Asp Asp
1   5   10   15

Ile Asp Asn Gly Ile Val Gln Asp Ile Glu Asp Glu Ala Ser Asn Asn
            20   25   30

Val Asp His Asp Tyr Val Tyr Pro Leu Pro Glu Asn Met Val Tyr Arg
        35   40   45

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

His Val Met Met Ala Val Arg Tyr Tyr Met Ser Lys Gln Arg Leu Asp
65   70   75   80

Asp Leu Tyr Arg Gln Leu Pro Thr Lys Thr Arg Ser Tyr Ile Asp Ile
                85   90   95

Ile Asn Ile Tyr Cys Asp Lys Val Ser Asn Asp Tyr Asn Arg Asp Met
            100   105   110

Asn Ile Met Tyr Asp Met Ala Ser Thr Lys Ser Phe Thr Val Tyr Asp
        115   120   125

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

Val Arg Leu Ala Thr Ile Ser Phe Ile Thr Glu Leu Gly Arg Arg Cys
145   150   155   160

Met Asn Pro Val Lys Thr Ile Lys Met Phe Thr Leu Leu Ser His Thr
                165   170   175

Ile Cys Asp Asp Cys Phe Val Asp Tyr Ile Thr Asp Ile Ser Pro Pro

```
            180                 185                 190

Asp Asn Thr Ile Pro Asn Thr Ser Thr Arg Glu Tyr Leu Lys Leu Ile
        195                 200                 205

Gly Ile Thr Ala Ile Met Phe Ala Thr Tyr Lys Thr Leu Lys Tyr Met
    210                 215                 220

Ile Gly
225
```

<210> 12
<211> 147
<212> PRT
<213> Vaccinia virus

<400> 12

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

Asn Arg Ala Lys Ser Pro Thr Arg Gln Ser Pro Gly Ala Ala Gly Tyr
            20                  25                  30

Asp Leu Tyr Ser Ala Tyr Asp Tyr Thr Ile Pro Pro Gly Glu Arg Gln
        35                  40                  45

Leu Ile Lys Thr Asp Ile Ser Met Ser Met Pro Lys Ile Cys Tyr Gly
    50                  55                  60

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

Gly Gly Val Ile Asp Glu Asp Tyr Arg Gly Asn Ile Gly Val Ile Leu
                85                  90                  95

Ile Asn Asn Gly Lys Cys Thr Phe Asn Val Asn Thr Gly Asp Arg Ile
            100                 105                 110

Ala Gln Leu Ile Tyr Gln Arg Ile Tyr Tyr Pro Glu Leu Glu Glu Val
        115                 120                 125
```

Gln Ser Leu Asp Ser Thr Asn Arg Gly Asp Gln Gly Phe Gly Ser Thr
130 135 140

Gly Leu Arg
145

<210> 13
<211> 480
<212> PRT
<213> Vaccinia virus

<400> 13
Met Pro Ile Phe Val Asn Thr Val Tyr Cys Lys Asn Ile Leu Ala Leu
1 5 10 15

Ser Met Thr Lys Lys Phe Lys Thr Ile Ile Asp Ala Ile Gly Gly Asn
20 25 30

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

Thr His Leu Arg Gln Lys Tyr Thr Lys Asn Lys Asp Pro Val Thr Arg
50 55 60

Val Cys Leu Asp Leu Asp Ile His Ser Leu Thr Ser Ile Val Ile Tyr
65 70 75 80

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

Leu Arg Ala Ser Ile Leu Thr Ser Val Glu Phe Ile Ile Tyr Thr Cys
100 105 110

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

Tyr Met Met Gly Ile Glu Tyr Gly Leu Ser Asn Leu Leu Cys His Thr
130 135 140

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

```
Asp Asn Phe Asp Tyr Leu Ser Met Lys Leu Ile Leu Glu Ser Asp Glu
                165                 170                 175

Leu Asn Val Pro Asp Glu Asp Tyr Val Val Asp Phe Val Ile Lys Trp
            180                 185                 190

Tyr Ile Lys Arg Arg Asn Lys Leu Gly Asn Leu Leu Leu Leu Ile Lys
        195                 200                 205

Asn Val Ile Arg Ser Asn Tyr Leu Ser Pro Arg Gly Ile Asn Asn Val
    210                 215                 220

Lys Trp Ile Leu Asp Cys Thr Lys Ile Phe His Cys Asp Lys Gln Pro
225                 230                 235                 240

Arg Lys Ser Tyr Lys Tyr Pro Phe Ile Glu Tyr Pro Met Asn Met Asp
                245                 250                 255

Gln Ile Ile Asp Ile Phe His Met Cys Thr Ser Thr His Val Gly Glu
            260                 265                 270

Val Val Tyr Leu Ile Gly Gly Trp Met Asn Asn Glu Ile His Asn Asn
        275                 280                 285

Ala Ile Ala Val Asn Tyr Ile Ser Asn Asn Trp Ile Pro Ile Pro Pro
    290                 295                 300

Met Asn Ser Pro Arg Leu Tyr Ala Thr Gly Ile Pro Ala Asn Asn Lys
305                 310                 315                 320

Leu Tyr Val Val Gly Gly Leu Pro Asn Pro Thr Ser Val Glu Arg Trp
                325                 330                 335

Phe His Gly Asp Ala Ala Trp Val Asn Met Pro Ser Leu Leu Lys Pro
            340                 345                 350

Arg Cys Asn Pro Ala Val Ala Ser Ile Asn Asn Val Ile Tyr Val Met
        355                 360                 365
```

```
Gly Gly His Ser Glu Thr Asp Thr Thr Thr Glu Tyr Leu Leu Pro Asn
    370                 375                 380

His Asp Gln Trp Gln Phe Gly Pro Ser Thr Tyr Tyr Pro His Tyr Lys
385                 390                 395                 400

Ser Cys Ala Leu Val Phe Gly Arg Arg Leu Phe Leu Val Gly Arg Asn
                405                 410                 415

Ala Glu Phe Tyr Cys Glu Ser Ser Asn Thr Trp Thr Leu Ile Asp Asp
            420                 425                 430

Pro Ile Tyr Pro Arg Asp Asn Pro Glu Leu Ile Ile Val Asp Asn Lys
        435                 440                 445

Leu Leu Leu Ile Gly Gly Phe Tyr Arg Gly Ser Tyr Ile Asp Thr Ile
    450                 455                 460

Glu Val Tyr Asn His His Thr Tyr Ser Trp Asn Ile Trp Asp Gly Lys
465                 470                 475                 480
```

<210> 14
<211> 284
<212> PRT
<213> Vaccinia virus

<400> 14

```
Met Asp Leu Ser Arg Ile Asn Thr Trp Lys Ser Lys Gln Leu Lys Ser
1               5                   10                  15

Phe Leu Ser Ser Lys Asp Thr Phe Lys Ala Asp Val His Gly His Ser
            20                  25                  30

Ala Leu Tyr Tyr Ala Ile Ala Asp Asn Asn Val Arg Leu Val Cys Thr
        35                  40                  45

Leu Leu Asn Ala Gly Ala Leu Lys Asn Leu Leu Glu Asn Glu Phe Pro
    50                  55                  60

Leu His Gln Ala Ala Thr Leu Glu Asp Thr Lys Ile Val Lys Ile Leu
65                  70                  75                  80
```

```
Leu Phe Ser Gly Met Asp Asp Ser Gln Phe Asp Asp Lys Gly Asn Thr
                85                  90                  95

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

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

Lys Thr Ser Phe Tyr His Ala Val Met Leu Asn Asp Val Ser Ile Val
    130                 135                 140

Ser Tyr Phe Leu Ser Glu Ile Pro Ser Thr Phe Asp Leu Ala Ile Leu
145                 150                 155                 160

Leu Ser Cys Ile His Thr Thr Ile Lys Asn Gly His Val Asp Met Met
                165                 170                 175

Ile Leu Leu Leu Asp Tyr Met Thr Ser Thr Asn Thr Asn Asn Ser Leu
            180                 185                 190

Leu Phe Ile Pro Asp Ile Lys Leu Ala Ile Asp Asn Lys Asp Ile Glu
        195                 200                 205

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

Leu Glu Asn Val Leu Leu Asp Asp Ala Glu Ile Thr Lys Met Ile Ile
225                 230                 235                 240

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

Ile Val Lys Asn Asn Lys Leu Asp Glu Ile Ile Ser Lys Asn Lys Glu
            260                 265                 270

Leu Arg Leu Met Tyr Val Asn Cys Val Lys Lys Asn
        275                 280
```

<210> 15
<211> 369
<212> PRT
<213> Vaccinia virus

<400> 15
Met Ile Ala Leu Leu Ile Leu Ser Leu Thr Cys Ser Val Ser Thr Tyr
1   5   10   15

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

Gln Asp Asp Asn Ile Val Phe Ser Pro Phe Gly Tyr Ser Phe Ser Met
        35   40   45

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

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

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

Asp Leu Thr Tyr Gln Ser Phe Val Asp Asn Thr Val Cys Ile Lys Pro
            100   105   110

Leu Tyr Tyr Gln Gln Tyr His Arg Phe Gly Leu Tyr Arg Leu Asn Phe
        115   120   125

Arg Arg Asp Ala Val Asn Lys Ile Asn Ser Ile Val Glu Arg Arg Ser
    130   135   140

Gly Met Ser Asn Val Val Asp Ser Asn Met Leu Asp Asn Asn Thr Leu
145   150   155   160

Trp Ala Ile Ile Asn Thr Ile Tyr Phe Lys Gly Thr Trp Gln Tyr Pro
                165   170   175

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

```
Thr Lys Thr Val Pro Met Met Asn Val Val Thr Lys Leu Gln Gly Asn
        195                 200                 205

Thr Ile Thr Ile Asp Asp Glu Glu Tyr Asp Met Val Arg Leu Pro Tyr
    210                 215                 220

Lys Asp Ala Asn Ile Ser Met Tyr Leu Ala Ile Gly Asp Asn Met Thr
225                 230                 235                 240

His Phe Thr Asp Ser Ile Thr Ala Ala Lys Leu Asp Tyr Trp Ser Phe
                245                 250                 255

Gln Leu Gly Asn Lys Val Tyr Asn Leu Lys Leu Pro Lys Phe Ser Ile
            260                 265                 270

Glu Asn Lys Arg Asp Ile Lys Ser Ile Ala Glu Met Met Ala Pro Ser
        275                 280                 285

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

Leu Tyr Ile Tyr Lys Met Phe Gln Asn Ala Lys Ile Asp Val Asp Glu
305                 310                 315                 320

Gln Gly Thr Val Ala Glu Ala Ser Thr Ile Met Val Ala Thr Ala Arg
                325                 330                 335

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

Arg His Asp Ile Thr Gly Phe Ile Leu Phe Met Gly Lys Val Glu Ser
        355                 360                 365

Pro
```

<210> 16
<211> 88
<212> PRT
<213> Vaccinia virus

<400> 16
Met Leu Ala Phe Cys Tyr Ser Leu Pro Asn Ala Gly Asp Val Ile Lys
1   5   10   15

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

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

Asp Arg Tyr Val Glu Tyr Arg Asp Lys Leu Val Gly Lys Thr Val Lys
    50   55   60

Val Lys Val Ile Arg Val Asp Tyr Thr Lys Gly Tyr Ile Asp Val Asn
65   70   75   80

Tyr Lys Arg Met Cys Arg His Gln
                85

<210> 17
<211> 424
<212> PRT
<213> Vaccinia virus

<400> 17
Met Asn Pro Asp Asn Thr Ile Ala Val Ile Thr Glu Thr Ile Pro Ile
1   5   10   15

Gly Met Gln Phe Asp Lys Val Tyr Leu Ser Thr Phe Asn Met Trp Arg
            20   25   30

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

Trp Ser Leu Ser Asp Glu Val Gly Thr Asn Phe Gly Thr Ile Ile Leu
    50   55   60

Asn Glu Ile Val Gln Leu Pro Lys Arg Gly Val Arg Val Arg Val Ala
65   70   75   80

Val Asn Lys Ser Asn Lys Pro Leu Lys Asp Val Glu Arg Leu Gln Met

```
                85                  90                  95

Ala Gly Val Glu Val Arg Tyr Ile Asp Ile Thr Asn Ile Leu Gly Gly
            100                 105                 110

Val Leu His Thr Lys Phe Trp Ile Ser Asp Asn Thr His Ile Tyr Leu
        115                 120                 125

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

Gly Ile Ala Ile Phe Asn Asn Arg Asn Leu Ala Ala Asp Leu Thr Gln
145                 150                 155                 160

Ile Phe Glu Val Tyr Trp Tyr Leu Gly Val Asn Asn Leu Pro Tyr Asn
                165                 170                 175

Trp Lys Asn Phe Tyr Pro Ser Tyr Tyr Asn Thr Asp His Pro Leu Ser
            180                 185                 190

Ile Asn Val Ser Gly Val Pro His Ser Val Phe Ile Ala Ser Ala Pro
        195                 200                 205

Gln Gln Leu Cys Thr Met Glu Arg Thr Asn Asp Leu Thr Ala Leu Leu
    210                 215                 220

Ser Cys Ile Arg Asn Ala Ser Lys Phe Val Tyr Val Ser Val Met Asn
225                 230                 235                 240

Phe Ile Pro Ile Ile Tyr Ser Lys Ala Gly Lys Ile Leu Phe Trp Pro
                245                 250                 255

Tyr Ile Glu Asp Glu Leu Arg Arg Ser Ala Ile Asp Arg Gln Val Ser
            260                 265                 270

Val Lys Leu Leu Ile Ser Cys Trp Gln Arg Ser Ser Phe Ile Met Arg
        275                 280                 285

Asn Phe Leu Arg Ser Ile Ala Met Leu Lys Ser Lys Asn Ile Asp Ile
    290                 295                 300
```

```
Glu Val Lys Leu Phe Ile Val Pro Asp Ala Asp Pro Pro Ile Pro Tyr
305                 310                 315                 320


Ser Arg Val Asn His Ala Lys Tyr Met Val Thr Asp Lys Thr Ala Tyr
                325                 330                 335


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


Ala Ser Ile Asn Ile Thr Pro Asp Asp Gly Leu Gly Leu Arg Gln Gln
        355                 360                 365


Leu Glu Asp Ile Phe Met Arg Asp Trp Asn Ser Lys Tyr Ser Tyr Glu
    370                 375                 380


Leu Tyr Asp Thr Ser Pro Thr Lys Arg Cys Lys Leu Leu Lys Asn Met
385                 390                 395                 400


Lys Gln Cys Thr Asn Asp Ile Tyr Cys Asp Glu Ile Gln Pro Glu Lys
                405                 410                 415


Glu Ile Pro Glu Tyr Ser Leu Glu
            420


<210> 18
<211> 136
<212> PRT
<213> Vaccinia virus

<400> 18
Met Gly Ala Thr Ile Ser Ile Leu Ala Ser Tyr Asp Asn Pro Asn Leu
1               5                   10                  15


Phe Thr Ala Met Ile Leu Met Ser Pro Leu Val Asn Ala Asp Ala Val
            20                  25                  30


Ser Arg Leu Asn Leu Leu Ala Ala Lys Leu Met Gly Thr Ile Thr Pro
        35                  40                  45


Asn Ala Pro Val Gly Lys Leu Cys Pro Glu Ser Val Ser Arg Asp Met
```

50 55 60

Asp Lys Val Tyr Lys Tyr Gln Tyr Asp Pro Leu Ile Asn His Glu Lys
65 70 75 80

Ile Lys Ala Gly Phe Ala Ser Gln Val Leu Lys Ala Thr Asn Lys Val
85 90 95

Arg Lys Ile Ile Ser Lys Ile Asn Thr Pro Arg Leu Ser Tyr Ser Arg
100 105 110

Glu Gln Thr Met Arg Leu Val Met Phe Gln Val His Ile Ile Ser Cys
115 120 125

Asn Met Gln Ile Val Ile Glu Lys
130 135

<210> 19
<211> 81
<212> PRT
<213> Vaccinia virus

<400> 19
Met Ser Ala Asn Cys Met Phe Asn Leu Asp Asn Asp Tyr Ile Tyr Trp
1 5 10 15

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

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

Leu Gly Ile Leu Val Phe Ser His Asp His Ile Gly His Gly Arg Ser
50 55 60

Asn Gly Glu Lys Met Met Ile Asp Asp Phe Gly Thr Ala Arg Gly Asn
65 70 75 80

Tyr

<210> 20
<211> 149
<212> PRT
<213> Vaccinia virus

<400> 20
Met Ala Thr Lys Leu Asp Tyr Glu Asp Ala Val Phe Tyr Phe Val Asp
1   5   10   15

Asp Asp Lys Ile Cys Ser Arg Asp Ser Ile Ile Asp Leu Ile Asp Glu
            20   25   30

Tyr Ile Thr Trp Arg Asn His Val Ile Val Phe Asn Lys Asp Ile Thr
        35   40   45

Ser Cys Gly Arg Leu Tyr Lys Glu Leu Met Lys Phe Asp Asp Val Ala
    50   55   60

Ile Arg Tyr Tyr Gly Ile Asp Lys Ile Asn Glu Ile Val Glu Ala Met
65   70   75   80

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

Ser Leu Phe Ala Thr Ile Gly Ile Cys Ala Lys Ile Thr Glu His Trp
            100   105   110

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

Thr Asp Leu Met Thr Asp Asp Asn Ile Asn Ile Leu Ile Leu Phe Leu
    130   135   140

Glu Lys Lys Leu Asn
145

<210> 21
<211> 472
<212> PRT
<213> Vaccinia virus

<400> 21
Met Ile Phe Val Ile Glu Ser Lys Leu Leu Gln Ile Tyr Arg Asn Arg

```
1               5                   10                  15

Asn Arg Asn Ile Asn Phe Tyr Thr Thr Met Asp Asn Ile Met Ser Ala
            20                  25                  30

Glu Tyr Tyr Leu Ser Leu Tyr Ala Lys Tyr Asn Ser Lys Asn Leu Asp
        35                  40                  45

Val Phe Arg Asn Met Leu Gln Ala Ile Glu Pro Ser Gly Asn Asn Tyr
    50                  55                  60

His Ile Leu His Ala Tyr Cys Gly Ile Lys Gly Leu Asp Glu Arg Phe
65                  70                  75                  80

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

Asp Gly Asn Tyr Pro Leu His Ile Ala Ser Lys Ile Asn Asn Asn Arg
            100                 105                 110

Ile Val Ala Met Leu Leu Thr His Gly Ala Asp Pro Asn Ala Cys Asp
        115                 120                 125

Lys His Asn Lys Thr Pro Leu Tyr Tyr Leu Ser Gly Thr Asp Asp Glu
    130                 135                 140

Val Ile Glu Arg Ile Asn Leu Leu Val Gln Tyr Gly Ala Lys Ile Asn
145                 150                 155                 160

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

Pro Ser Glu Arg Val Phe Lys Lys Ile Met Ser Ile Gly Phe Glu Ala
            180                 185                 190

Arg Ile Val Asp Lys Phe Gly Lys Asn His Ile His Arg His Leu Met
        195                 200                 205

Ser Asp Asn Pro Lys Ala Ser Thr Ile Ser Trp Met Met Lys Leu Gly
    210                 215                 220
```

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

Val Cys Ser Lys Thr Val Lys Asn Val Asp Ile Ile Asp Leu Leu Leu
                245                 250                 255

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

Thr Leu Leu Ile Lys Thr Leu Ser Pro Ala His Leu Ile Asn Lys Leu
        275                 280                 285

Leu Ser Thr Ser Asn Val Ile Thr Asp Gln Thr Val Asn Ile Cys Ile
    290                 295                 300

Phe Tyr Asp Arg Asp Asp Val Leu Glu Ile Ile Asn Asp Lys Gly Lys
305                 310                 315                 320

Gln Tyr Asp Ser Thr Asp Phe Lys Met Ala Val Glu Val Gly Ser Ile
                325                 330                 335

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

Met Tyr Tyr Ala Val Leu Ser Glu Tyr Glu Thr Met Val Asp Tyr Leu
        355                 360                 365

Leu Phe Asn His Phe Ser Val Asp Ser Val Val Asn Gly His Thr Cys
    370                 375                 380

Met Ser Glu Cys Val Arg Leu Asn Asn Pro Val Ile Leu Ser Lys Leu
385                 390                 395                 400

Met Leu His Asn Pro Thr Ser Glu Thr Met Tyr Leu Thr Met Lys Ala
                405                 410                 415

Ile Glu Lys Asp Lys Leu Asp Lys Ser Ile Ile Ile Pro Phe Ile Ala
            420                 425                 430
```

Tyr Phe Val Leu Met His Pro Asp Phe Cys Lys Asn Arg Arg Tyr Phe
435 440 445

Thr Ser Tyr Lys Arg Phe Val Thr Asp Tyr Val His Glu Gly Val Ser
450 455 460

Tyr Glu Val Phe Asp Asp Tyr Phe
465 470

<210> 22
<211> 220
<212> PRT
<213> Vaccinia virus

<400> 22
Met Val Tyr Lys Leu Val Leu Leu Phe Cys Ile Ala Ser Leu Gly Tyr
1 5 10 15

Ser Val Glu Tyr Lys Asn Thr Ile Cys Pro Pro Arg Gln Asp Tyr Arg
20 25 30

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

Asn Ser Thr Ile Ile Gly Glu Cys His Met Ser Glu Ser Tyr Ile Asp
50 55 60

Arg Asn Ala Asn Ile Val Leu Thr Gly Tyr Gly Leu Glu Ile Asn Met
65 70 75 80

Thr Ile Met Asp Thr Asp Gln Arg Phe Val Ala Ala Ala Glu Gly Val
85 90 95

Gly Lys Asp Asn Lys Leu Ser Val Leu Leu Phe Thr Thr Gln Arg Leu
100 105 110

Asp Lys Val His His Asn Ile Ser Val Thr Ile Thr Cys Met Glu Met
115 120 125

Asn Cys Gly Thr Thr Lys Tyr Asp Ser Asp Leu Pro Glu Ser Ile His
130 135 140

```
Lys Ser Ser Ser Cys Asp Ile Thr Ile Asn Gly Ser Cys Val Thr Cys
145                 150                 155                 160


Val Asn Leu Glu Thr Asp Pro Thr Lys Ile Asn Pro His Tyr Leu His
                165                 170                 175


Pro Lys Asp Lys Tyr Leu Tyr His Asn Ser Glu Tyr Gly Met Arg Gly
            180                 185                 190


Ser Tyr Gly Val Thr Phe Ile Asp Glu Leu Asn Gln Cys Leu Leu Asp
        195                 200                 205


Ile Lys Glu Leu Ser Tyr Asp Ile Cys Tyr Arg Glu
    210                 215                 220


<210> 23
<211> 117
<212> PRT
<213> Vaccinia virus

<400> 23
Met Arg Thr Leu Leu Ile Arg Tyr Ile Leu Trp Arg Asn Asp Asn Asp
1               5                   10                  15


Gln Thr Tyr Tyr Asn Asp Asp Phe Lys Lys Leu Met Leu Leu Asp Glu
            20                  25                  30


Leu Val Asp Asp Gly Asp Val Cys Thr Leu Ile Lys Asn Met Arg Met
        35                  40                  45


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


Asn Ile Glu Asp Ala Lys Arg Met Ile Ala Ile Ser Ala Lys Val Ala
65                  70                  75                  80


Arg Asp Ile Gly Glu Arg Ser Glu Ile Arg Trp Glu Glu Ser Phe Thr
                85                  90                  95


Ile Leu Phe Arg Met Ile Glu Thr Tyr Phe Asp Asp Leu Met Ile Asp
```

```
            100                 105                 110


Leu Tyr Gly Glu Lys
        115


<210> 24
<211> 224
<212> PRT
<213> Vaccinia virus

<400> 24
Met Val Lys Asn Asn Lys Ile Ser Asn Ser Cys Arg Met Ile Met Ser
1               5                   10                  15


Thr Asn Pro Asn Asn Ile Leu Met Arg His Leu Lys Asn Leu Thr Asp
            20                  25                  30


Asp Glu Phe Lys Cys Ile Ile His Arg Ser Ser Asp Phe Leu Tyr Leu
        35                  40                  45


Ser Asp Ser Asp Tyr Thr Ser Ile Thr Lys Glu Thr Leu Val Ser Glu
    50                  55                  60


Ile Val Glu Glu Tyr Pro Asp Asp Cys Asn Lys Ile Leu Ala Ile Ile
65                  70                  75                  80


Phe Leu Val Leu Asp Lys Asp Ile Asp Val Asp Ile Glu Thr Lys Leu
                85                  90                  95


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


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


Gln Asp Ile Pro Leu Gly Pro Leu Phe Lys Lys Ile Asp Ser Tyr Arg
    130                 135                 140


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

```
Tyr Phe Asn Lys Tyr Gly His Leu Met Phe Tyr Thr Leu Pro Ile Pro
                165                 170                 175


Tyr Asn Arg Phe Phe Cys Arg Asn Ser Ile Gly Phe Leu Ala Val Leu
            180                 185                 190


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


Val Ser Ile Asp Asp Arg Arg Lys Phe Lys Lys Glu Leu Met Ser Lys
    210                 215                 220


<210> 25
<211> 117
<212> PRT
<213> Vaccinia virus

<400> 25
Met Arg Thr Leu Leu Ile Arg Tyr Ile Leu Trp Arg Asn Asp Asn Asp
1               5                   10                  15


Gln Thr Tyr Tyr Asn Asp Asp Phe Lys Lys Leu Met Leu Leu Asp Glu
            20                  25                  30


Leu Val Asp Asp Gly Asp Val Cys Thr Leu Ile Lys Asn Met Arg Met
        35                  40                  45


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


Asn Ile Glu Asp Ala Lys Arg Met Ile Ala Ile Ser Ala Lys Val Ala
65                  70                  75                  80


Arg Asp Ile Gly Glu Arg Ser Glu Ile Arg Trp Glu Glu Ser Phe Thr
                85                  90                  95


Ile Leu Phe Arg Met Ile Glu Thr Tyr Phe Asp Asp Leu Met Ile Asp
            100                 105                 110


Leu Tyr Gly Glu Lys
        115
```

<210> 26
<211> 175
<212> PRT
<213> Vaccinia virus

<400> 26
Met Thr Ser Ser Ala Met Asp Asn Asn Glu Pro Lys Val Leu Glu Met
1   5   10   15

Val Tyr Asp Ala Thr Ile Leu Pro Glu Gly Ser Ser Met Asp Pro Asn
            20   25   30

Ile Met Asp Cys Ile Asn Arg His Ile Asn Met Cys Ile Gln Arg Thr
        35   40   45

Tyr Ser Ser Ser Ile Ile Ala Ile Leu Asn Arg Phe Leu Thr Met Asn
    50   55   60

Lys Asp Glu Leu Asn Asn Thr Gln Cys His Ile Ile Lys Glu Phe Met
65   70   75   80

Thr Tyr Glu Gln Met Ala Ile Asp His Tyr Gly Glu Tyr Val Asn Ala
                85   90   95

Ile Leu Tyr Gln Ile Arg Lys Arg Pro Asn Gln His His Thr Ile Asp
            100   105   110

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

Pro Val Glu Phe Val Lys Lys Val Ile Gly Phe Val Ser Ile Leu Asn
    130   135   140

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

Asp Glu Phe Lys Cys Phe Ile Asn Tyr Val Glu Thr Lys Tyr Phe
                165   170   175

<210> 27
<211> 472

<212> PRT
<213> Vaccinia virus

<400> 27
Met Ile Phe Val Ile Glu Ser Lys Leu Leu Gln Ile Tyr Arg Asn Arg
1   5   10   15

Asn Arg Asn Ile Asn Phe Tyr Thr Thr Met Asp Asn Ile Met Ser Ala
            20   25   30

Glu Tyr Tyr Leu Ser Leu Tyr Ala Lys Tyr Asn Ser Lys Asn Leu Asp
        35   40   45

Val Phe Arg Asn Met Leu Gln Ala Ile Glu Pro Ser Gly Asn Asn Tyr
    50   55   60

His Ile Leu His Ala Tyr Cys Gly Ile Lys Gly Leu Asp Glu Arg Phe
65   70   75   80

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

Asp Gly Asn Tyr Pro Leu His Ile Ala Ser Lys Ile Asn Asn Asn Arg
            100   105   110

Ile Val Ala Met Leu Leu Thr His Gly Ala Asp Pro Asn Ala Cys Asp
        115   120   125

Lys His Asn Lys Thr Pro Leu Tyr Tyr Leu Ser Gly Thr Asp Asp Glu
    130   135   140

Val Ile Glu Arg Ile Asn Leu Leu Val Gln Tyr Gly Ala Lys Ile Asn
145   150   155   160

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

Pro Ser Glu Arg Val Phe Lys Lys Ile Met Ser Ile Gly Phe Glu Ala
            180   185   190

Arg Ile Val Asp Lys Phe Gly Lys Asn His Ile His Arg His Leu Met

```
        195                 200                 205

Ser Asp Asn Pro Lys Ala Ser Thr Ile Ser Trp Met Met Lys Leu Gly
    210                 215                 220

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

Val Cys Ser Lys Thr Val Lys Asn Val Asp Ile Ile Asp Leu Leu Leu
                245                 250                 255

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

Thr Leu Leu Ile Lys Thr Leu Ser Pro Ala His Leu Ile Asn Lys Leu
        275                 280                 285

Leu Ser Thr Ser Asn Val Ile Thr Asp Gln Thr Val Asn Ile Cys Ile
    290                 295                 300

Phe Tyr Asp Arg Asp Asp Val Leu Glu Ile Ile Asn Asp Lys Gly Lys
305                 310                 315                 320

Gln Tyr Asp Ser Thr Asp Phe Lys Met Ala Val Glu Val Gly Ser Ile
                325                 330                 335

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

Met Tyr Tyr Ala Val Leu Ser Glu Tyr Glu Thr Met Val Asp Tyr Leu
        355                 360                 365

Leu Phe Asn His Phe Ser Val Asp Ser Val Val Asn Gly His Thr Cys
    370                 375                 380

Met Ser Glu Cys Val Arg Leu Asn Asn Pro Val Ile Leu Ser Lys Leu
385                 390                 395                 400

Met Leu His Asn Pro Thr Ser Glu Thr Met Tyr Leu Thr Met Lys Ala
                405                 410                 415
```

Ile Glu Lys Asp Lys Leu Asp Lys Ser Ile Ile Ile Pro Phe Ile Ala
420 425 430

Tyr Phe Val Leu Met His Pro Asp Phe Cys Lys Asn Arg Arg Tyr Phe
435 440 445

Thr Ser Tyr Lys Arg Phe Val Thr Asp Tyr Val His Glu Gly Val Ser
450 455 460

Tyr Glu Val Phe Asp Asp Tyr Phe
465 470

<210> 28
<211> 220
<212> PRT
<213> Vaccinia virus

<400> 28
Met Val Tyr Lys Leu Val Leu Leu Phe Cys Ile Ala Ser Leu Gly Tyr
1 5 10 15

Ser Val Glu Tyr Lys Asn Thr Ile Cys Pro Pro Arg Gln Asp Tyr Arg
20 25 30

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

Asn Ser Thr Ile Ile Gly Glu Cys His Met Ser Glu Ser Tyr Ile Asp
50 55 60

Arg Asn Ala Asn Ile Val Leu Thr Gly Tyr Gly Leu Glu Ile Asn Met
65 70 75 80

Thr Ile Met Asp Thr Asp Gln Arg Phe Val Ala Ala Ala Glu Gly Val
85 90 95

Gly Lys Asp Asn Lys Leu Ser Val Leu Leu Phe Thr Thr Gln Arg Leu
100 105 110

Asp Lys Val His His Asn Ile Ser Val Thr Ile Thr Cys Met Glu Met

```
        115                 120                 125

Asn Cys Gly Thr Thr Lys Tyr Asp Ser Asp Leu Pro Glu Ser Ile His
    130                 135                 140

Lys Ser Ser Ser Cys Asp Ile Thr Ile Asn Gly Ser Cys Val Thr Cys
145                 150                 155                 160

Val Asn Leu Glu Thr Asp Pro Thr Lys Ile Asn Pro His Tyr Leu His
                165                 170                 175

Pro Lys Asp Lys Tyr Leu Tyr His Asn Ser Glu Tyr Gly Met Arg Gly
            180                 185                 190

Ser Tyr Gly Val Thr Phe Ile Asp Glu Leu Asn Gln Cys Leu Leu Asp
        195                 200                 205

Ile Lys Glu Leu Ser Tyr Asp Ile Cys Tyr Arg Glu
    210                 215                 220


<210> 29
<211> 284
<212> PRT
<213> Vaccinia virus

<400> 29
Met Asp Leu Ser Arg Ile Asn Thr Trp Lys Ser Lys Gln Leu Lys Ser
1               5                   10                  15

Phe Leu Ser Ser Lys Asp Thr Phe Lys Ala Asp Val His Gly His Ser
            20                  25                  30

Ala Leu Tyr Tyr Ala Ile Ala Asp Asn Asn Val Arg Leu Val Cys Thr
        35                  40                  45

Leu Leu Asn Ala Gly Ala Leu Lys Asn Leu Leu Glu Asn Glu Phe Pro
    50                  55                  60

Leu His Gln Ala Ala Thr Leu Glu Asp Thr Lys Ile Val Lys Ile Leu
65                  70                  75                  80
```

```
Leu Phe Ser Gly Met Asp Asp Ser Gln Phe Asp Asp Lys Gly Asn Thr
                85                  90                  95

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

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

Lys Thr Ser Phe Tyr His Ala Val Met Leu Asn Asp Val Ser Ile Val
    130                 135                 140

Ser Tyr Phe Leu Ser Glu Ile Pro Ser Thr Phe Asp Leu Ala Ile Leu
145                 150                 155                 160

Leu Ser Cys Ile His Thr Thr Ile Lys Asn Gly His Val Asp Met Met
                165                 170                 175

Ile Leu Leu Leu Asp Tyr Met Thr Ser Thr Asn Thr Asn Asn Ser Leu
            180                 185                 190

Leu Phe Ile Pro Asp Ile Lys Leu Ala Ile Asp Asn Lys Asp Ile Glu
        195                 200                 205

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

Leu Glu Asn Val Leu Leu Asp Asp Ala Glu Ile Thr Lys Met Ile Ile
225                 230                 235                 240

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

Ile Val Lys Asn Asn Lys Leu Asp Glu Ile Ile Ser Lys Asn Lys Glu
            260                 265                 270

Leu Arg Leu Met Tyr Val Asn Cys Val Lys Lys Asn
        275                 280
```

<210> 30

<211> 369
<212> PRT
<213> Vaccinia virus

<400> 30
Met Ile Ala Leu Leu Ile Leu Ser Leu Thr Cys Ser Val Ser Thr Tyr
1   5   10   15

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

Gln Asp Asp Asn Ile Val Phe Ser Pro Phe Gly Tyr Ser Phe Ser Met
        35   40   45

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

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

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

Asp Leu Thr Tyr Gln Ser Phe Val Asp Asn Thr Val Cys Ile Lys Pro
            100   105   110

Leu Tyr Tyr Gln Gln Tyr His Arg Phe Gly Leu Tyr Arg Leu Asn Phe
        115   120   125

Arg Arg Asp Ala Val Asn Lys Ile Asn Ser Ile Val Glu Arg Arg Ser
    130   135   140

Gly Met Ser Asn Val Val Asp Ser Asn Met Leu Asp Asn Asn Thr Leu
145   150   155   160

Trp Ala Ile Ile Asn Thr Ile Tyr Phe Lys Gly Thr Trp Gln Tyr Pro
                165   170   175

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

```
Thr Lys Thr Val Pro Met Met Asn Val Val Thr Lys Leu Gln Gly Asn
        195                 200                 205

Thr Ile Thr Ile Asp Asp Glu Glu Tyr Asp Met Val Arg Leu Pro Tyr
    210                 215                 220

Lys Asp Ala Asn Ile Ser Met Tyr Leu Ala Ile Gly Asp Asn Met Thr
225                 230                 235                 240

His Phe Thr Asp Ser Ile Thr Ala Ala Lys Leu Asp Tyr Trp Ser Phe
                245                 250                 255

Gln Leu Gly Asn Lys Val Tyr Asn Leu Lys Leu Pro Lys Phe Ser Ile
            260                 265                 270

Glu Asn Lys Arg Asp Ile Lys Ser Ile Ala Glu Met Met Ala Pro Ser
        275                 280                 285

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

Leu Tyr Ile Tyr Lys Met Phe Gln Asn Ala Lys Ile Asp Val Asp Glu
305                 310                 315                 320

Gln Gly Thr Val Ala Glu Ala Ser Thr Ile Met Val Ala Thr Ala Arg
                325                 330                 335

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

Arg His Asp Ile Thr Gly Phe Ile Leu Phe Met Gly Lys Val Glu Ser
        355                 360                 365

Pro
```

<210> 31
<211> 81
<212> PRT
<213> Vaccinia virus

<400> 31
Met Gly His Ile Ile Thr Tyr Cys Gln Val His Thr Asn Ile Ser Ile
1   5   10   15

Leu Ile Arg Lys Ala His His Ile Ile Phe Phe Val Ile Asp Cys Asp
            20   25   30

Cys Ile Ser Leu Gln Phe Ser Asn Tyr Val His His Gly Asn Arg Phe
        35   40   45

Arg Thr Val Leu Ile Ser Lys Thr Ser Ile Ala Cys Phe Ser Asp Ile
    50   55   60

Lys Arg Ile Leu Pro Cys Thr Phe Lys Ile Tyr Ser Ile Asn Asp Cys
65   70   75   80

Pro

<210> 32
<211> 79
<212> PRT
<213> Vaccinia virus

<400> 32
Met Gly Thr Val Phe Val Pro Tyr Leu Leu Val Lys Leu Ala Leu Arg
1   5   10   15

Val Leu Val Ile Ser Asn Gly Tyr Cys His Val Pro Leu Lys Tyr Ile
            20   25   30

Val Leu Met Ile Ala His Arg Val Leu Leu Ser Ser Ile Leu Glu Ser
        35   40   45

Thr Thr Leu Asp Ile Pro Asp Leu Arg Ser Thr Ile Glu Leu Ile Leu
    50   55   60

Leu Thr Ala Ser Arg Leu Lys Phe Asn Leu Tyr Arg Pro Asn Leu
65   70   75

<210> 33
<211> 88

<212> PRT
<213> Vaccinia virus

<400> 33
Met Leu Ala Phe Cys Tyr Ser Leu Pro Asn Ala Gly Asp Val Ile Lys
1   5   10   15

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

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

Asp Arg Tyr Val Glu Tyr Arg Asp Lys Leu Val Gly Lys Thr Val Lys
    50   55   60

Val Lys Val Ile Arg Val Asp Tyr Thr Lys Gly Tyr Ile Asp Val Asn
65   70   75   80

Tyr Lys Arg Met Cys Arg His Gln
                85

<210> 34
<211> 424
<212> PRT
<213> Vaccinia virus

<400> 34
Met Asn Pro Asp Asn Thr Ile Ala Val Ile Thr Glu Thr Ile Pro Ile
1   5   10   15

Gly Met Gln Phe Asp Lys Val Tyr Leu Ser Thr Phe Asn Met Trp Arg
            20   25   30

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

Trp Ser Leu Ser Asp Glu Val Gly Thr Asn Phe Gly Thr Ile Ile Leu
    50   55   60

Asn Glu Ile Val Gln Leu Pro Lys Arg Gly Val Arg Val Arg Val Ala
65   70   75   80

```
Val Asn Lys Ser Asn Lys Pro Leu Lys Asp Val Glu Arg Leu Gln Met
                85                  90                  95

Ala Gly Val Glu Val Arg Tyr Ile Asp Ile Thr Asn Ile Leu Gly Gly
            100                 105                 110

Val Leu His Thr Lys Phe Trp Ile Ser Asp Asn Thr His Ile Tyr Leu
        115                 120                 125

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

Gly Ile Ala Ile Phe Asn Asn Arg Asn Leu Ala Ala Asp Leu Thr Gln
145                 150                 155                 160

Ile Phe Glu Val Tyr Trp Tyr Leu Gly Val Asn Asn Leu Pro Tyr Asn
                165                 170                 175

Trp Lys Asn Phe Tyr Pro Ser Tyr Tyr Asn Thr Asp His Pro Leu Ser
            180                 185                 190

Ile Asn Val Ser Gly Val Pro His Ser Val Phe Ile Ala Ser Ala Pro
        195                 200                 205

Gln Gln Leu Cys Thr Met Glu Arg Thr Asn Asp Leu Thr Ala Leu Leu
    210                 215                 220

Ser Cys Ile Arg Asn Ala Ser Lys Phe Val Tyr Val Ser Val Met Asn
225                 230                 235                 240

Phe Ile Pro Ile Ile Tyr Ser Lys Ala Gly Lys Ile Leu Phe Trp Pro
                245                 250                 255

Tyr Ile Glu Asp Glu Leu Arg Arg Ser Ala Ile Asp Arg Gln Val Ser
            260                 265                 270

Val Lys Leu Leu Ile Ser Cys Trp Gln Arg Ser Ser Phe Ile Met Arg
        275                 280                 285
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Asn Phe Leu Arg Ser Ile Ala Met Leu Lys Ser Lys Asn Ile Asp Ile
    290                 295                 300

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

Ser Arg Val Asn His Ala Lys Tyr Met Val Thr Asp Lys Thr Ala Tyr
                325                 330                 335

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

Ala Ser Ile Asn Ile Thr Pro Asp Asp Gly Leu Gly Leu Arg Gln Gln
        355                 360                 365

Leu Glu Asp Ile Phe Met Arg Asp Trp Asn Ser Lys Tyr Ser Tyr Glu
    370                 375                 380

Leu Tyr Asp Thr Ser Pro Thr Lys Arg Cys Lys Leu Leu Lys Asn Met
385                 390                 395                 400

Lys Gln Cys Thr Asn Asp Ile Tyr Cys Asp Glu Ile Gln Pro Glu Lys
                405                 410                 415

Glu Ile Pro Glu Tyr Ser Leu Glu
            420


<210> 35
<211> 135
<212> PRT
<213> Vaccinia virus

<400> 35
Met Gly Ala Thr Ile Ser Ile Leu Ala Ser Tyr Asp Asn Pro Asn Leu
1               5                   10                  15

Phe Thr Ala Met Ile Leu Met Ser Pro Leu Val Asn Ala Asp Ala Val
            20                  25                  30

Ser Arg Leu Asn Leu Leu Ala Ala Lys Leu Met Gly Thr Ile Thr Pro
        35                  40                  45
```

Asn Ala Pro Val Gly Lys Leu Cys Pro Glu Ser Val Ser Arg Asp Met
50 55 60

Asp Lys Val Tyr Lys Tyr Gln Tyr Asp Pro Leu Ile Asn His Glu Lys
65 70 75 80

Ile Lys Ala Gly Phe Ala Ser Gln Val Leu Lys Ala Thr Asn Lys Val
85 90 95

Arg Lys Ile Ile Ser Lys Ile Asn Thr Pro Arg Leu Ser Tyr Ser Arg
100 105 110

Glu Gln Thr Met Arg Leu Val Met Phe Gln Val His Ile Ile Ser Cys
115 120 125

Asn Met Gln Ile Val Ile Glu
130 135

<210> 36
<211> 81
<212> PRT
<213> Vaccinia virus

<400> 36
Met Ser Ala Asn Cys Met Phe Asn Leu Asp Asn Asp Tyr Ile Tyr Trp
1 5 10 15

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

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

Leu Gly Ile Leu Val Phe Ser His Asp His Ile Gly His Gly Arg Ser
50 55 60

Asn Gly Glu Lys Met Met Ile Asp Asp Phe Gly Thr Ala Arg Gly Asn
65 70 75 80

Tyr

<210> 37
<211> 149
<212> PRT
<213> Vaccinia virus

<400> 37
Met Ala Thr Lys Leu Asp Tyr Glu Asp Ala Val Phe Tyr Phe Val Asp
1   5   10   15

Asp Asp Lys Ile Cys Ser Arg Asp Ser Ile Ile Asp Leu Ile Asp Glu
            20   25   30

Tyr Ile Thr Trp Arg Asn His Val Ile Val Phe Asn Lys Asp Ile Thr
        35   40   45

Ser Cys Gly Arg Leu Tyr Lys Glu Leu Met Lys Phe Asp Asp Val Ala
    50   55   60

Ile Arg Tyr Tyr Gly Ile Asp Lys Ile Asn Glu Ile Val Glu Ala Met
65   70   75   80

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

Ser Leu Phe Ala Thr Ile Gly Ile Cys Ala Lys Ile Thr Glu His Trp
            100   105   110

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

Thr Asp Leu Met Thr Asp Asp Asn Ile Asn Ile Leu Ile Leu Phe Leu
    130   135   140

Glu Lys Lys Leu Asn
145

<210> 38
<211> 226
<212> PRT
<213> Vaccinia virus

<400> 38
Met Leu Ser Met Phe Met Cys Asn Asn Ile Val Asp Tyr Val Asp Asp
1   5   10   15

Ile Asp Asn Gly Ile Val Gln Asp Ile Glu Asp Glu Ala Ser Asn Asn
            20   25   30

Val Asp His Asp Tyr Val Tyr Pro Leu Pro Glu Asn Met Val Tyr Arg
        35   40   45

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

His Val Met Met Ala Val Arg Tyr Tyr Met Ser Lys Gln Arg Leu Asp
65   70   75   80

Asp Leu Tyr Arg Gln Leu Pro Thr Lys Thr Arg Ser Tyr Ile Asp Ile
                85   90   95

Ile Asn Ile Tyr Cys Asp Lys Val Ser Asn Asp Tyr Asn Arg Asp Met
            100   105   110

Asn Ile Met Tyr Asp Met Ala Ser Thr Lys Ser Phe Thr Val Tyr Asp
        115   120   125

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

Val Arg Leu Ala Thr Ile Ser Phe Ile Thr Glu Leu Gly Arg Arg Cys
145   150   155   160

Met Asn Pro Val Lys Thr Ile Lys Met Phe Thr Leu Leu Ser His Thr
                165   170   175

Ile Cys Asp Asp Cys Phe Val Asp Tyr Ile Thr Asp Ile Ser Pro Pro
            180   185   190

Asp Asn Thr Ile Pro Asn Thr Ser Thr Arg Glu Tyr Leu Lys Leu Ile
        195   200   205

Gly Ile Thr Ala Ile Met Phe Ala Thr Tyr Lys Thr Leu Lys Tyr Met
210 215 220

Ile Gly
225

<210> 39
<211> 147
<212> PRT
<213> Vaccinia virus

<400> 39
Met Phe Asn Met Asn Ile Asn Ser Pro Val Arg Phe Val Lys Glu Thr
1 5 10 15

Asn Arg Ala Lys Ser Pro Thr Arg Gln Ser Pro Gly Ala Ala Gly Tyr
20 25 30

Asp Leu Tyr Ser Ala Tyr Asp Tyr Thr Ile Pro Pro Gly Glu Arg Gln
35 40 45

Leu Ile Lys Thr Asp Ile Ser Met Ser Met Pro Lys Ile Cys Tyr Gly
50 55 60

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

Gly Gly Val Ile Asp Glu Asp Tyr Arg Gly Asn Ile Gly Val Ile Leu
85 90 95

Ile Asn Asn Gly Lys Cys Thr Phe Asn Val Asn Thr Gly Asp Arg Ile
100 105 110

Ala Gln Leu Ile Tyr Gln Arg Ile Tyr Tyr Pro Glu Leu Glu Glu Val
115 120 125

Gln Ser Leu Asp Ser Thr Asn Arg Gly Asp Gln Gly Phe Gly Ser Thr
130 135 140

Gly Leu Arg
145

<210> 40
<211> 480
<212> PRT
<213> Vaccinia virus

<400> 40
Met Pro Ile Phe Val Asn Thr Val Tyr Cys Lys Asn Ile Leu Ala Leu
1   5   10   15

Ser Met Thr Lys Lys Phe Lys Thr Ile Ile Asp Ala Ile Gly Gly Asn
            20   25   30

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

Thr His Leu Arg Gln Lys Tyr Thr Lys Asn Lys Asp Pro Val Thr Arg
    50   55   60

Val Cys Leu Asp Leu Asp Ile His Ser Leu Thr Ser Ile Val Ile Tyr
65   70   75   80

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

Leu Arg Ala Ser Ile Leu Thr Ser Val Glu Phe Ile Ile Tyr Thr Cys
            100   105   110

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

Tyr Met Met Gly Ile Glu Tyr Gly Leu Ser Asn Leu Leu Cys His Thr
    130   135   140

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

Asp Asn Phe Asp Tyr Leu Ser Met Lys Leu Ile Leu Glu Ser Asp Glu
                165   170   175

Leu Asn Val Pro Asp Glu Asp Tyr Val Val Asp Phe Val Ile Lys Trp
            180   185   190

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Tyr Ile Lys Arg Arg Asn Lys Leu Gly Asn Leu Leu Leu Leu Ile Lys
        195                 200                 205

Asn Val Ile Arg Ser Asn Tyr Leu Ser Pro Arg Gly Ile Asn Asn Val
    210                 215                 220

Lys Trp Ile Leu Asp Cys Thr Lys Ile Phe His Cys Asp Lys Gln Pro
225                 230                 235                 240

Arg Lys Ser Tyr Lys Tyr Pro Phe Ile Glu Tyr Pro Met Asn Met Asp
                245                 250                 255

Gln Ile Ile Asp Ile Phe His Met Cys Thr Ser Thr His Val Gly Glu
            260                 265                 270

Val Val Tyr Leu Ile Gly Gly Trp Met Asn Asn Glu Ile His Asn Asn
        275                 280                 285

Ala Ile Ala Val Asn Tyr Ile Ser Asn Asn Trp Ile Pro Ile Pro Pro
    290                 295                 300

Met Asn Ser Pro Arg Leu Tyr Ala Thr Gly Ile Pro Ala Asn Asn Lys
305                 310                 315                 320

Leu Tyr Val Val Gly Gly Leu Pro Asn Pro Thr Ser Val Glu Arg Trp
                325                 330                 335

Phe His Gly Asp Ala Ala Trp Val Asn Met Pro Ser Leu Leu Lys Pro
            340                 345                 350

Arg Cys Asn Pro Ala Val Ala Ser Ile Asn Asn Val Ile Tyr Val Met
        355                 360                 365

Gly Gly His Ser Glu Thr Asp Thr Thr Thr Glu Tyr Leu Leu Pro Asn
    370                 375                 380

His Asp Gln Trp Gln Phe Gly Pro Ser Thr Tyr Tyr Pro His Tyr Lys
385                 390                 395                 400
```

Ser Cys Ala Leu Val Phe Gly Arg Arg Leu Phe Leu Val Gly Arg Asn
405 410 415

Ala Glu Phe Tyr Cys Glu Ser Ser Asn Thr Trp Thr Leu Ile Asp Asp
420 425 430

Pro Ile Tyr Pro Arg Asp Asn Pro Glu Leu Ile Ile Val Asp Asn Lys
435 440 445

Leu Leu Leu Ile Gly Gly Phe Tyr Arg Gly Ser Tyr Ile Asp Thr Ile
450 455 460

Glu Val Tyr Asn His His Thr Tyr Ser Trp Asn Ile Trp Asp Gly Lys
465 470 475 480

<210> 41
<211> 512
<212> PRT
<213> Vaccinia virus

<400> 41
Met Glu Ser Val Ile Phe Ser Ile Asn Gly Glu Ile Ile Gln Val Asn
1 5 10 15

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

Asp His His Leu Lys Asp Glu Ala Ile Ile Leu Asn Gly Ile Asn Tyr
35 40 45

His Ala Phe Glu Ser Leu Leu Asp Tyr Ile Arg Trp Lys Lys Ile Asn
50 55 60

Ile Thr Ile Asn Asn Val Glu Met Ile Leu Val Ala Ala Ile Ile Ile
65 70 75 80

Asp Val Pro Pro Val Val Asp Leu Cys Val Lys Thr Met Ile His Asn
85 90 95

Ile Asn Ser Thr Asn Cys Ile Arg Met Phe Asn Phe Ser Lys Arg Tyr
100 105 110

```
Gly Ile Lys Lys Leu Tyr Asn Ala Ser Met Ser Glu Ile Ile Asn Asn
        115                 120                 125

Ile Thr Ala Val Thr Ser Asp Pro Glu Phe Gly Lys Leu Ser Lys Asp
    130                 135                 140

Glu Leu Thr Thr Ile Leu Ser His Glu Asn Val Asn Val Asn His Glu
145                 150                 155                 160

Asp Val Thr Ala Met Ile Leu Leu Lys Trp Ile His Lys Asn Pro Asn
                165                 170                 175

Asp Val Asp Ile Ile Asn Ile Leu His Pro Lys Phe Met Thr Asn Thr
            180                 185                 190

Met Arg Asn Ala Ile Ser Leu Leu Gly Leu Thr Ile Ser Lys Ser Thr
        195                 200                 205

Lys Pro Val Thr Arg Asn Gly Ile Lys His Asn Ile Val Val Ile Lys
    210                 215                 220

Asn Ser Asp Tyr Ile Ser Thr Ile Thr His Tyr Ser Pro Arg Thr Glu
225                 230                 235                 240

Tyr Trp Thr Ile Val Gly Asn Thr Asp Arg Gln Phe Tyr Asn Ala Asn
                245                 250                 255

Val Leu His Asn Cys Leu Tyr Ile Ile Gly Gly Met Ile Asn Asn Arg
            260                 265                 270

His Val Tyr Ser Val Ser Arg Val Asp Leu Glu Thr Lys Lys Trp Lys
        275                 280                 285

Thr Val Thr Asn Met Ser Ser Leu Lys Ser Glu Val Ser Thr Cys Val
    290                 295                 300

Asn Asp Gly Lys Leu Tyr Val Ile Gly Gly Leu Glu Phe Ser Ile Ser
305                 310                 315                 320
```

```
Thr Gly Val Ala Glu Tyr Leu Lys His Gly Thr Ser Lys Trp Ile Arg
                325                 330                 335

Leu Pro Asn Leu Ile Thr Pro Arg Tyr Ser Gly Ala Ser Val Phe Val
            340                 345                 350

Asn Asp Asp Ile Tyr Val Met Gly Gly Val Tyr Thr Thr Tyr Glu Lys
        355                 360                 365

Tyr Val Val Leu Asn Asp Val Glu Cys Phe Thr Lys Asn Arg Trp Ile
    370                 375                 380

Lys Lys Ser Pro Met Pro Arg His His Ser Ile Val Tyr Ala Val Glu
385                 390                 395                 400

Tyr Asp Gly Asp Ile Tyr Val Ile Thr Gly Ile Thr His Glu Thr Arg
                405                 410                 415

Asn Tyr Leu Tyr Lys Tyr Ile Val Lys Glu Asp Lys Trp Ile Glu Leu
            420                 425                 430

Tyr Met Tyr Phe Asn His Val Gly Lys Met Phe Val Cys Ser Cys Gly
        435                 440                 445

Asp Tyr Ile Leu Ile Ile Ala Asp Ala Lys Tyr Glu Tyr Tyr Pro Lys
    450                 455                 460

Ser Asn Thr Trp Asn Leu Phe Asp Met Ser Thr Arg Asn Ile Glu Tyr
465                 470                 475                 480

Tyr Asp Met Phe Thr Lys Asp Glu Thr Pro Lys Cys Asn Val Thr His
                485                 490                 495

Lys Ser Leu Pro Ser Phe Leu Ser Asn Cys Glu Lys Gln Phe Leu Gln
            500                 505                 510
```

<210> 42
<211> 229
<212> PRT
<213> Vaccinia virus

<400> 42
Met Val Lys Asn Asn Lys Ile Gln Lys Asn Lys Ile Ser Asn Ser Cys
1   5   10   15

Arg Met Ile Met Ser Thr Asp Pro Asn Asn Ile Leu Met Arg His Leu
            20   25   30

Lys Asn Leu Thr Asp Asp Glu Phe Lys Cys Ile Ile His Arg Ser Ser
        35   40   45

Asp Phe Leu Tyr Leu Ser Asp Ser Asp Tyr Thr Ser Ile Thr Lys Glu
    50   55   60

Thr Leu Val Ser Glu Ile Val Glu Glu Tyr Pro Asp Asp Cys Asn Lys
65   70   75   80

Ile Leu Ala Ile Ile Phe Leu Val Leu Asp Lys Asp Ile Asp Val Asp
                85   90   95

Ile Lys Thr Lys Leu Lys Pro Lys Pro Ala Val Arg Phe Ala Ile Leu
            100   105   110

Asp Lys Met Thr Glu Asp Ile Lys Leu Thr Asp Leu Val Arg His Tyr
        115   120   125

Phe Arg Tyr Ile Glu Gln Asp Ile Pro Leu Gly Pro Leu Phe Lys Lys
    130   135   140

Ile Asp Ser Tyr Arg Thr Arg Ala Ile Asn Lys Tyr Ser Lys Glu Leu
145   150   155   160

Gly Leu Ala Thr Glu Tyr Phe Asn Lys Tyr Gly His Leu Met Phe Tyr
                165   170   175

Thr Leu Pro Ile Pro Tyr Asn Arg Phe Phe Cys Arg Asn Ser Ile Gly
            180   185   190

Phe Leu Ala Val Leu Ser Pro Thr Ile Gly His Val Lys Ala Phe Tyr
        195   200   205

Lys Phe Ile Glu Tyr Val Ser Ile Asp Asp Arg Arg Lys Phe Lys Lys
210 215 220

Glu Leu Met Ser Lys
225

<210> 43
<211> 117
<212> PRT
<213> Vaccinia virus

<400> 43
Met Arg Thr Leu Leu Ile Arg Tyr Ile Leu Trp Arg Asn Asp Asn Asp
1 5 10 15

Gln Thr Tyr Tyr Asn Asp Asn Phe Lys Lys Leu Met Leu Leu Asp Glu
20 25 30

Leu Val Asp Asp Gly Asp Val Cys Thr Leu Ile Lys Asn Met Arg Met
35 40 45

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

Asn Ile Glu Asp Ala Lys Arg Met Ile Ala Ile Ser Ala Lys Val Ala
65 70 75 80

Arg Asp Ile Gly Glu Arg Ser Glu Ile Arg Trp Glu Glu Ser Phe Thr
85 90 95

Ile Leu Phe Arg Met Ile Glu Thr Tyr Phe Asp Asp Leu Met Ile Asp
100 105 110

Leu Tyr Gly Glu Lys
115

<210> 44
<211> 175
<212> PRT
<213> Vaccinia virus

<400> 44

```
Met Thr Ser Ser Ala Met Asp Asn Asn Glu Pro Lys Val Leu Glu Met
1               5                   10                  15

Val Tyr Asp Ala Thr Ile Leu Pro Glu Gly Ser Ser Met Asp Pro Asn
            20                  25                  30

Ile Met Asp Cys Ile Asn Arg His Ile Asn Met Cys Ile Gln Arg Thr
        35                  40                  45

Tyr Ser Ser Ser Ile Ile Ala Ile Leu Asp Arg Phe Leu Met Met Asn
    50                  55                  60

Lys Asp Glu Leu Asn Asn Thr Gln Cys His Ile Ile Lys Glu Phe Met
65                  70                  75                  80

Thr Tyr Glu Gln Met Ala Ile Asp His Tyr Gly Gly Tyr Val Asn Ala
                85                  90                  95

Ile Leu Tyr Gln Ile Arg Lys Arg Pro Asn Gln His His Thr Ile Asp
            100                 105                 110

Leu Phe Lys Arg Ile Lys Arg Thr Arg Tyr Asp Thr Phe Lys Val Asp
        115                 120                 125

Pro Val Glu Phe Val Lys Lys Val Ile Gly Phe Val Ser Ile Leu Asn
    130                 135                 140

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

Asp Glu Phe Lys Cys Phe Ile Asn Tyr Val Glu Thr Lys Tyr Phe
                165                 170                 175


<210> 45
<211> 472
<212> PRT
<213> Vaccinia virus

<400> 45
Met Ile Phe Val Ile Glu Ser Lys Leu Leu Gln Ile Tyr Arg Asn Arg
1               5                   10                  15
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```
Asn Arg Asn Ile Asn Phe Tyr Thr Thr Met Asp Asn Ile Met Ser Ala
            20                  25                  30

Glu Tyr Tyr Leu Ser Leu Tyr Ala Lys Tyr Asn Ser Lys Asn Leu Asp
        35                  40                  45

Val Phe Arg Asn Met Leu Gln Ala Ile Glu Pro Ser Gly Asn Asn Tyr
    50                  55                  60

His Ile Leu His Ala Tyr Cys Gly Ile Lys Gly Leu Asp Glu Arg Phe
65                  70                  75                  80

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

Asp Gly Asn Tyr Pro Leu His Ile Ala Ser Lys Ile Asn Asn Asn Arg
            100                 105                 110

Ile Val Ala Met Leu Leu Thr His Gly Ala Asp Pro Asn Ala Cys Asp
        115                 120                 125

Lys His Asn Lys Thr Pro Leu Tyr Tyr Leu Ser Gly Thr Asp Asp Glu
    130                 135                 140

Val Ile Glu Arg Ile Asn Leu Leu Val Gln Tyr Gly Ala Lys Ile Asn
145                 150                 155                 160

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

Pro Ser Glu Arg Val Phe Lys Lys Ile Met Ser Ile Gly Phe Glu Ala
            180                 185                 190

Arg Ile Val Asp Lys Phe Gly Lys Asn His Ile His Arg His Leu Met
        195                 200                 205

Ser Asp Asn Pro Lys Ala Ser Thr Ile Ser Trp Met Met Lys Leu Gly
    210                 215                 220
```

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

Val Cys Ser Lys Thr Val Lys Asn Val Asp Ile Ile Asp Leu Leu Leu
                245                 250                 255

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

Thr Leu Leu Ile Lys Thr Leu Ser Pro Ala His Leu Ile Asn Lys Leu
        275                 280                 285

Leu Ser Thr Ser Asn Val Ile Thr Asp Gln Thr Val Asn Ile Cys Ile
    290                 295                 300

Phe Tyr Asp Arg Asp Asp Val Leu Glu Ile Ile Asn Asp Lys Gly Lys
305                 310                 315                 320

Gln Tyr Asp Ser Thr Asp Phe Lys Met Ala Val Glu Val Gly Ser Ile
                325                 330                 335

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

Met Tyr Tyr Ala Val Leu Ser Glu Tyr Glu Thr Met Val Asp Tyr Leu
        355                 360                 365

Leu Phe Asn His Phe Ser Val Asp Phe Val Val Asn Gly His Thr Cys
    370                 375                 380

Met Ser Glu Cys Val Arg Leu Asn Asn Pro Val Ile Leu Ser Lys Leu
385                 390                 395                 400

Met Leu His Asn Pro Thr Ser Glu Thr Met Tyr Leu Thr Met Lys Ala
                405                 410                 415

Ile Glu Lys Asp Arg Leu Asp Lys Ser Ile Ile Ile Pro Phe Ile Ala
            420                 425                 430

Tyr Phe Val Leu Met His Pro Asp Phe Cys Lys Asn Arg Arg Tyr Phe
```

```
        435                 440                 445

Thr Ser Tyr Lys Arg Phe Val Thr Asp Tyr Val His Glu Gly Val Ser
    450                 455                 460

Tyr Glu Val Phe Asp Asp Tyr Phe
465                 470
```

<210> 46
<211> 220
<212> PRT
<213> Vaccinia virus

<400> 46

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

Ser Val Glu Tyr Lys Asn Thr Ile Cys Pro Pro Arg Gln Asp Tyr Arg
            20                  25                  30

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

Asn Ser Thr Ile Ile Gly Glu Cys His Met Ser Glu Ser Tyr Ile Asp
    50                  55                  60

Arg Asn Ala Asn Ile Val Leu Thr Gly Tyr Gly Leu Glu Ile Asn Met
65                  70                  75                  80

Thr Ile Met Asp Thr Asp Gln Arg Phe Val Ala Ala Ala Glu Gly Val
                85                  90                  95

Gly Lys Asp Asn Lys Leu Ser Val Leu Leu Phe Thr Thr Gln Arg Leu
            100                 105                 110

Asp Lys Val His His Asn Ile Ser Val Thr Ile Thr Cys Met Glu Met
        115                 120                 125

Asn Cys Gly Thr Thr Lys Tyr Asp Ser Asp Leu Pro Glu Ser Ile His
    130                 135                 140
```

```
Lys Ser Ser Ser Cys Asp Ile Thr Ile Asn Gly Ser Cys Val Thr Cys
145                 150                 155                 160


Val Asn Leu Glu Thr Asp Pro Thr Lys Ile Asn Pro His Tyr Leu His
                165                 170                 175


Pro Lys Asp Lys Tyr Leu Tyr His Asn Ser Glu Tyr Ser Met Arg Gly
            180                 185                 190


Ser Tyr Gly Val Thr Phe Ile Asp Glu Leu Asn Gln Cys Leu Leu Asp
        195                 200                 205


Ile Lys Glu Leu Ser Tyr Asp Ile Cys Tyr Arg Glu
    210                 215                 220


<210> 47
<211> 284
<212> PRT
<213> Vaccinia virus

<400> 47
Met Asp Leu Ser Arg Ile Asn Thr Trp Lys Ser Lys Gln Leu Lys Ser
1               5                   10                  15


Phe Leu Ser Ser Lys Asp Ala Phe Lys Ala Asp Val His Gly His Ser
            20                  25                  30


Ala Leu Tyr Tyr Ala Ile Ala Asp Asn Asn Val Arg Leu Val Cys Thr
        35                  40                  45


Leu Leu Asn Ala Gly Ala Leu Lys Asn Leu Leu Glu Asn Glu Phe Pro
    50                  55                  60


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


Leu Phe Ser Gly Leu Asp Asp Ser Gln Phe Asp Asp Lys Gly Asn Thr
                85                  90                  95


Ala Leu Tyr Tyr Ala Val Asp Ser Gly Asn Met Gln Thr Val Lys Leu
            100                 105                 110
```

```
Phe Val Lys Lys Asn Trp Arg Leu Met Phe Tyr Gly Lys Thr Gly Trp
        115                 120                 125

Lys Thr Ser Phe Tyr His Ala Val Met Leu Asn Asp Val Ser Ile Val
    130                 135                 140

Ser Tyr Phe Leu Ser Glu Ile Pro Ser Thr Phe Asp Leu Ala Ile Leu
145                 150                 155                 160

Leu Ser Cys Ile His Ile Thr Ile Lys Asn Gly His Val Asp Met Met
                165                 170                 175

Ile Leu Leu Leu Asp Tyr Met Thr Ser Thr Asn Thr Asn Asn Ser Leu
            180                 185                 190

Leu Phe Ile Pro Asp Ile Lys Leu Ala Ile Asp Asn Lys Asp Ile Glu
        195                 200                 205

Met Leu Gln Ala Leu Phe Lys Tyr Asp Ile Asn Ile Tyr Ser Ala Asn
    210                 215                 220

Leu Glu Asn Val Leu Leu Asp Asp Ala Glu Ile Ala Lys Met Ile Ile
225                 230                 235                 240

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

Ile Val Lys Asn Asn Lys Leu Asp Glu Ile Ile Ser Lys Asn Lys Glu
            260                 265                 270

Leu Arg Leu Met Tyr Val Asn Cys Val Lys Lys Asn
        275                 280


<210> 48
<211> 369
<212> PRT
<213> Vaccinia virus

<400> 48
Met Ile Ala Leu Leu Ile Leu Ser Leu Thr Cys Ser Val Ser Thr Tyr
1               5                   10                  15
```

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

Gln Asp Asp Asn Ile Val Phe Ser Pro Phe Gly Tyr Ser Phe Ser Met
        35                  40                  45

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

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

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

Asp Leu Thr Tyr Gln Ser Phe Val Asp Asn Thr Val Cys Ile Lys Pro
            100                 105                 110

Ser Tyr Tyr Gln Gln Tyr His Arg Phe Gly Leu Tyr Arg Leu Asn Phe
        115                 120                 125

Arg Arg Asp Ala Val Asn Lys Ile Asn Ser Ile Val Glu Arg Arg Ser
    130                 135                 140

Gly Met Ser Asn Val Val Asp Ser Asn Met Leu Asp Asn Asn Thr Leu
145                 150                 155                 160

Trp Ala Ile Ile Asn Thr Ile Tyr Phe Lys Gly Ile Trp Gln Tyr Pro
                165                 170                 175

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

Thr Lys Thr Val Pro Met Met Asn Val Val Thr Lys Leu Gln Gly Asn
        195                 200                 205

Thr Ile Thr Ile Asp Asp Glu Glu Tyr Asp Met Val Arg Leu Pro Tyr
    210                 215                 220
```

```
Lys Asp Ala Asn Ile Ser Met Tyr Leu Ala Ile Gly Asp Asn Met Thr
225                 230                 235                 240


His Phe Thr Asp Ser Ile Thr Ala Ala Lys Leu Asp Tyr Trp Ser Phe
                245                 250                 255


Gln Leu Gly Asn Lys Val Tyr Asn Leu Lys Leu Pro Lys Phe Ser Ile
            260                 265                 270


Glu Asn Lys Arg Asp Ile Lys Ser Ile Ala Glu Met Met Ala Pro Ser
        275                 280                 285


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


Leu Tyr Ile Tyr Lys Met Phe Gln Asn Ala Lys Ile Asp Val Asp Glu
305                 310                 315                 320


Gln Gly Thr Val Ala Glu Ala Ser Thr Ile Met Val Ala Thr Ala Arg
                325                 330                 335


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


Arg His Asp Ile Thr Gly Phe Ile Leu Phe Met Gly Lys Val Glu Ser
        355                 360                 365


Pro
```

<210> 49
<211> 88
<212> PRT
<213> Vaccinia virus

```
<400> 49
Met Leu Ala Phe Cys Tyr Ser Leu Pro Asn Ala Gly Asp Val Ile Lys
1               5                   10                  15


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

```
Tyr Pro His Phe Glu Ala Ile Leu Ala Glu Ser Val Lys Met His Met
        35                  40                  45


Asp Arg Tyr Val Glu Tyr Arg Asp Lys Leu Val Gly Lys Thr Val Lys
    50                  55                  60


Val Lys Val Ile Arg Val Asp Tyr Thr Lys Gly Tyr Ile Asp Val Asn
65                  70                  75                  80


Tyr Lys Arg Met Cys Arg His Gln
                85


<210> 50
<211> 424
<212> PRT
<213> Vaccinia virus

<400> 50
Met Asn Pro Asp Asn Thr Ile Ala Val Ile Thr Glu Thr Ile Pro Ile
1               5                   10                  15


Gly Met Gln Phe Asp Lys Val Tyr Leu Ser Thr Phe Asn Met Trp Arg
            20                  25                  30


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


Trp Ser Leu Ser Asp Glu Val Gly Thr Asn Phe Gly Thr Ile Ile Leu
    50                  55                  60


Asn Lys Ile Val Gln Leu Pro Lys Arg Gly Val Arg Val Arg Val Ala
65                  70                  75                  80


Val Asn Lys Ser Asn Lys Pro Leu Lys Asp Val Glu Arg Leu Gln Met
                85                  90                  95


Ala Gly Val Glu Val Arg Tyr Ile Asp Ile Thr Asn Ile Leu Gly Gly
            100                 105                 110


Val Leu His Thr Lys Phe Trp Ile Ser Asp Asn Thr His Ile Tyr Leu
```

```
        115                 120                 125

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

Gly Ile Ala Ile Phe Asn Asn Arg Asn Leu Ala Ala Asp Leu Thr Gln
145                 150                 155                 160

Ile Phe Glu Val Tyr Trp Tyr Leu Gly Val Asn Asn Leu Pro Tyr Asn
                165                 170                 175

Trp Lys Asn Phe Tyr Pro Ser Tyr Tyr Asn Thr Asp His Pro Leu Ser
            180                 185                 190

Ile Asn Val Ser Gly Val Pro His Ser Val Phe Ile Ala Ser Ala Pro
        195                 200                 205

Gln Gln Leu Cys Thr Met Glu Arg Thr Asn Asp Leu Thr Ala Leu Leu
    210                 215                 220

Ser Cys Ile Arg Asn Ala Ser Lys Phe Val Tyr Val Ser Val Met Asn
225                 230                 235                 240

Phe Ile Pro Ile Ile Tyr Ser Lys Ala Gly Asn Ile Leu Phe Trp Pro
                245                 250                 255

Tyr Ile Glu Asp Glu Leu Arg Arg Ala Ala Ile Asp Arg Gln Val Ser
            260                 265                 270

Val Lys Leu Leu Ile Ser Cys Trp Gln Arg Ser Ser Phe Ile Met Arg
        275                 280                 285

Asn Phe Leu Arg Ser Ile Ala Met Leu Lys Ser Lys Asn Ile Asn Ile
    290                 295                 300

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

Ser Arg Val Asn His Ala Lys Tyr Met Val Thr Asp Lys Thr Ala Tyr
                325                 330                 335
```

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

Ala Ser Ile Asn Ile Thr Pro Asp Asp Gly Leu Gly Leu Arg Gln Gln
        355                 360                 365

Leu Glu Asp Ile Phe Met Arg Asp Trp Asn Ser Lys Tyr Ser Tyr Glu
    370                 375                 380

Leu Tyr Asp Thr Ser Pro Thr Lys Arg Cys Arg Leu Leu Lys Asn Met
385                 390                 395                 400

Lys Gln Cys Thr Asn Asp Ile Tyr Cys Asp Glu Ile Gln Pro Glu Lys
                405                 410                 415

Glu Ile Pro Glu Tyr Ser Leu Glu
            420
```

<210> 51
<211> 44
<212> PRT
<213> Vaccinia virus

<400> 51

```
Met Gln His Ala Asn Cys Asn Arg Glu Ile Lys Ile Tyr Glu Gly Ala
1               5                   10                  15

Lys His His Leu His Lys Glu Thr Asp Glu Val Lys Lys Ser Val Met
            20                  25                  30

Lys Glu Ile Glu Thr Trp Ile Phe Asn Arg Val Lys
        35                  40
```

<210> 52
<211> 134
<212> PRT
<213> Vaccinia virus

<400> 52

```
Met Thr Leu Val Gln His Val Val Thr Ile Lys Ser Thr Tyr Trp Val
1               5                   10                  15
```

Ile Pro Trp Glu Leu Ala Ser Tyr Asp Asn Pro Asn Leu Phe Thr Ala
            20   25   30

Met Ile Leu Met Ser Pro Leu Val Asn Ala Asp Ala Val Ser Lys Leu
        35   40   45

Asn Leu Leu Ala Ala Lys Leu Met Gly Thr Ile Thr Leu Asn Ala Pro
    50   55   60

Val Gly Lys Leu Cys Pro Glu Ser Val Ser Arg Asp Met Asp Lys Val
65   70   75   80

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

Gly Phe Ala Ser Gln Val Leu Lys Ala Thr Asn Lys Val Arg Lys Ile
            100   105   110

Ile Ser Lys Ile Asn Thr Pro Arg Leu Ser Tyr Ser Arg Glu Gln Thr
        115   120   125

Ile Arg Leu Ala Met Phe
    130

<210> 53
<211> 81
<212> PRT
<213> Vaccinia virus

<400> 53
Met Ser Ala Asn Cys Met Phe Asn Leu Asp Asn Asp Tyr Ile Tyr Trp
1   5   10   15

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

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

Leu Gly Ile Leu Val Phe Ser His Asp His Ile Gly His Gly Arg Ser
    50   55   60

Asn Gly Glu Lys Met Met Ile Asp Asp Phe Gly Thr Ala Arg Gly Asn
65 70 75 80

Tyr

<210> 54
<211> 149
<212> PRT
<213> Vaccinia virus

<400> 54
Met Ala Thr Lys Leu Asp Tyr Glu Asp Ala Val Phe Tyr Phe Val Asp
1 5 10 15

Asp Asp Lys Ile Cys Ser Arg Asp Ser Ile Ile Asp Leu Ile Asp Glu
20 25 30

Tyr Ile Thr Trp Arg Asn His Val Ile Val Phe Asn Lys Asp Ile Thr
35 40 45

Ser Cys Gly Arg Leu Tyr Lys Glu Leu Met Lys Phe Asp Asp Val Ala
50 55 60

Ile Arg Tyr Tyr Gly Ile Asp Lys Ile Asn Glu Ile Val Glu Ala Met
65 70 75 80

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

Ser Leu Phe Ala Thr Ile Gly Ile Cys Ala Lys Ile Thr Glu His Trp
100 105 110

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

Thr Asp Leu Met Thr Asp Asp Asn Ile Asn Ile Leu Ile Leu Phe Leu
130 135 140

Glu Lys Lys Leu Asn

145

<210> 55
<211> 226
<212> PRT
<213> Vaccinia virus

<400> 55
Met Leu Ser Met Phe Met Cys Asn Asn Ile Val Asp Tyr Val Asp Asp
1   5   10   15

Ile Asp Asn Gly Ile Val Gln Asp Ile Glu Asp Glu Ala Ser Asn Asn
            20   25   30

Val Asp His Asp Tyr Val Tyr Pro Leu Pro Glu Asn Met Val Tyr Arg
        35   40   45

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

His Val Met Met Ala Val Arg Tyr Tyr Met Ser Lys Gln Arg Leu Asp
65   70   75   80

Asp Leu Tyr Arg Gln Leu Pro Thr Lys Thr Arg Ser Tyr Ile Asp Ile
                85   90   95

Ile Asn Ile Tyr Cys Asp Lys Val Ser Asn Asp Tyr Asn Arg Asp Met
            100   105   110

Asn Ile Met Tyr Asp Met Ala Ser Thr Lys Ser Phe Thr Val Tyr Asp
        115   120   125

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

Val Arg Leu Ala Thr Ile Ser Phe Ile Thr Glu Leu Gly Arg Arg Cys
145   150   155   160

Met Asn Pro Val Glu Thr Ile Lys Met Phe Thr Leu Leu Ser His Thr
                165   170   175

Ile Cys Asp Asp Tyr Phe Val Asp Tyr Ile Thr Asp Ile Ser Pro Pro
180 185 190

Asp Asn Thr Ile Pro Asn Thr Ser Thr Arg Glu Tyr Leu Lys Leu Ile
195 200 205

Gly Ile Thr Ala Ile Met Phe Ala Thr Tyr Lys Thr Leu Lys Tyr Met
210 215 220

Ile Gly
225

<210> 56
<211> 147
<212> PRT
<213> Vaccinia virus

<400> 56
Met Phe Asn Met Asn Ile Asn Ser Pro Val Arg Phe Val Lys Glu Thr
1 5 10 15

Asn Arg Ala Lys Ser Pro Thr Arg Gln Ser Pro Tyr Ala Ala Gly Tyr
20 25 30

Asp Leu Tyr Ser Ala Tyr Asp Tyr Thr Ile Pro Pro Gly Glu Arg Gln
35 40 45

Leu Ile Lys Thr Asp Ile Ser Met Ser Met Pro Lys Phe Cys Tyr Gly
50 55 60

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

Gly Gly Val Ile Asp Glu Asp Tyr Arg Gly Asn Ile Gly Val Ile Leu
85 90 95

Ile Asn Asn Gly Lys Cys Thr Phe Asn Val Asn Thr Gly Asp Arg Ile
100 105 110

Ala Gln Leu Ile Tyr Gln Arg Ile Tyr Tyr Pro Glu Leu Glu Glu Val
115 120 125

Gln Ser Leu Asp Ser Thr Asn Arg Gly Asp Gln Gly Phe Gly Ser Thr
130 135 140

Gly Leu Arg
145

<210> 57
<211> 480
<212> PRT
<213> Vaccinia virus

<400> 57
Met Pro Ile Phe Val Asn Thr Val Tyr Cys Lys Asn Ile Leu Ala Leu
1 5 10 15

Ser Met Thr Lys Lys Phe Lys Thr Ile Ile Asp Ala Ile Gly Gly Asn
20 25 30

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

Thr His Leu Arg Gln Lys Tyr Thr Lys Asn Lys Asp Pro Val Thr Trp
50 55 60

Val Cys Leu Asp Leu Asp Ile His Ser Leu Thr Ser Ile Val Ile Tyr
65 70 75 80

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

Leu Arg Ala Ser Ile Leu Thr Ser Val Glu Phe Ile Ile Tyr Thr Cys
100 105 110

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

Tyr Met Met Gly Ile Glu Tyr Gly Leu Ser Asn Leu Leu Cys His Thr
130 135 140

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

```
Asp Asn Phe Asp Tyr Leu Ser Met Lys Leu Ile Leu Glu Ser Asp Glu
                165                 170                 175

Leu Asn Val Pro Asp Glu Asp Tyr Val Val Asp Phe Val Ile Lys Trp
            180                 185                 190

Tyr Ile Lys Arg Arg Asn Lys Leu Gly Asn Leu Leu Leu Leu Ile Lys
        195                 200                 205

Asn Val Ile Arg Ser Asn Tyr Leu Ser Pro Arg Gly Ile Asn Asn Val
    210                 215                 220

Lys Trp Ile Leu Asp Cys Thr Lys Ile Phe His Cys Asp Lys Gln Pro
225                 230                 235                 240

Arg Lys Ser Tyr Lys Tyr Pro Phe Ile Glu Tyr Pro Met Asn Met Asp
                245                 250                 255

Gln Ile Ile Asp Ile Phe His Met Cys Thr Ser Thr His Val Gly Glu
            260                 265                 270

Val Val Tyr Leu Ile Gly Gly Trp Met Asn Asn Glu Ile His Asn Asn
        275                 280                 285

Ala Ile Ala Val Asn Tyr Ile Ser Asn Asn Trp Ile Pro Ile Pro Pro
    290                 295                 300

Met Asn Ser Pro Arg Leu Tyr Ala Ser Gly Ile Pro Ala Asn Asn Lys
305                 310                 315                 320

Leu Tyr Val Val Gly Gly Leu Pro Asn Pro Thr Ser Val Glu Arg Trp
                325                 330                 335

Phe His Gly Asp Ala Ala Trp Val Asn Met Pro Ser Leu Leu Lys Pro
            340                 345                 350

Arg Cys Asn Pro Ala Val Ala Ser Ile Asn Asn Val Ile Tyr Val Met
        355                 360                 365
```

Gly Gly His Ser Glu Thr Asp Thr Thr Thr Glu Tyr Leu Leu Pro Asn
370 375 380

His Asp Gln Trp Gln Phe Gly Pro Ser Thr Tyr Tyr Pro His Tyr Lys
385 390 395 400

Ser Cys Ala Leu Val Phe Gly Arg Arg Leu Phe Leu Val Gly Arg Asn
405 410 415

Ala Glu Phe Tyr Cys Glu Ser Ser Asn Thr Trp Thr Leu Ile Asp Asp
420 425 430

Pro Ile Tyr Pro Arg Asp Asn Pro Glu Leu Ile Ile Val Asp Asn Lys
435 440 445

Leu Leu Leu Ile Gly Gly Phe Tyr Arg Glu Ser Tyr Ile Asp Thr Ile
450 455 460

Glu Val Tyr Asn His His Thr Tyr Ser Trp Asn Ile Trp Asp Gly Lys
465 470 475 480

<210> 58
<211> 512
<212> PRT
<213> Vaccinia virus

<400> 58
Met Glu Ser Val Ile Phe Ser Ile Asn Gly Glu Ile Ile Gln Val Asn
1 5 10 15

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

Asp His His Leu Lys Asp Glu Ala Ile Ile Leu Asn Gly Ile Asn Tyr
35 40 45

His Ala Phe Glu Ser Leu Leu Asp Tyr Ile Arg Trp Lys Lys Ile Asn
50 55 60

Ile Thr Ile Asn Asn Val Glu Met Ile Leu Val Ala Ala Ile Ile Ile
65 70 75 80

```
Asp Val Pro Pro Val Val Asp Leu Cys Val Lys Thr Met Ile His Asn
                85                  90                  95

Ile Asn Ser Thr Asn Cys Ile Arg Met Phe Asn Phe Ser Lys Gln Tyr
            100                 105                 110

Gly Ile Lys Lys Leu Tyr Asn Ala Ser Met Ser Glu Ile Ile Asn Asn
        115                 120                 125

Ile Thr Ala Val Thr Ser Asp Pro Glu Phe Gly Lys Leu Ser Lys Asp
    130                 135                 140

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

Asp Val Thr Ala Met Ile Leu Leu Lys Trp Ile His Lys Asn Pro Asn
                165                 170                 175

Asp Val Asp Ile Ile Asn Ile Leu His Pro Lys Phe Met Thr Asn Thr
            180                 185                 190

Met Arg Asn Ala Ile Ser Leu Leu Gly Leu Thr Ile Ser Lys Ser Thr
        195                 200                 205

Lys Pro Val Thr Arg Asn Gly Ile Lys His Asn Ile Val Val Ile Lys
    210                 215                 220

Asn Ser Asp Tyr Ile Ser Thr Ile Thr His Tyr Ser Pro Arg Thr Glu
225                 230                 235                 240

Tyr Trp Thr Ile Val Gly Asn Thr Asp Arg Gln Phe Tyr Asn Ala Asn
                245                 250                 255

Val Leu His Asn Cys Leu Tyr Ile Ile Gly Gly Met Ile Asn Asn Arg
            260                 265                 270

His Val Tyr Ser Val Ser Arg Val Asp Leu Glu Thr Lys Lys Trp Lys
        275                 280                 285
```

```
Thr Val Thr Asn Met Ser Ser Leu Lys Ser Glu Val Ser Thr Cys Val
    290                 295                 300

Asn Asn Gly Lys Leu Tyr Val Ile Gly Gly Leu Glu Phe Ser Ile Ser
305                 310                 315                 320

Thr Gly Val Ala Glu Tyr Leu Lys His Gly Thr Ser Lys Trp Ile Arg
                325                 330                 335

Leu Pro Asn Leu Ile Thr Pro Arg Tyr Ser Gly Ala Ser Val Phe Val
            340                 345                 350

Asn Asp Asp Ile Tyr Val Met Gly Gly Val Tyr Thr Thr Tyr Glu Lys
        355                 360                 365

Tyr Val Val Leu Asn Asp Val Glu Cys Phe Thr Lys Asn Arg Trp Ile
    370                 375                 380

Lys Lys Ser Pro Met Pro Arg His His Ser Ile Val Tyr Ala Val Glu
385                 390                 395                 400

Tyr Asp Gly Asp Ile Tyr Val Ile Thr Gly Ile Thr His Glu Thr Arg
                405                 410                 415

Asn Tyr Leu Tyr Lys Tyr Ile Val Lys Glu Asp Lys Trp Ile Glu Leu
            420                 425                 430

Tyr Met Tyr Phe Asn His Val Gly Lys Met Phe Val Cys Ser Cys Gly
        435                 440                 445

Asp Tyr Ile Leu Ile Ile Ala Asp Ala Lys Tyr Glu Tyr Tyr Pro Lys
    450                 455                 460

Ser Asn Thr Trp Asn Leu Phe Asp Met Ser Thr Arg Asn Ile Glu Tyr
465                 470                 475                 480

Tyr Asp Met Phe Thr Lys Asp Glu Thr Pro Lys Cys Asn Val Thr His
                485                 490                 495
```

Lys Ser Leu Pro Ser Phe Leu Ser Asn Cys Glu Lys Gln Phe Leu Gln
500 505 510

<210> 59
<211> 224
<212> PRT
<213> Vaccinia virus

<400> 59
Met Val Lys Asn Asn Lys Ile Ser Asn Ser Cys Arg Met Ile Met Ser
1 5 10 15

Thr Asp Pro Asn Asn Ile Leu Met Arg His Leu Lys Asn Leu Thr Asp
20 25 30

Asp Glu Phe Lys Cys Ile Ile His Arg Ser Ser Asp Phe Leu Tyr Leu
35 40 45

Ser Asp Ser Asp Tyr Thr Ser Ile Thr Lys Glu Thr Leu Val Ser Glu
50 55 60

Ile Val Glu Glu Tyr Pro Asp Asp Cys Asn Lys Ile Leu Ala Ile Ile
65 70 75 80

Phe Leu Val Leu Asp Lys Asp Ile Asp Val Asp Ile Lys Thr Lys Leu
85 90 95

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

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

Gln Asp Ile Pro Leu Gly Pro Leu Phe Lys Lys Ile Asp Ser Tyr Arg
130 135 140

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

Tyr Phe Asn Lys Tyr Gly His Leu Met Phe Tyr Thr Leu Pro Ile Pro
165 170 175

```
Tyr Asn Arg Phe Phe Cys Arg Asn Ser Ile Gly Phe Leu Ala Val Leu
            180                 185                 190


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


Val Ser Ile Asp Asp Arg Arg Lys Phe Lys Lys Glu Leu Met Ser Lys
    210                 215                 220


<210> 60
<211> 117
<212> PRT
<213> Vaccinia virus

<400> 60
Met Arg Thr Leu Leu Ile Arg Tyr Ile Leu Trp Arg Asn Asp Asn Asp
1               5                   10                  15


Gln Thr Tyr Tyr Asn Asp Asp Phe Lys Lys Leu Met Leu Leu Asp Glu
            20                  25                  30


Leu Val Asp Asp Gly Asp Val Cys Thr Leu Ile Lys Asn Met Arg Met
        35                  40                  45


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


Asn Ile Glu Asp Ala Lys Arg Met Ile Ala Ile Ser Ala Lys Val Ala
65                  70                  75                  80


Arg Asp Ile Gly Glu Arg Ser Glu Ile Arg Trp Glu Glu Ser Phe Thr
                85                  90                  95


Ile Leu Phe Arg Met Ile Glu Thr Tyr Phe Asp Asp Leu Met Ile Asp
            100                 105                 110


Leu Tyr Gly Glu Lys
        115


<210> 61
<211> 79
```

<212> PRT
<213> Vaccinia virus

<400> 61
Met Thr Ser Ser Ala Met Asp Asn Asn Glu Pro Lys Val Leu Glu Met
1   5   10   15

Val Tyr Asp Ala Thr Ile Leu Pro Glu Gly Ser Ser Met Asp Pro Tyr
            20   25   30

Ile Met Asp Cys Ile Asn Arg His Ile Asn Met Cys Ile Gln Arg Thr
        35   40   45

Tyr Ser Ser Ser Ile Ile Ala Ile Leu Asp Arg Phe Leu Met Met Asn
    50   55   60

Lys Asp Glu Leu Asn Asn Thr Gln Cys His Ile Ile Lys Asn Leu
65   70   75

<210> 62
<211> 472
<212> PRT
<213> Vaccinia virus

<400> 62
Met Ile Phe Val Ile Glu Ser Lys Leu Leu Gln Ile Tyr Arg Asn Arg
1   5   10   15

Asn Arg Asn Ile Asn Phe Tyr Thr Thr Met Asp Asn Ile Met Ser Ala
            20   25   30

Glu Tyr Tyr Leu Ser Leu Tyr Ala Lys Tyr Asn Ser Lys Asn Leu Asp
        35   40   45

Val Phe Arg Asn Met Leu Gln Ala Ile Glu Pro Ser Gly Asn Asn Tyr
    50   55   60

His Ile Leu His Ala Tyr Cys Gly Ile Lys Gly Leu Asp Glu Arg Phe
65   70   75   80

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

```
Asp Gly Asn Tyr Pro Leu His Ile Ala Ser Lys Ile Asn Asn Asn Arg
            100                 105                 110

Ile Val Ala Met Leu Leu Thr His Gly Ala Asp Pro Asn Ala Cys Asp
        115                 120                 125

Lys His Asn Lys Thr Pro Leu Tyr Tyr Leu Ser Gly Thr Asp Asp Glu
    130                 135                 140

Val Ile Glu Arg Ile Asn Leu Leu Val Gln Tyr Gly Ala Lys Ile Asn
145                 150                 155                 160

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

Pro Ser Glu Arg Val Phe Lys Lys Ile Met Ser Ile Gly Phe Glu Ala
            180                 185                 190

Arg Ile Val Asp Lys Phe Gly Lys Asn His Ile His Arg His Leu Met
        195                 200                 205

Ser Asp Asn Pro Lys Ala Ser Thr Ile Ser Trp Met Met Lys Leu Gly
    210                 215                 220

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

Val Cys Ser Lys Thr Val Lys Asn Val Asp Ile Ile Asp Leu Leu Leu
                245                 250                 255

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

Thr Leu Leu Ile Lys Thr Leu Ser Pro Ala His Leu Ile Asn Lys Leu
        275                 280                 285

Leu Ser Thr Ser Asn Val Ile Thr Asp Gln Thr Val Asn Ile Cys Ile
    290                 295                 300
```

```
Phe Tyr Asp Arg Asp Asp Val Leu Glu Ile Ile Asn Asp Lys Gly Lys
305                 310                 315                 320

Gln Tyr Asp Ser Thr Asp Phe Lys Met Ala Val Glu Val Gly Ser Ile
                325                 330                 335

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

Met Tyr Tyr Ala Val Leu Ser Glu Tyr Glu Thr Met Val Asp Tyr Leu
        355                 360                 365

Leu Phe Asn His Phe Ser Val Asp Phe Val Val Asn Gly His Thr Cys
    370                 375                 380

Met Ser Glu Cys Val Arg Leu Asn Asn Pro Val Ile Leu Ser Lys Leu
385                 390                 395                 400

Met Leu His Asn Leu Thr Ser Glu Thr Met Tyr Leu Thr Met Lys Ala
                405                 410                 415

Ile Glu Lys Asp Arg Leu Asp Lys Ser Ile Ile Ile Pro Phe Ile Ala
            420                 425                 430

Tyr Phe Val Leu Met His Pro Asp Phe Cys Lys Asn Arg Arg Tyr Phe
        435                 440                 445

Thr Ser Tyr Lys Arg Phe Val Thr Asp Tyr Val His Glu Gly Val Ser
    450                 455                 460

Tyr Glu Val Phe Asp Asp Tyr Phe
465                 470


<210> 63
<211> 196
<212> PRT
<213> Vaccinia virus

<400> 63
Met Ser Ser Ser Thr Arg Leu Pro Val Leu Val Leu Ala Ala Glu Leu
1               5                   10                  15
```

```
Thr Ile Gly Val Asn Tyr Asp Ile Asn Ser Thr Ile Ile Gly Glu Cys
            20                  25                  30

His Met Ser Glu Ser Tyr Ile Asp Arg Asn Ala Asn Ile Val Leu Thr
        35                  40                  45

Gly Tyr Gly Leu Glu Ile Asn Met Thr Ile Met Asp Thr Asp Gln Arg
    50                  55                  60

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

Leu Leu Phe Thr Thr Gln Arg Leu Asp Lys Val His His Asn Ile Ser
                85                  90                  95

Val Thr Ile Thr Cys Met Glu Met Asn Cys Gly Thr Thr Lys Tyr Asp
            100                 105                 110

Ser Asp Leu Pro Glu Ser Ile His Lys Ser Ser Ser Cys Asp Ile Thr
        115                 120                 125

Ile Asn Gly Ser Cys Val Thr Cys Val Asn Leu Glu Thr Asp Pro Thr
    130                 135                 140

Lys Ile Asn Pro His Tyr Leu His Pro Lys Asp Lys Tyr Leu Tyr His
145                 150                 155                 160

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

Glu Leu Asn Gln Cys Leu Leu Asp Ile Lys Glu Leu Ser Tyr Asp Ile
            180                 185                 190

Cys Tyr Arg Glu
        195
```

<210> 64
<211> 76
<212> PRT
<213> Vaccinia virus

<400> 64
Met Leu Gln Ala Leu Phe Lys Tyr Asp Ile Asn Ile Tyr Ser Ala Asn
1   5   10   15

Leu Glu Asn Val Leu Leu Asp Asp Ala Glu Ile Ala Lys Met Ile Ile
            20   25   30

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

Ile Val Lys Asn Asn Lys Leu Asp Glu Ile Ile Ser Lys Asn Lys Glu
    50   55   60

Leu Arg Leu Met Tyr Val Asn Cys Val Lys Lys Asn
65   70   75

<210> 65
<211> 189
<212> PRT
<213> Vaccinia virus

<400> 65
Met Asp Leu Ser Arg Ile Asn Thr Trp Lys Ser Lys Gln Leu Lys Ser
1   5   10   15

Phe Leu Ser Ser Lys Asp Thr Phe Lys Ala Asp Val His Gly His Ser
            20   25   30

Ala Leu Tyr Tyr Ala Ile Ala Asp Asn Asn Val Arg Leu Val Cys Thr
        35   40   45

Leu Leu Asn Ser Gly Ala Leu Lys Asn Leu Leu Glu Asn Glu Phe Pro
    50   55   60

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

Leu Phe Ser Gly Leu Asp Asp Ser Gln Phe Asp Asp Lys Gly Asn Thr
                85   90   95

Ala Leu Tyr Tyr Ala Val Asp Ser Gly Asn Met Gln Thr Val Lys Leu

100 105 110

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

Lys Thr Ser Phe Tyr His Ala Val Met Leu Asn Asp Val Ser Ile Val
130 135 140

Ser Tyr Phe Leu Ser Glu Ile Pro Ser Thr Phe Asp Leu Ala Ile Leu
145 150 155 160

Leu Ser Cys Ile His Ile Thr Ile Lys Asn Gly His Val Asp Met Met
165 170 175

Ile Leu Leu Leu Asp Tyr Met Thr Val Asp Lys His Gln
180 185

<210> 66
<211> 368
<212> PRT
<213> Vaccinia virus

<400> 66
Met Ile Ala Leu Leu Ile Leu Ser Leu Ala Cys Ser Ala Ser Ala Tyr
1 5 10 15

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

Gln Asp Asp Asn Ile Val Phe Ser Pro Phe Gly Tyr Ser Phe Ser Met
35 40 45

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

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

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

```
Asp Leu Thr Tyr Gln Ser Phe Val Asp Asn Thr Val Cys Ile Lys Pro
            100                 105                 110

Ser Tyr Tyr Gln Gln Tyr His Arg Phe Gly Leu Tyr Arg Leu Asn Phe
        115                 120                 125

Arg Arg Asp Ala Val Asn Lys Ile Asn Ser Ile Val Glu Arg Arg Ser
    130                 135                 140

Gly Met Ser Asn Val Val Asp Ser Asn Met Leu Asp Asn Asn Thr Leu
145                 150                 155                 160

Trp Ala Ile Ile Asn Thr Ile Tyr Phe Lys Gly Thr Trp Gln Tyr Pro
                165                 170                 175

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

Thr Lys Thr Val Pro Met Met Asn Val Val Thr Lys Leu Gln Gly Asn
        195                 200                 205

Thr Ile Thr Ile Asp Asp Glu Glu Tyr Asp Met Val Arg Leu Pro Tyr
    210                 215                 220

Lys Asp Ala Asn Ile Ser Met Tyr Leu Ala Ile Gly Asp Asn Met Thr
225                 230                 235                 240

His Phe Thr Asp Ser Ile Thr Ala Ala Lys Asp Tyr Trp Ser Phe Gln
                245                 250                 255

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

Asn Lys Arg Asp Ile Lys Ser Ile Ala Glu Met Met Ala Pro Ser Met
        275                 280                 285

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

Tyr Ile Tyr Lys Met Phe Gln Asn Ala Lys Ile Asp Val Asp Glu Gln
```

305 310 315 320

Gly Thr Val Ala Glu Ala Ser Thr Ile Met Val Ala Thr Ala Arg Ser
325 330 335

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

His Asp Ile Thr Gly Phe Ile Leu Phe Met Gly Lys Val Glu Ser Pro
355 360 365

<210> 67
<211> 81
<212> PRT
<213> Vaccinia virus

<400> 67
Met Gly His Ile Ile Thr Tyr Cys Gln Val His Thr Asn Ile Ser Ile
1 5 10 15

Leu Ile Arg Lys Ala Tyr His Ile Ile Phe Phe Val Ile Asp Cys Asp
20 25 30

Cys Ile Ser Leu Gln Phe Ser Asn Tyr Val His His Gly Asn Arg Phe
35 40 45

Arg Thr Val Leu Ile Ser Lys Thr Ser Ile Ala Cys Phe Ser Asp Ile
50 55 60

Lys Arg Ile Leu Pro Cys Thr Phe Lys Ile Tyr Ser Ile Asn Asp Cys
65 70 75 80

Pro

<210> 68
<211> 88
<212> PRT
<213> Vaccinia virus

<400> 68
Met Leu Ala Phe Cys Tyr Ser Leu Pro Asn Ala Gly Asp Val Ile Lys
1 5 10 15

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

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

Asp Arg Tyr Val Glu Tyr Arg Asp Lys Leu Val Gly Lys Thr Val Lys
    50                  55                  60

Val Lys Val Ile Arg Val Asp Tyr Thr Lys Gly Tyr Ile Asp Val Asn
65                  70                  75                  80

Tyr Lys Arg Met Cys Arg His Gln
                85
```

<210> 69
<211> 134
<212> PRT
<213> Vaccinia virus

<400> 69

```
Met Thr Leu Val Gln His Val Val Thr Ile Lys Ser Thr Tyr Trp Val
1               5                   10                  15

Ile Pro Trp Glu Leu Ala Ser Tyr Asp Asn Pro Asn Leu Phe Thr Ala
            20                  25                  30

Met Ile Leu Met Ser Pro Leu Val Asn Ala Asp Ala Val Ser Lys Leu
        35                  40                  45

Asn Leu Leu Ala Ala Lys Leu Met Gly Thr Ile Thr Leu Asn Ala Pro
    50                  55                  60

Val Gly Lys Leu Cys Pro Glu Ser Val Ser Arg Asp Met Asp Lys Val
65                  70                  75                  80

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

Gly Phe Ala Ser Gln Val Leu Lys Ala Thr Asn Lys Val Arg Lys Ile
```

100 105 110

Ile Ser Lys Ile Asn Thr Pro Arg Leu Ser Tyr Ser Arg Glu Gln Thr
115 120 125

Ile Arg Leu Ala Met Phe
130

<210> 70
<211> 149
<212> PRT
<213> Vaccinia virus

<400> 70
Met Ala Thr Lys Leu Asp Tyr Glu Asp Ala Val Phe Tyr Phe Val Asp
1 5 10 15

Asp Asp Lys Ile Cys Ser Arg Asp Ser Ile Ile Asp Leu Ile Asp Glu
20 25 30

Tyr Ile Thr Trp Arg Asn His Val Ile Val Phe Asn Lys Asp Ile Thr
35 40 45

Ser Cys Gly Arg Leu Tyr Lys Glu Leu Met Lys Phe Asp Asp Val Ala
50 55 60

Ile Arg Tyr Tyr Gly Ile Asp Lys Ile Asn Glu Ile Val Glu Ala Met
65 70 75 80

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

Ser Leu Phe Ala Thr Ile Gly Ile Cys Ala Lys Ile Thr Glu His Trp
100 105 110

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

Thr Asp Leu Met Thr Asp Asp Asn Ile Asn Ile Leu Ile Leu Phe Leu
130 135 140

Glu Lys Lys Leu Asn
145

<210> 71
<211> 226
<212> PRT
<213> Vaccinia virus

<400> 71
Met Leu Ser Met Phe Met Cys Asn Asn Ile Val Asp Tyr Val Asp Asp
1   5   10   15

Ile Asp Asn Gly Ile Val Gln Asp Ile Glu Asp Glu Ala Ser Asn Asn
            20   25   30

Val Asp Arg Asp Tyr Val Tyr Pro Leu Pro Glu Asn Met Val Tyr Arg
        35   40   45

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

His Val Met Met Ala Val Arg Tyr Tyr Met Ser Lys Gln Arg Leu Asp
65   70   75   80

Asp Leu Tyr Arg Gln Leu Pro Thr Lys Thr Arg Ser Tyr Ile Asp Ile
                85   90   95

Ile Asn Ile Tyr Cys Asp Lys Val Ser Asn Asp Tyr Asn Arg Asp Met
            100   105   110

Asn Ile Met Tyr Asp Met Ala Ser Thr Lys Ser Phe Thr Val Tyr Asp
        115   120   125

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

Val Arg Leu Ala Thr Ile Ser Phe Ile Thr Glu Leu Gly Arg Arg Cys
145   150   155   160

Met Asn Pro Val Lys Thr Ile Lys Met Phe Thr Leu Leu Ser His Thr
                165   170   175

```
Ile Cys Asp Asp Cys Phe Val Asp Tyr Ile Thr Asp Ile Ser Pro Pro
            180                 185                 190


Asp Asn Thr Ile Pro Asn Thr Ser Thr Arg Glu Tyr Leu Lys Leu Ile
        195                 200                 205


Gly Ile Thr Ala Ile Met Phe Ala Thr Tyr Lys Thr Leu Lys Tyr Met
    210                 215                 220


Ile Gly
225


<210> 72
<211> 147
<212> PRT
<213> Vaccinia virus

<400> 72
Met Phe Asn Met Asn Ile Asn Ser Pro Val Arg Phe Val Lys Glu Thr
1               5                   10                  15


Asn Arg Ala Lys Ser Pro Thr Arg Gln Ser Pro Gly Ala Ala Gly Tyr
            20                  25                  30


Asp Leu Tyr Ser Ala Tyr Asp Tyr Thr Ile Pro Pro Gly Glu Arg Gln
        35                  40                  45


Leu Ile Lys Thr Asp Ile Ser Met Ser Met Pro Lys Ile Cys Tyr Gly
    50                  55                  60


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


Gly Gly Val Ile Asp Glu Asp Tyr Arg Gly Asn Ile Gly Val Ile Leu
                85                  90                  95


Ile Asn Asn Gly Lys Cys Thr Phe Asn Val Asn Thr Gly Asp Arg Ile
            100                 105                 110


Ala Gln Leu Ile Tyr Gln Arg Ile Tyr Tyr Pro Glu Leu Glu Glu Val
        115                 120                 125
```

Gln Ser Leu Asp Ser Thr Asp Arg Gly Asp Gln Gly Phe Gly Ser Thr
130 135 140

Gly Leu Arg
145

<210> 73
<211> 480
<212> PRT
<213> Vaccinia virus

<400> 73
Met Pro Ile Phe Val Asn Thr Val Tyr Cys Lys Asn Ile Leu Ala Leu
1 5 10 15

Ser Met Thr Lys Lys Phe Lys Thr Ile Ile Asp Ala Ile Gly Gly Asn
20 25 30

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

Thr His Leu Arg Gln Lys Tyr Thr Lys Asn Lys Asp Pro Val Thr Arg
50 55 60

Val Cys Leu Asp Leu Asp Ile His Ser Leu Thr Ser Ile Val Ile Tyr
65 70 75 80

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

Leu Arg Ala Ser Ile Leu Thr Ser Val Glu Phe Ile Ile Tyr Thr Cys
100 105 110

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

Tyr Met Met Gly Ile Glu Tyr Gly Leu Ser Asn Leu Leu Cys His Thr
130 135 140

Lys Asn Phe Ile Ala Lys His Phe Leu Glu Leu Glu Asp Asp Ile Ile

```
145                 150                 155                 160

Asp Asn Phe Asp Tyr Leu Ser Met Lys Leu Ile Leu Glu Ser Asp Glu
                165                 170                 175

Leu Asn Val Pro Asp Glu Asp Tyr Val Val Asp Phe Val Ile Lys Trp
            180                 185                 190

Tyr Ile Lys Arg Arg Asn Lys Leu Gly Asn Leu Leu Leu Leu Ile Lys
        195                 200                 205

Asn Val Ile Arg Ser Asn Tyr Leu Ser Pro Arg Gly Ile Asn Asn Val
    210                 215                 220

Lys Trp Ile Leu Asp Cys Thr Lys Ile Phe His Cys Asp Lys Gln Pro
225                 230                 235                 240

Arg Lys Ser Tyr Lys Tyr Pro Phe Ile Glu Tyr Pro Met Asn Met Asp
                245                 250                 255

Gln Ile Ile Asp Ile Phe His Met Cys Thr Ser Thr His Val Gly Glu
            260                 265                 270

Val Val Tyr Leu Ile Gly Gly Trp Met Asn Asn Glu Ile His Asn Asn
        275                 280                 285

Ala Ile Ala Val Asn Tyr Ile Ser Asn Asn Trp Ile Pro Ile Pro Pro
    290                 295                 300

Met Asn Ser Pro Arg Leu Tyr Ala Ser Gly Ile Pro Ala Asn Asn Lys
305                 310                 315                 320

Leu Tyr Val Val Gly Gly Leu Pro Asn Pro Thr Ser Val Glu Arg Trp
                325                 330                 335

Phe His Gly Asp Ala Ala Trp Val Asn Met Pro Ser Leu Leu Lys Pro
            340                 345                 350

Arg Cys Asn Pro Ala Val Ala Ser Ile Asn Asn Val Ile Tyr Val Met
        355                 360                 365
```

```
Gly Gly His Ser Glu Thr Asp Thr Thr Thr Glu Tyr Leu Leu Pro Asn
    370                 375                 380

His Asp Gln Trp Gln Phe Gly Pro Ser Thr Tyr Tyr Pro His Tyr Lys
385                 390                 395                 400

Ser Cys Ala Leu Val Phe Gly Arg Arg Leu Phe Leu Val Gly Arg Asn
                405                 410                 415

Ala Glu Phe Tyr Cys Glu Ser Ser Asn Thr Trp Thr Leu Ile Asp Asp
            420                 425                 430

Pro Ile Tyr Pro Arg Asp Asn Pro Glu Leu Ile Ile Val Asp Asn Lys
        435                 440                 445

Leu Leu Leu Ile Gly Gly Phe Tyr Arg Glu Ser Tyr Ile Asp Thr Ile
    450                 455                 460

Glu Val Tyr Asn His His Thr Tyr Ser Trp Asn Ile Trp Asp Gly Lys
465                 470                 475                 480
```

<210> 74
<211> 506
<212> PRT
<213> Vaccinia virus

<400> 74

```
Met Glu Ser Val Thr Phe Ser Ile Asn Gly Glu Ile Ile Gln Val Asn
1               5                   10                  15

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

Glu His His Ile Asn Asp Glu Val Ile Ile Leu Asn Gly Ile Asn Tyr
        35                  40                  45

His Ala Phe Glu Ser Leu Leu Asp Tyr Met Arg Trp Lys Lys Ile Asn
    50                  55                  60

Ile Thr Ile Asn Asn Val Glu Met Ile Leu Val Ala Ala Val Ile Ile
```

```
65                  70                  75                  80

Asp Val Thr Pro Val Val Asp Leu Cys Val Lys Thr Met Ile His Asn
                85                  90                  95

Ile Asn Ser Thr Asn Cys Ile Arg Met Phe Asn Phe Ser Lys Arg Tyr
            100                 105                 110

Gly Ile Lys Lys Leu Tyr Asn Ala Ser Met Ser Glu Ile Ile Asn Asn
        115                 120                 125

Ile Thr Ala Val Thr Ser Asp Pro Glu Phe Gly Lys Leu Ser Lys Asp
    130                 135                 140

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

Asp Val Thr Ala Met Ile Leu Leu Lys Trp Ile His Lys Asn Pro Asn
                165                 170                 175

Asp Val Asp Ile Ile Asn Ile Leu His Pro Lys Phe Met Thr Asn Thr
            180                 185                 190

Met Arg Asn Ala Ile Ser Leu Leu Gly Leu Thr Ile Ser Lys Ser Thr
        195                 200                 205

Lys Pro Val Thr Arg Asn Gly Ile Lys His Asn Ile Val Val Ile Lys
    210                 215                 220

Asn Ser Asp Tyr Ile Ser Thr Ile Thr His Tyr Ser Pro Arg Thr Glu
225                 230                 235                 240

Tyr Trp Thr Ile Val Gly Asn Thr Asp Arg Gln Phe Tyr Asn Ala Asn
                245                 250                 255

Val Leu His Asn Cys Leu Tyr Ile Ile Gly Gly Met Ile Asn Asn Arg
            260                 265                 270

His Val Tyr Ser Val Ser Arg Val Asp Leu Glu Thr Lys Lys Trp Lys
        275                 280                 285
```

```
Thr Val Thr Asn Met Ser Ser Leu Lys Ser Glu Val Ser Thr Cys Val
    290                 295                 300

Asn Asn Gly Lys Leu Tyr Val Ile Gly Gly Leu Glu Phe Ser Ile Ser
305                 310                 315                 320

Thr Gly Val Ala Glu Tyr Leu Lys His Gly Thr Ser Lys Trp Ile Arg
                325                 330                 335

Leu Pro Asn Leu Ile Thr Pro Arg Tyr Ser Gly Ala Ser Val Phe Val
            340                 345                 350

Asn Asp Asp Ile Tyr Val Met Gly Gly Val Tyr Thr Thr Tyr Glu Lys
        355                 360                 365

Tyr Val Val Leu Asn Asp Val Glu Cys Phe Thr Lys Asn Arg Trp Ile
    370                 375                 380

Lys Lys Ser Pro Met Pro Arg His His Ser Ile Val Tyr Ala Val Glu
385                 390                 395                 400

Tyr Asp Gly Asp Ile Tyr Ala Ile Thr Gly Ile Thr His Glu Thr Arg
                405                 410                 415

Asn Tyr Leu Tyr Lys Tyr Ile Val Lys Glu Asp Lys Trp Ile Glu Leu
            420                 425                 430

Tyr Met Tyr Phe Asn His Val Gly Lys Met Phe Val Cys Ser Cys Gly
        435                 440                 445

Asp Tyr Ile Leu Ile Ile Ala Asp Ala Lys Tyr Glu Tyr Tyr Pro Lys
    450                 455                 460

Ser Asn Thr Trp Asn Leu Phe Asp Met Ser Thr Arg Asn Ile Glu Tyr
465                 470                 475                 480

Tyr Asp Met Phe Thr Lys Asp Glu Thr His Lys Ser Leu Pro Ser Phe
                485                 490                 495
```

Leu Ser Asn Cys Glu Lys Gln Phe Leu Gln
500 505

<210> 75
<211> 224
<212> PRT
<213> Vaccinia virus

<400> 75
Met Val Lys Asn Asn Lys Ile Ser Asn Ser Cys Arg Met Ile Met Ser
1 5 10 15

Thr Asn Pro Asn Asn Ile Leu Met Arg His Leu Lys Asn Leu Thr Asp
20 25 30

Asp Glu Phe Lys Cys Ile Ile His Arg Ser Ser Asp Phe Leu Tyr Leu
35 40 45

Ser Asp Arg Asp Tyr Thr Ser Ile Thr Lys Glu Thr Leu Val Ser Glu
50 55 60

Ile Val Glu Glu Tyr Pro Asp Asp Cys Asn Lys Ile Leu Ala Ile Ile
65 70 75 80

Phe Leu Val Leu Asp Lys Asp Ile Asp Val Asp Ile Lys Thr Lys Leu
85 90 95

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

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

Gln Asp Ile Pro Leu Gly Pro Leu Phe Lys Lys Ile Asp Ser Tyr Arg
130 135 140

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

Tyr Phe Asn Lys Tyr Gly His Leu Met Phe Tyr Thr Leu Pro Ile Pro
165 170 175

```
Tyr Asn Arg Phe Phe Cys Arg Asn Ser Ile Gly Phe Leu Ala Val Leu
            180                 185                 190


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


Val Ser Ile Asp Asp Arg Arg Lys Phe Lys Lys Glu Leu Met Ser Lys
    210                 215                 220


<210> 76
<211> 117
<212> PRT
<213> Vaccinia virus

<400> 76
Met Arg Thr Leu Leu Ile Arg Tyr Ile Leu Trp Arg Asn Asp Asn Asp
1               5                   10                  15


Gln Thr Tyr Tyr Asn Asp Asp Phe Lys Lys Leu Met Leu Leu Asp Glu
            20                  25                  30


Leu Val Asp Asp Gly Asp Val Cys Thr Leu Ile Lys Asn Met Arg Met
        35                  40                  45


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


Asn Ile Glu Asp Ala Lys Arg Met Ile Ala Ile Ser Ala Lys Val Ala
65                  70                  75                  80


Arg Asp Ile Gly Glu Arg Ser Glu Ile Arg Trp Glu Glu Ser Phe Thr
                85                  90                  95


Ile Leu Phe Arg Met Ile Glu Thr Tyr Phe Asp Asp Leu Met Ile Asp
            100                 105                 110


Leu Tyr Gly Glu Lys
        115


<210> 77
```

<211> 175
<212> PRT
<213> Vaccinia virus

<400> 77
Met Thr Ser Ser Ala Met Asp Asn Asn Glu Pro Lys Val Leu Glu Met
1   5   10   15

Val Tyr Asp Ala Thr Ile Leu Pro Glu Gly Ser Ser Met Asp Pro Asn
            20   25   30

Ile Ile Asp Cys Ile Asn Arg His Ile Asn Met Cys Ile Gln Arg Thr
        35   40   45

Tyr Ser Ser Ser Ile Ile Ala Ile Leu Asp Arg Phe Leu Thr Met Asn
    50   55   60

Lys Asp Glu Leu Asn Asn Thr Gln Cys His Ile Ile Lys Glu Phe Met
65   70   75   80

Thr Tyr Glu Gln Met Ala Ile Asp His Tyr Gly Gly Tyr Val Asn Ala
                85   90   95

Ile Leu Tyr Gln Ile Arg Lys Arg Pro Asn Gln His His Thr Ile Asp
            100   105   110

Leu Phe Lys Lys Ile Lys Arg Thr Arg Tyr Asp Thr Phe Lys Val Asp
        115   120   125

Pro Val Glu Phe Val Lys Lys Val Ile Gly Phe Val Ser Ile Leu Asn
    130   135   140

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

Asp Glu Phe Lys Cys Phe Ile Asp Tyr Val Glu Thr Lys Tyr Phe
                165   170   175

<210> 78
<211> 72
<212> PRT
<213> Vaccinia virus

<400> 78
Met Leu His Asn Pro Thr Ser Glu Thr Met Tyr Leu Thr Met Asn Ala
1   5   10   15

Ile Lys Lys Asp Lys Leu Asp Lys Ser Ile Ile Ile Pro Phe Ile Ala
            20   25   30

Tyr Phe Val Leu Met His Pro Asp Phe Cys Lys Asn Arg Arg Tyr Phe
        35   40   45

Thr Ser Tyr Lys Arg Phe Val Thr Asp Tyr Val His Glu Gly Val Ser
    50   55   60

Tyr Glu Val Phe Asp Asp Tyr Phe
65   70

<210> 79
<211> 214
<212> PRT
<213> Vaccinia virus

<400> 79
Met Ser Ile Gly Phe Glu Ala Arg Ile Val Asp Lys Phe Gly Lys Asn
1   5   10   15

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

Ser Trp Met Met Lys Leu Gly Ile Ser Pro Ser Lys Pro Asp His Asp
        35   40   45

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

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

Lys Phe Gly Asp Ser Pro Leu Thr Leu Leu Ile Lys Thr Leu Ser Leu
                85   90   95

Ala His Leu Ile Asn Lys Leu Leu Ser Thr Ser Asn Val Ile Thr Asp

```
            100                 105                 110

Gln Thr Val Asn Ile Cys Ile Phe Tyr Asp Arg Asp Asp Val Leu Glu
        115                 120                 125

Ile Ile Asn Asp Lys Gly Lys Gln Tyr Asp Phe Lys Met Ala Val Glu
    130                 135                 140

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

Cys Glu Asp Ala Met Tyr Tyr Ala Val Leu Ser Glu Tyr Lys Thr Met
                165                 170                 175

Val Asp Tyr Leu Leu Phe Asn His Phe Ser Val Asp Ser Val Val Asn
            180                 185                 190

Gly His Thr Cys Met Ser Glu Cys Val Lys Leu Asn Asn Arg His Phe
        195                 200                 205

Ile Glu Ala Asp Val Thr
    210
```

<210> 80
<211> 161
<212> PRT
<213> Vaccinia virus

<400> 80

```
Met Ile Phe Val Ile Glu Ser Lys Leu Leu Gln Ile Tyr Arg Asn Arg
1               5                   10                  15

Asn Arg Asn Ile Asn Phe Tyr Thr Thr Met Asp Asn Ile Met Ser Ala
            20                  25                  30

Glu Tyr Tyr Leu Ser Leu Tyr Ala Lys Tyr Asn Ser Lys Asn Leu Asp
        35                  40                  45

Val Phe Arg Asn Met Leu Gln Ala Ile Glu Pro Ser Gly Asn Asn Tyr
    50                  55                  60
```

```
His Ile Leu His Ala Tyr Cys Gly Ile Lys Gly Leu Asp Glu Arg Phe
65                  70                  75                  80


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


Asp Gly Asn Tyr Pro Leu His Ile Ala Ser Lys Ile Asn Asn Asn Arg
            100                 105                 110


Ile Val Ala Met Leu Leu Thr His Gly Ala Asp Pro Asn Ala Cys Asp
        115                 120                 125


Lys His Asn Lys Thr Pro Leu Tyr Tyr Leu Ser Gly Thr Asp Asp Glu
    130                 135                 140


Val Ile Glu Arg Ile Asn Leu Leu Val Gln Tyr Gly Ala Lys Ile Asn
145                 150                 155                 160


Asn



<210> 81
<211> 220
<212> PRT
<213> Vaccinia virus

<400> 81
Met Val Tyr Lys Leu Val Leu Leu Phe Cys Ile Ala Ser Leu Gly Tyr
1               5                   10                  15


Ser Val Glu Tyr Lys Asn Thr Ile Cys Pro Pro Arg Gln Asp Tyr Arg
            20                  25                  30


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


Asn Ser Thr Ile Ile Gly Glu Cys His Met Ser Glu Ser Tyr Ile Asp
    50                  55                  60


Arg Asn Ala Asn Ile Val Leu Thr Gly Tyr Gly Leu Glu Ile Asn Met
65                  70                  75                  80
```

```
Thr Ile Met Asp Thr Asp Gln Arg Phe Val Ala Ala Ala Glu Gly Val
                85                  90                  95

Gly Lys Asp Asn Lys Leu Ser Val Leu Leu Phe Thr Thr Gln Arg Leu
            100                 105                 110

Asp Lys Val His His Asn Ile Ser Val Thr Ile Thr Cys Met Glu Met
        115                 120                 125

Asn Cys Gly Thr Thr Lys Tyr Asp Ser Asp Leu Pro Glu Ser Ile His
    130                 135                 140

Lys Ser Ser Ser Cys Asp Ile Thr Ile Asn Gly Ser Cys Val Thr Cys
145                 150                 155                 160

Val Asn Leu Glu Thr Asp Pro Thr Lys Ile Asn Pro His Tyr Leu His
                165                 170                 175

Pro Lys Asp Lys Tyr Leu Tyr His Asn Ser Glu Tyr Gly Met Arg Gly
            180                 185                 190

Ser Tyr Gly Val Thr Phe Ile Asp Glu Leu Asn Gln Cys Leu Leu Asp
        195                 200                 205

Ile Lys Glu Leu Ser Tyr Asp Ile Cys Tyr Arg Glu
    210                 215                 220


<210> 82
<211> 284
<212> PRT
<213> Vaccinia virus

<400> 82
Met Asp Leu Ser Arg Ile Asn Thr Trp Lys Ser Lys Gln Leu Lys Ser
1               5                   10                  15

Phe Leu Ser Ser Lys Asp Thr Phe Lys Ala Asp Val His Gly His Ser
            20                  25                  30

Ala Leu Tyr Tyr Ala Ile Ala Asp Asn Asn Val Arg Leu Val Cys Thr
        35                  40                  45
```

```
Leu Leu Asn Ala Gly Ala Leu Lys Asn Leu Leu Glu Asn Glu Phe Pro
    50                  55                  60

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

Leu Phe Ser Gly Leu Asp Asp Ser Gln Phe Asp Asp Lys Gly Asn Thr
                85                  90                  95

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

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

Lys Thr Ser Phe Tyr His Ala Val Met Leu Asn Asp Val Ser Ile Val
    130                 135                 140

Ser Tyr Phe Leu Ser Glu Ile Pro Ser Thr Phe Asp Leu Ala Ile Leu
145                 150                 155                 160

Leu Ser Cys Ile His Ile Thr Ile Lys Asn Gly His Val Asp Met Met
                165                 170                 175

Ile Leu Leu Leu Asp Tyr Met Thr Ser Thr Asn Thr Asn Asn Ser Leu
            180                 185                 190

Leu Phe Ile Pro Asp Ile Lys Leu Ala Ile Asp Asn Lys Asp Ile Glu
        195                 200                 205

Met Leu Gln Ala Leu Phe Lys Tyr Asp Ile Asn Ile Tyr Ser Ala Asn
    210                 215                 220

Leu Glu Asn Val Leu Leu Asp Asp Ala Glu Ile Ala Lys Met Ile Ile
225                 230                 235                 240

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

Ile Val Lys Asn Asn Lys Leu Asp Glu Ile Ile Ser Lys Asn Lys Glu
260 265 270

Leu Arg Leu Met Tyr Val Asn Cys Val Lys Lys Asn
275 280

<210> 83
<211> 364
<212> PRT
<213> Vaccinia virus

<400> 83
Met Ile Ala Leu Leu Ile Leu Ser Leu Thr Cys Ser Val Ser Thr Tyr
1 5 10 15

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

Gln Asp Asp Asn Ile Val Phe Ser Pro Phe Gly Tyr Ser Phe Ser Met
35 40 45

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

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

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

Asp Leu Thr Tyr Gln Ser Phe Val Asp Asn Thr Val Cys Ile Lys Pro
100 105 110

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

Asn Lys Ile Asn Ser Ile Val Glu Arg Arg Ser Gly Met Ser Asn Val
130 135 140

Val Asp Ser Asn Met Leu Asp Asn Asn Thr Leu Trp Ala Ile Ile Asn
145 150 155 160

```
Thr Ile Tyr Phe Lys Gly Ile Trp Gln Tyr Pro Phe Asp Ile Thr Lys
                165                 170                 175

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

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

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

Ser Met Tyr Leu Ala Ile Gly Asp Asn Met Thr His Phe Thr Asp Ser
225                 230                 235                 240

Ile Thr Ala Ala Lys Leu Asp Tyr Trp Ser Phe Gln Leu Gly Asn Lys
                245                 250                 255

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

Ile Lys Ser Ile Ala Glu Met Met Ala Pro Ser Met Phe Asn Pro Asp
        275                 280                 285

Asn Ala Ser Phe Lys His Met Thr Arg Asp Pro Leu Tyr Ile Tyr Lys
    290                 295                 300

Met Phe Gln Asn Ala Lys Ile Asp Val Asp Glu Gln Gly Thr Val Ala
305                 310                 315                 320

Glu Ala Ser Thr Ile Met Val Ala Thr Ala Arg Ser Ser Pro Glu Lys
                325                 330                 335

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

Gly Phe Ile Leu Phe Met Gly Lys Val Glu Ser Pro
        355                 360
```

<210> 84
<211> 88
<212> PRT
<213> Vaccinia virus

<400> 84
Met Leu Ala Phe Cys Tyr Ser Leu Pro Asn Ala Gly Asp Val Ile Lys
1   5   10   15

Gly Arg Val Tyr Glu Asn Asp Tyr Ala Leu Tyr Ile Tyr Leu Phe Asp
            20   25   30

Tyr Pro His Phe Glu Ala Ile Leu Ala Glu Ser Val Lys Met His Met
        35   40   45

Asp Arg Tyr Val Glu Tyr Arg Asp Lys Leu Val Gly Lys Thr Val Lys
    50   55   60

Val Lys Val Ile Arg Val Asp Tyr Thr Lys Gly Tyr Ile Asp Val Asn
65   70   75   80

Tyr Lys Arg Met Cys Arg His Gln
                85

<210> 85
<211> 424
<212> PRT
<213> Vaccinia virus

<400> 85
Met Asn Pro Asp Asn Thr Ile Ala Val Ile Thr Glu Thr Ile Pro Ile
1   5   10   15

Gly Met Gln Phe Asp Lys Val Tyr Leu Ser Thr Phe Asn Met Trp Arg
            20   25   30

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

Trp Ser Leu Ser Asp Glu Val Gly Thr Asn Phe Gly Thr Ile Ile Leu
    50   55   60

```
Asn Glu Ile Val Gln Leu Pro Lys Arg Gly Val Arg Val Arg Val Ala
65                  70                  75                  80

Val Asn Lys Ser Asn Lys Pro Leu Lys Asp Val Glu Arg Leu Gln Met
                85                  90                  95

Ala Gly Val Glu Val Arg Tyr Ile Asp Ile Thr Asn Ile Leu Gly Gly
            100                 105                 110

Val Leu His Thr Lys Phe Trp Ile Ser Asp Asn Thr His Ile Tyr Leu
        115                 120                 125

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

Gly Ile Ala Ile Phe Asn Asn Arg Asn Leu Ala Ala Asp Leu Thr Gln
145                 150                 155                 160

Ile Phe Glu Val Tyr Trp Tyr Leu Gly Val Asn Asn Leu Pro Tyr Asn
                165                 170                 175

Trp Lys Asn Phe Tyr Pro Ser Tyr Tyr Asn Thr Asp His Pro Leu Ser
            180                 185                 190

Ile Asn Val Ser Gly Val Pro His Ser Val Phe Ile Ala Ser Ala Pro
        195                 200                 205

Gln Gln Leu Cys Thr Met Glu Arg Thr Asn Asp Leu Thr Ala Leu Leu
    210                 215                 220

Ser Cys Ile Arg Asn Ala Ser Lys Phe Val Tyr Val Ser Val Met Asn
225                 230                 235                 240

Phe Ile Pro Ile Ile Tyr Ser Lys Ala Gly Lys Ile Leu Phe Trp Pro
                245                 250                 255

Tyr Ile Glu Asp Glu Leu Arg Arg Ser Ala Ile Asp Arg Gln Val Ser
            260                 265                 270

Val Lys Leu Leu Ile Ser Cys Trp Gln Arg Ser Ser Phe Ile Met Arg
```

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        275                 280                 285

Asn Phe Leu Arg Ser Ile Ala Met Leu Lys Ser Lys Asn Ile Asn Ile
    290                 295                 300

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

Ser Arg Val Asn His Ala Lys Tyr Met Val Thr Asp Lys Thr Ala Tyr
                325                 330                 335

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

Ala Ser Ile Asn Ile Thr Pro Asp Asp Gly Leu Gly Leu Arg Gln Gln
        355                 360                 365

Leu Glu Asp Ile Phe Met Arg Asp Trp Asn Ser Lys Tyr Ser Tyr Glu
    370                 375                 380

Leu Tyr Asp Thr Ser Pro Thr Lys Arg Cys Lys Leu Leu Lys Asn Met
385                 390                 395                 400

Lys Gln Cys Thr Asn Asp Ile Tyr Cys Asp Glu Ile Gln Pro Glu Lys
                405                 410                 415

Glu Ile Pro Glu Tyr Ser Leu Glu
            420


<210> 86
<211> 171
<212> PRT
<213> Vaccinia virus

<400> 86
Met Gly Ala Thr Ile Ser Ile Leu Ala Ser Tyr Asp Asn Pro Asn Leu
1               5                   10                  15

Phe Thr Ala Met Ile Leu Met Ser Pro Leu Val Asn Ala Asp Ala Val
            20                  25                  30
```

Ser Lys Leu Asn Leu Leu Ala Ala Lys Leu Met Gly Thr Ile Thr Pro
35 40 45

Asn Ala Pro Val Gly Lys Leu Cys Pro Glu Ser Val Ser Arg Asp Met
50 55 60

Asp Lys Val Tyr Lys Tyr Gln Tyr Asp Pro Leu Ile Asn His Glu Lys
65 70 75 80

Ile Lys Ala Gly Phe Ala Ser Gln Val Leu Lys Ala Thr Asn Lys Val
85 90 95

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

Gly Thr Asn Asn Glu Ile Ser Asp Val Leu Gly Ala Tyr Tyr Phe Met
115 120 125

Gln His Ala Asn Cys Asn Arg Glu Ile Lys Ile Tyr Glu Gly Ala Lys
130 135 140

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

Glu Ile Glu Thr Trp Ile Phe Asn Arg Val Lys
165 170

<210> 87
<211> 81
<212> PRT
<213> Vaccinia virus

<400> 87
Met Ser Ala Asn Cys Met Phe Asn Leu Asp Asn Asp Tyr Ile Tyr Trp
1 5 10 15

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

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

Leu Gly Ile Leu Val Phe Ser His Asp His Ile Gly His Gly Arg Ser
    50   55   60

Asn Gly Glu Lys Met Met Ile Asp Asp Phe Gly Thr Ala Arg Gly Asn
65   70   75   80

Tyr

<210> 88
<211> 149
<212> PRT
<213> Vaccinia virus

<400> 88
Met Ala Thr Lys Leu Asp Tyr Glu Asp Ala Val Phe Tyr Phe Val Asp
1   5   10   15

Asp Asp Lys Ile Cys Ser Arg Asp Ser Ile Ile Asp Leu Ile Asp Glu
            20   25   30

Tyr Ile Thr Trp Arg Asn His Val Ile Val Phe Asn Lys Asp Ile Thr
        35   40   45

Ser Cys Gly Arg Leu Tyr Lys Glu Leu Met Lys Phe Asp Asp Val Ala
    50   55   60

Ile Arg Tyr Tyr Gly Ile Asp Lys Ile Asn Glu Ile Val Glu Ala Met
65   70   75   80

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

Ser Leu Phe Ala Thr Ile Gly Ile Cys Ala Lys Ile Thr Glu His Trp
            100   105   110

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

Thr Asp Leu Met Thr Asp Asp Asn Ile Asn Ile Leu Ile Leu Phe Leu
    130   135   140

Glu Lys Lys Leu Asn
145

<210> 89
<211> 226
<212> PRT
<213> Vaccinia virus

<400> 89
Met Leu Ser Met Phe Met Cys Asn Asn Ile Val Asp Tyr Val Asp Asp
1   5   10   15

Ile Asp Asn Gly Ile Val Gln Asp Ile Glu Asp Glu Ala Ser Asn Asn
            20   25   30

Val Asp His Asp Tyr Val Tyr Pro Leu Pro Glu Asn Met Val Tyr Arg
        35   40   45

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

His Val Met Met Ala Val Arg Tyr Tyr Met Ser Lys Gln Arg Leu Asp
65   70   75   80

Asp Leu Tyr Arg Gln Leu Pro Thr Lys Thr Arg Ser Tyr Ile Asp Ile
                85   90   95

Ile Asn Ile Tyr Cys Asp Lys Val Ser Asn Asp Tyr Asn Arg Asp Met
            100   105   110

Asn Ile Met Tyr Asp Met Ala Ser Thr Lys Ser Phe Thr Val Tyr Asp
        115   120   125

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

Val Arg Leu Ala Thr Ile Ser Phe Ile Thr Lys Leu Gly Arg Arg Cys
145   150   155   160

Met Asn Pro Val Lys Thr Ile Lys Met Phe Thr Leu Leu Ser His Thr

```
                165                 170                 175

Ile Cys Asp Asp Cys Phe Val Asp Tyr Ile Thr Asp Ile Ser Pro Pro
            180                 185                 190

Asp Asn Thr Ile Pro Asn Thr Ser Thr Arg Glu Tyr Leu Lys Leu Ile
        195                 200                 205

Gly Ile Thr Ala Ile Met Phe Ala Thr Tyr Lys Thr Leu Lys Tyr Met
    210                 215                 220

Ile Gly
225


<210> 90
<211> 147
<212> PRT
<213> Vaccinia virus

<400> 90
Met Phe Asn Met Asn Ile Asn Ser Pro Val Arg Phe Val Lys Glu Thr
1               5                   10                  15

Asn Arg Ala Lys Ser Pro Thr Arg Gln Ser Pro Gly Ala Ala Gly Tyr
            20                  25                  30

Asp Leu Tyr Ser Ala Tyr Asp Tyr Thr Ile Pro Pro Gly Glu Arg Gln
        35                  40                  45

Leu Ile Lys Thr Asp Ile Ser Met Ser Met Pro Lys Ile Cys Tyr Gly
    50                  55                  60

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

Gly Gly Val Ile Asp Glu Asp Tyr Arg Gly Asn Ile Gly Val Ile Leu
                85                  90                  95

Ile Asn Asn Gly Lys Cys Thr Phe Asn Val Asn Thr Gly Asp Arg Ile
            100                 105                 110
```

Ala Gln Leu Ile Tyr Gln Arg Ile Tyr Tyr Pro Glu Leu Glu Glu Val
        115   120   125

Gln Ser Leu Asp Ser Thr Asn Arg Gly Asp Gln Gly Phe Gly Ser Thr
    130   135   140

Gly Leu Arg
145

<210> 91
<211> 480
<212> PRT
<213> Vaccinia virus

<400> 91
Met Pro Ile Phe Val Asn Thr Val Tyr Cys Lys Asn Ile Leu Ala Leu
1   5   10   15

Ser Met Thr Lys Lys Phe Lys Thr Ile Ile Asp Ala Ile Gly Gly Asn
            20   25   30

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

Thr His Leu Arg Gln Lys Tyr Thr Lys Asn Lys Asp Pro Val Thr Arg
    50   55   60

Val Cys Leu Asp Leu Asp Ile His Ser Leu Thr Ser Ile Val Ile Tyr
65   70   75   80

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

Leu Arg Ala Ser Ile Leu Thr Ser Val Glu Phe Ile Ile Tyr Thr Cys
            100   105   110

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

Tyr Met Met Gly Ile Glu Tyr Gly Leu Ser Asn Leu Leu Cys His Thr
    130   135   140

```
Lys Asn Phe Ile Ala Lys His Phe Leu Glu Leu Glu Asp Asp Ile Ile
145                 150                 155                 160

Asp Asn Phe Asp Tyr Leu Ser Met Lys Leu Ile Leu Glu Ser Asp Glu
                165                 170                 175

Leu Asn Val Pro Asp Glu Asp Tyr Val Val Asp Phe Val Ile Lys Trp
            180                 185                 190

Tyr Ile Lys Arg Arg Asn Lys Leu Gly Asn Leu Leu Leu Leu Ile Lys
        195                 200                 205

Asn Val Ile Arg Ser Asn Tyr Leu Ser Pro Arg Gly Ile Asn Asn Val
    210                 215                 220

Lys Trp Ile Leu Asp Cys Thr Lys Ile Phe His Cys Asp Lys Gln Pro
225                 230                 235                 240

Arg Lys Ser Tyr Lys Tyr Pro Phe Ile Glu Tyr Pro Met Asn Met Asp
                245                 250                 255

Gln Ile Ile Asp Ile Phe His Met Cys Thr Ser Thr His Val Gly Glu
            260                 265                 270

Val Val Tyr Leu Ile Gly Gly Trp Met Asn Asn Glu Ile His Asn Asn
        275                 280                 285

Ala Ile Ala Val Asn Tyr Ile Ser Asn Asn Trp Ile Pro Ile Pro Pro
    290                 295                 300

Met Asn Ser Pro Arg Leu Tyr Ala Ser Gly Ile Pro Ala Asn Asn Lys
305                 310                 315                 320

Leu Tyr Val Val Gly Gly Leu Pro Asn Pro Thr Ser Val Glu Arg Trp
                325                 330                 335

Phe His Gly Asp Ala Ala Trp Val Asn Met Pro Ser Leu Leu Lys Pro
            340                 345                 350
```

```
Arg Cys Asn Pro Ala Val Ala Ser Ile Asn Asn Val Ile Tyr Val Met
        355                 360                 365

Gly Gly His Ser Glu Thr Asp Thr Thr Thr Glu Tyr Leu Leu Pro Asn
    370                 375                 380

His Asp Gln Trp Gln Phe Gly Pro Ser Thr Tyr Tyr Pro His Tyr Lys
385                 390                 395                 400

Ser Cys Ala Leu Val Phe Gly Arg Arg Leu Phe Leu Val Gly Arg Asn
                405                 410                 415

Ala Glu Phe Tyr Cys Glu Ser Ser Asn Thr Trp Thr Leu Ile Asp Asp
            420                 425                 430

Pro Ile Tyr Pro Arg Asp Asn Pro Glu Leu Ile Ile Val Asp Asn Lys
        435                 440                 445

Leu Leu Leu Ile Gly Gly Phe Tyr Arg Glu Ser Tyr Ile Asp Thr Ile
    450                 455                 460

Glu Val Tyr Asn His His Thr Tyr Ser Trp Asn Ile Trp Asp Gly Lys
465                 470                 475                 480
```

<210> 92
<211> 512
<212> PRT
<213> Vaccinia virus

<400> 92

```
Met Glu Ser Val Ile Phe Ser Ile Asn Gly Glu Ile Ile Gln Val Asn
1               5                   10                  15

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

Asp His His Leu Lys Asp Glu Ala Ile Ile Leu Asn Gly Ile Asn Tyr
        35                  40                  45

His Ala Phe Glu Ser Leu Leu Asp Tyr Met Arg Trp Lys Lys Ile Asn
    50                  55                  60
```

```
Ile Thr Ile Asn Asn Val Glu Met Ile Leu Val Ala Ala Ile Ile Ile
65                  70                  75                  80

Asp Val Pro Pro Val Val Asp Leu Cys Val Lys Thr Met Ile His Asn
                85                  90                  95

Ile Asn Phe Thr Asn Cys Ile Arg Met Phe Asn Phe Ser Lys Arg Tyr
            100                 105                 110

Gly Ile Lys Lys Leu Tyr Asn Ala Ser Met Ser Glu Ile Ile Asn Asn
        115                 120                 125

Ile Thr Ala Val Thr Ser Asp Pro Glu Phe Gly Lys Leu Ser Lys Asp
    130                 135                 140

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

Asp Val Thr Ala Met Ile Leu Leu Lys Trp Ile His Lys Asn Pro Asn
                165                 170                 175

Asp Val Asp Ile Ile Asn Ile Leu His Pro Lys Phe Met Thr Asn Thr
            180                 185                 190

Met Arg Asn Ala Ile Ser Leu Leu Gly Leu Thr Ile Ser Lys Ser Thr
        195                 200                 205

Lys Pro Val Thr Arg Asn Gly Ile Lys His Asn Ile Val Val Ile Lys
    210                 215                 220

Asn Ser Asp Tyr Ile Ser Thr Ile Thr His Tyr Ser Pro Arg Thr Glu
225                 230                 235                 240

Tyr Trp Thr Ile Val Gly Asn Thr Asp Arg Gln Phe Tyr Asn Ala Asn
                245                 250                 255

Val Leu His Asn Cys Leu Tyr Ile Ile Gly Gly Met Ile Asn Asn Arg
            260                 265                 270
```

```
His Val Tyr Ser Val Ser Arg Val Asp Leu Lys Thr Lys Lys Trp Lys
        275                 280                 285

Thr Val Thr Asn Met Ser Ser Leu Lys Ser Glu Val Ser Thr Cys Val
    290                 295                 300

Asn Asp Gly Lys Leu Tyr Val Ile Gly Gly Leu Glu Phe Ser Ile Ser
305                 310                 315                 320

Thr Gly Val Ala Glu Tyr Leu Lys His Gly Thr Ser Lys Trp Ile Arg
                325                 330                 335

Leu Pro Asn Leu Ile Thr Pro Arg Tyr Ser Gly Ala Ser Val Phe Val
            340                 345                 350

Asn Asp Asp Ile Tyr Val Met Gly Gly Val Tyr Thr Thr Tyr Glu Lys
        355                 360                 365

Tyr Val Val Leu Asn Asp Val Glu Cys Phe Thr Lys Asn Arg Trp Ile
    370                 375                 380

Lys Lys Ser Pro Met Pro Arg His His Ser Ile Val Tyr Ala Val Glu
385                 390                 395                 400

Tyr Asp Gly Asp Ile Tyr Val Ile Thr Gly Ile Thr His Glu Thr Arg
                405                 410                 415

Asn Tyr Leu Tyr Lys Tyr Ile Val Lys Glu Asp Lys Trp Ile Glu Leu
            420                 425                 430

Tyr Met Tyr Phe Asn His Val Gly Lys Met Phe Val Cys Ser Cys Gly
        435                 440                 445

Asp Tyr Ile Leu Ile Ile Ala Asp Ala Lys Tyr Glu Tyr Tyr Pro Lys
    450                 455                 460

Ser Asn Thr Trp Asn Leu Phe Asp Met Ser Thr Arg Asn Ile Glu Tyr
465                 470                 475                 480

Tyr Asp Met Phe Thr Lys Asp Glu Thr Pro Lys Cys Asn Val Thr His
```

485 490 495

Lys Ser Leu Pro Ser Phe Leu Ser Asn Cys Glu Lys Gln Phe Leu Gln
500 505 510

<210> 93
<211> 224
<212> PRT
<213> Vaccinia virus

<400> 93
Met Val Lys Asn Asn Lys Ile Ser Asn Ser Cys Arg Met Ile Met Ser
1 5 10 15

Thr Asn Pro Asn Asn Ile Leu Met Arg His Leu Lys Asn Leu Thr Asp
20 25 30

Asp Glu Phe Lys Cys Ile Ile His Arg Ser Ser Asp Phe Leu Tyr Leu
35 40 45

Ser Asp Ser Asp Tyr Thr Ser Ile Thr Lys Glu Thr Leu Val Ser Glu
50 55 60

Ile Val Glu Glu Tyr Pro Asp Asp Cys Asn Lys Ile Leu Ala Ile Ile
65 70 75 80

Phe Leu Val Leu Asp Lys Asp Ile Asp Val Asp Ile Glu Thr Lys Leu
85 90 95

Lys Pro Lys Pro Ala Val Arg Phe Ala Ile Leu Asp Lys Met Thr Ala
100 105 110

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

Gln Asp Ile Pro Leu Gly Pro Leu Phe Lys Lys Ile Asp Ser Tyr Arg
130 135 140

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

```
Tyr Phe Asn Lys Tyr Gly His Leu Met Phe Tyr Thr Leu Pro Ile Pro
                165                 170                 175

Tyr Asn Arg Phe Phe Cys Arg Asn Ser Ile Gly Phe Leu Ala Val Leu
            180                 185                 190

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

Val Ser Ile Asp Asp Arg Arg Lys Phe Lys Lys Glu Leu Met Ser Lys
    210                 215                 220
```

<210> 94
<211> 117
<212> PRT
<213> Vaccinia virus

<400> 94

```
Met Arg Thr Leu Leu Ile Arg Tyr Ile Leu Trp Arg Asn Asp Asn Asp
1               5                   10                  15

Gln Thr Tyr Tyr Asn Asp Asp Phe Lys Lys Leu Met Leu Leu Asp Glu
            20                  25                  30

Leu Val Asp Asp Gly Asp Val Cys Thr Leu Ile Lys Asn Met Arg Met
        35                  40                  45

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

Asn Ile Glu Asp Ala Lys Arg Met Ile Ala Ile Ser Ala Lys Val Ala
65                  70                  75                  80

Arg Asp Ile Gly Glu Arg Ser Glu Ile Arg Trp Glu Glu Ser Phe Thr
                85                  90                  95

Ile Leu Phe Arg Met Ile Glu Thr Tyr Phe Asp Asp Leu Met Ile Asp
            100                 105                 110

Leu Tyr Gly Glu Lys
        115
```

<210> 95
<211> 175
<212> PRT
<213> Vaccinia virus

<400> 95
Met Thr Ser Ser Ala Met Asp Asn Asn Glu Pro Lys Val Leu Glu Met
1   5   10   15

Val Tyr Asp Ala Thr Ile Leu Pro Glu Gly Ser Ser Met Asp Pro Asn
            20   25   30

Ile Met Asp Cys Ile Asn Arg His Ile Asn Met Cys Ile Gln Arg Thr
        35   40   45

Tyr Ser Ser Ser Ile Ile Ala Ile Leu Asp Arg Phe Leu Thr Met Asn
    50   55   60

Lys Asp Glu Leu Asn Asn Thr Gln Cys His Ile Ile Lys Glu Phe Met
65   70   75   80

Thr Tyr Glu Gln Met Ala Ile Asp His Tyr Gly Glu Tyr Val Asn Ala
                85   90   95

Ile Leu Tyr Gln Ile Arg Lys Arg Pro Asn Gln His His Thr Ile Asp
            100   105   110

Leu Phe Lys Lys Ile Lys Arg Thr Arg Tyr Asp Thr Phe Lys Val Asp
        115   120   125

Pro Val Glu Phe Val Lys Lys Val Ile Gly Phe Val Ser Ile Leu Asn
    130   135   140

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

Asp Glu Phe Lys Cys Phe Ile Asp Tyr Val Glu Thr Lys Tyr Phe
                165   170   175

<210> 96
<211> 470

<212> PRT
<213> Vaccinia virus

<400> 96
Met Ile Phe Val Ile Glu Ser Lys Leu Leu Gln Ile Tyr Arg Asn Arg
1   5   10   15

Asn Ile Asn Phe Tyr Thr Thr Met Asp Asn Ile Met Ser Ala Glu Tyr
            20   25   30

Tyr Leu Ser Leu Tyr Ala Lys Tyr Asn Ser Lys Asn Leu Asp Val Phe
        35   40   45

Arg Asn Met Leu Gln Ala Ile Glu Pro Ser Gly Asn Asn Tyr His Ile
    50   55   60

Leu His Ala Tyr Cys Gly Ile Lys Gly Leu Asp Glu Arg Phe Val Glu
65   70   75   80

Glu Leu Leu His Arg Gly Tyr Ser Pro Asn Glu Thr Asp Asp Asp Gly
                85   90   95

Asn Tyr Pro Leu His Ile Ala Ser Lys Ile Asn Asn Asn Arg Ile Val
            100   105   110

Ala Met Leu Leu Thr His Gly Ala Asp Pro Asn Ala Cys Asp Lys Gln
        115   120   125

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

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

Val Asp Glu Glu Gly Cys Gly Pro Leu Leu Ala Cys Thr Asp Pro Ser
                165   170   175

Glu Arg Val Phe Lys Lys Ile Met Ser Ile Gly Phe Glu Ala Arg Ile
            180   185   190

Val Asp Lys Phe Gly Lys Asn His Ile His Arg His Leu Met Ser Asp

```
        195                 200                 205

Asn Pro Lys Ala Ser Thr Ile Ser Trp Met Met Lys Leu Gly Ile Ser
    210                 215                 220

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

Ser Lys Thr Val Lys Asn Val Asp Ile Ile Asp Leu Leu Leu Pro Ser
                245                 250                 255

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

Leu Ile Lys Thr Leu Ser Pro Ala His Leu Ile Asn Lys Leu Leu Ser
        275                 280                 285

Thr Ser Asn Val Ile Thr Asp Gln Thr Val Asn Ile Cys Ile Phe Tyr
    290                 295                 300

Asp Arg Asp Asp Val Leu Glu Ile Ile Asn Asp Lys Gly Lys Gln Tyr
305                 310                 315                 320

Asp Ser Thr Asp Phe Lys Met Ala Val Glu Val Gly Ser Ile Arg Cys
                325                 330                 335

Val Lys Tyr Leu Leu Asp Asn Asp Ile Ile Cys Glu Asp Ala Met Tyr
            340                 345                 350

Tyr Ala Val Leu Ser Glu Tyr Glu Thr Met Val Asp Tyr Leu Leu Phe
        355                 360                 365

Asn His Phe Ser Val Asp Ser Val Val Asn Gly His Thr Cys Met Ser
    370                 375                 380

Glu Cys Val Arg Leu Asn Asn Pro Val Ile Leu Ser Lys Leu Met Leu
385                 390                 395                 400

His Asn Pro Thr Ser Glu Thr Met Tyr Leu Thr Met Lys Ala Ile Glu
                405                 410                 415
```

Lys Asp Arg Leu Asp Lys Ser Ile Ile Ile Pro Phe Ile Ala Tyr Phe
420 425 430

Val Leu Met His Pro Asp Phe Cys Lys Asn Arg Arg Tyr Phe Thr Ser
435 440 445

Tyr Lys Arg Phe Val Thr Asp Tyr Val His Glu Gly Val Ser Tyr Glu
450 455 460

Val Phe Asp Asp Tyr Phe
465 470

<210> 97
<211> 220
<212> PRT
<213> Vaccinia virus

<400> 97
Met Val Tyr Lys Leu Val Leu Leu Phe Cys Ile Ala Ser Leu Gly Tyr
1 5 10 15

Ser Val Glu Tyr Lys Asn Thr Ile Cys Pro Pro Arg Gln Asp Tyr Arg
20 25 30

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

Asn Ser Thr Ile Ile Gly Glu Cys His Met Ser Glu Ser Tyr Ile Asp
50 55 60

Arg Asn Ala Asn Ile Val Leu Thr Gly Tyr Gly Leu Glu Ile Asn Met
65 70 75 80

Thr Ile Met Asp Thr Asp Gln Arg Phe Val Ala Ala Ala Glu Gly Val
85 90 95

Gly Lys Asp Asn Lys Leu Ser Val Leu Leu Phe Thr Thr Gln Arg Leu
100 105 110

Asp Lys Val His His Asn Ile Ser Val Thr Ile Thr Cys Met Glu Met

```
        115                 120                 125

Asn Cys Gly Thr Thr Lys Tyr Asp Ser Asp Leu Pro Glu Ser Ile His
    130                 135                 140

Lys Ser Ser Ser Cys Asp Ile Thr Ile Asn Gly Ser Cys Val Thr Cys
145                 150                 155                 160

Val Asn Leu Glu Thr Asp Pro Thr Lys Ile Asn Pro His Tyr Leu His
                165                 170                 175

Pro Lys Asp Lys Tyr Leu Tyr His Asn Ser Glu Tyr Gly Met Arg Gly
            180                 185                 190

Ser Tyr Gly Val Thr Phe Ile Asp Glu Leu Asn Gln Cys Leu Leu Asp
        195                 200                 205

Ile Lys Glu Leu Ser Tyr Asp Ile Cys Tyr Arg Glu
    210                 215                 220


<210> 98
<211> 284
<212> PRT
<213> Vaccinia virus

<400> 98
Met Asp Leu Ser Arg Ile Asn Thr Trp Lys Ser Lys Gln Leu Lys Ser
1               5                   10                  15

Phe Leu Ser Ser Lys Asp Ala Phe Lys Ala Asp Ile Asn Gly His Ser
            20                  25                  30

Ala Leu Tyr Tyr Ala Ile Ala Asp Asn Asn Val Arg Leu Val Cys Thr
        35                  40                  45

Leu Leu Asn Ala Gly Ala Leu Lys Asn Leu Leu Glu Asn Glu Phe Pro
    50                  55                  60

Leu His Gln Ala Ala Thr Leu Glu Asp Thr Lys Ile Val Lys Ile Leu
65                  70                  75                  80
```

```
Leu Phe Ser Gly Leu Asp Asp Ser Gln Phe Asp Asp Lys Gly Asn Thr
                85                  90                  95

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

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

Lys Thr Ser Phe Tyr His Ala Val Met Leu Asn Asp Val Ser Ile Val
    130                 135                 140

Ser Tyr Phe Leu Ser Glu Ile Pro Ser Thr Phe Asp Leu Ala Ile Leu
145                 150                 155                 160

Leu Ser Cys Ile His Ile Thr Ile Lys Asn Gly His Val Asp Met Met
                165                 170                 175

Ile Leu Leu Leu Asp Tyr Met Thr Ser Thr Asn Thr Asn Asn Ser Leu
            180                 185                 190

Leu Phe Ile Pro Asp Ile Lys Leu Ala Ile Asp Asn Lys Asp Ile Glu
        195                 200                 205

Met Leu Gln Ala Leu Phe Lys Tyr Asp Ile Asn Ile Tyr Ser Ala Asn
    210                 215                 220

Leu Glu Asn Val Leu Leu Asp Asp Ala Glu Ile Ala Lys Met Ile Ile
225                 230                 235                 240

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

Ile Val Lys Asn Asn Lys Leu Asp Glu Ile Ile Ser Lys Asn Lys Glu
            260                 265                 270

Leu Lys Leu Met Tyr Val Asn Cys Val Lys Lys Asn
        275                 280
```

<210> 99

<211> 309
<212> PRT
<213> Vaccinia virus

<400> 99
Ile Glu Leu Leu Lys Thr Met Asp Leu Arg Lys Arg Asp Leu Gly Pro
1   5   10   15

Ala Phe Thr Glu Leu Ile Ser Gly Leu Ala Lys Leu Lys Thr Ser Lys
            20   25   30

Tyr Thr Tyr Thr Asp Leu Thr Tyr Gln Ser Phe Val Asp Asn Thr Val
        35   40   45

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

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

Glu Arg Arg Ser Gly Met Ser Asn Val Val Asp Ser Asn Met Leu Asp
                85   90   95

Asn Asn Thr Leu Trp Ala Ile Ile Asn Thr Ile Tyr Phe Lys Gly Ile
            100   105   110

Trp Gln Tyr Pro Phe Asp Ile Thr Lys Thr Arg Asn Ala Ser Phe Thr
        115   120   125

Asn Lys Tyr Gly Thr Lys Thr Val Pro Met Met Asn Val Val Thr Lys
    130   135   140

Leu Gln Gly Asn Thr Ile Thr Ile Asp Asp Glu Glu Tyr Asp Met Val
145   150   155   160

Arg Leu Pro Tyr Lys Asp Ala Asn Ile Ser Met Tyr Leu Ala Ile Gly
                165   170   175

Asp Asn Met Thr His Phe Thr Asp Ser Ile Thr Ala Ala Lys Leu Asp
            180   185   190

```
Tyr Trp Ser Ser Gln Leu Gly Asn Lys Val Tyr Asn Leu Lys Leu Pro
        195                 200                 205

Lys Phe Ser Ile Glu Asn Lys Arg Asp Ile Lys Ser Ile Ala Glu Met
    210                 215                 220

Met Ala Pro Ser Met Phe Asn Pro Asp Asn Ala Ser Phe Lys His Met
225                 230                 235                 240

Thr Arg Asp Pro Leu Tyr Ile Tyr Lys Met Phe Gln Asn Ala Lys Ile
                245                 250                 255

Asp Val Asp Glu Gln Gly Thr Val Ala Glu Ala Ser Thr Ile Met Val
            260                 265                 270

Ala Thr Ala Arg Ser Ser Pro Glu Lys Leu Glu Phe Asn Thr Pro Phe
        275                 280                 285

Val Phe Ile Ile Arg His Asp Ile Thr Gly Phe Ile Leu Phe Met Gly
    290                 295                 300

Lys Val Glu Ser Pro
305
```

<210> 100
<211> 88
<212> PRT
<213> Vaccinia virus

<400> 100

```
Met Leu Ala Phe Cys Tyr Ser Leu Pro Asn Ala Gly Asp Val Ile Lys
1               5                   10                  15

Gly Arg Val Tyr Glu Asn Asp Tyr Ala Leu Tyr Ile Tyr Leu Phe Asp
            20                  25                  30

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

Asp Arg Tyr Val Glu Tyr Arg Asp Lys Leu Val Gly Lys Thr Val Lys
    50                  55                  60
```

Val Lys Val Ile Arg Val Asp Tyr Thr Lys Gly Tyr Ile Asp Val Asn
65 70 75 80

Tyr Lys Arg Met Cys Arg His Gln
85

<210> 101
<211> 424
<212> PRT
<213> Vaccinia virus

<400> 101
Met Asn Pro Asp Asn Thr Ile Ala Val Ile Thr Glu Thr Ile Pro Ile
1 5 10 15

Gly Met Gln Phe Asp Lys Val Tyr Leu Ser Thr Phe Asn Met Trp Arg
20 25 30

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

Trp Ser Leu Ser Asp Glu Val Gly Thr Asn Phe Gly Thr Ile Ile Leu
50 55 60

Asn Glu Ile Val Gln Leu Pro Lys Arg Gly Val Arg Val Arg Val Ala
65 70 75 80

Val Asn Lys Ser Asn Lys Pro Leu Lys Asp Val Glu Arg Leu Gln Met
85 90 95

Ala Gly Val Glu Val Arg Tyr Ile Asp Ile Thr Asn Ile Leu Gly Gly
100 105 110

Val Leu His Thr Lys Phe Trp Ile Ser Asp Asn Thr His Ile Tyr Leu
115 120 125

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

Gly Ile Ala Ile Phe Asn Asn Arg Asn Leu Ala Ala Asp Leu Thr Gln
145 150 155 160

```
Ile Phe Glu Val Tyr Trp Tyr Leu Gly Val Asn Asn Leu Pro Tyr Asn
                165                 170                 175

Trp Lys Asn Phe Tyr Pro Ser Tyr Tyr Asn Thr Asp His Pro Leu Ser
            180                 185                 190

Ile Asn Val Ser Gly Val Pro His Ser Val Phe Ile Ala Ser Ala Pro
        195                 200                 205

Gln Gln Leu Cys Thr Met Glu Arg Thr Asn Asp Leu Thr Ala Leu Leu
    210                 215                 220

Ser Cys Ile Arg Asn Ala Ser Lys Phe Val Tyr Val Ser Val Met Asn
225                 230                 235                 240

Phe Ile Pro Ile Ile Tyr Ser Lys Ala Gly Lys Ile Leu Phe Trp Pro
                245                 250                 255

Tyr Ile Glu Asp Glu Leu Arg Arg Ser Ala Ile Asp Arg Gln Val Ser
            260                 265                 270

Val Lys Leu Leu Ile Ser Cys Trp Gln Arg Ser Ser Phe Ile Met Arg
        275                 280                 285

Asn Phe Leu Arg Ser Ile Ala Met Leu Lys Ser Lys Asn Ile Asn Ile
    290                 295                 300

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

Ser Arg Val Asn His Ala Lys Tyr Met Val Thr Asp Lys Thr Ala Tyr
                325                 330                 335

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

Ala Ser Ile Asn Ile Thr Pro Asp Asp Gly Leu Gly Leu Arg Gln Gln
        355                 360                 365
```

Leu Glu Asp Ile Phe Met Arg Asp Trp Asn Ser Lys Tyr Ser Tyr Glu
370 375 380

Leu Tyr Asp Thr Ser Pro Thr Lys Arg Cys Lys Leu Leu Lys Asn Met
385 390 395 400

Lys Gln Cys Thr Asn Asp Ile Tyr Cys Asp Glu Ile Gln Pro Glu Lys
405 410 415

Glu Ile Pro Glu Tyr Ser Leu Glu
420

<210> 102
<211> 175
<212> PRT
<213> Vaccinia virus

<400> 102
Met Gly His Ser Met Gly Ala Thr Ile Ser Ile Leu Ala Ser Tyr Asp
1 5 10 15

Asn Pro Asn Leu Phe Thr Ala Met Ile Leu Met Ser Pro Leu Val Asn
20 25 30

Ala Asp Ala Val Ser Arg Leu Asn Leu Leu Ala Ala Lys Leu Met Gly
35 40 45

Thr Ile Thr Pro Asn Ala Pro Val Gly Lys Leu Cys Pro Glu Ser Val
50 55 60

Ser Arg Asp Met Asp Lys Val Tyr Lys Tyr Gln Tyr Asp Pro Leu Ile
65 70 75 80

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

Thr Asn Lys Val Arg Lys Ile Ile Ser Lys Ile Asn Thr Pro Pro Thr
100 105 110

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

Tyr Tyr Phe Met Gln His Ala Asn Cys Asn Arg Glu Ile Lys Ile Tyr
130 135 140

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

Ser Val Met Lys Glu Ile Glu Thr Trp Ile Phe Asn Arg Val Lys
165 170 175

<210> 103
<211> 81
<212> PRT
<213> Vaccinia virus

<400> 103
Met Ser Ala Asn Cys Met Phe Asn Leu Asp Asn Asp Tyr Ile Tyr Trp
1 5 10 15

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

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

Leu Gly Ile Leu Val Phe Ser His Asp His Ile Gly His Gly Arg Ser
50 55 60

Asn Gly Glu Lys Met Met Ile Asp Asp Phe Gly Thr Ala Arg Gly Asn
65 70 75 80

Tyr

<210> 104
<211> 149
<212> PRT
<213> Vaccinia virus

<400> 104
Met Ala Thr Lys Leu Asp Tyr Glu Asp Ala Val Phe Tyr Phe Val Asp
1 5 10 15

Asp Asp Lys Ile Cys Ser Arg Asp Ser Ile Ile Asp Leu Ile Asp Glu
            20   25   30

Tyr Ile Thr Trp Arg Asn His Val Ile Val Phe Asn Lys Asp Ile Thr
        35   40   45

Ser Cys Gly Arg Leu Tyr Lys Glu Leu Met Lys Phe Asp Asp Val Ala
    50   55   60

Ile Arg Tyr Tyr Gly Ile Asp Lys Ile Asn Glu Ile Val Glu Ala Met
65   70   75   80

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

Ser Leu Phe Ala Thr Ile Gly Ile Cys Ala Lys Ile Thr Glu His Trp
            100   105   110

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

Thr Asp Leu Met Thr Asp Asp Asn Ile Asn Ile Leu Ile Leu Phe Leu
    130   135   140

Glu Lys Lys Leu Asn
145

<210> 105
<211> 226
<212> PRT
<213> Vaccinia virus

<400> 105
Met Leu Ser Met Phe Met Cys Asn Asn Ile Val Asp Tyr Val Asp Asp
1   5   10   15

Ile Asp Asn Gly Ile Val Gln Asp Ile Glu Asp Glu Ala Ser Asn Asn
            20   25   30

Val Asp His Asp Tyr Val Tyr Pro Leu Pro Glu Asn Met Val Tyr Arg
        35   40   45

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

His Val Met Met Ala Val Arg Tyr Tyr Met Ser Lys Gln Arg Leu Asp
65                  70                  75                  80

Asp Leu Tyr Arg Gln Leu Pro Thr Lys Thr Arg Ser Tyr Ile Asp Ile
                85                  90                  95

Ile Asn Ile Tyr Cys Asp Lys Val Ser Asn Asp Tyr Asn Arg Asp Met
            100                 105                 110

Asn Ile Met Tyr Asp Met Ala Ser Thr Lys Ser Phe Thr Val Tyr Asp
        115                 120                 125

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

Val Arg Leu Ala Thr Ile Ser Phe Ile Thr Glu Leu Gly Arg Arg Cys
145                 150                 155                 160

Met Asn Pro Val Lys Thr Ile Lys Met Phe Thr Leu Leu Ser His Thr
                165                 170                 175

Ile Cys Asp Asp Cys Phe Val Asp Tyr Ile Thr Asp Ile Ser Pro Pro
            180                 185                 190

Asp Asn Thr Ile Pro Asn Thr Ser Thr Arg Glu Tyr Leu Lys Leu Ile
        195                 200                 205

Gly Ile Thr Ala Ile Met Phe Ala Thr Tyr Lys Thr Leu Lys Tyr Met
    210                 215                 220

Ile Gly
225


<210> 106
<211> 147
<212> PRT
```

<213> Vaccinia virus

<400> 106
Met Phe Asn Met Asn Ile Asn Ser Pro Val Arg Phe Val Lys Glu Thr
1   5   10   15

Asn Arg Ala Lys Ser Pro Thr Arg Gln Ser Pro Gly Ala Ala Gly Tyr
            20   25   30

Asp Leu Tyr Ser Ala Tyr Asp Tyr Thr Ile Pro Pro Gly Glu Arg Gln
        35   40   45

Leu Ile Lys Thr Asp Ile Ser Met Ser Met Pro Lys Phe Cys Tyr Gly
    50   55   60

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

Gly Gly Val Ile Asp Glu Asp Tyr Arg Gly Asn Ile Gly Val Ile Leu
                85   90   95

Ile Asn Asn Gly Lys Cys Thr Phe Asn Val Asn Thr Gly Asp Arg Ile
            100   105   110

Ala Gln Leu Ile Tyr Gln Arg Ile Tyr Tyr Pro Glu Leu Glu Glu Val
        115   120   125

Gln Ser Leu Asp Ser Thr Asn Arg Gly Asp Gln Gly Phe Gly Ser Thr
    130   135   140

Gly Leu Arg
145

<210> 107
<211> 480
<212> PRT
<213> Vaccinia virus

<400> 107
Met Pro Ile Phe Val Asn Thr Val Tyr Cys Lys Asn Ile Leu Ala Leu
1   5   10   15

```
Ser Met Thr Lys Lys Phe Lys Thr Ile Ile Asp Ala Ile Gly Gly Asn
            20                  25                  30

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

Thr His Leu Arg Gln Lys Tyr Thr Lys Asn Lys Asp Pro Val Thr Arg
    50                  55                  60

Val Cys Leu Asp Leu Asp Ile His Ser Leu Thr Ser Ile Val Ile Tyr
65                  70                  75                  80

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

Leu Arg Ala Ser Ile Leu Thr Ser Val Glu Phe Ile Ile Tyr Thr Cys
            100                 105                 110

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

Tyr Met Met Gly Ile Glu Tyr Gly Leu Ser Asn Leu Leu Cys His Thr
    130                 135                 140

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

Asp Asn Phe Asp Tyr Leu Ser Ile Lys Leu Ile Leu Glu Ser Asp Glu
                165                 170                 175

Leu Asn Val Pro Asp Glu Asp Tyr Val Val Asp Phe Val Ile Lys Trp
            180                 185                 190

Tyr Ile Lys Arg Arg Asn Lys Leu Gly Asn Leu Leu Leu Leu Ile Lys
        195                 200                 205

Asn Val Ile Arg Ser Asn Tyr Leu Ser Pro Arg Gly Ile Asn Asn Val
    210                 215                 220

Lys Trp Ile Leu Asp Cys Thr Lys Ile Phe His Cys Asp Lys Gln Pro
```

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225                 230                 235                 240

Arg Lys Ser Tyr Lys Tyr Pro Phe Ile Glu Tyr Pro Met Asn Met Asp
                245                 250                 255

Gln Ile Ile Asp Ile Phe His Met Cys Thr Ser Thr His Val Gly Glu
            260                 265                 270

Val Val Tyr Leu Ile Gly Gly Trp Met Asn Asn Glu Ile His Asn Asn
        275                 280                 285

Ala Ile Ala Val Asn Tyr Ile Ser Asn Asn Trp Ile Pro Ile Pro Pro
    290                 295                 300

Met Asn Ser Pro Arg Leu Tyr Ala Ser Gly Ile Pro Ala Asn Asn Lys
305                 310                 315                 320

Leu Tyr Val Val Gly Gly Leu Pro Asn Pro Thr Ser Val Glu Arg Trp
                325                 330                 335

Phe His Gly Asp Ala Ala Trp Val Asn Met Pro Ser Leu Leu Lys Pro
            340                 345                 350

Arg Cys Asn Pro Ala Val Ala Ser Ile Asn Asn Val Ile Tyr Val Met
        355                 360                 365

Gly Gly His Ser Glu Thr Asp Thr Thr Thr Glu Tyr Leu Leu Pro Asn
    370                 375                 380

His Asp Gln Trp Gln Phe Gly Pro Ser Thr Tyr Tyr Pro His Tyr Lys
385                 390                 395                 400

Ser Cys Ala Leu Val Phe Gly Arg Arg Leu Phe Leu Val Gly Arg Asn
                405                 410                 415

Ala Glu Phe Tyr Cys Glu Ser Ser Asn Thr Trp Thr Leu Ile Asp Asp
            420                 425                 430

Pro Ile Tyr Pro Arg Asp Asn Pro Glu Leu Ile Ile Val Asp Asn Lys
        435                 440                 445
```

Leu Leu Leu Ile Gly Gly Phe Tyr Arg Glu Ser Tyr Ile Asp Thr Ile
    450   455   460

Glu Val Tyr Asn His His Thr Tyr Ser Trp Asn Ile Trp Asp Gly Lys
465   470   475   480

<210> 108
<211> 222
<212> PRT
<213> Vaccinia virus

<400> 108
Met Asn His Cys Leu Leu Ala Ile Ser Ala Val Tyr Phe Lys Ala Lys
1   5   10   15

Trp Leu Thr Pro Phe Glu Lys Glu Phe Thr Ser Asp Tyr Pro Phe Tyr
            20   25   30

Val Ser Pro Thr Glu Met Val Asp Val Ser Met Met Ser Met Tyr Gly
        35   40   45

Glu Leu Phe Asn His Ala Ser Val Lys Glu Ser Phe Gly Asn Phe Ser
    50   55   60

Ile Ile Glu Leu Pro Tyr Val Gly Asp Thr Ser Met Met Val Ile Leu
65   70   75   80

Pro Asp Lys Ile Asp Gly Leu Glu Ser Ile Glu Gln Asn Leu Thr Asp
                85   90   95

Thr Asn Phe Lys Lys Trp Cys Asn Ser Leu Asp Ala Met Phe Ile Asp
            100   105   110

Val His Ile Pro Lys Phe Lys Val Thr Gly Ser Tyr Asn Leu Val Asp
        115   120   125

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

Tyr Ser Asn Met Cys Asn Leu Asp Val Ser Val Asp Ala Met Ile His

145 150 155 160

Lys Thr Tyr Ile Asp Val Asn Glu Glu Tyr Thr Glu Ala Ala Ala Ala
165 170 175

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

Cys Val Asp His Pro Phe Ile Tyr Val Ile Arg His Val Asp Gly Lys
195 200 205

Ile Leu Phe Val Gly Arg Tyr Cys Ser Pro Thr Thr Asn Cys
210 215 220

<210> 109
<211> 149
<212> PRT
<213> Vaccinia virus

<400> 109
Met Thr Ala Asn Phe Ser Thr His Val Phe Ser Pro Gln His Cys Gly
1 5 10 15

Cys Asp Arg Leu Thr Ser Ile Asp Asp Val Lys Gln Cys Leu Thr Glu
20 25 30

Tyr Ile Tyr Trp Ser Ser Tyr Ala Tyr Arg Asn Arg Gln Cys Ala Gly
35 40 45

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

Phe Ile Asp Ile Arg Glu Leu Val Lys Asn Met Pro Trp Asp Asp Val
65 70 75 80

Lys Asp Cys Thr Glu Ile Ile Arg Cys Tyr Ile Pro Asp Glu Gln Lys
85 90 95

Thr Ile Arg Glu Ile Ser Ala Ile Ile Gly Leu Cys Ala Tyr Ala Ala
100 105 110

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

Leu Phe Val Met Leu Glu Met Leu Asn Tyr Val Asp Tyr Asn Ile Ile
130 135 140

Phe Arg Arg Met Asn
145

<210> 110
<211> 91
<212> PRT
<213> Vaccinia virus

<400> 110
Met Tyr Asn Ser Ser Ile His Thr Pro Glu Tyr Asp Val Ile Ile His
1 5 10 15

Val Ile Glu His Leu Lys His His Lys Gln Cys Val Gln Thr Val Thr
20 25 30

Ser Gly Met Val Phe Thr Ser Pro Val Ser Ser Ser Ile Cys Thr Lys
35 40 45

Ser Asp Asp Gly Arg Asn Leu Ser Asp Gly Phe Leu Leu Ile Arg Tyr
50 55 60

Ile Thr Thr Asp Asp Phe Cys Thr Ile Phe Asp Ile Ile Pro Arg His
65 70 75 80

Ile Phe Tyr Gln Leu Ala Asn Val Asp Glu His
85 90

<210> 111
<211> 30
<212> PRT
<213> Vaccinia virus

<400> 111
Met Ser Ile Leu Pro Val Ile Phe Leu Pro Ile Phe Phe Tyr Ser Ser
1 5 10 15

Phe Val Gln Thr Phe Asn Ala Ser Glu Cys Ile Asp Lys Gly

```
            20                  25                  30


<210> 112
<211> 75
<212> PRT
<213> Vaccinia virus

<400> 112
Met Val Ile Ile Pro Gly Val Arg Cys Leu Ser Leu Leu Phe Leu Arg
1               5                   10                  15


Arg Arg Cys Pro Leu His Ile Ile Ser Ala Phe Thr Leu Leu Ala Ile
            20                  25                  30


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


Thr Ile Cys Gly Tyr Glu Ile Lys Ser Ile Phe Asp Ser Glu Thr Asp
    50                  55                  60


Thr Ile Val Lys Phe Asn Asp Ile Met Ser Gln
65                  70                  75


<210> 113
<211> 340
<212> PRT
<213> Vaccinia virus

<400> 113
Met Ser Arg Lys Phe Met Gln Val Tyr Glu Tyr Asp Arg Glu Gln Tyr
1               5                   10                  15


Leu Asp Glu Phe Ile Glu Asp Arg Tyr Asn Asp Ser Phe Ile Thr Ser
            20                  25                  30


Pro Glu Tyr Tyr Ser Ala Glu Lys Tyr Met Cys Arg Tyr Thr Thr Leu
        35                  40                  45


Asn His Asn Cys Val Asn Val Arg Arg Cys Ala Leu Asp Ser Lys Leu
    50                  55                  60


Leu His Asp Ile Ile Thr Asn Cys Lys Ile Tyr Asn Asn Ile Glu Leu
65                  70                  75                  80
```

```
Val Arg Ala Thr Lys Phe Val Tyr Tyr Leu Asp Leu Ile Lys Cys Asn
                85                  90                  95

Trp Val Ser Lys Val Gly Asp Ser Val Leu Tyr Pro Val Ile Phe Ile
            100                 105                 110

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

Lys Gly Val Lys Val Lys Lys Leu Asn Arg Cys Ala Asp His Ala Ile
    130                 135                 140

Val Ile Asn Pro Phe Val Lys Phe Lys Leu Thr Leu Pro Asn Lys Thr
145                 150                 155                 160

Ser His Ala Lys Val Leu Val Thr Phe Cys Lys Leu Arg Thr Asp Ile
                165                 170                 175

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

Pro Asp Ile Asn Lys Arg Ile Pro Gly Tyr Ile His Val Asn Ile Glu
        195                 200                 205

Gly Cys Ile Asp Gly Met Ile Tyr Ile Asn Ser Ser Lys Phe Ala Cys
    210                 215                 220

Val Leu Lys Leu His Arg Ser Met Tyr Arg Ile Pro Pro Phe Pro Ile
225                 230                 235                 240

Asp Ile Cys Ser Cys Cys Ser Gln Tyr Thr Asn Asp Asp Ile Glu Ile
                245                 250                 255

Pro Ile His Asp Leu Ile Lys Asp Val Ala Ile Phe Lys Asn Lys Glu
            260                 265                 270

Thr Val Tyr Tyr Leu Lys Leu Asn Asn Lys Thr Ile Ala Arg Phe Thr
        275                 280                 285
```

Tyr Phe Asn Asn Ile Asp Thr Ala Ile Thr Gln Glu His Glu Tyr Val
290 295 300

Lys Ile Ala Leu Gly Ile Val Cys Lys Leu Met Ile Asn Asn Met His
305 310 315 320

Ser Ile Val Gly Val Asn His Ser Asn Thr Phe Val Asn Cys Leu Leu
325 330 335

Glu Asp Asn Val
340

<210> 114
<211> 574
<212> PRT
<213> Vaccinia virus

<400> 114
Met Ser Arg Arg Leu Ile Tyr Val Leu Asn Ile Asn Arg Lys Ser Thr
1 5 10 15

His Lys Ile Gln Glu Asn Glu Ile Tyr Thr Tyr Phe Ser His Cys Asn
20 25 30

Ile Asp His Thr Ser Thr Glu Leu Asp Phe Val Val Lys Asn Tyr Asp
35 40 45

Leu Asn Arg Arg Gln His Val Thr Gly Tyr Thr Ala Leu His Cys Tyr
50 55 60

Leu Tyr Asn Asn Tyr Phe Thr Asn Asp Val Leu Lys Ile Leu Leu Asn
65 70 75 80

His Asp Val Asn Val Thr Met Lys Thr Ser Ser Gly Arg Met Pro Val
85 90 95

Tyr Ile Leu Leu Thr Arg Cys Cys Asn Ile Ser His Asp Val Val Ile
100 105 110

Asp Met Ile Asp Lys Asp Lys Asn His Leu Ser His Arg Asp Tyr Ser
115 120 125

```
Asn Leu Leu Leu Glu Tyr Ile Lys Ser Arg Tyr Met Leu Leu Lys Glu
    130                 135                 140

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

Asp Pro Asn Phe Lys Gln Asp Gly Tyr Thr Ala Leu His Tyr Tyr Tyr
                165                 170                 175

Leu Cys Leu Ala His Val Tyr Lys Pro Gly Glu Cys Arg Lys Pro Ile
            180                 185                 190

Thr Ile Lys Lys Ala Lys Arg Ile Ile Ser Leu Phe Ile Gln His Gly
        195                 200                 205

Ala Asn Leu Asn Ala Leu Asp Asn Cys Gly Asn Thr Pro Phe His Leu
    210                 215                 220

Tyr Leu Ser Ile Glu Met Cys Asn Asn Ile His Met Thr Lys Met Leu
225                 230                 235                 240

Leu Thr Phe Asn Pro Asn Phe Lys Ile Cys Asn Asn His Gly Leu Thr
                245                 250                 255

Pro Ile Leu Cys Tyr Ile Thr Ser Asp Tyr Ile Gln His Asp Ile Leu
            260                 265                 270

Val Met Leu Ile His His Tyr Glu Thr Asn Val Gly Glu Met Pro Ile
        275                 280                 285

Asp Glu Arg Arg Met Ile Val Phe Glu Phe Ile Lys Thr Tyr Ser Thr
    290                 295                 300

Arg Pro Ala Asp Ser Ile Thr Tyr Leu Met Asn Arg Phe Lys Asn Ile
305                 310                 315                 320

Asn Ile Tyr Thr Arg Tyr Glu Gly Lys Thr Leu Leu His Val Ala Cys
                325                 330                 335
```

```
Glu Tyr Asn Asn Thr Gln Val Ile Asp Tyr Leu Ile Arg Ile Asn Gly
            340                 345                 350

Asp Ile Asn Ala Leu Thr Asp Asn Asn Lys His Ala Thr Gln Leu Ile
        355                 360                 365

Ile Asp Asn Lys Glu Asn Ser Pro Tyr Thr Ile Asn Cys Leu Leu Tyr
    370                 375                 380

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

Gln Leu Pro Ser Leu Pro Ile Phe Asp Ile Lys Ser Phe Glu Lys Phe
                405                 410                 415

Ile Ser Tyr Cys Ile Leu Leu Asp Asp Thr Phe Tyr Asp Arg His Val
            420                 425                 430

Lys Asn Arg Asp Ser Lys Thr Tyr Arg Tyr Ala Phe Ser Lys Tyr Met
        435                 440                 445

Ser Phe Asp Lys Tyr Asp Gly Ile Ile Thr Lys Cys His Asp Glu Thr
    450                 455                 460

Met Leu Leu Lys Leu Ser Thr Val Leu Asp Thr Thr Leu Tyr Ala Val
465                 470                 475                 480

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

Lys Lys Tyr Asn Asn Asp Lys Ser Phe Lys Ile Tyr Ser Asn Ile Met
            500                 505                 510

Asn Glu Arg Tyr Leu Asn Val Tyr Tyr Lys Asp Met Tyr Val Ser Lys
        515                 520                 525

Val Tyr Asp Lys Leu Phe Pro Val Phe Thr Asp Lys Asn Cys Leu Leu
    530                 535                 540
```

Thr Leu Leu Pro Ser Glu Ile Ile Tyr Glu Ile Leu Tyr Met Leu Thr
545 550 555 560

Ile Asn Asp Leu Tyr Asn Ile Ser Tyr Pro Pro Thr Lys Val
565 570

<210> 115
<211> 353
<212> PRT
<213> Vaccinia virus

<400> 115
Met Thr Met Lys Met Met Val His Ile Tyr Phe Val Ser Leu Ser Leu
1 5 10 15

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

Thr Glu Phe Phe Asn Lys Met Arg Asp Thr Leu Pro Ala Lys Asp Ser
35 40 45

Lys Trp Leu Asn Pro Ala Cys Met Phe Gly Gly Thr Met Asn Asp Met
50 55 60

Ala Thr Leu Gly Glu Pro Phe Ser Ala Lys Cys Pro Pro Ile Glu Asp
65 70 75 80

Ser Leu Leu Ser His Arg Tyr Lys Asp Tyr Val Val Lys Trp Glu Arg
85 90 95

Leu Glu Lys Asn Arg Arg Arg Gln Val Ser Asn Lys Arg Val Lys His
100 105 110

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

Tyr Leu Cys Thr Val Thr Thr Lys Asn Gly Asp Cys Val Gln Gly Ile
130 135 140

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

```
Glu Leu Gly Thr His Asp Lys Tyr Gly Ile Asp Leu Tyr Cys Gly Ile
                165                 170                 175

Leu Tyr Ala Lys His Tyr Asn Asn Ile Thr Trp Tyr Lys Asp Asn Lys
            180                 185                 190

Glu Ile Asn Ile Asp Asp Ile Lys Tyr Ser Gln Thr Gly Lys Glu Leu
        195                 200                 205

Ile Ile His Asn Pro Glu Leu Glu Asp Ser Gly Arg Tyr Asp Cys Tyr
    210                 215                 220

Val His Tyr Asp Asp Val Arg Ile Lys Asn Asp Ile Val Val Ser Arg
225                 230                 235                 240

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

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

Thr Cys Thr Ala Val Ser Thr Ser Leu Leu Ile Asp Asp Val Leu Ile
        275                 280                 285

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

Tyr Ser Val Leu Thr Ser Arg Gly Gly Ile Thr Glu Ala Thr Leu Tyr
305                 310                 315                 320

Phe Glu Asn Val Thr Glu Glu Tyr Ile Gly Asn Thr Tyr Lys Cys Arg
                325                 330                 335

Gly His Asn Tyr Tyr Phe Glu Lys Thr Leu Thr Thr Thr Val Val Leu
            340                 345                 350

Glu
```

<210> 116
<211> 127
<212> PRT
<213> Vaccinia virus

<400> 116
Met Asp Glu Asp Thr Arg Leu Ser Arg Tyr Leu Tyr Leu Thr Asp Arg
1   5   10   15

Glu His Ile Asn Val Asp Ser Ile Lys Gln Leu Cys Lys Ile Ser Asp
            20   25   30

Pro Asn Ala Cys Tyr Arg Cys Gly Cys Thr Ala Leu His Glu Tyr Phe
        35   40   45

Tyr Asn Tyr Arg Ser Val Asn Gly Lys Tyr Lys Tyr Arg Tyr Asn Gly
    50   55   60

Tyr Tyr Gln Tyr Tyr Ser Ser Ser Asp Tyr Glu Asn Tyr Asn Glu Tyr
65   70   75   80

Tyr Tyr Asp Asp Tyr Asp Arg Thr Gly Met Asn Ser Glu Ser Asp Ser
                85   90   95

Glu Ser Asp Asn Ile Ser Ile Lys Thr Glu Tyr Glu Asn Glu Tyr Glu
            100   105   110

Phe Tyr Asp Glu Thr Gln Asp Gln Ser Thr Gln His Asn Asp Leu
        115   120   125

<210> 117
<211> 91
<212> PRT
<213> Vaccinia virus

<400> 117
Met Ser Leu Glu Ser Phe Ile Ile Thr Thr Phe Asn Asn Asn Ser Ser
1   5   10   15

Thr Asn Ile Asp Asn Met Cys His Leu Tyr Val Lys Val Cys Pro Ser
            20   25   30

Ser Leu Leu Phe Arg Leu Phe Val Glu Cys Cys Asp Ile Asn Lys Leu

```
        35                  40                  45

Val Glu Gly Thr Thr Pro Leu His Cys Tyr Leu Met Asn Glu Gly Phe
    50                  55                  60

Glu Ser Ser Val Leu Lys Asn Leu Leu Lys Glu Tyr Val Met Asn Thr
65                  70                  75                  80

Phe Asn Val His Asp Ile His Tyr Thr Asn Ile
                85                  90

<210> 118
<211> 181
<212> PRT
<213> Vaccinia virus

<400> 118
Met Ile Ser Leu Ser Phe Leu Ile His Asn Pro Leu Lys Lys Trp Lys
1               5                   10                  15

Leu Lys Pro Ser Ile Ser Ile Asn Gly Tyr Arg Ser Thr Phe Thr Met
            20                  25                  30

Ala Phe Pro Cys Ala Gln Phe Arg Pro Cys His Cys His Ala Thr Lys
        35                  40                  45

Asp Ser Leu Asn Thr Val Ala Asp Val Arg His Cys Leu Thr Glu Tyr
    50                  55                  60

Ile Leu Trp Val Ser His Arg Trp Thr His Arg Glu Ser Ala Gly Ser
65                  70                  75                  80

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

Gly Gly Glu Leu Lys Asp Ser Leu Pro Trp Asp Asn Ile Asp Asn Cys
            100                 105                 110

Val Glu Ile Ile Lys Cys Phe Ile Arg Asn Asp Ser Met Lys Thr Ala
        115                 120                 125
```

```
Glu Glu Leu Arg Ala Ile Ile Gly Leu Cys Thr Gln Ser Ala Ile Val
    130                 135                 140

Ser Gly Arg Val Phe Asn Asp Lys Tyr Ile Asp Ile Leu Leu Met Leu
145                 150                 155                 160

Arg Lys Ile Leu Asn Glu Asn Asp Tyr Leu Thr Leu Leu Asp His Ile
                165                 170                 175

Arg Thr Ala Lys Tyr
            180
```

<210> 119
<211> 386
<212> PRT
<213> Vaccinia virus

<400> 119

```
Met Ile Ala Phe Ile Ile Phe Arg Glu Ile Gly Ile Ile Ser Thr Arg
1               5                   10                  15

Ile Ala Met Asp Tyr Cys Gly Arg Glu Cys Thr Ile Leu Cys Arg Leu
            20                  25                  30

Leu Asp Glu Asp Val Thr Tyr Lys Lys Ile Lys Leu Glu Ile Glu Thr
        35                  40                  45

Cys His Asn Leu Ser Lys His Ile Asp Arg Arg Gly Asn Asn Ala Leu
    50                  55                  60

His Cys Tyr Val Ser Asn Lys Cys Asp Thr Asp Ile Lys Ile Val Arg
65                  70                  75                  80

Leu Leu Leu Ser Arg Gly Val Glu Arg Leu Cys Arg Asn Asn Glu Gly
                85                  90                  95

Leu Thr Pro Leu Gly Ala Tyr Ser Lys His Arg Tyr Val Lys Ser Gln
            100                 105                 110

Ile Val His Leu Leu Ile Ser Ser Tyr Ser Asn Ser Ser Asn Glu Leu
        115                 120                 125
```

```
Lys Ser Asn Ile Asn Asp Phe Asp Leu Ser Ser Asp Asn Ile Asp Leu
    130                 135                 140

Arg Leu Leu Lys Tyr Leu Ile Val Asp Lys Arg Ile Arg Pro Ser Lys
145                 150                 155                 160

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

Thr Thr Pro Asn Pro Arg Pro Glu Val Leu Leu Trp Leu Leu Lys Ser
            180                 185                 190

Glu Cys Tyr Ser Thr Gly Tyr Val Phe Arg Thr Cys Met Tyr Asn Ser
        195                 200                 205

Asp Met Cys Lys Asn Ser Leu His Tyr Tyr Ile Ser Ser His Arg Glu
    210                 215                 220

Ser Gln Ser Leu Ser Lys Asp Val Ile Lys Cys Leu Ile Asn Asn Asn
225                 230                 235                 240

Val Ser Ile His Gly Arg Asp Glu Gly Gly Ser Leu Pro Ile Gln Tyr
                245                 250                 255

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

Ile Lys Asp Val Asp Thr Cys Arg Val Tyr Asp Val Ser Pro Ile Leu
        275                 280                 285

Glu Ala Tyr Tyr Leu Asn Lys Arg Phe Arg Val Thr Pro Tyr Asn Val
    290                 295                 300

Asp Met Glu Ile Val Asn Leu Leu Ile Glu Arg Arg His Thr Leu Val
305                 310                 315                 320

Asp Val Met Arg Ser Ile Thr Ser Tyr Asp Ser Arg Glu Tyr Asn His
                325                 330                 335
```

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

Ile Val Gln Ala Met Leu Ile Asn Tyr Leu His Tyr Gly Asp Met Val
355 360 365

Val Arg Cys Met Leu Asp Asn Gly Gln Gln Leu Ser Ser Ala Arg Leu
370 375 380

Leu Cys
385

<210> 120
<211> 150
<212> PRT
<213> Vaccinia virus

<400> 120
Met Tyr Gly Leu Ile Leu Ser Arg Phe Asn Asn Cys Gly Tyr His Cys
1 5 10 15

Tyr Glu Thr Ile Leu Ile Asp Val Phe Asp Ile Leu Ser Lys Tyr Met
20 25 30

Asp Asp Ile Asp Met Ile Asp Asn Glu Asn Lys Thr Leu Leu Tyr Tyr
35 40 45

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

Gly Ala Ser Val Thr Thr Ser Arg Ser Ile Ile Asn Thr Ala Ile Gln
65 70 75 80

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

Leu Ser Tyr His Pro Thr Leu Glu Thr Met Ile Asp Ala Phe Asn Arg
100 105 110

Asp Ile Arg Tyr Leu Tyr Pro Glu Pro Leu Phe Ala Cys Ile Arg Tyr
115 120 125

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

Pro Val Ile Ile Arg Asn
145 150

<210> 121
<211> 91
<212> PRT
<213> Vaccinia virus

<400> 121
Met Arg Arg Cys Ile His Ile Lys Glu Arg Lys Ile His Met Thr Asn
1 5 10 15

Ile Val Asp Arg Asn Val Thr Phe Ile Leu Thr Val Val His Lys Tyr
20 25 30

Val Arg Tyr Val Pro His Thr Val Ala Asn Asp Ala His Asn Leu Val
35 40 45

His Leu Ala His Leu Ile His Phe Ile Ile Tyr Phe Phe Ile Ile Arg
50 55 60

Asp Val Arg Lys Lys Lys Lys Lys Lys Lys Asn Arg Thr Ile Tyr
65 70 75 80

Phe Phe Ser Asn Val Tyr Ala Arg His Ile Lys
85 90

<210> 122
<211> 259
<212> PRT
<213> Vaccinia virus

<400> 122
Met Ser Arg Ile Asn Ile Thr Lys Lys Ile Tyr Cys Ser Val Phe Leu
1 5 10 15

Phe Leu Phe Leu Phe Leu Ser Tyr Ile Ser Asn Tyr Glu Lys Val Asn
20 25 30

```
Asp Glu Met Tyr Glu Met Gly Glu Met Asp Glu Ile Val Ser Ile Val
        35                  40                  45

Arg Asp Ser Met Trp Tyr Ile Pro Asn Val Phe Met Asp Asp Gly Lys
    50                  55                  60

Asn Glu Gly His Val Ser Val Asn Asn Val Cys His Met Tyr Phe Thr
65                  70                  75                  80

Phe Phe Asp Val Asp Thr Ser Ser His Leu Phe Lys Leu Val Ile Lys
                85                  90                  95

His Cys Asp Leu Asn Lys Arg Gly Asn Ser Pro Leu His Cys Tyr Thr
            100                 105                 110

Met Asn Thr Arg Phe Asn Pro Ser Val Leu Lys Ile Leu Leu His His
        115                 120                 125

Gly Met Arg Asn Phe Asp Ser Lys Asp Glu Lys Gly His His Tyr Leu
    130                 135                 140

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

Thr Ile Asp Asp Phe Ser Lys Ser Ser Asp Leu Leu Leu Cys Tyr Leu
                165                 170                 175

Arg Tyr Lys Phe Asn Gly Ser Leu Asn Tyr Tyr Val Leu Tyr Lys Gly
            180                 185                 190

Ser Asp Pro Asn Cys Ala Asp Glu Asp Glu Leu Thr Ser Leu His Tyr
        195                 200                 205

Tyr Cys Lys His Ile Ser Thr Phe Tyr Lys Ser Asn Tyr Tyr Lys Leu
    210                 215                 220

Ser His Thr Lys Met Arg Ala Glu Lys Arg Phe Ile Tyr Ala Ile Ile
225                 230                 235                 240

Asp Tyr Gly Ala Asn Ile Asn Ala Val Thr His Leu Pro Ser Thr Val
```

245 250 255

Tyr Gln Thr

<210> 123
<211> 103
<212> PRT
<213> Vaccinia virus

<400> 123
Met Glu Gln Thr Leu Thr Arg Leu His Thr Tyr Leu Gln Gln Tyr Thr
1 5 10 15

Lys His Ser Pro Arg Val Val Tyr Ala Leu Leu Ser Arg Gly Tyr Val
20 25 30

Ile Ile Leu Ile Val His Pro Ser Trp Asn Asp Cys Ala Thr Gly His
35 40 45

Ile Leu Ile Met Leu Leu Asn Trp His Glu Gln Lys Glu Glu Gly Gln
50 55 60

His Leu Leu Tyr Leu Phe Ile Lys His Asn Gln Gly Tyr Thr Leu Asn
65 70 75 80

Ile Leu Arg Tyr Leu Leu Asp Arg Phe Asp Ile Gln Lys Asp Glu Tyr
85 90 95

Ile Tyr Arg Leu Ser Lys Leu
100

<210> 124
<211> 113
<212> PRT
<213> Vaccinia virus

<400> 124
Met Leu Pro His Thr Ser Asp Thr Thr Ser Thr Phe Arg Leu Lys Thr
1 5 10 15

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

Val Val Asn Asp Ile Ile His His Arg Leu Lys Val Ser Leu Pro Met
        35   40   45

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

Tyr Tyr Val Lys Lys Ile Leu Ala Tyr Cys Leu Leu Arg Asp Glu Ser
65   70   75   80

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

Val Phe Met Lys Asn Ile Ser Phe Asp Lys Ile Asp Ser Ile Ile Val
            100   105   110

Thr

<210> 125
<211> 122
<212> PRT
<213> Vaccinia virus

<400> 125
Met Lys Ser Val Leu Tyr Ser Tyr Ile Leu Phe Leu Ser Cys Ile Ile
1   5   10   15

Ile Asn Gly Arg Asp Ile Ala Pro His Ala Pro Ser Asp Gly Lys Cys
            20   25   30

Lys Asp Asn Glu Tyr Lys Arg His Asn Leu Cys Pro Gly Thr Tyr Ala
        35   40   45

Ser Arg Leu Cys Asp Ser Lys Thr Asn Thr Gln Cys Thr Pro Cys Gly
    50   55   60

Ser Gly Thr Phe Thr Ser Arg Asn Asn His Leu Pro Ala Cys Leu Ser
65   70   75   80

Cys Asn Gly Arg Arg Asp Arg Val Thr Leu Leu Thr Ile Glu Ser Val

```
                85                  90                  95

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

Arg His Val Phe Pro Lys Gln Asn Val Glu
        115                 120
```

<210> 126
<211> 244
<212> PRT
<213> Vaccinia virus

<400> 126

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

Cys Thr Glu Glu Glu Asn Lys His His Met Gly Ile Asp Val Ile Ile
            20                  25                  30

Lys Val Thr Lys Gln Asp Gln Thr Pro Thr Asn Asp Lys Ile Cys Gln
        35                  40                  45

Ser Val Thr Glu Ile Thr Glu Ser Glu Ser Asp Pro Asp Pro Glu Val
    50                  55                  60

Glu Ser Glu Asp Asp Ser Thr Ser Val Glu Asp Val Asp Pro Pro Thr
65                  70                  75                  80

Thr Tyr Tyr Ser Ile Ile Gly Gly Gly Leu Arg Met Asn Phe Gly Phe
                85                  90                  95

Thr Lys Cys Pro Gln Ile Lys Ser Ile Ser Glu Ser Ala Asp Gly Asn
            100                 105                 110

Thr Val Asn Ala Arg Leu Ser Ser Val Ser Pro Gly Gln Gly Lys Asp
        115                 120                 125

Ser Pro Ala Ile Thr Arg Glu Glu Ala Leu Ala Met Ile Lys Asp Cys
    130                 135                 140
```

```
Glu Val Ser Ile Asp Ile Arg Cys Ser Glu Glu Glu Lys Asp Ser Asp
145                 150                 155                 160


Ile Lys Thr His Pro Val Leu Gly Ser Asn Ile Ser His Lys Lys Val
                165                 170                 175


Ser Tyr Glu Asp Ile Ile Gly Ser Thr Ile Val Asp Thr Lys Cys Val
            180                 185                 190


Lys Asn Leu Glu Phe Ser Val Arg Ile Gly Asp Met Cys Lys Glu Ser
        195                 200                 205


Ser Glu Leu Glu Val Lys Asp Gly Phe Lys Tyr Val Asp Gly Ser Ala
    210                 215                 220


Ser Glu Gly Ala Thr Asp Asp Thr Ser Leu Ile Asp Ser Thr Lys Leu
225                 230                 235                 240


Lys Ala Cys Val



<210> 127
<211> 345
<212> PRT
<213> Vaccinia virus

<400> 127
Met Asp Ile Phe Arg Glu Ile Ala Ser Ser Met Lys Gly Glu Asn Val
1               5                   10                  15


Phe Ile Ser Pro Ala Ser Ile Ser Ser Val Leu Thr Ile Leu Tyr Tyr
            20                  25                  30


Gly Ala Asn Gly Ser Thr Ala Glu Gln Leu Ser Lys Tyr Val Glu Lys
        35                  40                  45


Glu Glu Asn Met Asp Lys Val Ser Ala Gln Asn Ile Ser Phe Lys Ser
    50                  55                  60


Ile Asn Lys Val Tyr Gly Arg Tyr Ser Ala Val Phe Lys Asp Ser Phe
65                  70                  75                  80
```

```
Leu Arg Lys Ile Gly Asp Lys Phe Gln Thr Val Asp Phe Thr Asp Cys
                85                  90                  95

Arg Thr Ile Asp Ala Ile Asn Lys Cys Val Asp Ile Phe Thr Glu Gly
            100                 105                 110

Lys Ile Asn Pro Leu Leu Asp Glu Pro Leu Ser Pro Asp Thr Cys Leu
        115                 120                 125

Leu Ala Ile Ser Ala Val Tyr Phe Lys Ala Lys Trp Leu Thr Pro Phe
    130                 135                 140

Glu Lys Glu Phe Thr Ser Asp Tyr Pro Phe Tyr Val Ser Pro Thr Glu
145                 150                 155                 160

Met Val Asp Val Ser Met Met Ser Met Tyr Gly Lys Ala Phe Asn His
                165                 170                 175

Ala Ser Val Lys Glu Ser Phe Gly Asn Phe Ser Ile Ile Glu Leu Pro
            180                 185                 190

Tyr Val Gly Asp Thr Ser Met Met Val Ile Leu Pro Asp Lys Ile Asp
        195                 200                 205

Gly Leu Glu Ser Ile Glu Gln Asn Leu Thr Asp Thr Asn Phe Lys Lys
    210                 215                 220

Trp Cys Asn Ser Leu Glu Ala Thr Phe Ile Asp Val His Ile Pro Lys
225                 230                 235                 240

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

Gly Leu Thr Glu Val Phe Gly Ser Thr Gly Asp Tyr Ser Asn Met Cys
            260                 265                 270

Asn Ser Asp Val Ser Val Asp Ala Met Ile His Lys Thr Tyr Ile Asp
        275                 280                 285
```

```
Val Asn Glu Glu Tyr Thr Glu Ala Ala Ala Ala Thr Cys Ala Leu Val
    290                 295                 300

Ser Asp Cys Ala Ser Thr Ile Thr Asn Glu Phe Cys Val Asp His Pro
305                 310                 315                 320

Phe Ile Tyr Val Ile Arg His Val Asp Gly Lys Ile Leu Phe Val Gly
                325                 330                 335

Arg Tyr Cys Ser Pro Thr Thr Asn Cys
            340                 345
```

<210> 128
<211> 149
<212> PRT
<213> Vaccinia virus

<400> 128

```
Met Thr Ala Asn Phe Ser Thr His Val Phe Ser Pro Gln His Cys Gly
1               5                   10                  15

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

Tyr Ile Tyr Trp Ser Ser Tyr Ala Tyr Arg Asn Arg Gln Cys Ala Gly
        35                  40                  45

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

Phe Ile Asp Ile Arg Glu Leu Val Lys Asn Met Pro Trp Asp Asp Val
65                  70                  75                  80

Lys Asp Cys Ala Glu Ile Ile Arg Cys Tyr Ile Pro Asp Glu Gln Lys
                85                  90                  95

Thr Ile Arg Glu Ile Ser Ala Ile Ile Gly Leu Cys Ala Tyr Ala Ala
            100                 105                 110

Thr Tyr Trp Gly Gly Glu Asp His Pro Thr Ser Asn Ser Leu Asn Ala
        115                 120                 125
```

Leu Phe Val Met Leu Glu Met Leu Asn Tyr Val Asp Tyr Asn Ile Ile
130 135 140

Phe Arg Arg Met Asn
145

<210> 129
<211> 326
<212> PRT
<213> Vaccinia virus

<400> 129
Met Ser Ile Leu Pro Val Ile Phe Leu Ser Ile Phe Phe Tyr Ser Ser
1 5 10 15

Phe Val Gln Thr Phe Asn Ala Pro Glu Cys Ile Asp Lys Gly Gln Tyr
20 25 30

Phe Ala Ser Phe Met Glu Leu Glu Asn Glu Pro Val Ile Leu Pro Cys
35 40 45

Pro Gln Ile Asn Thr Leu Ser Ser Gly Tyr Asn Ile Leu Asp Ile Leu
50 55 60

Trp Glu Lys Arg Gly Ala Asp Asn Asp Arg Ile Ile Pro Ile Asp Asn
65 70 75 80

Gly Ser Asn Met Leu Ile Leu Asn Pro Thr Gln Ser Asp Ser Gly Ile
85 90 95

Tyr Ile Cys Ile Thr Thr Asn Glu Thr Tyr Cys Asp Met Met Ser Leu
100 105 110

Asn Leu Thr Ile Val Ser Val Ser Glu Ser Asn Ile Asp Leu Ile Ser
115 120 125

Tyr Pro Gln Ile Val Asn Glu Arg Ser Thr Gly Glu Met Val Cys Pro
130 135 140

Asn Ile Asn Ala Phe Ile Ala Ser Asn Val Asn Ala Asp Ile Ile Trp
145 150 155 160

```
Ser Gly His Arg Arg Leu Arg Asn Lys Arg Leu Lys Gln Arg Thr Pro
                165                 170                 175

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

Thr Cys Val Leu Glu Tyr Ile Tyr Gly Gly Lys Thr Tyr Asn Val Thr
        195                 200                 205

Arg Ile Val Lys Leu Glu Val Arg Asp Lys Ile Ile Pro Ser Thr Met
    210                 215                 220

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

Ala Cys Arg Val Ser Leu Arg Pro Pro Thr Thr Asp Ala Asp Val Phe
                245                 250                 255

Trp Ile Ser Asn Gly Met Tyr Tyr Glu Glu Asp Asp Gly Asp Gly Asn
            260                 265                 270

Gly Arg Ile Ser Val Ala Asn Lys Ile Tyr Met Thr Asp Lys Arg Arg
        275                 280                 285

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

Thr Thr Phe Thr Cys Met Ala Phe Thr Ile Pro Ser Ile Ser Lys Thr
305                 310                 315                 320

Val Thr Val Ser Ile Thr
                325
```

<210> 130
<211> 340
<212> PRT
<213> Vaccinia virus

<400> 130
```
Met Ser Arg Lys Phe Met Gln Val Tyr Glu Tyr Asp Arg Glu Gln Tyr
```

```
1               5                   10                  15

Leu Asp Glu Phe Ile Glu Asp Arg Tyr Asn Asp Ser Phe Ile Thr Ser
            20                  25                  30

Pro Glu Tyr Tyr Ser Ala Glu Lys Tyr Met Cys Arg Tyr Thr Thr Leu
        35                  40                  45

Asn His Asn Cys Ile Asn Val Arg Arg Cys Ala Leu Asp Ser Lys Leu
    50                  55                  60

Leu His Asp Ile Ile Thr Asn Cys Lys Ile Tyr Asn Asn Ile Glu Leu
65                  70                  75                  80

Val Arg Ala Thr Lys Phe Val Tyr Tyr Leu Asp Leu Ile Lys Cys Asn
                85                  90                  95

Trp Val Ser Lys Val Gly Asp Ser Val Leu Tyr Pro Val Ile Phe Ile
            100                 105                 110

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

Lys Gly Val Lys Val Lys Lys Leu Asn Arg Cys Ala Asp His Ala Ile
    130                 135                 140

Val Ile Asn Pro Phe Val Lys Phe Lys Leu Thr Leu Pro Asn Lys Thr
145                 150                 155                 160

Ser His Ala Lys Val Leu Val Thr Phe Cys Lys Leu Lys Thr Asp Ile
                165                 170                 175

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

Pro Asp Ile Asn Lys Arg Ile Pro Gly Tyr Ile His Leu Asn Ile Glu
        195                 200                 205

Gly Cys Ile Asp Gly Met Ile Tyr Ile Asn Ser Ser Lys Phe Ala Cys
    210                 215                 220
```

```
Val Leu Lys Leu His Arg Ser Met Tyr Arg Ile Pro Pro Phe Pro Ile
225                 230                 235                 240


Asp Ile Cys Ser Cys Cys Ser Gln Tyr Ile Asn Tyr Asp Ile Glu Ile
                245                 250                 255


Pro Ile His Asp Leu Ile Lys Asp Val Ala Ile Phe Lys Asn Lys Glu
            260                 265                 270


Thr Val Tyr Tyr Leu Lys Leu Asn Asn Lys Thr Ile Ala Arg Phe Thr
        275                 280                 285


Tyr Phe Asn Asn Ile Asp Thr Ala Ile Thr Gln Glu His Glu Tyr Val
    290                 295                 300


Lys Ile Ala Leu Gly Ile Val Cys Lys Leu Met Ile Asn Asn Met His
305                 310                 315                 320


Ser Ile Val Gly Val Asn His Ser Asn Thr Phe Val Asn Cys Leu Leu
                325                 330                 335


Glu Asp Asn Val
            340


<210> 131
<211> 574
<212> PRT
<213> Vaccinia virus

<400> 131
Met Ser Arg Arg Leu Ile Tyr Val Leu Asn Ile Asn Arg Glu Ser Thr
1               5                   10                  15


His Lys Ile Gln Glu Asn Glu Ile Tyr Thr Tyr Phe Ser His Cys Asn
            20                  25                  30


Ile Asp His Thr Ser Thr Glu Leu Asp Phe Val Val Lys Asn Tyr Asp
        35                  40                  45


Leu Asn Arg Arg Gln Pro Val Thr Gly Tyr Thr Ala Leu His Cys Tyr
```

```
    50                  55                  60

Leu Tyr Asn Asn Tyr Phe Thr Asn Asp Val Leu Lys Ile Leu Leu Asn
65                  70                  75                  80

His Gly Val Asp Val Thr Met Lys Thr Ser Ser Gly Arg Met Pro Val
                85                  90                  95

Tyr Ile Leu Leu Thr Arg Cys Cys Asn Ile Ser His Asp Val Val Ile
            100                 105                 110

Asp Met Ile Asp Lys Asp Lys Asn His Leu Leu His Arg Asp Tyr Ser
        115                 120                 125

Asn Leu Leu Leu Glu Tyr Ile Lys Ser Arg Tyr Met Leu Leu Lys Glu
    130                 135                 140

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

Asp Pro Asn Phe Lys Gln Asp Gly Tyr Thr Ala Leu His Tyr Tyr Tyr
                165                 170                 175

Leu Cys Leu Ala His Val Tyr Lys Pro Gly Glu Cys Arg Lys Pro Ile
            180                 185                 190

Thr Ile Lys Lys Ala Lys Arg Ile Ile Ser Leu Phe Ile Gln His Gly
        195                 200                 205

Ala Asn Leu Asn Ala Leu Asp Asn Cys Gly Asn Thr Pro Phe His Leu
    210                 215                 220

Tyr Leu Ser Ile Glu Met Cys Asn Asn Ile His Met Thr Lys Met Leu
225                 230                 235                 240

Leu Thr Phe Asn Pro Asn Phe Glu Ile Cys Asn Asn His Gly Leu Thr
                245                 250                 255

Pro Ile Leu Cys Tyr Ile Thr Ser Asp Tyr Ile Gln His Asp Ile Leu
            260                 265                 270
```

```
Val Met Leu Ile His His Tyr Glu Thr Asn Val Gly Glu Met Pro Ile
        275                 280                 285

Asp Glu Arg Arg Ile Ile Val Phe Glu Phe Ile Lys Thr Tyr Ser Thr
    290                 295                 300

Arg Pro Ala Asp Ser Ile Thr Tyr Leu Met Asn Arg Phe Lys Asn Ile
305                 310                 315                 320

Asp Ile Tyr Thr Arg Tyr Glu Gly Lys Thr Leu Leu His Val Ala Cys
                325                 330                 335

Glu Tyr Asn Asn Thr His Val Ile Asp Tyr Leu Ile Arg Ile Asn Gly
            340                 345                 350

Asp Ile Asn Ala Leu Thr Asp Asn Asn Lys His Ala Thr Gln Leu Ile
        355                 360                 365

Ile Asp Asn Lys Glu Asn Ser Pro Tyr Thr Ile Asn Cys Leu Leu Tyr
    370                 375                 380

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

Gln Leu Pro Ser Leu Pro Ile Phe Asp Ile Lys Ser Phe Glu Lys Phe
                405                 410                 415

Ile Ser Tyr Cys Ile Leu Leu Asp Asp Thr Phe Tyr Asn Arg His Val
            420                 425                 430

Arg Asn Arg Asp Ser Lys Thr Tyr Arg Tyr Ala Phe Ser Lys Tyr Met
        435                 440                 445

Ser Phe Asp Lys Tyr Asp Gly Ile Ile Thr Lys Cys His Lys Glu Thr
    450                 455                 460

Ile Leu Leu Lys Leu Ser Thr Val Leu Asp Thr Thr Leu Tyr Ala Val
465                 470                 475                 480
```

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

Lys Lys Tyr Asn Asn Asp Lys Ser Phe Lys Ile Tyr Ser Asn Ile Met
500 505 510

Asn Glu Arg Tyr Leu Asn Val Tyr Tyr Lys Asp Met Tyr Val Ser Lys
515 520 525

Val Tyr Asp Lys Leu Phe Pro Val Phe Thr Asp Lys Asn Cys Leu Leu
530 535 540

Thr Leu Leu Pro Ser Glu Ile Ile Tyr Glu Ile Leu Tyr Met Leu Thr
545 550 555 560

Ile Asn Asp Leu Tyr Asn Ile Ser Tyr Pro Pro Thr Lys Val
565 570

<210> 132
<211> 351
<212> PRT
<213> Vaccinia virus

<400> 132
Met Thr Met Lys Met Met Val His Ile Tyr Phe Val Ser Leu Leu Leu
1 5 10 15

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

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

Leu Asn Pro Ala Cys Met Phe Gly Gly Thr Met Asn Asp Ile Ala Ala
50 55 60

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

Leu Ser His Arg Tyr Lys Asp Tyr Val Val Lys Trp Glu Arg Leu Glu
85 90 95

```
Lys Asn Arg Arg Arg Gln Val Ser Asn Lys Arg Val Lys His Gly Asp
            100                 105                 110

Leu Trp Ile Ala Asn Tyr Thr Ser Lys Phe Ser Asn Arg Arg Tyr Leu
        115                 120                 125

Cys Thr Val Thr Thr Lys Asn Gly Asp Cys Val Gln Gly Ile Val Arg
    130                 135                 140

Ser His Ile Arg Lys Pro Pro Ser Cys Ile Pro Lys Thr Tyr Glu Leu
145                 150                 155                 160

Gly Thr His Asp Lys Tyr Gly Ile Asp Leu Tyr Cys Gly Ile Leu Tyr
                165                 170                 175

Ala Lys His Tyr Asn Asn Ile Thr Trp Tyr Lys Asp Asn Lys Glu Ile
            180                 185                 190

Asn Ile Asp Asp Ile Lys Tyr Ser Gln Thr Gly Lys Glu Leu Ile Ile
        195                 200                 205

His Asn Pro Glu Leu Glu Asp Ser Gly Arg Tyr Asp Cys Tyr Val His
    210                 215                 220

Tyr Asp Asp Val Arg Ile Lys Asn Asp Ile Val Val Ser Arg Cys Lys
225                 230                 235                 240

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

Asp Pro Lys Ile Asn Val Thr Ile Gly Glu Pro Ala Asn Ile Thr Cys
            260                 265                 270

Thr Ala Val Ser Thr Ser Leu Leu Ile Asp Asp Val Leu Ile Glu Trp
        275                 280                 285

Glu Asn Pro Ser Gly Trp Leu Ile Gly Phe Asp Phe Asp Val Tyr Ser
    290                 295                 300
```

Val Leu Thr Ser Arg Gly Gly Ile Thr Glu Ala Thr Leu Tyr Phe Glu
305 310 315 320

Asn Val Thr Glu Glu Tyr Ile Gly Asn Thr Tyr Lys Cys Arg Gly His
325 330 335

Asn Tyr Tyr Phe Glu Lys Thr Leu Thr Thr Thr Val Val Leu Glu
340 345 350

<210> 133
<211> 56
<212> PRT
<213> Vaccinia virus

<400> 133
Met His Val Ile Asp Val Asp Val Arg Leu Tyr Met Ser Thr Phe Ile
1 5 10 15

Ile Ile Asp Gln Ser Thr Glu Asn Thr Ser Ile Asp Thr Thr Val Thr
20 25 30

Ile Asn Ile Ile Tyr Leu Ala Ile Met Lys Ile Ile Met Asn Ile Ile
35 40 45

Met Met Ile Met Ile Glu Leu Val
50 55

<210> 134
<211> 53
<212> PRT
<213> Vaccinia virus

<400> 134
Met Asn Ser Glu Ser Asp Asn Ile Ser Ile Lys Thr Glu Tyr Glu Phe
1 5 10 15

Tyr Asp Glu Thr Gln Asp Gln Ser Thr Gln Leu Val Gly Tyr Asp Ile
20 25 30

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

Val Ser Met Ile Ile
    50

<210> 135
<211> 309
<212> PRT
<213> Vaccinia virus

<400> 135
Met Glu Met Tyr Pro Arg His Arg Tyr Ser Lys His Ser Val Phe Lys
1   5   10   15

Gly Phe Ser Asp Lys Val Arg Lys Asn Asp Leu Asp Met Asn Val Val
            20   25   30

Lys Glu Leu Leu Ser Asn Gly Ala Ser Leu Thr Ile Lys Asp Ser Ser
        35   40   45

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

Glu Met Ile Asp Glu Arg Lys Tyr Ile Val His Ser Tyr Leu Lys Asn
65   70   75   80

Tyr Lys Asn Phe Asp Tyr Pro Phe Phe Arg Lys Leu Val Leu Thr Asn
                85   90   95

Lys His Cys Leu Asn Asn Tyr Tyr Asn Ile Ser Asp Ser Lys Tyr Gly
            100   105   110

Thr Pro Leu His Ile Leu Ala Ser Asn Lys Lys Leu Ile Thr Pro Asn
        115   120   125

Tyr Met Lys Leu Leu Val Tyr Asn Gly Asn Asp Ile Asn Ala Arg Gly
    130   135   140

Glu Asp Thr Gln Met Arg Thr Pro Leu His Lys Tyr Leu Cys Lys Phe
145   150   155   160

Val Tyr His Asn Ile Glu Tyr Gly Ile Arg Tyr Tyr Asn Glu Lys Ile
                165   170   175

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

Asp Gly Met Ile Pro Val Val Tyr Cys Ile His Ser Asn Ala Glu Tyr
        195                 200                 205

Gly Tyr Asn Asn Ile Thr Asn Ile Lys Ile Ile Arg Lys Leu Leu Asn
    210                 215                 220

Leu Ser Arg Arg Ala Ser His Asn Leu Phe Arg Asp Arg Val Met His
225                 230                 235                 240

Asp Tyr Ile Ser Asn Thr Tyr Ile Asp Leu Glu Cys Leu Asp Ile Ile
                245                 250                 255

Arg Ser Leu Asp Gly Phe Asp Ile Asn Gly Tyr Phe Glu Gly Arg Thr
            260                 265                 270

Pro Leu His Cys Ala Ile Gln His Asn Phe Thr Gln Ile Ala Lys Tyr
        275                 280                 285

Leu Leu Asp Arg Gly Ala Asp Ile Val Val Pro Asn Thr Leu Ile Ile
    290                 295                 300

His Gln Tyr Ile Gln
305
```

<210> 136
<211> 134
<212> PRT
<213> Vaccinia virus

<400> 136

```
Met Glu Glu Asp Thr Asn Ile Ser Asn Lys Val Ile Arg Tyr Asn Thr
1               5                   10                  15

Val Asn Asn Ile Trp Glu Thr Leu Pro Asn Phe Trp Thr Gly Thr Ile
            20                  25                  30

Asn Pro Gly Val Val Ser His Lys Asp Asp Ile Tyr Val Val Cys Asp
        35                  40                  45
```

Ile Lys Asp Glu Lys Asn Val Lys Thr Cys Ile Phe Arg Tyr Asn Thr
    50   55   60

Asn Thr Tyr Asn Gly Trp Glu Leu Val Thr Thr Thr Glu Ser Arg Leu
65   70   75   80

Ser Ala Leu His Thr Ile Leu Tyr Asn Asn Thr Ile Met Met Leu His
                85   90   95

Cys Tyr Glu Ser Tyr Met Leu Gln Asp Thr Phe Asn Val Tyr Thr Arg
            100   105   110

Glu Trp Asn His Met Cys His Gln His Ser Asn Ser Tyr Ile Met Tyr
        115   120   125

Asn Ile Leu Pro Ile Tyr
    130

<210> 137
<211> 353
<212> PRT
<213> Vaccinia virus

<400> 137
Met Asp Ile Phe Lys Glu Leu Ile Leu Lys His Thr Asp Glu Asn Val
1   5   10   15

Leu Ile Ser Pro Val Ser Ile Leu Ser Thr Leu Ser Ile Leu Asn His
            20   25   30

Gly Ala Ala Gly Ser Thr Ala Glu Gln Leu Ser Lys Tyr Ile Glu Asn
        35   40   45

Met Asn Glu Asn Thr Pro Asp Asp Asn Asn Asp Met Asp Val Asp Ile
    50   55   60

Pro Tyr Cys Ala Thr Leu Ala Thr Ala Asn Lys Ile Tyr Gly Ser Asp
65   70   75   80

Ser Ile Glu Phe His Ala Ser Phe Leu Gln Lys Ile Lys Asp Asp Phe

```
                85                  90                  95

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

Glu Trp Val Lys Thr Met Thr Asn Gly Lys Ile Asn Ser Leu Leu Thr
        115                 120                 125

Ser Pro Leu Ser Ile Asn Thr Arg Met Thr Val Val Ser Ala Val His
    130                 135                 140

Phe Lys Ala Met Trp Lys Tyr Pro Phe Ser Lys His Leu Thr Tyr Thr
145                 150                 155                 160

Asp Lys Phe Tyr Ile Ser Lys Asn Ile Val Thr Ser Val Asp Met Met
                165                 170                 175

Val Ser Thr Glu Asn Asn Leu Gln Tyr Val His Ile Asn Glu Leu Phe
            180                 185                 190

Gly Gly Phe Ser Ile Ile Asp Ile Pro Tyr Glu Gly Asn Ser Ser Met
        195                 200                 205

Val Ile Ile Leu Pro Asp Asp Ile Glu Gly Ile Tyr Asn Ile Glu Lys
    210                 215                 220

Asn Ile Thr Asp Glu Lys Phe Lys Lys Trp Cys Gly Met Leu Ser Thr
225                 230                 235                 240

Lys Ser Ile Asp Leu Tyr Met Pro Lys Phe Lys Val Glu Met Thr Glu
                245                 250                 255

Pro Tyr Asn Leu Val Pro Ile Leu Glu Asn Leu Gly Leu Thr Asn Ile
            260                 265                 270

Phe Gly Tyr Tyr Ala Asp Phe Ser Lys Met Cys Asn Glu Thr Ile Thr
        275                 280                 285

Val Glu Lys Phe Leu His Thr Thr Phe Ile Asp Val Asn Glu Glu Tyr
    290                 295                 300
```

Thr Glu Ala Ser Ala Val Thr Gly Val Phe Met Thr Asn Phe Ser Met
305 310 315 320

Val Tyr Arg Thr Lys Val Tyr Ile Asn His Pro Phe Met Tyr Met Ile
325 330 335

Lys Asp Asn Thr Gly Arg Ile Leu Phe Ile Gly Lys Tyr Cys Tyr Pro
340 345 350

Gln

<210> 138
<211> 190
<212> PRT
<213> Vaccinia virus

<400> 138
Met Met Ile Tyr Gly Leu Ile Ala Cys Leu Ile Phe Val Thr Ser Ser
1 5 10 15

Ile Ala Ser Pro Leu Tyr Ile Pro Val Ile Pro Pro Ile Ser Glu Asp
20 25 30

Lys Ser Phe Asn Ser Val Glu Val Leu Val Ser Leu Phe Arg Asp Asp
35 40 45

Gln Lys Asp Tyr Thr Val Thr Ser Gln Phe Asn Asn Tyr Thr Ile Asp
50 55 60

Thr Lys Asp Trp Thr Ile Gly Val Leu Ser Thr Pro Asp Gly Leu Asp
65 70 75 80

Ile Pro Leu Thr Asn Ile Thr Tyr Trp Ser Arg Phe Thr Ile Gly Arg
85 90 95

Ala Leu Phe Lys Ser Glu Ser Glu Asp Ile Phe Gln Lys Lys Met Ser
100 105 110

Ile Leu Gly Val Ser Ile Glu Cys Lys Lys Ser Ser Thr Leu Leu Thr

```
        115                 120                 125

Phe Leu Thr Val Arg Lys Met Thr Arg Val Phe Asn Lys Phe Pro Asp
    130                 135                 140

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

Thr Tyr Lys Asn Thr Lys Thr Gly Glu Thr Asp Tyr Thr Tyr Leu Ser
                165                 170                 175

Asn Gly Gly Leu Pro Ala Tyr Tyr Arg Asn Gly Val Asp Gly
            180                 185                 190
```

<210> 139
<211> 62
<212> PRT
<213> Vaccinia virus

<400> 139

```
Met Lys Leu Phe Thr Gln Asn Asp Arg Tyr Phe Gly Leu Leu Asp Ser
1               5                   10                  15

Cys Thr His Ile Phe Cys Ile Thr Cys Ile Asn Ile Trp His Lys Thr
            20                  25                  30

Arg Arg Glu Thr Gly Ala Ser Asp Asn Cys Pro Ile Cys Arg Thr Arg
        35                  40                  45

Phe Arg Asn Ile Thr Met Ser Lys Phe Tyr Lys Leu Val Asn
    50                  55                  60
```

<210> 140
<211> 184
<212> PRT
<213> Vaccinia virus

<400> 140

```
Met Glu Phe Asp Pro Ala Lys Ile Asn Thr Ser Ser Ile Asp His Val
1               5                   10                  15

Thr Ile Leu Gln Tyr Ile Asp Glu Pro Asn Asp Ile Arg Leu Thr Val
            20                  25                  30
```

```
Cys Ile Ile Arg Asn Ile Asn Asn Ile Thr Tyr Tyr Ile Asn Ile Thr
        35                  40                  45

Lys Ile Asn Thr His Leu Ala Asn Gln Phe Arg Ala Trp Lys Lys Arg
    50                  55                  60

Ile Ala Gly Arg Asp Tyr Met Thr Asn Leu Ser Arg Asp Thr Gly Ile
65                  70                  75                  80

Gln Gln Ser Lys Leu Thr Glu Thr Ile Arg Asn Cys Gln Lys Asn Arg
                85                  90                  95

Asn Ile Tyr Gly Leu Tyr Ile His Tyr Asn Leu Val Ile Asn Val Val
            100                 105                 110

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

Val Asn Trp Tyr Ile Ala Asn Asn Thr Tyr Thr Pro Asn Thr Pro Asn
    130                 135                 140

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

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

Tyr Glu Val Val Tyr Ser Lys Arg
            180


<210> 141
<211> 331
<212> PRT
<213> Vaccinia virus

<400> 141
Met Asp Ile Tyr Asp Asp Lys Gly Leu Gln Thr Ile Lys Leu Phe Asn
1               5                   10                  15

Asn Glu Phe Asp Cys Ile Arg Asn Asp Ile Arg Glu Leu Phe Lys His
```

```
            20                  25                  30

Val Thr Asp Ser Asp Ser Ile Gln Leu Pro Met Glu Asp Asn Ser Asp
        35                  40                  45

Ile Ile Glu Asn Ile Arg Lys Ile Leu Tyr Arg Arg Leu Lys Asn Val
    50                  55                  60

Glu Cys Val Asp Ile Asp Ser Thr Ile Thr Phe Met Lys Tyr Asp Pro
65                  70                  75                  80

Asn Asp Asp Asn Lys Arg Thr Cys Ser Asn Trp Val Pro Leu Thr Asn
                85                  90                  95

Asn Tyr Met Glu Tyr Cys Leu Val Ile Tyr Leu Glu Thr Pro Ile Cys
            100                 105                 110

Gly Gly Lys Ile Lys Leu Tyr His Pro Thr Gly Asn Ile Lys Ser Asp
        115                 120                 125

Lys Asp Ile Met Phe Ala Lys Thr Leu Asp Phe Lys Ser Lys Lys Val
    130                 135                 140

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

Asn Arg Ser Met Thr Thr Ile His Tyr Asn Asp Asp Val Asp Ile Asp
                165                 170                 175

Ile His Thr Asp Lys Asn Gly Lys Glu Leu Cys Tyr Cys Tyr Ile Thr
            180                 185                 190

Ile Asp Asp His Tyr Leu Val Asp Val Glu Thr Ile Gly Val Ile Val
        195                 200                 205

Asn Arg Ser Gly Lys Cys Leu Leu Val Asn Asn His Leu Gly Ile Gly
    210                 215                 220

Ile Val Lys Asp Lys Arg Ile Ser Asp Ser Phe Gly Asp Val Cys Met
225                 230                 235                 240
```

```
Asp Thr Ile Phe Asp Phe Ser Glu Ala Arg Glu Leu Phe Ser Leu Thr
                245                 250                 255

Asn Asp Asp Asn Arg Asn Ile Ala Trp Asp Thr Asp Lys Leu Asp Asp
            260                 265                 270

Asp Thr Asp Ile Trp Thr Pro Val Thr Glu Asp Asp Tyr Lys Phe Leu
        275                 280                 285

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

Tyr Tyr Val Leu Thr Gly Asp Thr Glu Pro Pro Thr Val Phe Ile Phe
305                 310                 315                 320

Lys Val Thr Arg Phe Tyr Phe Asn Met Pro Lys
                325                 330
```

<210> 142
<211> 140
<212> PRT
<213> Vaccinia virus

<400> 142

```
Met Ser Met Lys Tyr Leu Met Leu Leu Phe Ala Ala Met Ile Ile Arg
1               5                   10                  15

Ser Phe Ala Asp Ser Gly Asn Ala Ile Glu Thr Thr Ser Pro Glu Ile
            20                  25                  30

Thr Asn Ala Thr Thr Asp Ile Pro Ala Ile Arg Leu Cys Gly Pro Glu
        35                  40                  45

Gly Asp Gly Tyr Cys Leu His Gly Asp Cys Ile His Ala Arg Asp Ile
    50                  55                  60

Asp Gly Met Tyr Cys Arg Cys Ser His Gly Tyr Thr Gly Ile Arg Cys
65                  70                  75                  80

Gln His Val Val Leu Val Asp Tyr Gln Arg Ser Glu Asn Pro Asn Thr
```

85 90 95

Thr Thr Ser Tyr Ile Pro Ser Pro Gly Ile Met Leu Val Leu Val Gly
100 105 110

Ile Ile Ile Ile Thr Cys Cys Leu Leu Ser Val Tyr Arg Phe Thr Arg
115 120 125

Arg Thr Lys Leu Pro Ile Gln Asp Met Val Val Pro
130 135 140

<210> 143
<211> 112
<212> PRT
<213> Vaccinia virus

<400> 143
Met Asp Glu Ile Val Arg Ile Val Arg Asp Ser Met Trp Tyr Ile Pro
1 5 10 15

Asn Val Phe Met Asp Asp Gly Lys Asn Glu Gly His Val Ser Val Asn
20 25 30

Asn Val Cys His Met Tyr Phe Thr Phe Phe Asp Val Asp Thr Ser Ser
35 40 45

His Leu Phe Lys Leu Val Ile Lys His Cys Asp Leu Asn Lys Arg Gly
50 55 60

Asn Ser Pro Leu His Cys Tyr Thr Met Asn Thr Arg Phe Asn Pro Ser
65 70 75 80

Val Leu Lys Ile Leu Leu His His Gly Met Arg Asn Phe Asp Ser Lys
85 90 95

Asp Glu Lys Gly His His Tyr Gln Ser Ile Thr Arg Ser Leu Ile Tyr
100 105 110

<210> 144
<211> 109
<212> PRT
<213> Vaccinia virus

<400> 144
Met Leu Phe Tyr Leu Glu Glu Pro Ile Arg Gly Tyr Val Ile Ile Leu
1   5   10   15

Ile Val His Pro Ser Trp Asn Asp Cys Ala Thr Gly His Ile Leu Ile
            20   25   30

Met Leu Leu Asn Trp His Glu Gln Lys Glu Glu Gly Gln His Leu Leu
        35   40   45

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

Tyr Leu Leu Asp Arg Phe Asp Ile Gln Lys Asp Glu Tyr Tyr Asn Thr
65   70   75   80

Ala Phe Gln Asn Cys Asn Asn Asn Val Ala Ser Tyr Ile Gly Tyr Asp
                85   90   95

Ile Asn Leu Pro Thr Lys Asp Gly Ile Arg Leu Gly Val
            100   105

<210> 145
<211> 64
<212> PRT
<213> Vaccinia virus

<400> 145
Met Leu Pro His Thr Ser Asp Thr Thr Ser Thr Phe Arg Leu Lys Thr
1   5   10   15

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

Val Val Asn Asp Ile Ile His His Arg Leu Lys Val Ser Leu Pro Met
        35   40   45

Ile Lys Ser Leu Phe Tyr Lys Met Ser Leu Pro Thr Thr Ile Thr Thr
    50   55   60

<210> 146

<211> 48
<212> PRT
<213> Vaccinia virus

<400> 146
Met Tyr Asp Asp Leu Ile Glu Gln Cys His Leu Ser Met Glu Arg Lys
1   5   10   15

Ser Lys Leu Val Asp Lys Ala Leu Asn Lys Leu Glu Ser Thr Ile Gly
            20   25   30

Gln Ser Arg Leu Ser Tyr Leu Pro Pro Glu Ile Met Arg Asn Ile Ile
        35   40   45

<210> 147
<211> 122
<212> PRT
<213> Vaccinia virus

<400> 147
Met Lys Ser Val Leu Tyr Ser Tyr Ile Leu Phe Leu Ser Cys Ile Ile
1   5   10   15

Ile Asn Gly Arg Asp Ile Ala Pro His Ala Pro Ser Asp Gly Lys Cys
            20   25   30

Lys Asp Asn Glu Tyr Lys Arg His Asn Leu Cys Pro Gly Thr Tyr Ala
        35   40   45

Ser Arg Leu Cys Asp Ser Lys Thr Asn Thr Gln Cys Thr Pro Cys Gly
    50   55   60

Ser Gly Thr Phe Thr Ser Arg Asn Asn His Leu Pro Ala Cys Leu Ser
65   70   75   80

Cys Asn Gly Arg Arg Asp Arg Val Thr Arg Leu Thr Ile Glu Ser Val
                85   90   95

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

Arg His Val Phe Pro Lys Gln Asn Val Glu
        115   120

<210> 148
<211> 72
<212> PRT
<213> Vaccinia virus

<400> 148
Met Asp Ser Leu Arg Pro Val Val Val Val Asn Trp Ile Gln Ile Asn
1   5   10   15

Phe His Ile Asp Ile Val Lys Gly Ile Thr Gly Tyr Gly Phe Ala Phe
            20   25   30

Ile Cys Gly Arg Asp Gly Val Arg Ile Cys Ser Glu Thr Thr Arg Arg
        35   40   45

Thr Asp Asp Val Ser Gly Tyr Ser Val Ser Tyr Ser Thr Phe Cys Leu
    50   55   60

Gly Asn Thr Cys Leu Ala Ser Gly
65   70

<210> 149
<211> 61
<212> PRT
<213> Vaccinia virus

<400> 149
Met Trp Lys Leu Ile Cys Ile Gln Leu Thr Thr Thr Thr Gly Leu Ser
1   5   10   15

Glu Ser Ile Ser Thr Ser Glu Leu Thr Ile Thr Met Asn His Lys Asp
            20   25   30

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

Ala Thr Ser Gly Phe Phe Thr Gly Glu Arg Cys Ala Leu
    50   55   60

<210> 150
<211> 244
<212> PRT

<213> Vaccinia virus

<400> 150
Met His Val Pro Ala Ser Leu Gln Gln Ser Ser Ser Ser Ser Ser Ser
1   5   10   15

Cys Thr Glu Glu Glu Asn Lys His His Met Gly Ile Asp Val Ile Ile
            20   25   30

Lys Val Thr Lys Gln Asp Gln Thr Pro Thr Asn Asp Lys Ile Cys Gln
        35   40   45

Ser Val Thr Glu Ile Thr Glu Ser Glu Ser Asp Pro Asp Pro Glu Val
    50   55   60

Glu Ser Glu Asp Asp Ser Thr Ser Val Glu Asp Val Asp Pro Pro Thr
65   70   75   80

Thr Tyr Tyr Ser Ile Ile Gly Gly Gly Leu Arg Met Asn Phe Gly Phe
                85   90   95

Thr Lys Cys Pro Gln Ile Lys Ser Ile Ser Glu Ser Ala Asp Gly Asn
            100   105   110

Thr Val Asn Ala Arg Leu Ser Ser Val Ser Pro Gly Gln Gly Lys Asp
        115   120   125

Ser Pro Ala Ile Thr His Glu Glu Ala Leu Ala Met Ile Lys Asp Cys
    130   135   140

Glu Val Ser Ile Asp Ile Arg Cys Ser Glu Glu Glu Lys Asp Ser Asp
145   150   155   160

Ile Lys Thr His Pro Val Leu Gly Ser Asn Ile Ser His Lys Lys Val
                165   170   175

Ser Tyr Glu Asp Ile Ile Gly Ser Thr Ile Val Asp Thr Lys Cys Val
            180   185   190

Lys Asn Leu Glu Phe Ser Val Arg Ile Gly Asp Met Cys Lys Glu Ser
        195   200   205

Ser Glu Leu Glu Val Lys Asp Gly Phe Lys Tyr Val Asp Gly Ser Ala
    210   215   220

Ser Glu Gly Ala Thr Asp Asp Thr Ser Leu Ile Asp Ser Thr Lys Leu
225   230   235   240

Lys Ala Cys Val

<210> 151
<211> 222
<212> PRT
<213> Vaccinia virus

<400> 151
Met Asn His Cys Leu Leu Ala Ile Ser Ala Val Tyr Phe Lys Ala Lys
1   5   10   15

Trp Leu Thr Pro Phe Glu Lys Glu Phe Thr Ser Asp Tyr Pro Phe Tyr
            20   25   30

Val Ser Pro Thr Glu Met Val Asp Val Ser Met Met Ser Met Tyr Gly
        35   40   45

Lys Ala Phe Asn His Ala Ser Val Lys Glu Ser Phe Gly Asn Phe Ser
    50   55   60

Ile Ile Glu Leu Pro Tyr Val Gly Asp Thr Ser Met Met Val Ile Leu
65   70   75   80

Pro Asp Lys Ile Asp Gly Leu Glu Ser Ile Glu Gln Asn Leu Thr Asp
                85   90   95

Thr Asn Phe Lys Lys Trp Cys Asp Phe Met Asp Ala Met Phe Ile Asp
            100   105   110

Val His Ile Pro Lys Phe Lys Val Thr Gly Ser Tyr Asn Leu Val Asp
        115   120   125

Thr Leu Val Lys Ser Gly Leu Thr Glu Val Phe Gly Ser Thr Gly Asp

```
    130                 135                 140

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

Lys Thr Tyr Ile Asp Val Asn Glu Glu Tyr Thr Glu Ala Ala Ala Ala
                165                 170                 175

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

Cys Val Asp His Pro Phe Ile Tyr Val Ile Arg His Val Asp Gly Lys
        195                 200                 205

Ile Leu Phe Val Gly Arg Tyr Cys Ser Pro Thr Thr Asn Cys
    210                 215                 220


<210> 152
<211> 149
<212> PRT
<213> Vaccinia virus

<400> 152
Met Thr Ala Asn Phe Ser Thr His Val Phe Ser Pro Gln His Cys Gly
1               5                   10                  15

Cys Asp Arg Leu Thr Ser Ile Asp Asp Val Lys Gln Cys Leu Thr Glu
            20                  25                  30

Tyr Ile Tyr Trp Ser Ser Tyr Ala Tyr Arg Asn Arg Gln Cys Ala Gly
        35                  40                  45

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

Phe Ile Asp Ile Arg Glu Leu Val Lys Asn Met Pro Trp Asp Asp Val
65                  70                  75                  80

Lys Asp Cys Thr Glu Ile Ile Arg Cys Tyr Ile Pro Asp Glu Gln Lys
                85                  90                  95
```

Thr Ile Arg Glu Ile Ser Ala Ile Ile Gly Leu Cys Ala Tyr Ala Ala
100 105 110

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

Leu Phe Val Met Leu Glu Met Leu Asn Tyr Val Asp Tyr Asn Ile Ile
130 135 140

Phe Arg Arg Met Asn
145

<210> 153
<211> 91
<212> PRT
<213> Vaccinia virus

<400> 153
Met Tyr Asn Ser Ser Ile His Thr Pro Glu Tyr Asp Val Ile Ile His
1 5 10 15

Val Ile Glu His Leu Lys His His Lys Gln Cys Val Gln Thr Val Thr
20 25 30

Ser Gly Met Val Phe Thr Ser Pro Val Ser Ser Ser Ile Cys Thr Lys
35 40 45

Ser Asp Asp Gly Arg Asn Leu Ser Asp Gly Phe Leu Leu Ile Arg Tyr
50 55 60

Ile Thr Thr Asp Asp Phe Cys Thr Ile Phe Asp Ile Ile Pro Arg His
65 70 75 80

Ile Phe Tyr Gln Leu Ala Asn Val Asp Glu His
85 90

<210> 154
<211> 290
<212> PRT
<213> Vaccinia virus

<400> 154
Met Glu Leu Glu Asn Glu Pro Val Ile Leu Pro Cys Pro Gln Ile Asn

```
1               5                   10                  15

Thr Leu Ser Ser Gly Tyr Asn Ile Leu Asp Ile Leu Trp Glu Lys Arg
            20                  25                  30

Gly Ala Asp Asn Asp Arg Ile Ile Pro Ile Asp Asn Gly Ser Asn Met
        35                  40                  45

Leu Ile Leu Asn Pro Thr Gln Ser Asp Ser Gly Ile Tyr Ile Cys Ile
    50                  55                  60

Thr Thr Asn Glu Thr Tyr Cys Asp Met Met Ser Leu Asn Leu Thr Ile
65                  70                  75                  80

Val Ser Val Leu Glu Ser Asn Ile Asp Leu Ile Ser Tyr Pro Gln Ile
                85                  90                  95

Val Asn Glu Arg Ser Thr Gly Glu Met Val Cys Pro Asn Ile Asn Ala
            100                 105                 110

Phe Ile Ala Ser Asn Val Asn Ala Asp Ile Ile Trp Ser Gly His Arg
        115                 120                 125

Arg Leu Arg Asn Lys Arg Leu Lys Gln Arg Thr Pro Gly Ile Ile Thr
    130                 135                 140

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

Glu Tyr Ile Tyr Arg Gly Lys Thr Tyr Asn Val Thr Arg Ile Val Lys
                165                 170                 175

Leu Glu Val Arg Asp Lys Ile Ile Pro Ser Thr Met Gln Leu Pro Asp
            180                 185                 190

Gly Ile Val Thr Ser Ile Gly Ser Asn Leu Thr Ile Ala Cys Arg Val
        195                 200                 205

Ser Leu Arg Pro Pro Thr Thr Asp Ala Asp Val Phe Trp Ile Ser Asn
    210                 215                 220
```

Gly Met Tyr Tyr Glu Glu Asp Asp Gly Asp Gly Asn Gly Arg Ile Ser
225 230 235 240

Val Ala Asn Lys Ile Tyr Met Thr Asp Lys Arg Arg Val Ile Thr Ser
245 250 255

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

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

Ile Thr
290

<210> 155
<211> 75
<212> PRT
<213> Vaccinia virus

<400> 155
Met Val Ile Ile Pro Gly Val Arg Cys Leu Ser Leu Leu Phe Leu Arg
1 5 10 15

Arg Arg Cys Pro Leu His Ile Ile Ser Ala Phe Thr Leu Leu Ala Ile
20 25 30

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

Thr Ile Cys Gly Tyr Glu Ile Arg Ser Ile Phe Asp Ser Lys Thr Asp
50 55 60

Thr Ile Val Lys Phe Asn Asp Ile Met Ser Gln
65 70 75

<210> 156
<211> 340
<212> PRT
<213> Vaccinia virus

<400> 156
Met Ser Arg Lys Phe Met Gln Val Tyr Glu Tyr Asp Arg Glu Gln Tyr
1   5   10   15

Leu Asp Glu Phe Ile Glu Asp Arg Tyr Asn Asp Ser Phe Ile Thr Ser
            20   25   30

Pro Glu Tyr Tyr Ser Ala Glu Lys Tyr Met Cys Arg Tyr Thr Thr Leu
        35   40   45

Asn His Asn Cys Val Asn Val Arg Arg Cys Ala Leu Asp Ser Lys Leu
    50   55   60

Leu His Asp Ile Ile Thr Asn Cys Lys Ile Tyr Asn Asn Ile Glu Leu
65   70   75   80

Val Arg Ala Thr Lys Phe Val Tyr Tyr Leu Asp Leu Ile Lys Cys Asn
                85   90   95

Trp Val Ser Lys Val Gly Asp Ser Val Leu Tyr Pro Val Ile Phe Ile
            100   105   110

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

Lys Gly Val Lys Val Lys Lys Leu Asn Arg Cys Ala Asp His Ala Ile
    130   135   140

Val Ile Asn Pro Phe Val Lys Phe Lys Leu Thr Leu Pro Asn Lys Thr
145   150   155   160

Ser His Ala Lys Val Leu Val Thr Phe Cys Lys Leu Arg Thr Asp Ile
                165   170   175

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

Pro Asn Ile Asn Lys Arg Ile Pro Gly Tyr Ile His Val Asn Ile Glu
        195   200   205

```
Gly Cys Ile Asp Gly Met Ile Tyr Ile Asn Ser Ser Lys Phe Ala Cys
    210                 215                 220

Val Leu Lys Leu His Arg Ser Met Tyr Arg Ile Pro Pro Phe Pro Ile
225                 230                 235                 240

Asp Ile Cys Ser Cys Cys Ser Gln Tyr Thr Asn Gly Asp Ile Glu Ile
                245                 250                 255

Pro Ile His Asp Leu Ile Lys Asp Val Ala Ile Phe Lys Asn Lys Glu
            260                 265                 270

Thr Val Tyr Tyr Leu Lys Leu Asn Asn Lys Thr Ile Ala Arg Phe Thr
        275                 280                 285

Tyr Phe Asn Asn Ile Asp Thr Ala Ile Thr Gln Glu His Glu Tyr Val
    290                 295                 300

Lys Ile Ala Leu Gly Ile Val Cys Lys Leu Met Ile Asn Asn Met His
305                 310                 315                 320

Ser Ile Val Gly Val Asn His Ser Asn Thr Phe Val Asn Cys Leu Leu
                325                 330                 335

Glu Asp Asn Val
            340
```

<210> 157
<211> 574
<212> PRT
<213> Vaccinia virus

<400> 157

```
Met Ser Arg Arg Leu Ile Tyr Val Leu Asn Ile Asn Arg Glu Ser Thr
1               5                   10                  15

His Lys Ile Gln Glu Asn Glu Ile Tyr Thr Tyr Phe Ser His Cys Asn
            20                  25                  30

Ile Asp His Thr Ser Thr Glu Leu Asp Phe Val Val Lys Asn Tyr Asp
        35                  40                  45
```

```
Leu Asn Arg Arg His Pro Val Thr Gly Tyr Thr Ala Leu His Cys Tyr
    50                  55                  60

Leu Tyr Asn Asn Tyr Phe Thr Asn Asp Val Leu Lys Ile Leu Leu Asn
65                  70                  75                  80

His Gly Val Asp Val Thr Met Lys Thr Ser Ser Gly Arg Met Pro Val
                85                  90                  95

Tyr Ile Leu Leu Thr Arg Cys Cys Asn Ile Ser His Asp Val Val Ile
            100                 105                 110

Asp Met Ile Asp Lys Asp Lys Asn His Leu Leu His Arg Asp Tyr Ser
        115                 120                 125

Asn Leu Leu Leu Glu Tyr Ile Lys Ser Arg Tyr Met Leu Leu Lys Glu
    130                 135                 140

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

Asp Pro Asn Phe Lys Gln Asp Gly Tyr Thr Ala Leu His Tyr Tyr Tyr
                165                 170                 175

Leu Cys Leu Ala His Val Tyr Lys Pro Gly Glu Cys Arg Lys Pro Ile
            180                 185                 190

Thr Ile Lys Lys Ala Lys Arg Ile Ile Ser Leu Phe Ile Gln His Gly
        195                 200                 205

Ala Asn Leu Asn Ala Leu Asp Asn Cys Gly Asn Thr Pro Phe His Leu
    210                 215                 220

Tyr Leu Ser Ile Glu Met Cys Asn Asn Ile His Met Thr Lys Met Leu
225                 230                 235                 240

Leu Thr Phe Asn Pro Asn Phe Lys Ile Cys Asn Asn His Gly Leu Thr
                245                 250                 255
```

```
Pro Ile Leu Cys Tyr Ile Thr Ser Asp Tyr Ile Gln His Asp Ile Leu
            260                 265                 270

Val Met Leu Ile His His Tyr Glu Thr Asn Val Gly Glu Met Pro Ile
        275                 280                 285

Asp Glu Arg Arg Ile Ile Val Phe Glu Phe Ile Lys Thr Tyr Ser Thr
    290                 295                 300

Arg Pro Ala Asp Ser Ile Thr Tyr Leu Met Asn Arg Phe Lys Asn Ile
305                 310                 315                 320

Asn Ile Tyr Thr Arg Tyr Glu Gly Lys Thr Leu Leu His Val Ala Cys
                325                 330                 335

Glu Tyr Asn Asn Thr Gln Val Ile Asp Tyr Leu Ile Arg Ile Asn Gly
            340                 345                 350

Asp Ile Asn Ala Leu Thr Asp Asn Asn Lys His Ala Thr Gln Leu Ile
        355                 360                 365

Ile Asp Asn Lys Glu Asn Ser Pro Tyr Thr Ile Asn Cys Leu Leu Tyr
    370                 375                 380

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

Gln Leu Pro Ser Leu Pro Ile Phe Asp Ile Lys Ser Phe Glu Lys Phe
                405                 410                 415

Ile Ser Tyr Cys Ile Leu Leu Asp Asp Thr Phe Tyr Asp Arg His Val
            420                 425                 430

Lys Asn Arg Asn Ser Lys Thr Tyr Arg Tyr Ala Phe Ser Lys Tyr Met
        435                 440                 445

Ser Phe Asp Lys Tyr Asp Gly Ile Ile Thr Lys Cys His Asp Glu Thr
    450                 455                 460

Met Leu Leu Lys Leu Ser Thr Val Leu Asp Thr Thr Leu Tyr Ala Val
```

```
465                 470                 475                 480

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

Lys Lys Tyr Asn Asn Asp Lys Ser Phe Lys Ile Tyr Ser Asn Ile Met
            500                 505                 510

Asn Glu Arg Tyr Leu Asn Val Tyr Tyr Lys Asp Met Tyr Val Ser Lys
        515                 520                 525

Val Tyr Asp Lys Leu Phe Pro Val Phe Thr Asp Lys Asn Cys Leu Leu
    530                 535                 540

Thr Leu Leu Pro Ser Glu Ile Ile Tyr Glu Ile Leu Tyr Met Leu Thr
545                 550                 555                 560

Ile Asn Asp Leu Tyr Asn Ile Ser Tyr Pro Pro Thr Lys Val
                565                 570

<210> 158
<211> 353
<212> PRT
<213> Vaccinia virus

<400> 158
Met Thr Met Lys Met Met Val His Ile Tyr Phe Val Ser Leu Ser Leu
1               5                   10                  15

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

Thr Glu Phe Phe Asn Lys Met Arg Asp Thr Leu Pro Ala Lys Asp Ser
        35                  40                  45

Lys Trp Leu Asn Pro Ala Cys Met Phe Gly Gly Thr Met Asn Asp Ile
    50                  55                  60

Ala Ala Leu Gly Glu Pro Phe Ser Ala Lys Cys Pro Pro Ile Glu Asp
65                  70                  75                  80
```

```
Ser Leu Leu Ser His Arg Tyr Lys Asp Tyr Val Val Lys Trp Glu Arg
                85                  90                  95

Leu Glu Lys Asn Arg Arg Arg Gln Val Ser Asn Lys Arg Val Lys His
            100                 105                 110

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

Tyr Leu Cys Thr Val Thr Thr Lys Asn Gly Asp Cys Val Gln Gly Ile
    130                 135                 140

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

Glu Leu Gly Thr His Asp Lys Tyr Gly Ile Asp Leu Tyr Cys Gly Ile
                165                 170                 175

Leu Tyr Ala Lys His Tyr Asn Asn Ile Thr Trp Tyr Lys Asp Asn Lys
            180                 185                 190

Glu Ile Asn Ile Asp Asp Ile Lys Tyr Ser Gln Thr Gly Lys Glu Leu
        195                 200                 205

Ile Ile His Asn Pro Glu Leu Glu Asp Ser Gly Arg Tyr Asp Cys Tyr
    210                 215                 220

Val His Tyr Asp Asp Val Arg Ile Lys Asn Asp Ile Val Val Ser Arg
225                 230                 235                 240

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

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

Thr Cys Thr Ala Val Ser Thr Ser Leu Leu Ile Asp Asp Val Leu Ile
        275                 280                 285

Glu Trp Glu Asn Pro Ser Gly Trp Leu Ile Gly Phe Asp Phe Asp Val
```

```
    290                 295                 300

Tyr Ser Val Leu Thr Ser Arg Gly Gly Ile Thr Glu Ala Thr Leu Tyr
305                 310                 315                 320

Phe Glu Asn Val Thr Glu Glu Tyr Ile Gly Asn Thr Tyr Lys Cys Arg
                325                 330                 335

Gly His Asn Tyr Tyr Phe Glu Lys Thr Leu Thr Thr Thr Val Val Leu
            340                 345                 350

Glu
```

<210> 159
<211> 56
<212> PRT
<213> Vaccinia virus

<400> 159

```
Met His Val Ile Asp Val Asp Val Arg Leu Tyr Met Ser Thr Phe Ile
1               5                   10                  15

Ile Ile Asp Gln Ser Thr Glu Asn Thr Ser Ile Asp Thr Thr Val Thr
            20                  25                  30

Ile Asn Ile Ile Tyr Leu Ala Ile Met Lys Ile Ile Met Asn Ile Ile
        35                  40                  45

Met Met Ile Met Ile Glu Leu Val
    50                  55
```

<210> 160
<211> 271
<212> PRT
<213> Vaccinia virus

<400> 160

```
Leu Lys Asn Val Glu Cys Val Asp Ile Asp Ser Thr Ile Thr Phe Met
1               5                   10                  15

Lys Tyr Asp Pro Asn Asp Asp Asn Lys Arg Thr Cys Ser Asn Trp Val
            20                  25                  30
```

```
Pro Leu Thr Asn Asn Tyr Met Glu Tyr Cys Leu Val Ile Tyr Leu Glu
        35                  40                  45

Thr Pro Ile Cys Gly Gly Lys Ile Lys Leu Tyr His Pro Thr Gly Asn
    50                  55                  60

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

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

Ser Val Ser Tyr Asn Arg Ser Met Thr Thr Ile His Tyr Asn Asp Asp
            100                 105                 110

Val Asp Ile Asp Ile His Thr Asp Lys Asn Gly Lys Glu Leu Cys Tyr
        115                 120                 125

Cys Tyr Ile Thr Ile Asp Asp His Tyr Leu Val Asp Val Glu Thr Ile
    130                 135                 140

Gly Val Ile Val Asn Arg Ser Gly Lys Cys Leu Leu Val Asn Asn His
145                 150                 155                 160

Leu Gly Ile Gly Ile Val Lys Asp Lys Arg Ile Ser Asp Ser Phe Gly
                165                 170                 175

Asp Val Cys Met Asp Thr Ile Phe Asp Phe Ser Glu Ala Arg Glu Leu
            180                 185                 190

Phe Ser Leu Thr Asn Asp Asp Asn Arg Asn Ile Ala Trp Asp Thr Asp
        195                 200                 205

Lys Leu Asp Asp Asp Thr Asp Ile Trp Thr Pro Val Thr Glu Asn Asp
    210                 215                 220

Tyr Lys Phe Leu Ser Arg Leu Val Leu Tyr Ala Lys Ser Gln Ser Asp
225                 230                 235                 240
```

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


Val Phe Ile Phe Lys Val Thr Arg Phe Tyr Phe Asn Met Pro Lys
            260                 265                 270


<210> 161
<211> 74
<212> PRT
<213> Vaccinia virus

<400> 161
Met Tyr Cys Arg Cys Ser His Gly Tyr Thr Gly Ile Arg Cys Gln His
1               5                   10                  15


Val Val Leu Val Asp Tyr Gln Arg Ser Glu Lys Pro Asn Thr Thr Thr
            20                  25                  30


Ser Tyr Ile Pro Ser Pro Gly Ile Met Leu Val Leu Val Gly Ile Ile
        35                  40                  45


Ile Ile Thr Cys Cys Leu Leu Ser Val Tyr Arg Phe Thr Arg Arg Thr
    50                  55                  60


Lys Leu Pro Leu Gln Asp Met Val Val Pro
65                  70


<210> 162
<211> 244
<212> PRT
<213> Vaccinia virus

<400> 162
Met His Val Pro Ala Ser Leu Gln Gln Ser Ser Ser Ser Ser Ser Ser
1               5                   10                  15


Cys Thr Glu Glu Glu Asn Lys His His Met Gly Ile Asp Val Ile Ile
            20                  25                  30


Lys Val Thr Lys Gln Asp Gln Thr Pro Thr Asn Asp Lys Ile Cys Gln
        35                  40                  45
```

```
Ser Val Thr Glu Ile Thr Glu Ser Glu Ser Asp Pro Asp Pro Glu Val
    50                  55                  60

Glu Ser Glu Asp Asp Ser Thr Ser Val Glu Asp Val Asp Pro Pro Thr
65                  70                  75                  80

Thr Tyr Tyr Ser Ile Ile Gly Gly Gly Leu Arg Met Asn Phe Gly Phe
                85                  90                  95

Thr Lys Cys Pro Gln Ile Lys Ser Ile Ser Glu Ser Ala Asp Gly Asn
            100                 105                 110

Thr Val Asn Ala Arg Leu Ser Ser Val Ser Pro Gly Gln Gly Lys Asp
        115                 120                 125

Ser Pro Ala Ile Thr His Glu Glu Ala Leu Ala Met Ile Lys Asp Cys
    130                 135                 140

Glu Val Ser Ile Asp Ile Arg Cys Ser Glu Glu Glu Lys Asp Ser Asp
145                 150                 155                 160

Ile Lys Thr His Pro Val Leu Gly Ser Asn Ile Ser His Lys Lys Val
                165                 170                 175

Ser Tyr Glu Asp Ile Ile Gly Ser Thr Ile Val Asp Thr Lys Cys Val
            180                 185                 190

Lys Asn Leu Glu Phe Ser Val Arg Ile Gly Asp Met Cys Lys Glu Ser
        195                 200                 205

Ser Glu Leu Glu Val Lys Asp Gly Phe Lys Tyr Val Asp Gly Ser Ala
    210                 215                 220

Ser Glu Gly Ala Thr Asp Asp Thr Ser Leu Ile Asp Ser Thr Lys Leu
225                 230                 235                 240

Lys Ala Cys Val
```

<210> 163

<211> 222
<212> PRT
<213> Vaccinia virus

<400> 163
Met Asn His Cys Leu Leu Ala Ile Ser Ala Val Tyr Phe Lys Ala Lys
1   5   10   15

Trp Leu Thr Pro Phe Glu Lys Glu Phe Thr Ser Asp Tyr Pro Phe Tyr
            20   25   30

Val Ser Pro Thr Glu Met Val Asp Val Ser Met Met Ser Met Tyr Gly
        35   40   45

Lys Ala Phe Asn His Ala Ser Val Lys Glu Ser Phe Gly Asn Phe Ser
    50   55   60

Ile Ile Glu Leu Pro Tyr Val Gly Asp Thr Ser Met Met Val Ile Leu
65   70   75   80

Pro Asp Lys Ile Asp Gly Leu Glu Ser Ile Glu Gln Asn Leu Thr Asp
                85   90   95

Thr Asn Phe Lys Lys Trp Cys Asp Phe Met Asp Ala Met Phe Ile Asp
            100   105   110

Val His Ile Pro Lys Phe Lys Val Thr Gly Ser Tyr Asn Leu Val Asp
        115   120   125

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

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

Lys Thr Tyr Ile Asp Val Asn Glu Glu Tyr Thr Glu Ala Ala Ala Ala
                165   170   175

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

```
Cys Ala Asp His Pro Phe Ile Tyr Val Ile Arg His Val Asp Gly Lys
        195                 200                 205


Ile Leu Phe Val Gly Arg Tyr Cys Ser Pro Thr Thr Asn Cys
    210                 215                 220


<210> 164
<211> 149
<212> PRT
<213> Vaccinia virus

<400> 164
Met Thr Ala Asn Phe Ser Thr His Val Phe Ser Pro Gln His Cys Gly
1               5                   10                  15


Cys Asp Arg Leu Thr Ser Ile Asp Asp Val Lys Gln Cys Leu Thr Glu
            20                  25                  30


Tyr Ile Tyr Trp Ser Ser Tyr Ala Tyr Arg Asn Arg Gln Cys Ala Gly
        35                  40                  45


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


Phe Ile Asp Ile Arg Glu Leu Val Lys His Met Pro Trp Asp Asp Val
65                  70                  75                  80


Lys Asp Cys Ala Glu Ile Ile Arg Cys Tyr Ile Pro Asp Glu Gln Lys
                85                  90                  95


Thr Ile Arg Glu Ile Ser Ala Ile Ile Gly Leu Cys Ala Tyr Ala Ala
            100                 105                 110


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


Leu Phe Val Met Leu Glu Met Leu Asn Tyr Val Asp Tyr Asn Ile Ile
    130                 135                 140


Phe Arg Arg Met Asn
145
```

<210> 165
<211> 326
<212> PRT
<213> Vaccinia virus

<400> 165
Met Ser Ile Leu Pro Val Ile Phe Leu Ser Ile Phe Phe Tyr Ser Ser
1   5   10   15

Phe Val Gln Thr Phe Asn Ala Ser Glu Cys Ile Asp Lys Gly Gln Tyr
            20   25   30

Phe Ala Ser Phe Met Glu Leu Glu Asn Glu Pro Val Ile Leu Pro Cys
        35   40   45

Pro Gln Ile Asn Thr Leu Ser Ser Gly Tyr Asn Ile Leu Asp Ile Leu
    50   55   60

Trp Glu Lys Arg Gly Ala Asp Asn Asp Arg Ile Ile Pro Ile Asp Asn
65   70   75   80

Gly Ser Asn Met Leu Ile Leu Asn Pro Thr Gln Ser Asp Ser Gly Ile
                85   90   95

Tyr Ile Cys Ile Thr Thr Asn Glu Thr Tyr Cys Asp Met Met Ser Leu
            100   105   110

Asn Leu Thr Ile Val Ser Val Ser Glu Ser Asn Ile Asp Leu Ile Ser
        115   120   125

Tyr Pro Gln Ile Val Asn Glu Arg Ser Thr Gly Glu Met Val Cys Pro
    130   135   140

Asn Ile Asn Ala Phe Ile Ala Ser Asn Val Asn Ala Asp Ile Ile Trp
145   150   155   160

Ser Gly His Arg Arg Leu Arg Asn Lys Arg Leu Lys Gln Arg Thr Pro
                165   170   175

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

```
Thr Cys Val Leu Glu Tyr Ile Tyr Gly Gly Lys Thr Tyr Asn Val Thr
        195                 200                 205


Arg Ile Val Lys Leu Glu Val Arg Asp Lys Ile Ile Pro Ser Thr Met
    210                 215                 220


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


Ala Cys Arg Val Ser Leu Arg Pro Pro Thr Thr Asp Thr Asp Val Phe
                245                 250                 255


Trp Ile Ser Asn Gly Met Tyr Tyr Glu Glu Asp Asp Gly Asp Gly Asp
            260                 265                 270


Gly Arg Ile Ser Val Ala Asn Lys Ile Tyr Met Thr Asp Lys Arg Arg
        275                 280                 285


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


Thr Thr Phe Thr Cys Met Ala Phe Thr Ile Pro Ser Ile Ser Lys Thr
305                 310                 315                 320


Val Thr Val Ser Ile Thr
                325


<210> 166
<211> 340
<212> PRT
<213> Vaccinia virus

<400> 166
Met Ser Arg Lys Phe Met Gln Val Tyr Glu Tyr Asp Arg Glu Gln Tyr
1               5                   10                  15


Leu Asp Glu Phe Ile Glu Asp Arg Tyr Asn Asp Ser Phe Ile Thr Ser
            20                  25                  30


Pro Glu Tyr Tyr Ser Ala Glu Lys Tyr Met Cys Arg Tyr Thr Thr Leu
```

```
        35                  40                  45

Asn His Asn Cys Val Asn Val Arg Arg Cys Ala Leu Asp Ser Lys Leu
    50                  55                  60

Leu His Asp Ile Ile Thr Asn Cys Lys Ile Tyr Asn Asn Ile Glu Leu
65                  70                  75                  80

Val Arg Ala Thr Lys Phe Val Tyr Tyr Leu Asp Leu Ile Lys Cys Asn
                85                  90                  95

Trp Val Ser Lys Val Gly Asp Ser Val Leu Tyr Pro Val Ile Phe Ile
            100                 105                 110

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

Lys Gly Val Lys Val Lys Lys Leu Asn Arg Cys Ala Asp His Ala Ile
    130                 135                 140

Val Ile Asn Pro Phe Val Lys Phe Lys Leu Thr Leu Pro Asn Lys Thr
145                 150                 155                 160

Ser His Ala Lys Val Leu Val Thr Phe Cys Lys Leu Arg Thr Asp Ile
                165                 170                 175

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

Pro Asp Ile Asn Lys Arg Ile Pro Gly Tyr Ile His Val Asn Ile Glu
        195                 200                 205

Gly Cys Ile Asp Gly Met Ile Tyr Ile Asn Ser Ser Lys Phe Ala Cys
    210                 215                 220

Val Leu Lys Leu His Arg Ser Met Tyr Arg Ile Pro Pro Phe Pro Ile
225                 230                 235                 240

Asp Ile Cys Ser Cys Cys Ser Gln Tyr Thr Asn Asp Asp Ile Glu Ile
                245                 250                 255
```

```
Pro Ile His Asp Leu Ile Lys Asp Val Ala Ile Phe Lys Asn Lys Glu
            260                 265                 270

Thr Val Tyr Tyr Leu Lys Leu Asn Asn Lys Thr Ile Ala Arg Phe Thr
        275                 280                 285

Tyr Phe Asn Asn Ile Asp Thr Ala Ile Thr Gln Glu His Glu Tyr Val
    290                 295                 300

Lys Ile Ala Leu Gly Ile Val Cys Lys Leu Met Ile Asn Asn Met His
305                 310                 315                 320

Ser Ile Val Gly Val Asn His Ser Asn Thr Phe Val Asn Cys Leu Leu
                325                 330                 335

Glu Asp Asn Val
            340
```

<210> 167
<211> 574
<212> PRT
<213> Vaccinia virus

<400> 167

```
Met Ser Arg Arg Leu Ile Tyr Val Leu Asn Ile Asn Arg Glu Ser Thr
1               5                   10                  15

His Lys Ile Gln Glu Asn Glu Ile Tyr Thr Tyr Phe Ser His Cys Asn
            20                  25                  30

Ile Asp His Thr Ser Thr Glu Leu Asp Phe Val Val Lys Asn Tyr Asp
        35                  40                  45

Leu Asn Arg Arg Gln Pro Val Thr Gly Tyr Thr Ala Leu His Cys Tyr
    50                  55                  60

Leu Tyr Asn Asn Tyr Phe Thr Asn Asp Val Leu Lys Ile Leu Leu Asn
65                  70                  75                  80

His Gly Val Asp Val Thr Met Lys Thr Ser Ser Gly Arg Met Pro Val
```

```
                85                  90                  95

Tyr Ile Leu Leu Thr Arg Cys Cys Asn Ile Ser His Asp Val Val Ile
            100                 105                 110

Asp Met Ile Asp Lys Asp Lys Asn His Leu Ser His Arg Asp Tyr Ser
        115                 120                 125

Asn Leu Leu Leu Glu Tyr Ile Lys Ser Arg Tyr Met Leu Leu Lys Glu
    130                 135                 140

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

Asp Pro Asn Phe Lys Gln Asp Gly Tyr Thr Ala Leu His Tyr Tyr Tyr
                165                 170                 175

Leu Cys Leu Ala His Val Tyr Lys Pro Gly Glu Cys Arg Lys Pro Ile
            180                 185                 190

Thr Ile Lys Lys Ala Lys Arg Ile Ile Ser Leu Phe Ile Gln His Gly
        195                 200                 205

Ala Asn Leu Asn Ala Leu Asp Asn Cys Gly Asn Thr Pro Phe His Leu
    210                 215                 220

Tyr Leu Ser Ile Glu Met Cys Asn Asn Ile His Met Thr Lys Met Leu
225                 230                 235                 240

Leu Thr Phe Asn Pro Asn Phe Lys Ile Cys Asn Asn His Gly Leu Thr
                245                 250                 255

Pro Ile Leu Cys Tyr Ile Thr Ser Asp Tyr Ile Gln His Asp Ile Leu
            260                 265                 270

Val Met Leu Ile His His Tyr Glu Thr Asn Val Gly Glu Met Pro Ile
        275                 280                 285

Asp Glu Arg Arg Ile Ile Val Phe Glu Phe Ile Lys Thr Tyr Ser Thr
    290                 295                 300
```

```
Arg Pro Ala Asp Ser Ile Thr Tyr Leu Met Asn Arg Phe Lys Asn Ile
305                 310                 315                 320

Asn Ile Tyr Thr Arg Tyr Glu Gly Lys Thr Leu Leu His Val Ala Cys
                325                 330                 335

Glu Tyr Asn Asn Thr His Val Ile Asp Tyr Leu Ile Arg Ile Asn Gly
            340                 345                 350

Asp Ile Asn Ala Leu Thr Asp Asn Asn Lys His Ala Ile Gln Leu Ile
        355                 360                 365

Ile Asp Asn Lys Glu Asn Ser Pro Tyr Thr Ile Asp Cys Leu Leu Tyr
    370                 375                 380

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

Gln Leu Pro Ser Leu Pro Ile Phe Asp Ile Lys Ser Phe Glu Lys Phe
                405                 410                 415

Ile Ser Tyr Cys Ile Leu Leu Asp Asp Thr Phe Tyr Asn Arg His Val
            420                 425                 430

Arg Asn Arg Asn Ser Lys Thr Tyr Arg Tyr Ala Phe Ser Lys Tyr Met
        435                 440                 445

Ser Phe Asp Lys Tyr Asp Gly Ile Ile Thr Lys Cys His Asp Glu Thr
    450                 455                 460

Met Leu Leu Lys Leu Ser Thr Val Leu Asp Thr Thr Leu Tyr Ala Val
465                 470                 475                 480

Leu Arg Cys His Asn Ser Lys Lys Leu Arg Arg Tyr Leu Asn Glu Leu
                485                 490                 495

Lys Lys Tyr Asn Asn Asp Lys Ser Phe Lys Ile Tyr Ser Asn Ile Met
            500                 505                 510
```

```
Asn Glu Arg Tyr Leu Asn Val Tyr Tyr Lys Asp Met Tyr Val Ser Lys
        515                 520                 525


Val Tyr Asp Lys Leu Phe Pro Val Phe Thr Asp Lys Asn Cys Leu Leu
    530                 535                 540


Thr Leu Leu Pro Ser Glu Ile Ile Tyr Glu Ile Leu Tyr Met Leu Thr
545                 550                 555                 560


Ile Asn Asp Leu Tyr Asn Ile Ser Tyr Pro Pro Thr Lys Val
                565                 570


<210> 168
<211> 265
<212> PRT
<213> Vaccinia virus

<400> 168
Met Thr Met Lys Met Met Val His Ile Tyr Phe Val Ser Leu Ser Leu
1               5                   10                  15


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


Thr Glu Phe Phe Asn Lys Met Arg Asp Thr Leu Pro Ala Lys Asp Ser
        35                  40                  45


Lys Trp Leu Asn Pro Ala Cys Met Phe Gly Gly Thr Met Asn Asp Ile
    50                  55                  60


Ala Thr Leu Gly Glu Pro Phe Ser Ala Lys Cys Pro Pro Ile Glu Asp
65                  70                  75                  80


Ser Leu Leu Ser His Arg Tyr Lys Asp Tyr Val Val Lys Trp Glu Arg
                85                  90                  95


Leu Glu Lys Asn Arg Arg Arg Gln Val Ser Asn Lys Arg Val Lys His
            100                 105                 110


Gly Asp Leu Trp Ile Ala Asn Tyr Thr Ser Lys Phe Ser Asn Arg Arg
        115                 120                 125
```

```
Tyr Leu Cys Thr Val Thr Thr Lys Asn Gly Asp Cys Val Gln Gly Ile
    130                 135                 140

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

Glu Leu Gly Thr His Asp Lys Tyr Gly Ile Asp Leu Tyr Cys Gly Ile
                165                 170                 175

Leu Tyr Ala Lys His Tyr Asn Asn Ile Thr Trp Tyr Lys Asp Asn Lys
            180                 185                 190

Glu Ile Asn Ile Asp Asp Ile Lys Tyr Ser Gln Thr Gly Lys Lys Leu
        195                 200                 205

Ile Ile His Asn Pro Glu Leu Glu Asp Ser Gly Arg Tyr Asp Cys Tyr
    210                 215                 220

Val His Tyr Asp Asp Val Arg Ile Lys Asn Asp Ile Val Val Ser Arg
225                 230                 235                 240

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

Lys Arg Asn Cys Gly Tyr Ala Ser Asn
            260                 265


<210> 169
<211> 91
<212> PRT
<213> Vaccinia virus

<400> 169
Met Arg Gln Ile Lys Ile Asn Gly Thr Asp Met Leu Thr Val Met Tyr
1               5                   10                  15

Met Leu Asn Lys Pro Thr Lys Lys Arg Tyr Val Asn Asn Pro Ile Phe
            20                  25                  30

Thr Asp Trp Ala Asn Lys Gln Tyr Lys Phe Tyr Asn Gln Ile Ile Tyr
```

```
        35                  40                  45

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

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

Ile Arg His Leu Ile Phe Ser Tyr Ala Phe Leu
                85                  90
```

<210> 170
<211> 55
<212> PRT
<213> Vaccinia virus

<400> 170

```
Met Ser Ser Lys Gly Gly Ser Gly Gly Met Trp Ser Val Phe Ile His
1               5                   10                  15

Gly His Asp Gly Ser Asn Lys Gly Ser Lys Thr Tyr Thr Ser Gly Gly
            20                  25                  30

Gly Gly Met Trp Gly Gly Gly Ser Ser Ser Gly Val Asn Gly Gly Val
        35                  40                  45

Lys Ser Gly Thr Gly Lys Ile
    50                  55
```

<210> 171
<211> 71
<212> PRT
<213> Vaccinia virus

<400> 171

```
Met Phe Asp Tyr Leu Glu Asn Glu Glu Val Ala Leu Asp Glu Leu Lys
1               5                   10                  15

Gln Met Leu Arg Asp Arg Asp Pro Asn Asp Thr Arg Asn Gln Phe Lys
            20                  25                  30

Asn Asn Ala Leu His Ala Tyr Leu Phe Asn Glu His Cys Asn Asn Val
        35                  40                  45
```

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

Asn Trp Arg Gln Leu Pro His
65   70

<210> 172
<211> 83
<212> PRT
<213> Vaccinia virus

<400> 172
Met Leu Lys Leu Lys Asp Ile Ala Met Ala Leu Leu Glu Ala Thr Gly
1   5   10   15

Phe Ser Asn Ile Asn Asp Phe Asn Ile Phe Ser Tyr Met Lys Ser Lys
            20   25   30

Asn Val Asp Val Asp Leu Ile Lys Val Leu Val Glu His Gly Phe Asp
        35   40   45

Leu Ser Val Lys Cys Glu Asn His Arg Ser Val Ile Glu Asn Tyr Val
    50   55   60

Met Thr Met Ile Leu Phe Ile Glu Asn Gly Cys Ser Val Leu Tyr Glu
65   70   75   80

Asp Glu Tyr

<210> 173
<211> 170
<212> PRT
<213> Vaccinia virus

<400> 173
Met Lys Gly Ile Asp Asn Thr Ala Tyr Ser Tyr Ile Asp Asp Leu Thr
1   5   10   15

Cys Cys Thr Arg Gly Ile Met Ala Asp Tyr Leu Asn Ser Asp Tyr Arg
            20   25   30

```
Tyr Asn Lys Asp Val Asp Leu Val Lys Leu Phe Leu Glu Asn Gly Lys
        35                  40                  45

Pro His Gly Ile Met Cys Ser Ile Val Pro Leu Trp Arg Asn Asp Lys
    50                  55                  60

Glu Thr Ile Phe Leu Ile Leu Lys Thr Met Asn Ser Asp Val Leu Gln
65                  70                  75                  80

His Ile Leu Ile Glu Tyr Met Thr Phe Gly Asp Ile Pro Leu Val Glu
                85                  90                  95

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

Ile Asn Ile Asp Ser Tyr Thr Met Lys Tyr Leu Leu Lys Lys Glu Gly
        115                 120                 125

Arg Cys His Gln Leu Ser Arg Leu Asp Thr Tyr Val Asn Pro Thr Met
    130                 135                 140

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

Cys Leu Met Leu Ala Gln Phe Leu Val Leu
                165                 170
```

<210> 174
<211> 173
<212> PRT
<213> Vaccinia virus

<400> 174

```
Met Pro Ser Ile Ile Ser Ile Gly His Leu Cys Lys Ser Asn Tyr Gly
1               5                   10                  15

Cys Tyr Asn Phe Tyr Thr Tyr Thr Tyr Lys Lys Gly Leu Cys Asp Met
            20                  25                  30

Ser Tyr Ala Cys Pro Ile Leu Ser Thr Ile Asn Ile Cys Leu Pro Tyr
        35                  40                  45
```

```
Leu Lys Asp Ile Asn Met Ile Asp Lys Arg Gly Glu Thr Leu Leu His
    50                  55                  60

Lys Ala Val Arg Tyr Asn Lys Gln Ser Leu Val Ser Leu Leu Leu Glu
65                  70                  75                  80

Ser Gly Ser Asp Val Asn Ile Arg Ser Asn Asn Gly Tyr Thr Cys Ile
                85                  90                  95

Ala Ile Ala Ile Asn Glu Ser Lys Asn Ile Glu Leu Leu Lys Met Leu
            100                 105                 110

Leu Cys His Lys Pro Thr Leu Asp Tyr Val Ile Asp Ser Leu Arg Glu
        115                 120                 125

Ile Ser Asn Ile Val Asp Asn Asp Tyr Ala Ile Lys Gln Cys Ile Lys
    130                 135                 140

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

Ile Ser Gln Arg Tyr Asn Asp Tyr Ile Asp Leu Cys Asn
                165                 170
```

<210> 175
<211> 90
<212> PRT
<213> Vaccinia virus

<400> 175

```
Met Lys Lys Ile Met Val Gly Gly Asn Thr Met Phe Ser Leu Ile Phe
1               5                   10                  15

Thr Asp His Gly Ala Lys Ile Ile His Arg Tyr Ala Asn Asn Pro Glu
            20                  25                  30

Leu Arg Glu Tyr Tyr Glu Leu Lys Gln Asn Lys Ile Tyr Val Glu Ala
        35                  40                  45

Tyr Asp Ile Ile Ser Asn Ala Ile Val Lys His Asp Arg Ile His Lys
```

50 55 60

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

Thr Ile Lys Tyr Lys Ile Phe Glu Gln Gln
85 90

<210> 176
<211> 126
<212> PRT
<213> Vaccinia virus

<400> 176
Met Arg Ile Leu Phe Leu Ile Ala Phe Met Tyr Gly Cys Val His Ser
1 5 10 15

Tyr Val Asn Ala Val Glu Thr Lys Cys Ser Asn Leu Asp Ile Val Thr
20 25 30

Ser Ser Gly Glu Phe His Cys Ser Gly Cys Val Glu His Met Pro Asn
35 40 45

Phe Ser Tyr Met Tyr Trp Leu Ala Lys Asp Met Arg Ser Asp Glu Asp
50 55 60

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

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

Val Thr Asp Thr Asn Lys Phe Ala His Tyr Arg Phe Thr Cys Val Leu
100 105 110

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

<210> 177
<211> 62
<212> PRT
<213> Vaccinia virus

<400> 177
Met Lys Leu Phe Thr Gln Asn Asp Arg Tyr Phe Gly Leu Leu Asp Ser
1   5   10   15

Cys Asn His Ile Phe Cys Ile Thr Cys Ile Asn Ile Trp His Lys Thr
            20   25   30

Arg Arg Glu Thr Gly Ala Ser Asp Asn Cys Pro Ile Cys Arg Thr Arg
        35   40   45

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

<210> 178
<211> 66
<212> PRT
<213> Vaccinia virus

<400> 178
Met His Tyr Pro Lys Tyr Tyr Ile Asn Ile Thr Lys Ile Asn Pro His
1   5   10   15

Leu Ala Asn Gln Phe Arg Ala Trp Lys Lys Arg Ile Ala Gly Arg Asp
            20   25   30

Tyr Met Thr Asn Leu Ser Lys Asp Thr Gly Ile Gln Gln Ser Lys Leu
        35   40   45

Tyr Val Thr Val Lys Lys Ile Glu Thr Tyr Met Val Tyr Ile Tyr Thr
    50   55   60

Thr Ile
65

<210> 179
<211> 331
<212> PRT
<213> Vaccinia virus

<400> 179
Met Asp Ile Tyr Asp Asp Lys Gly Leu Gln Thr Ile Lys Leu Phe Asn
1   5   10   15

```
Asn Glu Phe Asp Cys Ile Arg Asn Asp Ile Arg Glu Leu Phe Lys His
            20                  25                  30

Val Thr Asp Ser Asp Ser Ile Gln Leu Pro Met Glu Asp Asn Ser Asp
        35                  40                  45

Ile Ile Glu Asn Ile Arg Lys Ile Leu Tyr Arg Arg Leu Lys Asn Val
    50                  55                  60

Glu Cys Val Asp Ile Asp Asn Thr Ile Thr Phe Met Lys Tyr Asp Pro
65                  70                  75                  80

Asn Asp Asp Asn Lys Arg Thr Cys Ser Asn Trp Val Pro Leu Thr Asn
                85                  90                  95

Asn Tyr Met Glu Tyr Cys Leu Val Ile Tyr Leu Glu Thr Pro Ile Cys
            100                 105                 110

Gly Gly Lys Ile Lys Leu Tyr His Pro Thr Gly Asn Ile Lys Ser Asp
        115                 120                 125

Lys Asp Ile Met Phe Ala Lys Thr Leu Asp Phe Lys Ser Lys Lys Val
    130                 135                 140

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

Asn Arg Ser Ile Thr Thr Ile His Tyr Asn Asp Asp Val Asp Ile Asp
                165                 170                 175

Ile His Thr Asp Lys Asn Gly Lys Glu Leu Cys Tyr Cys Tyr Ile Thr
            180                 185                 190

Ile Asp Asp His Tyr Leu Val Asp Val Glu Thr Ile Gly Val Ile Val
        195                 200                 205

Asn Arg Ser Gly Lys Cys Leu Leu Val Asn Asn His Leu Gly Ile Gly
    210                 215                 220
```

```
Ile Val Lys Asp Lys Arg Ile Ser Asp Ser Phe Gly Asp Val Cys Met
225                 230                 235                 240


Asp Thr Ile Phe Asp Phe Ser Glu Ala Arg Glu Leu Phe Ser Leu Thr
                245                 250                 255


Asn Asp Asp Asn Arg Asn Ile Ala Trp Asp Thr Asp Lys Leu Asp Asp
            260                 265                 270


Asp Thr Asp Ile Trp Thr Pro Val Thr Glu Asn Asp Tyr Lys Phe Leu
        275                 280                 285


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


Tyr Tyr Val Leu Thr Gly Asp Thr Glu Pro Pro Thr Val Phe Ile Phe
305                 310                 315                 320


Lys Val Thr Arg Phe Tyr Phe Asn Met Pro Lys
                325                 330


<210> 180
<211> 141
<212> PRT
<213> Vaccinia virus

<400> 180
Met Leu Ile Asn Tyr Leu Met Leu Leu Phe Ala Ala Met Ile Ile Arg
1               5                   10                  15


Ser Phe Ala Asp Ser Gly Asn Ala Ile Glu Thr Thr Leu Pro Glu Ile
            20                  25                  30


Thr Asn Ala Thr Thr Asp Ile Pro Ala Ile Arg Leu Cys Gly Pro Glu
        35                  40                  45


Gly Asp Gly Tyr Cys Leu His Gly Asp Cys Ile His Ala Arg Asp Ile
    50                  55                  60


Asp Gly Met Tyr Cys Arg Cys Ser His Gly Tyr Thr Gly Ile Arg Cys
65                  70                  75                  80
```

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

Thr Thr Ser Tyr Ile Pro Ser Pro Gly Ile Met Leu Val Leu Val Gly
100 105 110

Ile Ile Ile Ile Thr Cys Cys Leu Leu Ser Val Tyr Arg Phe Thr Arg
115 120 125

Arg Thr Asn Lys Leu Pro Leu Gln Asp Met Val Val Pro
130 135 140

<210> 181
<211> 357
<212> PRT
<213> Vaccinia virus

<400> 181
Met Asp Ile Phe Lys Glu Leu Ile Val Lys His Pro Asp Glu Asn Val
1 5 10 15

Leu Ile Ser Pro Val Ser Ile Leu Ser Thr Leu Ser Ile Leu Asn His
20 25 30

Gly Ala Ala Gly Ser Thr Ala Glu Gln Leu Ser Lys Tyr Ile Glu Asn
35 40 45

Met Asn Glu Asn Thr Pro Asp Asp Lys Lys Asp Asp Asn Asn Asp Met
50 55 60

Asp Val Asp Ile Pro Tyr Cys Ala Thr Leu Ala Thr Ala Asn Lys Ile
65 70 75 80

Tyr Gly Ser Asp Ser Ile Glu Phe His Ala Ser Phe Leu Gln Lys Ile
85 90 95

Lys Asp Asp Phe Gln Thr Val Asn Phe Asn Asn Ala Asn Gln Thr Lys
100 105 110

Glu Leu Ile Asn Glu Trp Val Lys Thr Met Thr Asn Gly Lys Ile Asn
115 120 125

```
Ser Leu Leu Thr Ser Pro Leu Ser Ile Asn Thr Arg Met Thr Val Val
    130                 135                 140

Ser Ala Val His Phe Lys Ala Met Trp Lys Tyr Pro Phe Ser Lys His
145                 150                 155                 160

Leu Thr Tyr Thr Asp Lys Phe Tyr Ile Ser Lys Asn Ile Val Thr Ser
                165                 170                 175

Val Asp Met Met Val Gly Thr Glu Asn Asn Leu Gln Tyr Val His Ile
            180                 185                 190

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

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

Asn Ile Glu Lys Asn Ile Thr Asp Glu Lys Phe Lys Lys Trp Cys Gly
225                 230                 235                 240

Met Leu Ser Thr Lys Ser Ile Asp Leu Tyr Met Pro Lys Phe Lys Val
                245                 250                 255

Glu Met Thr Glu Pro Tyr Asn Leu Val Pro Ile Leu Glu Asn Leu Gly
            260                 265                 270

Leu Thr Asn Ile Phe Gly Tyr Tyr Ala Asp Phe Ser Lys Met Cys Asn
        275                 280                 285

Glu Thr Ile Thr Val Glu Lys Phe Leu His Thr Thr Phe Ile Asp Val
    290                 295                 300

Asn Glu Glu Tyr Thr Glu Ala Ser Ala Val Thr Gly Val Phe Met Thr
305                 310                 315                 320

Asn Phe Ala Met Val Tyr Arg Thr Lys Val Tyr Ile Asn His Pro Phe
                325                 330                 335
```

Met Tyr Met Ile Lys Asp Thr Thr Gly Arg Ile Leu Phe Ile Gly Lys
340 345 350

Tyr Cys Tyr Pro Gln
355

<210> 182
<211> 190
<212> PRT
<213> Vaccinia virus

<400> 182
Met Met Ile Tyr Gly Leu Ile Ala Cys Leu Ile Phe Val Thr Ser Ser
1 5 10 15

Ile Ala Ser Pro Leu Tyr Ile Pro Val Ile Pro Pro Ile Thr Glu Asp
20 25 30

Lys Ser Phe Asn Ser Val Glu Val Leu Val Ser Leu Phe Arg Asp Asp
35 40 45

Gln Lys Asp Tyr Thr Val Thr Ser Gln Phe Asn Asn Tyr Thr Ile Asp
50 55 60

Thr Lys Asp Trp Thr Ile Gly Val Leu Ser Thr Pro Asp Gly Leu Asp
65 70 75 80

Ile Pro Leu Thr Asn Ile Thr Tyr Trp Ser Arg Phe Thr Ile Gly Arg
85 90 95

Ala Leu Phe Lys Ser Glu Ser Glu Asp Ile Phe Gln Lys Lys Met Ser
100 105 110

Ile Leu Gly Val Ser Ile Glu Cys Lys Lys Ser Ser Thr Leu Leu Thr
115 120 125

Phe Leu Thr Val Arg Lys Met Thr Arg Val Phe Asn Lys Phe Pro Asp
130 135 140

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

```
Thr Tyr Lys Asn Thr Lys Thr Gly Glu Thr Asp Tyr Thr Tyr Leu Ser
                165                 170                 175


Asn Gly Gly Leu Pro Ala Tyr Tyr Arg Asn Gly Val Asp Gly
            180                 185                 190


<210> 183
<211> 51
<212> PRT
<213> Vaccinia virus

<400> 183
Met Asn Leu Gln Lys Leu Ser Leu Ala Ile Tyr Leu Thr Ala Thr Cys
1               5                   10                  15


Ser Trp Cys Tyr Glu Thr Cys Ile Arg Lys Thr Ala Leu Tyr His Asp
            20                  25                  30


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


Pro Tyr Lys
    50


<210> 184
<211> 87
<212> PRT
<213> Vaccinia virus

<400> 184
Met Ser Leu Glu Ser Phe Ile Ile Thr Thr Phe Asn Asn Asn Ser Ser
1               5                   10                  15


Thr Asn Ile Asp Asn Met Cys His Leu Tyr Val Lys Val Cys Pro Ser
            20                  25                  30


Ser Leu Leu Phe Arg Leu Phe Val Glu Cys Cys Asp Ile Asn Lys Leu
        35                  40                  45


Val Glu Gly Thr Thr Pro Leu His Cys Tyr Leu Met Asn Glu Gly Phe
    50                  55                  60
```

Glu Ser Ser Val Leu Lys Asn Leu Leu Lys Glu Tyr Val Met Thr Ser
65 70 75 80

Ile Thr Gln Ile Phe Asn Ser
85

<210> 185
<211> 181
<212> PRT
<213> Vaccinia virus

<400> 185
Met Ile Ser Leu Ser Phe Leu Ile His Asn Pro Leu Lys Lys Trp Lys
1 5 10 15

Leu Lys Pro Ser Ile Ser Ile Asn Gly Tyr Arg Ser Thr Phe Thr Met
20 25 30

Ala Phe Pro Cys Ala Gln Phe Arg Pro Cys His Cys His Ala Thr Lys
35 40 45

Asp Ser Leu Asn Thr Val Ala Asp Val Arg His Cys Leu Thr Glu Tyr
50 55 60

Ile Leu Trp Val Ser His Arg Trp Thr His Arg Glu Thr Ala Gly Pro
65 70 75 80

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

Gly Gly Glu Leu Lys Asp Ser Leu Pro Trp Asp Asn Ile Asp Asn Cys
100 105 110

Val Glu Ile Ile Lys Cys Phe Ile Arg Asn Asp Ser Met Lys Thr Ala
115 120 125

Glu Glu Leu Arg Ala Ile Ile Gly Leu Cys Thr Gln Ser Ala Ile Val
130 135 140

Ser Gly Arg Val Phe Asn Asp Lys Tyr Ile Asp Ile Leu Leu Met Leu
145 150 155 160

```
Arg Lys Ile Leu Asn Glu Asn Asp Tyr Leu Thr Leu Leu Asp His Ile
                165                 170                 175


Arg Thr Ala Lys Tyr
            180


<210> 186
<211> 382
<212> PRT
<213> Vaccinia virus

<400> 186
Met Ile Ala Phe Ile Ile Phe Arg Glu Ile Gly Ile Ile Ser Thr Arg
1               5                   10                  15


Ile Ala Met Asp Cys Thr Cys Ile Leu Cys Arg Leu Leu Asp Glu Asp
            20                  25                  30


Val Thr Tyr Lys Lys Ile Lys Leu Glu Ile Glu Thr Cys His Asn Leu
        35                  40                  45


Ser Lys His Ile Asp Arg Arg Gly Asn Asn Ala Leu His Cys Tyr Val
    50                  55                  60


Phe Asn Lys Cys Asp Thr Asp Ile Lys Ile Val Arg Leu Leu Leu Ser
65                  70                  75                  80


Arg Gly Val Glu Arg Leu Cys Arg Asn Asn Glu Gly Leu Thr Pro Leu
                85                  90                  95


Gly Val Tyr Ser Lys His Arg Tyr Val Lys Ser Gln Ile Val His Leu
            100                 105                 110


Leu Ile Ser Ser Tyr Ser Asn Ser Ser Asn Glu Leu Lys Ser Asn Ile
        115                 120                 125


Asn Asp Phe Asp Leu Ser Ser Asp Asn Ile Asp Leu Arg Leu Leu Lys
    130                 135                 140


Tyr Leu Ile Val Asp Lys Arg Ile Arg Pro Ser Lys Asn Thr Asn Tyr
```

```
145                 150                 155                 160

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

Pro Arg Pro Glu Val Leu Leu Trp Leu Leu Lys Ser Glu Cys Tyr Ser
            180                 185                 190

Thr Gly Tyr Val Phe Arg Thr Cys Met Tyr Asn Ser Asp Met Cys Lys
        195                 200                 205

Asn Ser Leu His Tyr Tyr Ile Ser Ser His Arg Glu Ser Gln Ser Leu
    210                 215                 220

Ser Lys Asp Val Ile Lys Cys Leu Ile Asn Asn Asn Val Ser Ile His
225                 230                 235                 240

Gly Arg Asp Glu Gly Gly Ser Leu Pro Ile Gln Tyr Tyr Trp Ser Phe
                245                 250                 255

Ser Thr Ile Asp Ile Glu Ile Val Lys Leu Leu Leu Ile Lys Asp Val
            260                 265                 270

Asp Thr Cys Arg Val Tyr Asp Val Ser Pro Ile Leu Glu Ala Tyr Tyr
        275                 280                 285

Leu Asn Lys Arg Phe Arg Val Thr Pro Tyr Asn Val Asp Met Glu Ile
    290                 295                 300

Val Asn Leu Leu Ile Glu Arg Arg His Thr Leu Val Asp Val Met Arg
305                 310                 315                 320

Ser Ile Thr Ser Tyr Asp Ser Arg Glu Tyr Asn His Tyr Ile Ile Asp
                325                 330                 335

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

Met Leu Ile Asn Tyr Leu His Tyr Gly Asp Met Val Val Arg Cys Met
        355                 360                 365
```

Leu Asp Asn Gly Gln Gln Leu Ser Ser Ala Arg Leu Leu Cys
370 375 380

<210> 187
<211> 198
<212> PRT
<213> Vaccinia virus

<400> 187
Met Tyr Gly Leu Ile Leu Ser Arg Phe Asn Asn Cys Gly Tyr His Cys
1 5 10 15

Tyr Glu Thr Ile Leu Ile Asp Val Phe Asp Ile Leu Ser Lys Tyr Met
20 25 30

Asp Asn Ile Asp Met Ile Asp Asn Glu Asn Lys Thr Leu Leu Tyr Tyr
35 40 45

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

Gly Ala Ser Val Thr Thr Ser Arg Ser Ile Ile Asn Thr Ala Ile Gln
65 70 75 80

Lys Ser Ser Tyr Arg Arg Glu Asn Lys Thr Lys Leu Val Asp Leu Leu
85 90 95

Leu Ser Tyr His Pro Thr Leu Glu Thr Met Ile Asp Ala Phe Asn Arg
100 105 110

Asp Ile Arg Tyr Leu Tyr Pro Glu Pro Leu Phe Ala Cys Ile Arg Tyr
115 120 125

Ala Leu Ile Leu Asp Asp Asp Phe Pro Ser Lys Val Lys Tyr Asp Ile
130 135 140

Ser Gly Arg His Lys Glu Leu Lys Arg Tyr Arg Val Asp Ile Asn Arg
145 150 155 160

Met Lys Asn Ala Tyr Ile Ser Gly Val Ser Met Phe Asp Ile Leu Phe

```
                165                 170                 175

Lys Arg Ser Lys Arg His Arg Leu Arg Tyr Ala Lys Asn Pro Thr Ser
            180                 185                 190

Asn Gly Thr Lys Lys Asn
        195
```

<210> 188
<211> 147
<212> PRT
<213> Vaccinia virus

<400> 188

```
Met Ser Arg Ile Asn Ile Thr Lys Lys Ile Tyr Cys Ser Val Phe Leu
1               5                   10                  15

Phe Leu Phe Leu Ser Tyr Ile Ser Asn Tyr Glu Lys Val Asn Asp Glu
            20                  25                  30

Met Tyr Glu Met Gly Glu Met Asp Glu Ile Val Ser Ile Val Arg Asp
        35                  40                  45

Ser Met Trp Tyr Ile Pro Asn Val Phe Met Asp Asp Gly Lys Asn Glu
    50                  55                  60

Gly His Val Ser Val Asn Asn Val Cys His Met Tyr Phe Thr Phe Phe
65                  70                  75                  80

Asp Val Asp Thr Ser Ser His Leu Phe Lys Leu Val Ile Lys His Cys
                85                  90                  95

Asp Leu Asn Lys Arg Gly Asn Ser Pro Leu His Cys Tyr Thr Met Asn
            100                 105                 110

Thr Arg Phe Asn Pro Ser Val Leu Lys Ile Leu Leu His His Gly Met
        115                 120                 125

Arg Asn Phe Asp Ser Lys Asp Asp His Tyr Gln Ser Ile Thr Arg Ser
    130                 135                 140
```

Leu Ile Tyr
145

<210> 189
<211> 128
<212> PRT
<213> Vaccinia virus

<400> 189
Met Glu Gln Thr Leu Thr Arg Leu His Thr Tyr Leu Gln Gln Tyr Thr
1 5 10 15

Lys His Ser Pro Arg Val Val Tyr Ala Leu Leu Ser Arg Gly Tyr Val
20 25 30

Ile Ile Leu Ile Val His Pro Ser Trp Asn Asp Cys Ala Thr Gly His
35 40 45

Ile Leu Ile Met Leu Leu Asn Trp His Glu Gln Lys Glu Glu Gly Gln
50 55 60

His Leu Leu Tyr Leu Phe Ile Lys His Asn Gln Gly Tyr Thr Leu Asn
65 70 75 80

Ile Leu Arg Tyr Leu Leu Asp Arg Phe Asp Ile Gln Lys Asp Glu Tyr
85 90 95

Tyr Asn Thr Ala Phe Gln Asn Cys Asn Asn Asn Val Ala Ser Tyr Ile
100 105 110

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

<210> 190
<211> 111
<212> PRT
<213> Vaccinia virus

<400> 190
Met Leu Pro His Thr Ser Asp Thr Thr Ser Thr Phe Arg Leu Lys Thr
1 5 10 15

Val Phe Asp Leu Val Phe Glu Asn Arg Asn Ile Ile Tyr Lys Ala Asp

```
            20                  25                  30

Val Val Asn Asp Ile Ile His His Arg Leu Lys Val Pro Met Ile Lys
        35                  40                  45

Ser Leu Phe Tyr Lys Met Ser Glu Phe Ser Pro Tyr Asp Asp Tyr Tyr
    50                  55                  60

Val Lys Lys Ile Leu Ala Tyr Cys Leu Leu Arg Asp Glu Ser Phe Ala
65                  70                  75                  80

Glu Leu His Ser Lys Phe Cys Leu Asn Glu Asp Tyr Lys Ser Val Phe
                85                  90                  95

Met Lys Asn Ile Ser Phe Asp Lys Ile Asp Ser Ile Ile Val Thr
            100                 105                 110
```

<210> 191
<211> 94
<212> PRT
<213> Vaccinia virus

<400> 191

```
Met His His Pro Met Glu Ser Val Lys Thr Thr Asn Thr Asn Ala Ile
1               5                   10                  15

Ile Cys Val Arg Glu His Thr Leu Pro Asp Tyr Ala Asn Thr Gln Cys
            20                  25                  30

Thr Pro Cys Gly Ser Gly Thr Phe Thr Ser Arg Asn Asn His Leu Pro
        35                  40                  45

Ala Cys Leu Ser Cys Asn Gly Arg Arg Asp Arg Val Thr Leu Leu Thr
    50                  55                  60

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

His Pro Asp Ala Arg His Val Phe Pro Lys Gln Asn Val Glu
                85                  90
```

<210> 192
<211> 241
<212> PRT
<213> Vaccinia virus

<400> 192
Met His Val Pro Ala Ser Leu Gln Gln Ser Ser Ser Ser Cys Thr Glu
1   5   10   15

Glu Glu Asn Lys His His Met Gly Ile Asp Val Ile Ile Lys Val Thr
            20   25   30

Lys Gln Asp Gln Thr Pro Thr Asn Asp Lys Ile Cys Gln Ser Val Thr
        35   40   45

Glu Ile Thr Glu Ser Glu Ser Asp Pro Asp Pro Glu Val Glu Ser Glu
    50   55   60

Asp Asp Ser Thr Ser Val Glu Asp Val Asp Leu Pro Thr Thr Tyr Tyr
65   70   75   80

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

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

Ala Arg Leu Ser Ser Val Ser Pro Gly Gln Gly Lys Asp Ser Pro Ala
        115   120   125

Ile Thr His Glu Glu Ala Leu Ala Met Ile Lys Asp Cys Glu Val Ser
    130   135   140

Ile Asp Ile Arg Cys Ser Glu Glu Glu Lys Asp Ser Asp Ile Lys Thr
145   150   155   160

His Pro Val Leu Gly Ser Asn Ile Ser His Lys Lys Val Ser Tyr Glu
                165   170   175

Asp Ile Ile Gly Ser Thr Ile Val Asp Thr Lys Cys Val Lys Asn Leu
            180   185   190

Glu Phe Ser Val Arg Ile Gly Asp Met Cys Lys Glu Ser Ser Glu Leu
        195   200   205

Glu Val Lys Asp Gly Phe Lys Tyr Val Asp Gly Ser Ala Ser Glu Gly
    210   215   220

Ala Thr Asp Asp Thr Ser Leu Ile Asp Ser Thr Lys Leu Lys Ala Cys
225   230   235   240

Val

<210> 193
<211> 62
<212> PRT
<213> Vaccinia virus

<400> 193
Met Lys Leu Phe Thr Gln Asn Asp Arg Tyr Phe Gly Leu Leu Asp Ser
1   5   10   15

Cys Asn His Ile Phe Cys Ile Thr Cys Ile Asn Ile Trp His Lys Thr
            20   25   30

Arg Arg Glu Thr Gly Ala Ser Asp Asn Cys Pro Ile Cys Arg Thr Arg
        35   40   45

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

<210> 194
<211> 66
<212> PRT
<213> Vaccinia virus

<400> 194
Met His Tyr Pro Lys Tyr Tyr Ile Asn Ile Thr Lys Ile Asn Pro His
1   5   10   15

Leu Ala Asn Gln Phe Arg Ala Trp Lys Lys Arg Ile Ala Gly Arg Asp
            20   25   30

```
Tyr Met Thr Asn Leu Ser Lys Asp Thr Gly Ile Gln Gln Ser Lys Leu
        35                  40                  45


Tyr Val Thr Val Lys Lys Ile Glu Thr Tyr Met Val Tyr Ile Tyr Thr
    50                  55                  60


Thr Ile
65


<210> 195
<211> 331
<212> PRT
<213> Vaccinia virus

<400> 195
Met Asp Ile Tyr Asp Asp Lys Gly Leu Gln Thr Ile Lys Leu Phe Asn
1               5                   10                  15


Asn Glu Phe Asp Cys Ile Arg Asn Asp Ile Arg Glu Leu Phe Lys His
            20                  25                  30


Val Thr Asp Ser Asp Ser Ile Gln Leu Pro Met Glu Asp Asn Ser Asp
        35                  40                  45


Ile Ile Glu Asn Ile Arg Lys Ile Leu Tyr Arg Arg Leu Lys Asn Val
    50                  55                  60


Glu Cys Val Asp Ile Asp Asn Thr Ile Thr Phe Met Lys Tyr Asp Pro
65                  70                  75                  80


Asn Asp Asp Asn Lys Arg Thr Cys Ser Asn Trp Val Pro Leu Thr Asn
                85                  90                  95


Asn Tyr Met Glu Tyr Cys Leu Val Ile Tyr Leu Glu Thr Pro Ile Cys
            100                 105                 110


Gly Gly Lys Ile Lys Leu Tyr His Pro Thr Gly Asn Ile Lys Ser Asp
        115                 120                 125


Lys Asp Ile Met Phe Ala Lys Thr Leu Asp Phe Lys Ser Lys Lys Val
    130                 135                 140
```

```
Leu Thr Gly Arg Lys Thr Ile Ala Val Leu Asp Ile Ser Val Ser Tyr
145                 150                 155                 160

Asn Arg Ser Ile Thr Thr Ile His Tyr Asn Asp Asp Val Asp Ile Asp
                165                 170                 175

Ile His Thr Asp Lys Asn Gly Lys Glu Leu Cys Tyr Cys Tyr Ile Thr
            180                 185                 190

Ile Asp Asp His Tyr Leu Val Asp Val Glu Thr Ile Gly Val Ile Val
        195                 200                 205

Asn Arg Ser Gly Lys Cys Leu Leu Val Asn Asn His Leu Gly Ile Gly
    210                 215                 220

Ile Val Lys Asp Lys Arg Ile Ser Asp Ser Phe Gly Asp Val Cys Met
225                 230                 235                 240

Asp Thr Ile Phe Asp Phe Ser Glu Ala Arg Glu Leu Phe Ser Leu Thr
                245                 250                 255

Asn Asp Asp Asn Arg Asn Ile Ala Trp Asp Thr Asp Lys Leu Asp Asp
            260                 265                 270

Asp Thr Asp Ile Trp Thr Pro Val Thr Glu Asn Asp Tyr Lys Phe Leu
        275                 280                 285

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

Tyr Tyr Val Leu Thr Gly Asp Thr Glu Pro Pro Thr Val Phe Ile Phe
305                 310                 315                 320

Lys Val Thr Arg Phe Tyr Phe Asn Met Pro Lys
                325                 330
```

<210> 196
<211> 141
<212> PRT
<213> Vaccinia virus

<400> 196
Met Leu Ile Asn Tyr Leu Met Leu Leu Phe Ala Ala Met Ile Ile Arg
1   5   10   15

Ser Phe Ala Asp Ser Gly Asn Ala Ile Glu Thr Thr Leu Pro Glu Ile
            20   25   30

Thr Asn Ala Thr Thr Asp Ile Pro Ala Ile Arg Leu Cys Gly Pro Glu
        35   40   45

Gly Asp Gly Tyr Cys Leu His Gly Asp Cys Ile His Ala Arg Asp Ile
    50   55   60

Asp Gly Met Tyr Cys Arg Cys Ser His Gly Tyr Thr Gly Ile Arg Cys
65   70   75   80

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

Thr Thr Ser Tyr Ile Pro Ser Pro Gly Ile Met Leu Val Leu Val Gly
            100   105   110

Ile Ile Ile Ile Thr Cys Cys Leu Leu Ser Val Tyr Arg Phe Thr Arg
        115   120   125

Arg Thr Asn Lys Leu Pro Leu Gln Asp Met Val Val Pro
    130   135   140

<210> 197
<211> 94
<212> PRT
<213> Vaccinia virus

<400> 197
Met His His Pro Met Glu Ser Val Lys Thr Thr Asn Thr Asn Ala Ile
1   5   10   15

Ile Cys Val Arg Glu His Thr Leu Pro Asp Tyr Ala Asn Thr Gln Cys
            20   25   30

Thr Pro Cys Gly Ser Gly Thr Phe Thr Ser Arg Asn Asn His Leu Pro

```
        35                  40                  45

Ala Cys Leu Ser Cys Asn Gly Arg Arg Asp Arg Val Thr Leu Leu Thr
    50                  55                  60

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

His Pro Asp Ala Arg His Val Phe Pro Lys Gln Asn Val Glu
                85                  90

<210> 198
<211> 241
<212> PRT
<213> Vaccinia virus

<400> 198
Met His Val Pro Ala Ser Leu Gln Gln Ser Ser Ser Ser Cys Thr Glu
1               5                   10                  15

Glu Glu Asn Lys His His Met Gly Ile Asp Val Ile Ile Lys Val Thr
            20                  25                  30

Lys Gln Asp Gln Thr Pro Thr Asn Asp Lys Ile Cys Gln Ser Val Thr
        35                  40                  45

Glu Ile Thr Glu Ser Glu Ser Asp Pro Asp Pro Glu Val Glu Ser Glu
    50                  55                  60

Asp Asp Ser Thr Ser Val Glu Asp Val Asp Leu Pro Thr Thr Tyr Tyr
65                  70                  75                  80

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

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

Ala Arg Leu Ser Ser Val Ser Pro Gly Gln Gly Lys Asp Ser Pro Ala
        115                 120                 125
```

Ile Thr His Glu Glu Ala Leu Ala Met Ile Lys Asp Cys Glu Val Ser
130 135 140

Ile Asp Ile Arg Cys Ser Glu Glu Glu Lys Asp Ser Asp Ile Lys Thr
145 150 155 160

His Pro Val Leu Gly Ser Asn Ile Ser His Lys Lys Val Ser Tyr Glu
165 170 175

Asp Ile Ile Gly Ser Thr Ile Val Asp Thr Lys Cys Val Lys Asn Leu
180 185 190

Glu Phe Ser Val Arg Ile Gly Asp Met Cys Lys Glu Ser Ser Glu Leu
195 200 205

Glu Val Lys Asp Gly Phe Lys Tyr Val Asp Gly Ser Ala Ser Glu Gly
210 215 220

Ala Thr Asp Asp Thr Ser Leu Ile Asp Ser Thr Lys Leu Lys Ala Cys
225 230 235 240

Val

<210> 199
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 199
Ser Val Ser Glu Ser Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser
1 5 10 15

<210> 200
<211> 149
<212> PRT
<213> Vaccinia virus

<400> 200
Met Thr Ala Asn Phe Ser Thr His Val Phe Ser Pro Gln His Cys Gly

1 5 10 15

Cys Asp Arg Leu Thr Ser Ile Asp Asp Val Lys Gln Cys Leu Thr Glu
20 25 30

Tyr Ile Tyr Trp Ser Ser Tyr Ala Tyr Arg Asn Arg Gln Cys Ala Gly
35 40 45

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

Phe Ile Asp Ile Arg Glu Leu Val Lys Asn Met Pro Trp Asp Asp Val
65 70 75 80

Lys Asp Cys Thr Glu Ile Ile Arg Cys Tyr Ile Pro Asp Glu Gln Lys
85 90 95

Thr Ile Arg Glu Ile Ser Ala Ile Ile Gly Leu Cys Ala Tyr Ala Ala
100 105 110

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

Leu Phe Val Met Leu Glu Met Leu Asn Tyr Val Asp Tyr Asn Ile Ile
130 135 140

Phe Arg Arg Met Asn
145

<210> 201
<211> 326
<212> PRT
<213> Vaccinia virus

<400> 201
Met Ser Ile Leu Pro Val Ile Phe Leu Pro Ile Phe Phe Tyr Ser Ser
1 5 10 15

Phe Val Gln Thr Phe Asn Ala Pro Glu Cys Ile Asp Lys Gly Gln Tyr
20 25 30

```
Phe Ala Ser Phe Met Glu Leu Glu Asn Glu Pro Val Ile Leu Pro Cys
        35                  40                  45

Pro Gln Ile Asn Thr Leu Ser Ser Gly Tyr Asn Ile Leu Asp Ile Leu
    50                  55                  60

Trp Glu Lys Arg Gly Ala Asp Asn Asp Arg Ile Ile Pro Ile Asp Asn
65                  70                  75                  80

Gly Ser Asn Met Leu Ile Leu Asn Pro Thr Gln Ser Asp Ser Gly Ile
                85                  90                  95

Tyr Ile Cys Ile Thr Thr Asn Glu Thr Tyr Cys Asp Met Met Ser Leu
            100                 105                 110

Asn Leu Thr Ile Val Ser Val Ser Glu Ser Asn Ile Asp Leu Ile Ser
        115                 120                 125

Tyr Pro Gln Ile Val Asn Glu Arg Ser Thr Gly Glu Met Val Cys Pro
    130                 135                 140

Asn Ile Asn Ala Phe Ile Ala Ser Asn Val Asn Ala Asp Ile Ile Trp
145                 150                 155                 160

Ser Gly His Arg Arg Leu Arg Asn Lys Arg Leu Lys Gln Arg Thr Pro
                165                 170                 175

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

Thr Cys Val Leu Glu Tyr Ile Tyr Arg Gly Lys Thr Tyr Asn Val Thr
        195                 200                 205

Arg Ile Val Lys Leu Glu Val Arg Asp Lys Ile Ile Pro Ser Thr Met
    210                 215                 220

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

Ala Cys Arg Val Ser Leu Arg Pro Pro Thr Thr Asp Ala Asp Val Phe
```

245 250 255

Trp Ile Ser Asn Gly Met Tyr Tyr Glu Glu Asp Asp Gly Asp Gly Asn
260 265 270

Gly Arg Ile Ser Val Ala Asn Lys Ile Tyr Met Thr Asp Lys Arg Arg
275 280 285

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

Thr Thr Phe Thr Cys Met Ala Phe Thr Ile Pro Ser Ile Ser Lys Thr
305 310 315 320

Val Thr Val Ser Ile Thr
325

<210> 202
<211> 340
<212> PRT
<213> Vaccinia virus

<400> 202
Met Ser Arg Lys Phe Met Gln Val Tyr Glu Tyr Asp Arg Glu Gln Tyr
1 5 10 15

Leu Asp Glu Phe Ile Glu Asp Arg Tyr Asn Asp Ser Phe Ile Thr Ser
20 25 30

Pro Glu Tyr Tyr Ser Ala Glu Lys Tyr Met Cys Arg Tyr Thr Thr Leu
35 40 45

Asn His Asn Cys Ile Asn Val Arg Arg Cys Ala Leu Asp Ser Lys Leu
50 55 60

Leu His Asp Ile Ile Thr Asn Cys Lys Ile Tyr Asn Asn Ile Glu Leu
65 70 75 80

Val Arg Ala Thr Lys Phe Val Tyr Tyr Leu Asp Leu Ile Lys Cys Asn
85 90 95

```
Trp Val Ser Lys Val Gly Asp Ser Val Leu Tyr Pro Val Ile Phe Ile
            100                 105                 110

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

Lys Gly Val Lys Val Lys Lys Leu Asn Arg Cys Ala Asp His Ala Ile
    130                 135                 140

Val Ile Asn Pro Phe Val Lys Phe Lys Leu Thr Leu Pro Asn Lys Thr
145                 150                 155                 160

Ser His Ala Lys Val Leu Val Thr Phe Cys Lys Leu Arg Thr Asp Ile
                165                 170                 175

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

Pro Asp Ile Asn Lys Arg Ile Pro Gly Tyr Ile His Val Asn Ile Glu
        195                 200                 205

Gly Cys Ile Asp Gly Met Ile Tyr Ile Asn Ser Ser Lys Phe Ala Cys
    210                 215                 220

Val Leu Lys Leu His Arg Ser Met Tyr Arg Ile Pro Pro Phe Pro Ile
225                 230                 235                 240

Asp Ile Cys Ser Cys Cys Ser Gln Tyr Thr Asn Asp Asp Ile Glu Ile
                245                 250                 255

Pro Ile His Asp Leu Ile Lys Asp Val Ala Ile Phe Lys Asn Lys Glu
            260                 265                 270

Thr Val Tyr Tyr Leu Lys Leu Asn Asn Lys Thr Ile Ala Arg Phe Thr
        275                 280                 285

Tyr Phe Asn Asn Ile Asp Thr Ala Ile Thr Gln Glu His Glu Tyr Val
    290                 295                 300

Lys Ile Ala Leu Gly Ile Val Cys Lys Leu Met Ile Asn Asn Met His
```

305 310 315 320

Ser Ile Val Gly Val Asn His Ser Asn Thr Phe Val Asn Cys Leu Leu
325 330 335

Glu Asp Asn Val
340

<210> 203
<211> 167
<212> PRT
<213> Vaccinia virus

<400> 203
Met Thr Lys Val Ile Ile Ile Leu Gly Phe Leu Ile Ile Asn Thr Asn
1 5 10 15

Ser Leu Ser Met Lys Cys Glu Gln Gly Val Ser Tyr Tyr Asn Ser Gln
20 25 30

Glu Leu Lys Cys Cys Lys Leu Cys Lys Pro Gly Thr Tyr Ser Asp His
35 40 45

Arg Cys Asp Lys Tyr Ser Asp Thr Ile Cys Gly His Cys Pro Ser Asp
50 55 60

Thr Phe Thr Ser Ile Tyr Asn Arg Ser Pro Trp Cys His Ser Cys Arg
65 70 75 80

Gly Pro Cys Gly Thr Asn Arg Val Glu Val Thr Pro Cys Thr Pro Thr
85 90 95

Thr Asn Arg Ile Cys His Cys Asp Ser Asn Ser Tyr Cys Leu Leu Lys
100 105 110

Ala Ser Asp Gly Asn Cys Val Thr Cys Ala Pro Lys Thr Lys Cys Gly
115 120 125

Arg Gly Tyr Gly Lys Lys Gly Glu Asp Glu Met Gly Asn Thr Ile Cys
130 135 140

```
Lys Lys Cys Arg Lys Gly Thr Tyr Ser Asp Ile Val Ser Asp Ser Asp
145                 150                 155                 160


Gln Cys Lys Pro Met Thr Arg
                165
```

<210> 204
<211> 237
<212> PRT
<213> Vaccinia virus

<400> 204

```
Met Ala Met Pro Ser Leu Ser Ala Cys Ser Ser Ile Glu Asp Asp Phe
1               5                   10                  15


Asn Tyr Gly Ser Ser Val Ala Ser Ala Ser Val His Ile Arg Met Ala
            20                  25                  30


Phe Leu Arg Lys Val Tyr Gly Ile Leu Cys Leu Gln Phe Leu Leu Thr
        35                  40                  45


Thr Ala Thr Thr Ala Val Phe Leu Tyr Phe Asp Cys Met Arg Thr Phe
    50                  55                  60


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


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


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


Ser Val Val Thr Phe Tyr Asp Val His Val Val Met Gln Ala Phe Met
        115                 120                 125


Leu Thr Thr Ala Ala Phe Leu Ala Leu Thr Thr Tyr Thr Leu Gln Ser
    130                 135                 140


Lys Arg Asp Phe Ser Lys Leu Gly Ala Gly Leu Phe Ala Ala Leu Trp
145                 150                 155                 160
```

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


Val Lys Leu Val Leu Ser Ala Phe Gly Ala Leu Val Phe Cys Gly Phe
            180                 185                 190


Ile Ile Tyr Asp Thr His Ser Leu Ile His Lys Leu Ser Pro Glu Glu
        195                 200                 205


Tyr Val Leu Ala Ser Ile Asn Leu Tyr Leu Asp Ile Ile Asn Leu Phe
    210                 215                 220


Leu His Leu Leu Gln Leu Leu Glu Val Ser Asn Lys Lys
225                 230                 235


<210> 205
<211> 147
<212> PRT
<213> Vaccinia virus

<400> 205
Met Ala Ser Pro Cys Ala Lys Phe Arg Pro Cys His Cys His Ala Thr
1               5                   10                  15


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


Tyr Ile Leu Trp Val Ser His Arg Trp Thr His Arg Glu Ser Ala Gly
        35                  40                  45


Ser Leu Tyr Arg Leu Leu Ile Ser Phe Arg Thr Asp Ala Thr Glu Leu
    50                  55                  60


Phe Gly Gly Glu Leu Lys Asp Ser Leu Pro Trp Asp Asn Cys Val Glu
65                  70                  75                  80


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


Leu Arg Ala Ile Ile Gly Leu Cys Thr Gln Ser Ala Ile Val Ser Gly
            100                 105                 110
```

Arg Val Phe Asn Asp Lys Tyr Ile Asp Ile Leu Leu Met Leu Arg Lys
115 120 125

Ile Leu Asn Glu Asn Asp Tyr Leu Thr Leu Leu Asp His Ile Arg Thr
130 135 140

Ala Lys Tyr
145

<210> 206
<211> 128
<212> PRT
<213> Vaccinia virus

<400> 206
Met Glu Gln Thr Leu Thr Arg Leu His Thr Tyr Leu Gln Gln Tyr Thr
1 5 10 15

Lys His Ser Pro Arg Val Val Tyr Ala Leu Leu Ser Arg Gly Tyr Val
20 25 30

Ile Ile Leu Ile Val His Pro Ser Trp Asn Asp Cys Ala Thr Gly His
35 40 45

Ile Leu Ile Met Leu Leu Asn Trp His Glu Gln Lys Glu Glu Gly Gln
50 55 60

His Leu Leu Tyr Leu Phe Ile Lys His Asn Gln Gly Tyr Thr Leu Asn
65 70 75 80

Ile Leu Arg Tyr Leu Leu Asp Arg Phe Asp Ile Gln Lys Asp Glu Tyr
85 90 95

Tyr Asn Thr Ala Phe Gln Asn Cys Asn Asn Asn Val Ala Ser Tyr Ile
100 105 110

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

<210> 207

<211> 64
<212> PRT
<213> Vaccinia virus

<400> 207
Met Leu Pro His Thr Ser Asp Thr Thr Ser Thr Phe Arg Leu Lys Thr
1   5   10   15

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

Val Val Asn Asp Ile Ile His His Arg Leu Lys Val Ser Leu Pro Met
        35   40   45

Ile Lys Ser Leu Phe Tyr Lys Met Ser Leu Pro Thr Thr Ile Thr Thr
    50   55   60

<210> 208
<211> 258
<212> PRT
<213> Vaccinia virus

<400> 208
Met Lys Gln Tyr Ile Val Leu Ala Cys Met Cys Leu Ala Ala Ala Ala
1   5   10   15

Met Pro Ala Ser Leu Gln Gln Ser Ser Ser Ser Ser Ser Ser Cys Thr
            20   25   30

Glu Glu Glu Asn Lys His His Met Gly Ile Asp Val Ile Ile Lys Val
        35   40   45

Thr Lys Gln Asp Gln Thr Pro Thr Asn Asp Lys Ile Cys Gln Ser Val
    50   55   60

Thr Glu Ile Thr Glu Ser Glu Ser Asp Pro Asp Pro Glu Val Glu Ser
65   70   75   80

Glu Asp Asp Ser Thr Ser Val Glu Asp Val Asp Pro Pro Thr Thr Tyr
                85   90   95

Tyr Ser Ile Ile Gly Gly Gly Leu Arg Met Asn Phe Gly Phe Thr Lys
            100   105   110

```
Cys Pro Gln Ile Lys Ser Ile Ser Glu Ser Ala Asp Gly Asn Thr Val
        115                 120                 125


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


Ala Ile Thr His Glu Glu Ala Leu Ala Met Ile Lys Asp Cys Glu Val
145                 150                 155                 160


Ser Ile Asp Ile Arg Cys Ser Glu Glu Glu Lys Asp Ser Asp Ile Lys
                165                 170                 175


Thr His Pro Val Leu Gly Ser Asn Ile Ser His Lys Lys Val Ser Tyr
            180                 185                 190


Glu Asp Ile Ile Gly Ser Thr Ile Val Asp Thr Lys Cys Val Lys Asn
        195                 200                 205


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


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


Gly Ala Thr Asp Asp Thr Ser Leu Ile Asp Ser Thr Lys Leu Lys Ala
                245                 250                 255


Cys Val



<210> 209
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 209
Leu Leu Ala Asn Gly Arg Met Pro Thr Val Leu Gln Cys Val Asn
```

1 5 10 15

<210> 210
<211> 156904
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<220>
<221> misc_feature
<222> (18348)..(19490)
<223> remaining portion of the C2L gene

<220>
<221> misc_feature
<222> (19491)..(19849)
<223> remaining portion of the F3L gene

<220>
<221> misc_feature
<222> (153421)..(153469)
<223> sequence that replaces a portion of the B8R gene sequence

<220>
<221> misc_feature
<222> (153430)..(153463)
<223> loxP site

<220>
<221> misc_feature
<222> (153470)..(153619)
<223> remaining portion of the B8R gene

<220>
<221> misc_feature
<222> (153514)..(153528)
<223> potential transcription regulatory sequences of the B9R gene

<220>
<221> misc_feature
<222> (153638)..(153667)
<223> potential transcription regulatory sequences of the B9R gene

<220>
<221> misc_feature
<222> (156094)..(156489)
<223> remaining portion of the B14R gene

<220>
<221> misc_feature
<222> (156490)..(156904)
<223> remaining portion of the B29R (ITR) gene

<400> 210
tcagacacac gctttgagtt ttgttgaatc gatgagtgaa gtatcatcgg ttgcaccttc 60

agatgccgat ccgtcgacat acttgaatcc atccttgacc tcaagttcag atgattcctt 120

gcacatgtct ccgatacgaa cgctaaactc tagattcttg acacattttg tatcgacgat 180

cgttgaaccg atgatatctt cgtaactcac tttcttatga gagatgttag acccgagtac 240

tggatgggtc ttgatgtcgc tgtctttctc ttcttcgcta catctgatgt cgatagacac 300

ctcacagtct ttgatcatag ccagagcttc ttcacgagtg atcgcgggag agtccttacc 360

ttgtcctggg gacacgctgg acaatctagc attcactgtg tttccatcag cggattctga 420

gatggattta atctgaggac atttggtgaa tccaaagttc attctcagac ctccaccgat 480

gatggagtaa taagtggtag gaggatctac atcctcgact gatgtggaat catcttctga 540

ttccacctcg ggatctggat ctgactcgga ctctgtaatt tccgttacgg attggcaaat 600

cttatcattg gtcggtgttt ggtcttgctt tgtgactttg ataataacat cgattcccat 660

atgatgtttg ttttcttctt ccgtacacga ggaggaggat gaggatgatt gctgaagact 720

ggcaggcaca tgcatgccag gacgatatat tgtttcataa ttgctattga ttgagtactg 780

ttctttatga ttctacttcc ttaccatgca ataaattaga atatattttc tacttttacg 840

agaaattaat tattgtattt attatttatg ggtgaaaaac ttactataaa aagcgggtgg 900

gtttggaatt agtgatcagt ttatgtatat cgcaactacc gggcatatgg ctatcgacat 960

cgagaacatt acccacatga taagagattg tatcagtttc gtagtcttga gtattggtat 1020

tactatatag tatatagatg tcgacgctag atatacagtc tccgaatgcg gcatgatacc 1080

gtcatcattc tttgctttcg ttaactgttt ggaggaagaa tctttgttat tgcatttaat 1140

ctcgaaattc agagtgcaca cctttctcct gtaaagaatc ctgaagtcgc taccttatta 1200

agaacggaga agtatccatc acgaaatacg ggattacagt ctttatgatt catagtaata 1260

gttagttccg acgttgagat ggattcactg agaccggtag tggtcgtccg agtacacgac 1320

gtgtcgttga cgggatacag attaatttcc acatcgatat agttaaaggt atttctgggt 1380

acgggttcgc atttatctgc ggaagagacg gtgtgagaat atgttccgag accacacgga 1440

gaacagatga cgtctccgga tactccgtat cctattccac attttgtttg ggaaacacat 1500

gccttgcatc cggatgatcc tttgagaaga caataatatc cgggagagca ttcacagatt 1560

ctattgtgag tagtgttaca cgatcgcgtc ttccgttaca acttagacaa gcgggtaaat 1620

gattattgcg agatgtgaag gtacccgaac cacacggcgt acattgtgtg ttagtcttgc 1680

tatcgcataa tctggaagcg tatgttcccg gacacaaatt atggcgtttg tattcgttgt 1740

ctttacactt tccatcggat ggtgcatgcg gtgctatatc tcttccgttt attattatac 1800

atgagagaaa caatatatac gagtataata cggacttcat aatttaataa tgtagtaatc 1860

gttgtcgtgt tcctgtttcc tacttctcca atcatataga tattttcttt ctatcatgga 1920

taatatttgt aatggttctt tccgtacaac atactgttta gatgatattg cgcataattt 1980

ccggaggcaa atacgatagt ctagattgac cgatggtaga ctctaattta ttgagtgctt 2040

tgtcgacgag tttactttta cgctccatcg atagatggca ctgttctatg agatcgtcgt 2100

acatgggaaa tgaaatgtgt ctgtccgaat gtatggcttc aagatagctg tgataccgta 2160

tacaggtcgg tgtcggagat tcgaatctct ttgaggcgac ttatgtcacg atgatggaat 2220

ctatcttatc gaatgatata tttttcataa atacactttt atagtcctcg tttaaacaga 2280

atttactatg tagttccgcg aatgactcgt cccttaatag gcagtaggct agtatctttt 2340

ttacgtagta atcgtcgtag ggagagaatt ctgacatctt gtagaacaac gatttaatca 2400

taggtagaga tactttcagt ctgtggtgga tgatgtcatt cacaacatcc gccttgtata 2460

tgatgtttct gttttcaaac accaagtcga ataccgtctt tagtcggaag gttgatgtcg 2520

tatccgatgt atgaggcaac attgttgtta caattttgaa aggcggtatt atagtattcg 2580

tctttctgaa tgtcgaacct atctagtaga taccgtagta tattgagagt gtatccttga 2640

ttatgtttta tgaatagata aagtagatgt tgtccttctt ccttttgttc gtgccaattg 2700

agtaacatta tgagaatatg acctgttgca caatcgttcc atgatgggtg tacaatcaag 2760

attattacgt atcctcgaga taaaagagca tacaccacac gaggactatg tttggtatac 2820

tgttgaaggt aagtgtgtaa ccgcgttaat gtttgctcca taatctatta tcgcgtagat 2880

gaatcgcttc tcggctcgca tcttagtgtg acttaacttg taataattgc ttttgtagaa 2940

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atcatatcta ctaattttta taatcaatac aaaacataaa aaacaactcg ttattacata 154800

gcaggcatgg aatccttcaa gtattgtttt gataacgatg gcaagaaatg gattatcgga 154860

aatactttat attctggtaa ttcaatactc tataaggtca gaaaaaattt cactagttcg 154920

ttctacaatt acgtaatgaa gatagatcac aaatcacaca agccattgtt gtctgaaata 154980

cgattctata tatctgtatt ggatcctttg actatcgaca actggacacg ggaacgtggt 155040

ataaagtatt tggctattcc agatctgtat ggaattggag aaaccgatga ttatatgttc 155100

ttcgttataa agaatttggg aagagtattc gccccaaagg atactgaatc agtcttcgaa 155160

gcatgtgtca ctatgataaa cacgttagag tttatacact ctcgaggatt tacccatgga 155220

aaaatagaac cgaggaatat actgattaga aataaacgtc tttcactaat tgactattct 155280

agaactaaca aactatacaa gagtggaaac tcacatatag attacaacga ggacatgata 155340

acttcaggaa atatcaatta tatgtgtgta gacaatcatc ttggagcaac agtttcaaga 155400

cgaggagatt tagaaatgtt gggatattgc atgatagaat ggttcggtgg caaacttcca 155460

tggaaaaacg aaagtagtat aaaagtaata aaacaaaaaa aagaatataa aaaatttata 155520

gctactttct ttgaggactg ttttcctgaa ggaaatgaac ctctggaatt agttagatat 155580

atagaattag tatacacgtt agattattct caaactccta attatgacag actacgtaga 155640

ctgtttatac aagattgaaa ttatattctt tttttataga gtgtggtagt gttacggata 155700

tctaatatta atattagact atctctatcg cgctacacga ccaatatcga ttactatgaa 155760

tatcttctat gaaaggagag aatgtattca tttctccagc gtcaatctcg tcagtattga 155820

caatactgta ttatggagct aatggatcca ctgctgaaca gctatcaaaa tatgtagaaa 155880

cggaggagaa cacggataag gttagcgctc agaatatctc attcaaatcc ataaataaag 155940

tatatgggcg atattctgcc gtgtttaaag atttcttttt gggaaaaatt ggcgataagt 156000

ttcaaactgt tgacttcact gattgtcgca ctatagatgc aatcaacaag tgtgtagata 156060

tctttactga ggggaaaatc aatccactat tggatgaacc attgtctcct agcaattagt 156120

gccgtatact ttaaagcaaa atggttgacg ccattcgaaa aggaatttac cagtgattat 156180

ccctttttacg tatcaccaac ggaaatggta gatgtaagta tgatgtctat gtacggcgag 156240

ctatttaatc acgcatctgt aaaggaatca ttcggcaact tttcaatcat agaactgcca 156300

tatgttggag atactagtat gatggtcatt cttccagaca agattgatgg attagaatcc 156360

atagaacaaa atctaacaga tacaaatttt aagaaatggt gtaactctct ggatgctatg 156420

tttatagatg ttcacattcc caagtttaag gtaacaggct cgtataatct ggtggatact 156480

ctagtaaaga tccgctgatg gaaacacagt gaatgctaga ttgtccagcg tgtccccagg 156540

acaaggtaag gactctcccg cgatcactcg tgaagaagct ctggctatga tcaaagactg 156600

tgaggtgtct atcgacatca gatgtagcga agaagagaaa gacagcgaca tcaagaccca 156660

tccagtactc gggtctaaca tctctcataa gaaagtgagt tacgaagata tcatcggttc 156720

aacgatcgtc gatacaaaat gtgtcaagaa tctagagttt agcgttcgta tcggagacat 156780

gtgcaaggaa tcatctgaac ttgaggtcaa ggatggattc aagtatgtcg acggatcggc 156840

atctgaaggt gcaaccgatg atacttcact catcgattca acaaaactca aagcgtgtgt 156900

ctga 156904

<210> 211
<211> 727
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

polypeptide

<220>
<221> MISC_FEATURE
<222> (1)..(20)
<223> Signal peptide sequence

<220>
<221> MISC_FEATURE
<222> (21)..(490)
<223> heavy chain sequence

<220>
<221> MISC_FEATURE
<222> (469)..(491)
<223> T2A sequence

<220>
<221> MISC_FEATURE
<222> (491)..(512)
<223> Signal peptide sequence

<220>
<221> MISC_FEATURE
<222> (513)..(727)
<223> light chain sequence

<400> 211
Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro
1 5 10 15

Gly Ser Thr Gly Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val
20 25 30

Gln Pro Gly Arg Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr
35 40 45

Phe Ser Ser Tyr Thr Met His Trp Val Arg Gln Ala Pro Gly Lys Gly
50 55 60

Leu Glu Trp Val Thr Phe Ile Ser Tyr Asp Gly Asn Asn Lys Tyr Tyr
65 70 75 80

Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys
85 90 95

```
Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala
            100                 105                 110

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

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

Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr
145                 150                 155                 160

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

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

Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr
        195                 200                 205

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

His Lys Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Pro Lys Ser
225                 230                 235                 240

Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu
                245                 250                 255

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

Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser
        275                 280                 285

His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu
    290                 295                 300

Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr
```

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305                 310                 315                 320

Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn
                325                 330                 335

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

Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln
        355                 360                 365

Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val
    370                 375                 380

Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val
385                 390                 395                 400

Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro
                405                 410                 415

Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr
            420                 425                 430

Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val
        435                 440                 445

Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu
    450                 455                 460

Ser Pro Gly Lys Pro Arg Gly Ser Gly Glu Gly Arg Gly Ser Leu Leu
465                 470                 475                 480

Thr Cys Gly Asp Val Glu Glu Asn Pro Gly Pro Lys Leu Met Ala Trp
                485                 490                 495

Thr Pro Gly Ile Phe Met Val Leu Ser Tyr Leu Thr Gly Ser Phe Ser
            500                 505                 510

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu Ser Leu Ser Pro Gly
        515                 520                 525
```

```
Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Val Gly Ser Ser
    530                 535                 540

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu
545                 550                 555                 560

Ile Tyr Gly Ala Phe Ser Arg Ala Thr Gly Ile Pro Asp Arg Phe Ser
                565                 570                 575

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Arg Leu Glu
            580                 585                 590

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Tyr Gly Ser Ser Pro
        595                 600                 605

Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys Arg Thr Val Ala
    610                 615                 620

Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser
625                 630                 635                 640

Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu
                645                 650                 655

Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser
            660                 665                 670

Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu
        675                 680                 685

Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val
    690                 695                 700

Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys
705                 710                 715                 720

Ser Phe Asn Arg Gly Glu Cys
                725
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<210> 212
<211> 260
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<220>
<221> MISC_FEATURE
<222> (235)..(255)
<223> B7-1 transmembrane domain

<220>
<221> MISC_FEATURE
<222> (235)..(260)
<223> B7-1 cytoplasmic domain

<400> 212
Met Cys Pro Ala Arg Ser Leu Leu Leu Val Ala Thr Leu Val Leu Leu
1 5 10 15

Asp His Leu Ser Leu Ala Arg Asn Leu Pro Val Ala Thr Pro Asp Pro
20 25 30

Gly Met Phe Pro Cys Leu His His Ser Gln Asn Leu Leu Arg Ala Val
35 40 45

Ser Asn Met Leu Gln Lys Ala Arg Gln Thr Leu Glu Phe Tyr Pro Cys
50 55 60

Thr Ser Glu Glu Ile Asp His Glu Asp Ile Thr Lys Asp Lys Thr Ser
65 70 75 80

Thr Val Glu Ala Cys Leu Pro Leu Glu Leu Thr Lys Asn Glu Ser Cys
85 90 95

Leu Asn Ser Arg Glu Thr Ser Phe Ile Thr Asn Gly Ser Cys Leu Ala
100 105 110

Ser Arg Lys Thr Ser Phe Met Met Ala Leu Cys Leu Ser Ser Ile Tyr
115 120 125

Glu Asp Leu Lys Met Tyr Gln Val Glu Phe Lys Thr Met Asn Ala Lys
130 135 140

Leu Leu Met Asp Pro Lys Arg Gln Ile Phe Leu Asp Gln Asn Met Leu
145 150 155 160

Ala Val Ile Asp Glu Leu Met Gln Ala Leu Asn Phe Asn Ser Glu Thr
165 170 175

Val Pro Gln Lys Ser Ser Leu Glu Glu Pro Asp Phe Tyr Lys Thr Lys
180 185 190

Ile Lys Leu Cys Ile Leu Leu His Ala Phe Arg Ile Arg Ala Val Thr
195 200 205

Ile Asp Arg Val Met Ser Tyr Leu Asn Ala Ser Gly Gly Gly Gly Ser
210 215 220

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Leu Leu Pro Ser Trp Ala
225 230 235 240

Ile Thr Leu Ile Ser Val Asn Gly Ile Phe Val Ile Cys Cys Leu Thr
245 250 255

Tyr Cys Phe Ala
260

<210> 213
<211> 186
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 213
Met Thr Val Leu Ala Pro Ala Trp Ser Pro Thr Thr Tyr Leu Leu Leu
1 5 10 15

Leu Leu Leu Leu Ser Ser Gly Leu Ser Gly Thr Gln Asp Cys Ser Phe
20 25 30

```
Gln His Ser Pro Ile Ser Ser Asp Phe Ala Val Lys Ile Arg Glu Leu
        35                  40                  45

Ser Asp Tyr Leu Leu Gln Asp Tyr Pro Val Thr Val Ala Ser Asn Leu
    50                  55                  60

Gln Asp Glu Glu Leu Cys Gly Gly Leu Trp Arg Leu Val Leu Ala Gln
65                  70                  75                  80

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

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

Phe Gln Pro Pro Pro Ser Cys Leu Arg Phe Val Gln Thr Asn Ile Ser
        115                 120                 125

Arg Leu Leu Gln Glu Thr Ser Glu Gln Leu Val Ala Leu Lys Pro Trp
    130                 135                 140

Ile Thr Arg Gln Asn Phe Ser Arg Cys Leu Glu Leu Gln Cys Gln Pro
145                 150                 155                 160

Gly Ala Pro Arg Pro Gln Ser Pro Gly Pro Ala Ala Cys Gly Ala Leu
                165                 170                 175

Thr Trp Pro Arg Pro His Pro Ala Glu Pro
            180                 185
```

<210> 214
<211> 2184
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 214
atggaaacag acaccctatt attatgggtt ttgcttctat gggtgccagg atctacgggt 60

caggttcagc tagtcgaatc gggtggagga gtcgtgcagc cgggacgttc cttacgttta 120

tcttgcgcag cgtctggttt tactttctcg tcctacacta tgcattgggt tcgtcaggct 180

ccgggaaagg gattggagtg ggtaacattt ataagttacg acggtaataa taaatactat 240

gcagacagtg tgaagggacg tttcactata tctcgagata atagtaagaa cactttgtat 300

ttgcagatga attcattgag agcggaagat acagcaattt actactgcgc cagaaccgga 360

tggttgggtc cctttgacta ttggggacag ggtactcttg ttacggtgtc ttctgcttca 420

acaaagggtc cctctgtctt cccgcttgcg ccctcatcaa aatcgacgtc gggtggaacc 480

gctgccttgg gatgcttggt taaggactat ttccccgaac ctgtcaccgt gtcttggaat 540

tccggtgctc taacgtctgg tgtgcacact ttccctgccg ttttacaaag ttccggacta 600

tattcacttt cgtccgtagt aactgttcca agttcgtccc ttggaacaca gacctatata 660

tgcaacgtaa accacaaacc ctccaatacc aaagtcgata aaagagttga gcctaaatcc 720

tgcgacaaaa cacacacctg cccaccttgc ccggcccctg aacttcttgg aggaccatct 780

gtattccttt tcccaccgaa gcctaaggac accttgatga tatccagaac tcccgaagtc 840

acgtgcgtag tagtcgatgt gagtcacgaa gatccggaag tcaagtttaa ctggtatgta 900

gacggagtag aggttcataa cgccaagacc aagccaagag aagaacaata taactcgact 960

tacagagtcg tgtctgtatt aaccgtcttg catcaggact ggttaaacgg taaagagtac 1020

aagtgcaagg tctccaataa agccctacct gcccccatcg aaaaaaccat atccaaggct 1080

aagggtcagc ctagagaacc tcaagtttac acattaccgc ccagtagaga tgaacttacg 1140

aagaatcaag tgagtctaac ctgccttgtt aaaggattct accccagtga catagcggtg 1200

gagtgggagt ccaacggtca acccgagaac aattataaga cgacaccgcc cgttcttgac 1260

agtgacggat cgttctttct atactctaag ttgactgtgg ataaatcccg atggcagcag 1320

ggaaacgtat tctcttgctc agtgatgcat gaggcgttgc acaatcatta cacccaaaag 1380

tctttgtcgc taagtccagg taaaccgcgg ggcagcggag agggcagagg aagcctgctg 1440

acttgtggcg atgtggaaga gaaccctggc cctaagctta tggcttggac accaggaatc 1500

ttcatggtac ttagttactt gacaggatct ttctcggaaa tagtcttaac tcagtcaccg 1560

ggtacacttt ccctttcgcc cggagagcgt gcgaccctat cgtgtcgagc ttcccagtcg 1620

gttggttctt cgtatcttgc ttggtatcag cagaagcccg gacaagctcc tcgtcttttg 1680

atctacggtg cgttttcgag agcgactggt atcccggata gattttctgg atcgggttct 1740

ggtactgatt tcactttaac gatttcgaga ctagagcccg aagattttgc tgtgtattat 1800

tgccagcaat atggatctag tccgtggacg ttcggtcagg gtaccaaggt cgagataaaa 1860

agaactgtgg ccgcaccctc cgtgtttatc tttccccctt ccgacgaaca gctaaagtcg 1920

ggtactgcat cggtggtatg tttacttaac aacttttacc cacgagaggc caaggtacaa 1980

tggaaggtgg ataacgcctt acaatcagga aactcacaag agtccgtcac cgagcaagat 2040

tccaaggaca gtacatactc gttatcctcg acattaacat tgagtaaggc ggattatgag 2100

aagcataagg tttacgcatg cgaagtgacg caccaaggac tttcatcccc cgtcaccaag 2160

tctttcaatc gtggtgagtg ctga 2184

<210> 215
<211> 783
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<220>
<221> misc_feature
<222> (703)..(765)
<223> B7-1 transmembrane domain

<220>
<221> misc_feature
<222> (703)..(780)
<223> B7-1 cytoplasmic domain

<400> 215
atgtgtcccg cgcgatcgtt attgttagtt gcgacgttgg tcctacttga ccatctatca 60

ctagcgcgta atttgcccgt tgccacacca gatcccggaa tgtttccttg cttacatcat 120

agtcagaact tacttcgtgc agtctccaac atgttacaga aagcccgaca gaccttagag 180

ttctatccct gtacttccga agagatagat cacgaggaca taacgaaaga caaaacatcg 240

accgttgaag cgtgcttacc cttagaacta accaaaaatg aaagttgtct aaactctaga 300

gaaacgagtt ttatcaccaa tggaagttgc ttggcgtcta gaaaaacatc atttatgatg 360

gccttgtgtc tttcctccat atacgaggac ttgaagatgt atcaggtcga gttcaagaca 420

atgaacgcga aattgcttat ggaccccaaa cgacagatat ttttggacca aaacatgtta 480

gctgttatag acgaattgat gcaggcgcta aacttcaatt cggaaactgt gccacagaag 540

tcatccttag aggagcccga tttttacaag acaaaaatca agttatgcat tcttcttcac 600

gcgtttagaa ttcgtgccgt tacgattgat agagtaatgt cgtacttgaa tgcgtcgggt 660

ggaggaggtt ccggaggagg aggatccgga ggaggtggat ccttacttcc ttcgtgggct 720

ataacattaa tctccgttaa tggtatcttc gtgatttgct gtctaacata ctgctttgca 780

tga 783

<210> 216
<211> 561
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 216
atgacagtct tagcgccagc ttggagtcct accacatatt tactactatt attgctttta 60

tctagtggtt tatcaggaac gcaagactgc tcattccaac attcaccgat cagttccgac 120

tttgcagtta agattcgaga actatcagac tacctattgc aagactatcc ggtgacggta 180

gcatcgaatc ttcaagacga agagctttgt ggtggactat ggcgtcttgt acttgcccaa 240

agatggatgg agcgactaaa aaccgttgcc ggttcaaaga tgcagggttt actagagcgt 300

gtgaatacgg aaattcattt tgttacgaaa tgtgcgttcc aacccccacc cagttgcttg 360

cgtttcgtgc agactaatat ctctcgttta ctacaagaaa catccgagca actagtggcg 420

ctaaagccct ggataacacg tcaaaacttt agtcgttgct tggagttaca gtgccaaccc 480

ggtgccccac gacctcaaag tcctggtcca gcggcttgcg gagcccttac ctggcctcga 540

ccgcatccgg ccgaaccatg a 561

<210> 217
<211> 470
<212> PRT

<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 217
Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Arg
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr
20 25 30

Thr Met His Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Thr Phe Ile Ser Tyr Asp Gly Asn Asn Lys Tyr Tyr Ala Asp Ser Val
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Ile Tyr Tyr Cys
85 90 95

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

Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro
115 120 125

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

Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn
145 150 155 160

Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln
165 170 175

Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser
180 185 190

```
Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser
        195                 200                 205

Asn Thr Lys Val Asp Lys Arg Val Glu Pro Lys Ser Cys Asp Lys Thr
    210                 215                 220

His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser
225                 230                 235                 240

Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg
                245                 250                 255

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro
            260                 265                 270

Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
        275                 280                 285

Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val
    290                 295                 300

Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr
305                 310                 315                 320

Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr
                325                 330                 335

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

Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys
        355                 360                 365

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

Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp
385                 390                 395                 400
```

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

Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala
420 425 430

Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
435 440 445

Pro Arg Gly Ser Gly Glu Gly Arg Gly Ser Leu Leu Thr Cys Gly Asp
450 455 460

Val Glu Glu Asn Pro Gly
465 470

<210> 218
<211> 215
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 218
Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu Ser Leu Ser Pro Gly
1 5 10 15

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

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu
35 40 45

Ile Tyr Gly Ala Phe Ser Arg Ala Thr Gly Ile Pro Asp Arg Phe Ser
50 55 60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Arg Leu Glu
65 70 75 80

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Tyr Gly Ser Ser Pro
85 90 95

```
Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys Arg Thr Val Ala
            100                 105                 110

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

Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu
    130                 135                 140

Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser
145                 150                 155                 160

Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu
                165                 170                 175

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

Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys
        195                 200                 205

Ser Phe Asn Arg Gly Glu Cys
    210                 215
```

<210> 219
<211> 512
<212> PRT
<213> Vaccinia virus

<400> 219

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Met Glu Ser Val Ile Phe Ser Ile Asn Gly Glu Ile Ile Gln Val Asn
1               5                   10                  15

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

Asp His His Leu Lys Asp Glu Ala Ile Ile Leu Asn Gly Ile Asn Tyr
        35                  40                  45

His Ala Phe Glu Ser Leu Leu Asp Tyr Ile Arg Trp Lys Lys Ile Asn
```

```
    50                  55                  60

Ile Thr Ile Asn Asn Val Glu Met Ile Leu Val Ala Ala Ile Ile Ile
65                  70                  75                  80

Asp Val Pro Pro Val Val Asp Leu Cys Val Lys Thr Met Ile His Asn
                85                  90                  95

Ile Asn Ser Thr Asn Cys Ile Arg Met Phe Asn Phe Ser Lys Arg Tyr
            100                 105                 110

Gly Ile Lys Lys Leu Tyr Asn Ala Ser Met Ser Glu Ile Ile Asn Asn
        115                 120                 125

Ile Thr Ala Val Thr Ser Asp Pro Glu Phe Gly Lys Leu Ser Lys Asp
    130                 135                 140

Glu Leu Thr Thr Ile Leu Ser His Glu Asn Val Asn Val Asn His Glu
145                 150                 155                 160

Asp Val Thr Ala Met Ile Leu Leu Lys Trp Ile His Lys Asn Pro Asn
                165                 170                 175

Asp Val Asp Ile Ile Asn Ile Leu His Pro Lys Phe Met Thr Asn Thr
            180                 185                 190

Met Arg Asn Ala Ile Ser Leu Leu Gly Leu Thr Ile Ser Lys Ser Thr
        195                 200                 205

Lys Pro Val Thr Arg Asn Gly Ile Lys His Asn Ile Val Val Ile Lys
    210                 215                 220

Asn Ser Asp Tyr Ile Ser Thr Ile Thr His Tyr Ser Pro Arg Thr Glu
225                 230                 235                 240

Tyr Trp Thr Ile Val Gly Asn Thr Asp Arg Gln Phe Tyr Asn Ala Asn
                245                 250                 255

Val Leu His Asn Cys Leu Tyr Ile Ile Gly Gly Met Ile Asn Asn Arg
            260                 265                 270
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His Val Tyr Ser Val Ser Arg Val Asp Leu Glu Thr Lys Lys Trp Lys
        275                 280                 285

Thr Val Thr Asn Met Ser Ser Leu Lys Ser Glu Val Ser Thr Cys Val
    290                 295                 300

Asn Asp Gly Lys Leu Tyr Val Ile Gly Gly Leu Glu Phe Ser Ile Ser
305                 310                 315                 320

Thr Gly Val Ala Glu Tyr Leu Lys His Gly Thr Ser Lys Trp Ile Arg
                325                 330                 335

Leu Pro Asn Leu Ile Thr Pro Arg Tyr Ser Gly Ala Ser Val Phe Val
            340                 345                 350

Asn Asp Asp Ile Tyr Val Met Gly Gly Val Tyr Thr Thr Tyr Glu Lys
        355                 360                 365

Tyr Val Val Leu Asn Asp Val Glu Cys Phe Thr Lys Asn Arg Trp Ile
    370                 375                 380

Lys Lys Ser Pro Met Pro Arg His His Ser Ile Val Tyr Ala Val Glu
385                 390                 395                 400

Tyr Asp Gly Asp Ile Tyr Val Ile Thr Gly Ile Thr His Glu Thr Arg
                405                 410                 415

Asn Tyr Leu Tyr Lys Tyr Ile Val Lys Glu Asp Lys Trp Ile Glu Leu
            420                 425                 430

Tyr Met Tyr Phe Asn His Val Gly Lys Met Phe Val Cys Ser Cys Gly
        435                 440                 445

Asp Tyr Ile Leu Ile Ile Ala Asp Ala Lys Tyr Glu Tyr Tyr Pro Lys
    450                 455                 460

Ser Asn Thr Trp Asn Leu Phe Asp Met Ser Thr Arg Asn Ile Glu Tyr
465                 470                 475                 480
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Tyr Asp Met Phe Thr Lys Asp Glu Thr Pro Lys Cys Asn Val Thr His
485 490 495

Lys Ser Leu Pro Ser Phe Leu Ser Asn Cys Glu Lys Gln Phe Leu Gln
500 505 510

<210> 220
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<220>
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<400> 220
Arg Met Pro Thr Val Leu Gln Cys Val Asn Val Ser Val Val Ser
1 5 10 15

<210> 221
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 221
Cys Thr Ala Cys Arg Trp Lys Lys Ala Cys Gln Arg
1 5 10

<210> 222
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<400> 222
Val Leu Asp Gly Leu Asp Val Leu Leu
1 5

<210> 223
<211> 10

<212> PRT
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<220>
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peptide

<400> 223
Ser Leu Tyr Ser Phe Pro Glu Pro Glu Ala
1 5 10

<210> 224
<211> 10
<212> PRT
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<220>
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peptide

<400> 224
Ala Leu Tyr Val Asp Ser Leu Phe Phe Leu
1 5 10

<210> 225
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<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 225
Ser Leu Leu Gln His Leu Ile Gly Leu
1 5

<210> 226
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 226
Leu Tyr Val Asp Ser Leu Phe Phe Leu
1 5

<210> 227
<211> 11
<212> PRT
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<220>
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peptide

<400> 227
Thr Ser Glu Lys Arg Pro Phe Met Cys Ala Tyr
1 5 10

<210> 228
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peptide

<400> 228
Cys Met Thr Trp Asn Gln Met Asn Leu
1 5

<210> 229
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<220>
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peptide

<400> 229
Leu Ser His Leu Gln Met His Ser Arg Lys His
1 5 10

<210> 230
<211> 16
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<213> Artificial Sequence

<220>
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peptide

<400> 230

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

<210> 231
<211> 8
<212> PRT
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<220>
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<400> 231
Cys Tyr Met Glu Ala Val Ala Leu
1 5

<210> 232
<211> 9
<212> PRT
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<220>
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<400> 232
Ser Leu Leu Phe Leu Leu Phe Ser Leu
1 5

<210> 233
<211> 9
<212> PRT
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<220>
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<400> 233
Val Leu Pro Leu Thr Val Ala Glu Val
1 5

<210> 234
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<220>
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peptide

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Ala Leu Gln Gly Gly Gly Pro Pro Tyr
1 5

<210> 235
<211> 9
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1 5

<210> 236
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1 5

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Ser Leu Leu Met Trp Ile Thr Gln Cys
1 5

<210> 238
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peptide

<400> 238
Leu Ala Met Pro Phe Ala Thr Pro Met
1 5

<210> 239
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peptide

<400> 239
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1 5

<210> 240
<211> 11
<212> PRT
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peptide

<400> 240
Met Leu Met Ala Gln Glu Ala Leu Ala Phe Leu
1 5 10

<210> 241
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peptide

<400> 241
Tyr Leu Ala Met Pro Phe Ala Thr Pro Met Glu
1 5 10

<210> 242

<211> 10
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<220>
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peptide

<400> 242
Ala Ser Gly Pro Gly Gly Gly Ala Pro Arg
1 5 10

<210> 243
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<213> Artificial Sequence

<220>
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peptide

<400> 243
Leu Ala Ala Gln Glu Arg Arg Val Pro Arg
1 5 10

<210> 244
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peptide

<400> 244
Thr Val Ser Gly Asn Ile Leu Thr Ile Arg
1 5 10

<210> 245
<211> 13
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peptide

<400> 245
Ala Pro Arg Gly Pro His Gly Gly Ala Ala Ser Gly Leu
1 5 10

<210> 246
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<220>
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peptide

<400> 246
Met Pro Phe Ala Thr Pro Met Glu Ala Glu Leu
1 5 10

<210> 247
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 247
Lys Glu Phe Thr Val Ser Gly Asn Ile Leu Thr Ile
1 5 10

<210> 248
<211> 9
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<220>
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peptide

<400> 248
Met Pro Phe Ala Thr Pro Met Glu Ala
1 5

<210> 249
<211> 9
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<213> Artificial Sequence

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peptide

<400> 249
Phe Ala Thr Pro Met Glu Ala Glu Leu
1   5

<210> 250
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<220>
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      peptide

<400> 250
Phe Ala Thr Pro Met Glu Ala Glu Leu Ala Arg
1   5   10

<210> 251
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<220>
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      peptide

<400> 251
Ser Leu Leu Met Trp Ile Thr Gln Cys Phe Leu Pro Val Phe
1   5   10

<210> 252
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 252
Leu Leu Glu Phe Tyr Leu Ala Met Pro Phe Ala Thr Pro Met Glu Ala
1   5   10   15

Glu Leu Ala Arg Arg Ser Leu Ala Gln
            20   25

<210> 253
<211> 12

<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 253
Glu Phe Tyr Leu Ala Met Pro Phe Ala Thr Pro Met
1 5 10

<210> 254
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 254
Pro Gly Val Leu Leu Lys Glu Phe Thr Val Ser Gly Asn Ile Leu Thr
1 5 10 15

Ile Arg Leu Thr Ala Ala Asp His Arg
20 25

<210> 255
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 255
Arg Leu Leu Glu Phe Tyr Leu Ala Met Pro Phe Ala
1 5 10

<210> 256
<211> 20
<212> PRT
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<220>
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peptide

<400> 256
Gln Gly Ala Met Leu Ala Ala Gln Glu Arg Arg Val Pro Arg Ala Ala
1   5   10   15

Glu Val Pro Arg
            20

<210> 257
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 257
Pro Phe Ala Thr Pro Met Glu Ala Glu Leu Ala Arg Arg
1   5   10

<210> 258
<211> 20
<212> PRT
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<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 258
Pro Gly Val Leu Leu Lys Glu Phe Thr Val Ser Gly Asn Ile Leu Thr
1   5   10   15

Ile Arg Leu Thr
            20

<210> 259
<211> 10
<212> PRT
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<220>
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      peptide

<400> 259
Val Leu Leu Lys Glu Phe Thr Val Ser Gly
1   5   10

<210> 260
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 260
Ala Ala Asp His Arg Gln Leu Gln Leu Ser Ile Ser Ser Cys Leu Gln
1 5 10 15

Gln Leu

<210> 261
<211> 15
<212> PRT
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<220>
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peptide

<400> 261
Leu Lys Glu Phe Thr Val Ser Gly Asn Ile Leu Thr Ile Arg Leu
1 5 10 15

<210> 262
<211> 11
<212> PRT
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<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 262
Lys Glu Phe Thr Val Ser Gly Asn Ile Leu Thr
1 5 10

<210> 263
<211> 14
<212> PRT
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<220>
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peptide

<400> 263
Leu Leu Glu Phe Tyr Leu Ala Met Pro Phe Ala Thr Pro Met
1 5 10

<210> 264
<211> 14
<212> PRT
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<220>
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peptide

<400> 264
Ala Gly Ala Thr Gly Gly Arg Gly Pro Arg Gly Ala Gly Ala
1 5 10

<210> 265
<211> 13
<212> PRT
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peptide

<400> 265
Thr Tyr Tyr Arg Pro Gly Val Asn Leu Ser Leu Ser Cys
1 5 10

<210> 266
<211> 13
<212> PRT
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peptide

<400> 266
Glu Ile Ile Tyr Pro Asn Ala Ser Leu Leu Ile Gln Asn
1 5 10

<210> 267
<211> 15

<212> PRT
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<220>
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peptide

<400> 267
Tyr Ala Cys Phe Val Ser Asn Leu Ala Thr Gly Arg Asn Asn Ser
1 5 10 15

<210> 268
<211> 13
<212> PRT
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peptide

<400> 268
Leu Trp Trp Val Asn Asn Gln Ser Leu Pro Val Ser Pro
1 5 10

<210> 269
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peptide

<400> 269
Asn Ser Ile Val Lys Ser Ile Thr Val Ser Ala Ser Gly
1 5 10

<210> 270
<211> 9
<212> PRT
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peptide

<400> 270
Lys Thr Trp Gly Gln Tyr Trp Gln Val
1 5

<210> 271
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<212> PRT
<213> Artificial Sequence

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peptide

<400> 271
Ala Met Leu Gly Thr His Thr Met Glu Val
1 5 10

<210> 272
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peptide

<400> 272
Ile Thr Asp Gln Val Pro Phe Ser Val
1 5

<210> 273
<211> 9
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<220>
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peptide

<400> 273
Tyr Leu Glu Pro Gly Pro Val Thr Ala
1 5

<210> 274
<211> 10
<212> PRT
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<220>
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peptide

<400> 274

Leu Leu Asp Gly Thr Ala Thr Leu Arg Leu
1 5 10

<210> 275
<211> 10
<212> PRT
<213> Artificial Sequence

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<400> 275
Val Leu Tyr Arg Tyr Gly Ser Phe Ser Val
1 5 10

<210> 276
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<400> 276
Ser Leu Ala Asp Thr Asn Ser Leu Ala Val
1 5 10

<210> 277
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<400> 277
Arg Leu Met Lys Gln Asp Phe Ser Val
1 5

<210> 278
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 278
Arg Leu Pro Arg Ile Phe Cys Ser Cys
1 5

<210> 279
<211> 9
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<400> 279
Leu Ile Tyr Arg Arg Arg Leu Met Lys
1 5

<210> 280
<211> 9
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<400> 280
Ala Leu Leu Ala Val Gly Ala Thr Lys
1 5

<210> 281
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<400> 281
Ile Ala Leu Asn Phe Pro Gly Ser Gln Lys
1 5 10

<210> 282
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peptide

<400> 282
Arg Ser Tyr Val Pro Leu Ala His Arg
1 5

<210> 283
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peptide

<400> 283
Val Val Pro Cys Glu Pro Pro Glu Val
1 5

<210> 284
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peptide

<400> 284
His Leu Tyr Gln Gly Cys Gln Val Val
1 5

<210> 285
<211> 10
<212> PRT
<213> Artificial Sequence

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peptide

<400> 285
Tyr Leu Val Pro Gln Gln Gly Phe Phe Cys
1 5 10

<210> 286

<211> 9
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peptide

<400> 286
Pro Leu Gln Pro Glu Gln Leu Gln Val
1 5

<210> 287
<211> 9
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peptide

<400> 287
Thr Leu Glu Glu Ile Thr Gly Tyr Leu
1 5

<210> 288
<211> 9
<212> PRT
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peptide

<400> 288
Ala Leu Ile His His Asn Thr His Leu
1 5

<210> 289
<211> 9
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peptide

<400> 289
Pro Leu Thr Ser Ile Ile Ser Ala Val
1 5

<210> 290
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<400> 290
Val Leu Arg Glu Asn Thr Ser Pro Lys
1 5

<210> 291
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Thr Tyr Leu Pro Thr Asn Ala Ser Leu
1 5

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<400> 292
Arg Tyr Gln Leu Asp Pro Lys Phe Ile
1 5

<210> 293
<211> 9
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<400> 293
Ile Leu Phe Thr Ile Asn Phe Thr Ile
1 5

<210> 294
<211> 9
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<213> Artificial Sequence

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<400> 294
Val Leu Phe Thr Ile Asn Phe Thr Ile
1 5

<210> 295
<211> 9
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<400> 295
Thr Leu Asn Phe Thr Ile Thr Asn Leu
1 5

<210> 296
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<400> 296
Val Leu Gln Gly Leu Leu Lys Pro Leu
1 5

<210> 297
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peptide

<400> 297
Val Leu Gln Gly Leu Leu Arg Pro Val
1 5

<210> 298
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peptide

<400> 298
Arg Leu Asp Pro Lys Ser Pro Gly Val
1 5

<210> 299
<211> 9
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peptide

<400> 299
Gln Leu Tyr Trp Glu Leu Ser Lys Leu
1 5

<210> 300
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peptide

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Lys Leu Thr Arg Gly Ile Val Glu Leu
1 5

<210> 301
<211> 9
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peptide

<400> 301
Gln Leu Thr Asn Gly Ile Thr Glu Leu
1 5

<210> 302
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peptide

<400> 302
Gln Leu Thr His Asn Ile Thr Glu Leu
1 5

<210> 303
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<213> Artificial Sequence

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peptide

<400> 303
Thr Leu Asp Arg Asn Ser Leu Tyr Val
1 5

<210> 304
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<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 304
Phe Leu Leu Ser Leu Ala Leu Met Leu
1 5

<210> 305
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 305
Asn Leu Gly Pro Trp Ile Gln Gln Val
1 5

<210> 306
<211> 9
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peptide

<400> 306
Ile Leu Asp Ser Ser Glu Glu Asp Lys
1 5

<210> 307
<211> 10
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<220>
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peptide

<400> 307
Tyr Leu Pro Lys Ser Trp Thr Ile Gln Val
1 5 10

<210> 308
<211> 12
<212> PRT
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<220>
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peptide

<400> 308
Trp Ile His Glu Gln Met Glu Arg Asp Leu Lys Thr

1 5 10

<210> 309
<211> 9
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<220>
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<400> 309
Leu Leu Ala Asn Ala Tyr Ile Tyr Val
1 5

<210> 310
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 310
Tyr Leu Leu Cys Lys Ala Phe Gly Ala
1 5

<210> 311
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 311
Lys Leu Ser Pro Tyr Val His Tyr Thr
1 5

<210> 312
<211> 20
<212> PRT
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<400> 312
Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly
1   5   10   15

Val Thr Ser Ala
            20

<210> 313
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<220>
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      peptide

<400> 313
Ser Thr Ala Pro Pro Val His Asn Val
1   5

<210> 314
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<212> PRT
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      peptide

<400> 314
Leu Leu Leu Leu Thr Val Leu Thr Val
1   5

<210> 315
<211> 12
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      peptide

<400> 315
Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr
1   5   10

<210> 316

<211> 9
<212> PRT
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<220>
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peptide

<400> 316
Met Leu Ala Val Ile Ser Cys Ala Val
1 5

<210> 317
<211> 9
<212> PRT
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<220>
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peptide

<400> 317
Arg Gln Lys Arg Ile Leu Val Asn Leu
1 5

<210> 318
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 318
Asn Tyr Asn Asn Phe Tyr Arg Phe Leu
1 5

<210> 319
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 319
Glu Tyr Ser Lys Glu Cys Leu Lys Glu Phe
1 5 10

<210> 320
<211> 9
<212> PRT
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<220>
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peptide

<400> 320
Glu Tyr Leu Ser Leu Ser Asp Lys Ile
1 5

<210> 321
<211> 9
<212> PRT
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<220>
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peptide

<400> 321
Glu Leu Val Arg Arg Ile Leu Ser Arg
1 5

<210> 322
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 322
Ala Pro Arg Gly Val Arg Met Ala Val
1 5

<210> 323
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 323
Cys Leu Ser Arg Arg Pro Trp Lys Arg Ser Trp Ser Ala Gly Ser Cys
1   5   10   15

Pro Gly Met Pro His Leu
            20

<210> 324
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 324
Ile Leu Ser Arg Asp Ala Ala Pro Leu Pro Arg Pro Gly
1   5   10

<210> 325
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 325
Glu Val Asp Pro Ala Ser Asn Thr Tyr
1   5

<210> 326
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 326
Gly Val Tyr Asp Gly Arg Glu His Thr Val
1   5   10

<210> 327
<211> 9

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 327
Asn Tyr Lys Arg Cys Phe Pro Val Ile
1 5

<210> 328
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 328
Ser Glu Ser Leu Lys Met Ile Phe
1 5

<210> 329
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 329
Ile Asn Lys Thr Ser Gly Pro Lys Arg Gly Lys His Ala Trp Thr His
1 5 10 15

Arg Leu Arg Glu
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<210> 330
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 330
Tyr Phe Ser Lys Lys Glu Trp Glu Lys Met Lys Ser Ser Glu Lys Ile
1   5   10   15

Val Tyr Val Tyr
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<210> 331
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 331
Met Lys Leu Asn Tyr Glu Val Met Thr Lys Leu Gly Phe Lys Val Thr
1   5   10   15

Leu Pro Pro Phe
            20

<210> 332
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 332
Lys His Ala Trp Thr His Arg Leu Arg Glu Arg Lys Gln Leu Val Val
1   5   10   15

Tyr Glu Glu Ile
            20

<210> 333
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 333
Leu Gly Phe Lys Val Thr Leu Pro Pro Phe Met Arg Ser Lys Arg Ala
1   5   10   15

Ala Asp Phe His
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<210> 334
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 334
Lys Ser Ser Glu Lys Ile Val Tyr Val Tyr Met Lys Leu Asn Tyr Glu
1   5   10   15

Val Met Thr Lys
            20

<210> 335
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 335
Ser Leu Gly Trp Leu Phe Leu Leu Leu
1   5

<210> 336
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 336
Leu Ser Arg Leu Ser Asn Arg Leu Leu

1 5

<210> 337
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 337
Thr Met Asn Gly Ser Lys Ser Pro Val
1 5

<210> 338
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 338
Pro Leu Leu Glu Asn Val Ile Ser Lys
1 5

<210> 339
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 339
Ser Leu Ser Lys Ile Leu Asp Thr Val
1 5

<210> 340
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 340
Ala Ala Arg Ala Val Phe Leu Ala Leu
1 5

<210> 341
<211> 9
<212> PRT
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<220>
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<400> 341
Glu Ala Asp Pro Thr Gly His Ser Tyr
1 5

<210> 342
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<400> 342
Lys Val Leu Glu Tyr Val Ile Lys Val
1 5

<210> 343
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<400> 343
Ser Leu Phe Arg Ala Val Ile Thr Lys
1 5

<210> 344
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 344
Glu Val Tyr Asp Gly Arg Glu His Ser Ala
1 5 10

<210> 345
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 345
Arg Val Arg Phe Phe Phe Pro Ser Leu
1 5

<210> 346
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 346
Arg Glu Pro Val Thr Lys Ala Glu Met Leu
1 5 10

<210> 347
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 347
Lys Glu Ala Asp Pro Thr Gly His Ser Tyr
1 5 10

<210> 348
<211> 9

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 348
Asp Pro Ala Arg Tyr Glu Phe Leu Trp
1 5

<210> 349
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 349
Ile Thr Lys Lys Val Ala Asp Leu Val Gly Phe
1 5 10

<210> 350
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 350
Ser Ala Phe Pro Thr Thr Ile Asn Phe
1 5

<210> 351
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 351
Ser Ala Tyr Gly Glu Pro Arg Lys Leu
1 5

<210> 352
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 352
Thr Ser Cys Ile Leu Glu Ser Leu Phe Arg Ala Val Ile Thr Lys
1 5 10 15

<210> 353
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 353
Pro Arg Ala Leu Ala Glu Thr Ser Tyr Val Lys Val Leu Glu Tyr
1 5 10 15

<210> 354
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 354
Phe Leu Leu Leu Lys Tyr Arg Ala Arg Glu Pro Val Thr Lys Ala Glu
1 5 10 15

<210> 355
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 355

Glu Tyr Val Ile Lys Val Ser Ala Arg Val Arg Phe
1 5 10

<210> 356
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 356
Tyr Leu Gln Leu Val Phe Gly Ile Glu Val
1 5 10

<210> 357
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 357
Glu Tyr Leu Gln Leu Val Phe Gly Ile
1 5

<210> 358
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 358
Glu Gly Asp Cys Ala Pro Glu Glu Lys
1 5

<210> 359
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

peptide

<400> 359
Leu Leu Lys Tyr Arg Ala Arg Glu Pro Val Thr Lys Ala Glu
1 5 10

<210> 360
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 360
Lys Ala Ser Glu Lys Ile Phe Tyr Val
1 5

<210> 361
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 361
Glu Lys Ile Gln Lys Ala Phe Asp Asp Ile Ala Lys Tyr Phe Ser Lys
1 5 10 15

<210> 362
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 362
Phe Gly Arg Leu Gln Gly Ile Ser Pro Lys Ile
1 5 10

<210> 363
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 363
Trp Glu Lys Met Lys Ala Ser Glu Lys Ile Phe Tyr Val Tyr Met Lys
1 5 10 15

Arg Lys

<210> 364
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 364
Lys Ile Phe Tyr Val Tyr Met Lys Arg Lys Tyr Glu Ala Met Thr
1 5 10 15

<210> 365
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 365
Lys Ile Phe Tyr Val Tyr Met Lys Arg Lys Tyr Glu Ala Met
1 5 10

<210> 366
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 366
Cys Glu Phe His Ala Cys Trp Pro Ala Phe Thr Val Leu Gly Glu

1 5 10 15

<210> 367
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<400> 367
Lys Phe Leu Asp Ala Leu Ile Ser Leu
1 5

<210> 368
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
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<400> 368
Ala Leu Gly Gly His Pro Leu Leu Gly Val
1 5 10

<210> 369
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<400> 369
Leu Pro Arg Trp Pro Pro Pro Gln Leu
1 5

<210> 370
<211> 9
<212> PRT
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<220>
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<400> 370
Ile Leu Ala Lys Phe Leu His Trp Leu
1   5

<210> 371
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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      peptide

<400> 371
Arg Leu Val Asp Asp Phe Leu Leu Val
1   5

<210> 372
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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      peptide

<400> 372
Arg Pro Gly Leu Leu Gly Ala Ser Val Leu Gly Leu Asp Asp Ile
1   5   10   15

<210> 373
<211> 15
<212> PRT
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<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 373
Leu Thr Asp Leu Gln Pro Tyr Met Arg Gln Phe Val Ala His Leu
1   5   10   15

<210> 374
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 374
Val Val Val Gly Ala Val Gly Val Gly
1 5

<210> 375
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 375
His Leu Ser Thr Ala Phe Ala Arg Val
1 5

<210> 376
<211> 9
<212> PRT
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<220>
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peptide

<400> 376
Lys Ile Phe Gly Ser Leu Ala Phe Leu
1 5

<210> 377
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 377
Ile Ile Ser Ala Val Val Gly Ile Leu
1 5

<210> 378
<211> 9

<212> PRT
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<220>
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peptide

<400> 378
Ala Leu Cys Arg Trp Gly Leu Leu Leu
1 5

<210> 379
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 379
Ile Leu His Asn Gly Ala Tyr Ser Leu
1 5

<210> 380
<211> 9
<212> PRT
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<220>
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peptide

<400> 380
Arg Leu Leu Gln Glu Thr Glu Leu Val
1 5

<210> 381
<211> 9
<212> PRT
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<220>
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peptide

<400> 381
Val Val Lys Gly Val Val Phe Gly Ile
1 5

<210> 382
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 382
Tyr Met Ile Met Val Lys Cys Trp Met Ile
1 5 10

<210> 383
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 383
Ser Leu Leu Ser Gly Asp Trp Val Leu
1 5

<210> 384
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 384
Gly Leu Gln Leu Gly Val Gln Ala Val
1 5

<210> 385
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 385

Pro Leu Thr Glu Tyr Ile Gln Pro Val
1 5

<210> 386
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 386
Ser Pro Arg Trp Trp Pro Thr Cys Leu
1 5

<210> 387
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<400> 387
Gly Val Ala Leu Gln Thr Met Lys Gln
1 5

<210> 388
<211> 9
<212> PRT
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<220>
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<400> 388
Phe Met Asn Lys Phe Ile Tyr Glu Ile
1 5

<210> 389
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 389
Gln Leu Ala Val Ser Val Ile Leu Arg Val
1 5 10

<210> 390
<211> 14
<212> PRT
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<220>
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<400> 390
Leu Pro Ala Val Val Gly Leu Ser Pro Gly Glu Gln Glu Tyr
1 5 10

<210> 391
<211> 9
<212> PRT
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<220>
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<400> 391
Asn Tyr Ala Arg Thr Glu Asp Phe Phe
1 5

<210> 392
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<400> 392
Phe Leu Ile Ile Trp Gln Asn Thr Met
1 5

<210> 393
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 393
Thr Leu Tyr Gln Asp Asp Thr Leu Thr Leu Gln Ala Ala Gly
1 5 10

<210> 394
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 394
Ser Leu Tyr Lys Phe Ser Pro Phe Pro Leu
1 5 10

<210> 395
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 395
Lys Glu Leu Glu Gly Ile Leu Leu Leu
1 5

<210> 396
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 396
Arg Leu Ser Ser Cys Val Pro Val Ala
1 5

<210> 397

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

<220>
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peptide

<400> 397
Val Leu Leu Gln Ala Gly Ser Leu His Ala
1 5 10

<210> 398
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 398
Leu Leu Asn Ala Phe Thr Val Thr Val
1 5

<210> 399
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 399
Val Leu Phe Tyr Leu Gly Gln Tyr
1 5

<210> 400
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 400
Phe Ile Ala Ser Asn Gly Val Lys Leu Val
1 5 10

<210> 401
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<400> 401
Glu Thr Val Ser Glu Gln Ser Asn Val
1 5

<210> 402
<211> 9
<212> PRT
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<220>
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<400> 402
Phe Leu Asp Glu Phe Met Glu Gly Val
1 5

<210> 403
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
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<400> 403
Gln Gln Ile Thr Lys Thr Glu Val
1 5

<210> 404
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 404
Tyr Arg Pro Arg Pro Arg Arg Tyr
1 5

<210> 405
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<400> 405
Ala Leu Lys Asp Val Glu Glu Arg Val
1 5

<210> 406
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 406
Ile Ser Gly Gly Pro Arg Ile Ser Tyr
1 5

<210> 407
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 407
Arg Gln Lys Lys Ile Arg Ile Gln Leu
1 5

<210> 408
<211> 16
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 408
His Leu Gly Ser Arg Gln Lys Lys Ile Arg Ile Gln Leu Arg Ser Gln
1 5 10 15

<210> 409
<211> 17
<212> PRT
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<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 409
Cys Ala Thr Trp Lys Val Ile Cys Lys Ser Cys Ile Ser Gln Thr Pro
1 5 10 15

Gly

<210> 410
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 410
Phe Leu Gly Tyr Leu Ile Leu Gly Val
1 5

<210> 411
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 411
Met Ile Ala Val Phe Leu Pro Ile Val
1 5

<210> 412
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 412
His Gln Gln Tyr Phe Tyr Lys Ile Pro Ile Leu Val Ile Asn Lys
1 5 10 15

<210> 413
<211> 9
<212> PRT
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<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 413
Phe Leu Phe Leu Leu Phe Phe Trp Leu
1 5

<210> 414
<211> 9
<212> PRT
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<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 414
Thr Leu Met Ser Ala Met Thr Asn Leu
1 5

<210> 415
<211> 9
<212> PRT
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<220>
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peptide

<400> 415

Ala Leu Asp Val Tyr Asn Gly Leu Leu
1   5

<210> 416
<211> 10
<212> PRT
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<220>
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      peptide

<400> 416
Phe Leu Thr Pro Lys Lys Leu Gln Cys Val
1   5   10

<210> 417
<211> 10
<212> PRT
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<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 417
Val Ile Ser Asn Asp Val Cys Ala Gln Val
1   5   10

<210> 418
<211> 9
<212> PRT
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<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 418
Tyr Tyr Trp Pro Arg Pro Arg Arg Tyr
1   5

<210> 419
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

peptide

<400> 419
Asn Thr Tyr Ala Ser Pro Arg Phe Lys
1 5

<210> 420
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 420
Ser Leu Phe Glu Gly Ile Asp Ile Tyr Thr
1 5 10

<210> 421
<211> 9
<212> PRT
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<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 421
Ala Leu Ser Val Met Gly Val Tyr Val
1 5

<210> 422
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 422
Gly Leu Gln Leu Gly Val Gln Ala
1 5

<210> 423
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 423
Tyr Ser Val Tyr Phe Asn Leu Pro Ala Asp Thr Ile Tyr Thr Asn
1 5 10 15

<210> 424
<211> 29
<212> PRT
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<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 424
Glu Asp Leu Thr Val Lys Ile Gly Asp Phe Gly Leu Ala Thr Glu Lys
1 5 10 15

Ser Arg Trp Ser Gly Ser His Gln Phe Glu Gln Leu Ser
20 25

<210> 425
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 425
Ser Tyr Leu Asp Ser Gly Ile His Phe
1 5

<210> 426
<211> 12
<212> PRT
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<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 426
Phe Ser Trp Ala Met Asp Leu Asp Pro Lys Gly Ala

1 5 10

<210> 427
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 427
Ala Cys Asp Pro His Ser Gly His Phe Val
1 5 10

<210> 428
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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<400> 428
Cys Ile Leu Gly Lys Leu Phe Thr Lys
1 5

<210> 429
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 429
Ala Val Cys Pro Trp Thr Trp Leu Arg
1 5

<210> 430
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 430
Ile Leu Asp Lys Val Leu Val His Leu
1 5

<210> 431
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 431
Gly Leu Phe Gly Asp Ile Tyr Leu Ala
1 5

<210> 432
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 432
Met Ile Phe Glu Lys His Gly Phe Arg Arg Thr Thr Pro Pro
1 5 10

<210> 433
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 433
Ser Leu Ala Asp Glu Ala Glu Val Tyr Leu
1 5 10

<210> 434
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 434
Thr Leu Asp Trp Leu Leu Gln Thr Pro Lys
1 5 10

<210> 435
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 435
Ile Leu Asn Ala Met Ile Ala Lys Ile
1 5

<210> 436
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 436
Trp Arg Arg Ala Pro Ala Pro Gly Ala
1 5

<210> 437
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 437
Pro Val Thr Trp Arg Arg Ala Pro Ala
1 5

<210> 438
<211> 11

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 438
Phe Leu Glu Gly Asn Glu Val Gly Lys Thr Tyr
1 5 10

<210> 439
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 439
Lys Thr Leu Thr Ser Val Phe Gln Lys
1 5

<210> 440
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 440
Glu Glu Lys Leu Ile Val Val Leu Phe
1 5

<210> 441
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 441
Ser Glu Leu Phe Arg Ser Gly Leu Asp Ser Tyr
1 5 10

<210> 442
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 442
Phe Arg Ser Gly Leu Asp Ser Tyr Val
1 5

<210> 443
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 443
Glu Ala Phe Ile Gln Pro Ile Thr Arg
1 5

<210> 444
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 444
Arg Val Ile Lys Asn Ser Ile Arg Leu Thr Leu
1 5 10

<210> 445
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 445

Lys Ile Asn Lys Asn Pro Lys Tyr Lys
1 5

<210> 446
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 446
Tyr Thr Asp Phe His Cys Gln Tyr Val
1 5

<210> 447
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 447
Leu Leu Leu Asp Asp Leu Leu Val Ser Ile
1 5 10

<210> 448
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 448
Pro Tyr Tyr Phe Ala Ala Glu Leu Pro Pro Arg Asn Leu Pro Glu Pro
1 5 10 15

<210> 449
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

peptide

<400> 449
Ile Leu Asp Thr Ala Gly Arg Glu Glu Tyr
1 5 10

<210> 450
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 450
Arg Pro His Val Pro Glu Ser Ala Phe
1 5

<210> 451
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 451
Lys Ile Phe Ser Glu Val Thr Leu Lys
1 5

<210> 452
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 452
Ser His Glu Thr Val Ile Ile Glu Leu
1 5

<210> 453
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 453
Gly Glu Leu Ile Gly Ile Leu Asn Ala Ala Lys Val Pro Ala Asp
1 5 10 15

<210> 454
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 454
Leu Tyr Ser Ala Cys Phe Trp Trp Leu
1 5

<210> 455
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 455
Val Leu His Trp Asp Pro Glu Thr Val
1 5

<210> 456
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 456
Met Ser Leu Gln Arg Gln Phe Leu Arg
1 5

<210> 457

<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 457
Ile Ser Pro Asn Ser Val Phe Ser Gln Trp Arg Val Val Cys Asp Ser
1 5 10 15

Leu Glu Asp Tyr
20

<210> 458
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 458
Ser Leu Pro Tyr Trp Asn Phe Ala Thr Gly
1 5 10

<210> 459
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 459
Ser Gln Trp Arg Val Val Cys Asp Ser Leu Glu Asp Tyr Asp Thr
1 5 10 15

<210> 460
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 460
Ser Val Tyr Asp Phe Phe Val Trp Leu
1 5

<210> 461
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 461
Thr Leu Asp Ser Gln Val Met Ser Leu
1 5

<210> 462
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 462
Leu Leu Gly Pro Gly Arg Pro Tyr Arg
1 5

<210> 463
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 463
Ala Asn Asp Pro Ile Phe Val Val Leu
1 5

<210> 464
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 464
Gln Cys Thr Glu Val Arg Ala Asp Thr Arg Pro Trp Ser Gly Pro
1 5 10 15

<210> 465
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 465
Ala Leu Pro Tyr Trp Asn Phe Ala Thr Gly
1 5 10

<210> 466
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 466
Lys Cys Asp Ile Cys Thr Asp Glu Tyr
1 5

<210> 467
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 467
Ser Ser Asp Tyr Val Ile Pro Ile Gly Thr Tyr
1 5 10

<210> 468
<211> 9

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 468
Met Leu Leu Ala Val Leu Tyr Cys Leu
1 5

<210> 469
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 469
Cys Leu Leu Trp Ser Phe Gln Thr Ser Ala
1 5 10

<210> 470
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 470
Tyr Met Asp Gly Thr Met Ser Gln Val
1 5

<210> 471
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 471
Ile Tyr Met Asp Gly Thr Ala Asp Phe Ser Phe
1 5 10

<210> 472
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 472
Gln Cys Ser Gly Asn Phe Met Gly Phe
1 5

<210> 473
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 473
Thr Pro Arg Leu Pro Ser Ser Ala Asp Val Glu Phe
1 5 10

<210> 474
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 474
Leu Pro Ser Ser Ala Asp Val Glu Phe
1 5

<210> 475
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 475

Leu His His Ala Phe Val Asp Ser Ile Phe
1   5   10

<210> 476
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 476
Ser Glu Ile Trp Arg Asp Ile Asp Phe
1   5

<210> 477
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 477
Gln Asn Ile Leu Leu Ser Asn Ala Pro Leu Gly Pro Gln Phe Pro
1   5   10   15

<210> 478
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 478
Ser Tyr Leu Gln Asp Ser Asp Pro Asp Ser Phe Gln Asp
1   5   10

<210> 479
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

peptide

<400> 479
Phe Leu Leu His His Ala Phe Val Asp Ser Ile Phe Glu Gln Trp Leu
1 5 10 15

Gln Arg His Arg Pro
20

<210> 480
<211> 30
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 480
Tyr Thr Thr Ala Glu Glu Ala Ala Gly Ile Gly Ile Leu Thr Val Ile
1 5 10 15

Leu Gly Val Leu Leu Leu Ile Gly Cys Trp Tyr Cys Arg Arg
20 25 30

<210> 481
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 481
Ala Leu Asn Phe Pro Gly Ser Gln Lys
1 5

<210> 482
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 482

Val Tyr Phe Phe Leu Pro Asp His Leu
1   5

<210> 483
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 483
Arg Thr Lys Gln Leu Tyr Pro Glu Trp
1   5

<210> 484
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 484
His Thr Met Glu Val Thr Val Tyr His Arg
1   5   10

<210> 485
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 485
Ser Ser Pro Gly Cys Gln Pro Pro Ala
1   5

<210> 486
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

peptide

<400> 486
Val Pro Leu Asp Cys Val Leu Tyr Arg Tyr
1 5 10

<210> 487
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 487
Leu Pro His Ser Ser Ser His Trp Leu
1 5

<210> 488
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 488
Ser Asn Asp Gly Pro Thr Leu Ile
1 5

<210> 489
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 489
Gly Arg Ala Met Leu Gly Thr His Thr Met Glu Val Thr Val Tyr
1 5 10 15

<210> 490
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 490
Trp Asn Arg Gln Leu Tyr Pro Glu Trp Thr Glu Ala Gln Arg Leu Asp
1 5 10 15

<210> 491
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 491
Thr Thr Glu Trp Val Glu Thr Thr Ala Arg Glu Leu Pro Ile Pro Glu
1 5 10 15

Pro Glu

<210> 492
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 492
Thr Gly Arg Ala Met Leu Gly Thr His Thr Met Glu Val Thr Val Tyr
1 5 10 15

His

<210> 493
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

peptide

<400> 493
Val Leu Pro Asp Val Phe Ile Arg Cys Val
1 5 10

<210> 494
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 494
Arg Tyr Cys Asn Leu Glu Gly Pro Pro Ile
1 5 10

<210> 495
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 495
Lys Trp Thr Glu Pro Tyr Cys Val Ile Ala Ala Val Lys Ile Phe Pro
1 5 10 15

Arg Phe Phe Met Val Ala Lys Gln
20

<210> 496
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 496
Lys Cys Cys Lys Ile Arg Tyr Cys Asn Leu Glu Gly Pro Pro Ile Asn
1 5 10 15

Ser Ser Val Phe
20

<210> 497
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 497
Gly Leu Tyr Asp Gly Met Glu His Leu
1 5

<210> 498
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 498
Phe Leu Trp Gly Pro Arg Ala Leu Val
1 5

<210> 499
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 499
Val Arg Ile Gly His Leu Tyr Ile Leu
1 5

<210> 500
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

peptide

<400> 500
Arg Glu Pro Phe Thr Lys Ala Glu Met Leu Gly Ser Val Ile Arg
1 5 10 15

<210> 501
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 501
Ala Glu Leu Val His Phe Leu Leu Leu Lys Tyr Arg Ala Arg
1 5 10

<210> 502
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 502
Leu Leu Phe Gly Leu Ala Leu Ile Glu Val
1 5 10

<210> 503
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 503
Ser Glu Ser Ile Lys Lys Lys Val Leu
1 5

<210> 504
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 504
Ala Ser Ser Thr Leu Tyr Leu Val Phe
1 5

<210> 505
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 505
Ser Ser Thr Leu Tyr Leu Val Phe Ser Pro Ser Ser Phe Ser Thr
1 5 10 15

<210> 506
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 506
Gln Gly Gln His Phe Leu Gln Lys Val
1 5

<210> 507
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 507
Glu Val Ile Ser Cys Lys Leu Ile Lys Arg
1 5 10

<210> 508

<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 508
Phe Pro Ser Asp Ser Trp Cys Tyr Phe
1 5

<210> 509
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 509
Leu Tyr Ala Thr Val Ile His Asp Ile
1 5

<210> 510
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 510
Ser Ser Lys Ala Leu Gln Arg Pro Val
1 5

<210> 511
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 511
Gly Phe Lys Gln Ser Ser Lys Ala Leu
1 5

<210> 512
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 512
Ala Thr Gly Phe Lys Gln Ser Ser Lys Ala Leu Gln Arg Pro Val Ala
1 5 10 15

Ser

<210> 513
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 513
Thr Met Lys Gln Ile Cys Lys Lys Glu Ile Arg Arg Leu His Gln Tyr
1 5 10 15

<210> 514
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 514
Lys Ile Leu Asp Ala Val Val Ala Gln Lys
1 5 10

<210> 515
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 515
Arg Ile Ala Glu Cys Ile Leu Gly Met
1 5

<210> 516
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 516
Ile Gly Arg Ile Ala Glu Cys Ile Leu Gly Met Asn Pro Ser Arg
1 5 10 15

<210> 517
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 517
Tyr Val Asp Phe Arg Glu Tyr Glu Tyr Tyr
1 5 10

<210> 518
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 518
Phe Leu Asp Arg Phe Leu Ser Cys Met
1 5

<210> 519
<211> 11

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 519
Ser Leu Ile Ala Ala Ala Ala Phe Cys Leu Ala
1 5 10

<210> 520
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 520
Val Val Met Ser Trp Ala Pro Pro Val
1 5

<210> 521
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 521
Asn Ser Asn His Val Ala Ser Gly Ala Gly Glu Ala Ala Ile Glu Thr
1 5 10 15

Gln Ser Ser Ser Ser Glu Glu Ile Val
20 25

<210> 522
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 522
Ile Leu Phe Gly Ile Ser Leu Arg Glu Val
1   5   10

<210> 523
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 523
Lys Val Val Glu Phe Leu Ala Met Leu
1   5

<210> 524
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 524
Ser Ser Ala Leu Leu Ser Ile Phe Gln Ser Ser Pro Glu
1   5   10

<210> 525
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 525
Ser Phe Ser Tyr Thr Leu Leu Ser Leu
1   5

<210> 526
<211> 9
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 526
Val Ser Ser Phe Phe Ser Tyr Thr Leu
1 5

<210> 527
<211> 93
<212> PRT
<213> Vaccinia virus

<400> 527
Met His His Pro Met Glu Ser Val Lys Thr Thr Asn Thr Asn Ala Ile
1 5 10 15

Ile Cys Val Arg Glu His Thr Leu Pro Asp Tyr Ala Asn Thr Gln Cys
20 25 30

Thr Pro Cys Gly Ser Gly Thr Phe Thr Ser Arg Asn Asn His Leu Pro
35 40 45

Ala Cys Leu Ser Cys Asn Gly Arg Arg Asp Arg Val Thr Leu Leu Thr
50 55 60

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

His Pro Asp Ala Arg His Val Phe Pro Lys Gln Asn Val
85 90

<210> 528
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 528
Lys Pro Leu Phe Arg Arg Met Ser Ser Leu Glu Leu Val Ile Ala
1 5 10 15

<210> 529

<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 529
Met Val Lys Ile Ser Gly Gly Pro Arg
1 5

<210> 530
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 530
Glu Val Asp Pro Ile Gly His Val Tyr
1 5

<210> 531
<211> 244
<212> PRT
<213> Vaccinia virus

<400> 531
Met His Val Pro Ala Ser Leu Gln Gln Ser Ser Ser Ser Ser Ser Ser
1 5 10 15

Cys Thr Glu Glu Glu Asn Lys His His Met Gly Ile Asp Val Ile Ile
20 25 30

Lys Val Thr Lys Gln Asp Gln Thr Pro Thr Asn Asp Lys Ile Cys Gln
35 40 45

Ser Val Thr Glu Ile Thr Glu Ser Glu Ser Asp Pro Asp Pro Glu Val
50 55 60

Glu Ser Glu Asp Asp Ser Thr Ser Val Glu Asp Val Asp Pro Pro Thr
65 70 75 80

Thr Tyr Tyr Ser Ile Ile Gly Gly Gly Leu Arg Met Asn Phe Gly Phe
85 90 95

Thr Lys Cys Pro Gln Ile Lys Ser Ile Ser Glu Ser Ala Asp Gly Asn
100 105 110

Thr Val Asn Ala Arg Leu Ser Ser Val Ser Pro Gly Gln Gly Lys Asp
115 120 125

Ser Pro Ala Ile Thr His Glu Glu Ala Leu Ala Met Ile Lys Asp Cys
130 135 140

Glu Val Ser Ile Asp Ile Arg Cys Ser Glu Glu Glu Lys Asp Ser Asp
145 150 155 160

Ile Lys Thr His Pro Val Leu Gly Ser Asn Ile Ser His Lys Lys Val
165 170 175

Ser Tyr Glu Asp Ile Ile Gly Ser Thr Ile Val Asp Thr Lys Cys Val
180 185 190

Lys Asn Leu Glu Phe Ser Val Arg Ile Gly Asp Met Cys Lys Glu Ser
195 200 205

Ser Glu Leu Glu Val Lys Asp Gly Phe Lys Tyr Val Asp Gly Ser Ala
210 215 220

Ser Glu Gly Ala Thr Asp Asp Thr Ser Leu Ile Asp Ser Thr Lys Leu
225 230 235 240

Lys Ala Cys Val

<210> 532
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 532
Glu Val Asp Pro Ile Gly His Leu Tyr
1   5

<210> 533
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 533
Lys Val Ala Glu Leu Val His Phe Leu
1   5

<210> 534
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 534
Thr Phe Pro Asp Leu Glu Ser Glu Phe
1   5

<210> 535
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 535
Val Ala Glu Leu Val His Phe Leu Leu
1   5

<210> 536
<211> 10
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 536
Met Glu Val Asp Pro Ile Gly His Leu Tyr
1 5 10

<210> 537
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 537
Ala Glu Leu Val His Phe Leu Leu Leu
1 5

<210> 538
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 538
Trp Gln Tyr Phe Phe Pro Val Ile Phe
1 5

<210> 539
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 539
Lys Lys Leu Leu Thr Gln His Phe Val Gln Glu Asn Tyr Leu Glu Tyr
1 5 10 15

<210> 540
<211> 15
<212> PRT

<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 540
Arg Lys Val Ala Glu Leu Val His Phe Leu Leu Leu Lys Tyr Arg
1 5 10 15

<210> 541
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 541
Ala Cys Tyr Glu Phe Leu Trp Gly Pro Arg Ala Leu Val Glu Thr Ser
1 5 10 15

<210> 542
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 542
Val Ile Phe Ser Lys Ala Ser Ser Ser Leu Gln Leu
1 5 10

<210> 543
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 543
Val Phe Gly Ile Glu Leu Met Glu Val Asp Pro Ile Gly His Leu
1 5 10 15

<210> 544
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 544
Gly Asp Asn Gln Ile Met Pro Lys Ala Gly Leu Leu Ile Ile Val
1 5 10 15

<210> 545
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 545
Thr Ser Tyr Val Lys Val Leu His His Met Val Lys Ile Ser Gly
1 5 10 15

<210> 546
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 546
Arg Lys Val Ala Glu Leu Val His Phe Leu Leu Leu Lys Tyr Arg Ala
1 5 10 15

<210> 547
<211> 309
<212> PRT
<213> Vaccinia virus

<400> 547
Ile Glu Leu Leu Lys Thr Met Asp Leu Arg Lys Arg Asp Leu Gly Pro
1 5 10 15

Ala Phe Thr Glu Leu Ile Ser Gly Leu Ala Lys Leu Lys Thr Ser Lys

```
            20                  25                  30

Tyr Thr Tyr Thr Asp Leu Thr Tyr Gln Ser Phe Val Asp Asn Thr Val
        35                  40                  45

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

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

Glu Arg Arg Ser Gly Met Ser Asn Val Val Asp Ser Asn Met Leu Asp
                85                  90                  95

Asn Asn Thr Leu Trp Ala Ile Ile Asn Thr Ile Tyr Phe Lys Gly Ile
            100                 105                 110

Trp Gln Tyr Pro Phe Asp Ile Thr Lys Thr Arg Asn Ala Ser Phe Thr
        115                 120                 125

Asn Lys Tyr Gly Thr Lys Thr Val Pro Met Met Asn Val Val Thr Lys
    130                 135                 140

Leu Gln Gly Asn Thr Ile Thr Ile Asp Asp Glu Glu Tyr Asp Met Val
145                 150                 155                 160

Arg Leu Pro Tyr Lys Asp Ala Asn Ile Ser Met Tyr Leu Ala Ile Gly
                165                 170                 175

Asp Asn Met Thr His Phe Thr Asp Ser Ile Thr Ala Ala Lys Leu Asp
            180                 185                 190

Tyr Trp Ser Ser Gln Leu Gly Asn Lys Val Tyr Asn Leu Lys Leu Pro
        195                 200                 205

Lys Phe Ser Ile Glu Asn Lys Arg Asp Ile Lys Ser Ile Ala Glu Met
    210                 215                 220

Met Ala Pro Ser Met Phe Asn Pro Asp Asn Ala Ser Phe Lys His Met
225                 230                 235                 240
```

```
Thr Arg Asp Pro Leu Tyr Ile Tyr Lys Met Phe Gln Asn Ala Lys Ile
                245                 250                 255


Asp Val Asp Glu Gln Gly Thr Val Ala Glu Ala Ser Thr Ile Met Val
            260                 265                 270


Ala Thr Ala Arg Ser Ser Pro Glu Lys Leu Glu Phe Asn Thr Pro Phe
        275                 280                 285


Val Phe Ile Ile Arg His Asp Ile Thr Gly Phe Ile Leu Phe Met Gly
    290                 295                 300


Lys Val Glu Ser Pro
305


<210> 548
<211> 222
<212> PRT
<213> Vaccinia virus

<400> 548
Met Asn His Cys Leu Leu Ala Ile Ser Ala Val Tyr Phe Lys Ala Lys
1               5                   10                  15


Trp Leu Thr Pro Phe Glu Lys Glu Phe Thr Ser Asp Tyr Pro Phe Tyr
            20                  25                  30


Val Ser Pro Thr Glu Met Val Asp Val Ser Met Met Ser Met Tyr Gly
        35                  40                  45


Lys Ala Phe Asn His Ala Ser Val Lys Glu Ser Phe Gly Asn Phe Ser
    50                  55                  60


Ile Ile Glu Leu Pro Tyr Val Gly Asp Thr Ser Met Met Val Ile Leu
65                  70                  75                  80


Pro Asp Lys Ile Asp Gly Leu Glu Ser Ile Glu Gln Asn Leu Thr Asp
                85                  90                  95


Thr Asn Phe Lys Lys Trp Cys Asp Phe Met Asp Ala Met Phe Ile Asp
```

```
            100                 105                 110

Val His Ile Pro Lys Phe Lys Val Thr Gly Ser Tyr Asn Leu Val Asp
        115                 120                 125

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

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

Lys Thr Tyr Ile Asp Val Asn Glu Glu Tyr Thr Glu Ala Ala Ala Ala
                165                 170                 175

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

Cys Ala Asp His Pro Phe Ile Tyr Val Ile Arg His Val Asp Gly Lys
        195                 200                 205

Ile Leu Phe Val Gly Arg Tyr Cys Ser Pro Thr Thr Asn Cys
    210                 215                 220
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<210> 549
<211> 289
<212> PRT
<213> Vaccinia virus

<400> 549

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Met Glu Leu Glu Asn Glu Pro Val Ile Leu Pro Cys Pro Gln Ile Asn
1               5                   10                  15

Thr Leu Ser Ser Gly Tyr Asn Ile Leu Asp Ile Leu Trp Glu Lys Arg
            20                  25                  30

Gly Ala Asp Asn Asp Arg Ile Ile Pro Ile Asp Asn Gly Ser Asn Met
        35                  40                  45

Leu Ile Leu Asn Pro Thr Gln Ser Asp Ser Gly Ile Tyr Ile Cys Ile
    50                  55                  60
```

```
Thr Thr Asn Glu Thr Tyr Cys Asp Met Met Ser Leu Asn Leu Thr Ile
65                  70                  75                  80

Val Ser Val Leu Glu Ser Asn Ile Asp Leu Ile Ser Tyr Pro Gln Ile
                85                  90                  95

Val Asn Glu Arg Ser Thr Gly Glu Met Val Cys Pro Asn Ile Asn Ala
            100                 105                 110

Phe Ile Ala Ser Asn Val Asn Ala Asp Ile Ile Trp Ser Gly His Arg
        115                 120                 125

Arg Leu Arg Asn Lys Arg Leu Lys Gln Arg Thr Pro Gly Ile Ile Thr
    130                 135                 140

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

Glu Tyr Ile Tyr Arg Gly Lys Thr Tyr Asn Val Thr Arg Ile Val Lys
                165                 170                 175

Leu Glu Val Arg Asp Lys Ile Ile Pro Ser Thr Met Gln Leu Pro Asp
            180                 185                 190

Gly Ile Val Thr Ser Ile Gly Ser Asn Leu Thr Ile Ala Cys Arg Val
        195                 200                 205

Ser Leu Arg Pro Pro Thr Thr Asp Ala Asp Val Phe Trp Ile Ser Asn
    210                 215                 220

Gly Met Tyr Tyr Glu Glu Asp Asp Gly Asp Gly Asn Gly Arg Ile Ser
225                 230                 235                 240

Val Ala Asn Lys Ile Tyr Met Thr Asp Lys Arg Arg Val Ile Thr Ser
                245                 250                 255

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

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

Ile

<210> 550
<211> 827
<212> DNA
<213> Vaccinia virus

<400> 550
acaacaccat gagatatatt ataattctcg cagttttgtt cattaatagt atacacgcta 60

aaataactag ttataagttt gaatccgtca attttgattc caaaattgaa tggactgggg 120

atggtctata caatatatcc cttaaaaatt atggcatcaa gacgtggcaa acaatgtata 180

caaatgtacc agaaggaaca tacgacatat ccgcatttcc aaagaatgat ttcgtatctt 240

tctgggttaa atttgaacaa ggcgattata aagtggaaga gtattgtacg ggactatgcg 300

tcgaagtaaa aattggacca ccgactgtaa cattgactga atacgacgac catatcaatt 360

tgtacatcga gcatccgtat gctactagag gtagcaaaaa gattcctatt tacaaacgcg 420

gtgacatgtg tgatatctac ttgttgtata cggctaactt cacattcgga gattctgaag 480

aaccagtaac atatgatatc gatgactacg attgcacgtc tacaggttgc agcatagact 540

ttgccacaac agaaaaagtg tgcgtgacag cacagggagc cacagaaggg tttctcgaaa 600

aaattactcc atggagttcg gaagtatgtc tgacacctaa aaagaatgta tatacatgtg 660

caattagatc caaagaagat gttcccaatt tcaaggacaa aatggccaga gttatcaaga 720

gaaaatttaa taaacagtct caatcttatt taactaaatt tctcggtagc acatcaaatg 780

atgttaccac ttttcttagc atgcttaact tgactaaata ttcataa 827

<210> 551
<211> 15
<212> DNA
<213> Vaccinia virus

<400> 551
aaaatttaat aaaca 15

<210> 552
<211> 150

<212> DNA
<213> Vaccinia virus

<400> 552
gatgttccca atttcaagga caaaatggcc agagttatca agagaaaatt taataaacag 60

tctcaatctt atttaactaa atttctcggt agcacatcaa atgatgttac cacttttctt 120

agcatgctta acttgactaa atattcataa 150

<210> 553
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 553
taaaaaatga aaataaatac aaaggttctt 30

<210> 554
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 554
aaattgaaag cgagaaataa tcataaat 28

<210> 555
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 555
aaaattgaaa tttta 15

<210> 556
<211> 29
<212> DNA

<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 556
ttttattttt ttttttgga atataaata 29

<210> 557
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 557
aaaattgaaa ttttattttt ttttttgga atataaata 39

<210> 558
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 558
aaaattgaaa aaata 15

<210> 559
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 559
ttttattttt ttttttgga atataaatat ccggtaaaat tgaaaaaata 50

<210> 560
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<220>
<221> modified_base
<222> (3)..(3)
<223> a, c, t, g, unknown or other

<220>
<221> modified_base
<222> (10)..(10)
<223> a, c, t, g, unknown or other

<220>
<221> modified_base
<222> (18)..(21)
<223> a, c, t, g, unknown or other

<400> 560
ttnttttttn ttttttnnn ntataaat 28

<210> 561
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 561
ttgtattttc ttttgttggc atataaat 28

<210> 562
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 562
tttattgtaa gctttttcca ttttaaat 28

<210> 563
<211> 28

<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 563
tcattttgtt tttttctatg ctataaat 28

<210> 564
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 564
taaaaattta aaatatatta tcacttcagt 30

<210> 565
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 565
aaaaaactga tattatataa atattttagt 30

<210> 566
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<220>
<221> modified_base
<222> (1)..(2)
<223> a, c, t, g, unknown or other

<220>

<221> modified_base
<222> (7)..(7)
<223> a, c, t, g, unknown or other

<220>
<221> modified_base
<222> (14)..(14)
<223> a, c, t, g, unknown or other

<220>
<221> modified_base
<222> (18)..(30)
<223> a, c, t, g, unknown or other

<400> 566
nnaaaantga aaanatannn nnnnnnnnnn 30

<210> 567
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 567
aaaaaaatga taaagtaggt tcagttttat 30

<210> 568
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 568
taaaaagtga aaaacaatat tatttttatc 30

<210> 569
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 569
aaaattaaaa aataacttaa tttattattg 30

<210> 570
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 570
Gly Ser Gly Glu Gly Arg Gly Ser Leu Leu Thr Cys Gly Asp Val Glu
1 5 10 15

Glu Asn Pro Gly Pro
20

<210> 571
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 571
Pro Arg Gly Ser Gly Glu Gly Arg Gly Ser Leu Leu Thr Cys Gly Asp
1 5 10 15

Val Glu Glu Asn Pro Gly Pro
20

<210> 572
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 572
Glu Gly Arg Gly Ser Leu Leu Thr Cys Gly Asp Val Glu Glu Asn Pro
1 5 10 15

Gly Pro

<210> 573
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 573
Gly Ser Gly Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly Asp Val
1 5 10 15

Glu Glu Asn Pro Gly Pro
20

<210> 574
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 574
Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly Asp Val Glu Glu Asn
1 5 10 15

Pro Gly Pro

<210> 575
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 575
Gly Ser Gly Gln Cys Thr Asn Tyr Ala Leu Leu Lys Leu Ala Gly Asp
1 5 10 15

Val Glu Ser Asn Pro Gly Pro
            20

<210> 576
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 576
Gln Cys Thr Asn Tyr Ala Leu Leu Lys Leu Ala Gly Asp Val Glu Ser
1   5   10   15

Asn Pro Gly Pro
            20

<210> 577
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 577
Gly Ser Gly Val Lys Gln Thr Leu Asn Phe Asp Leu Leu Lys Leu Ala
1   5   10   15

Gly Asp Val Glu Ser Asn Pro Gly Pro
            20   25

<210> 578
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      peptide

<400> 578
Val Lys Gln Thr Leu Asn Phe Asp Leu Leu Lys Leu Ala Gly Asp Val

1 5 10 15

Glu Ser Asn Pro Gly Pro
20

<210> 579
<211> 846
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 579
atggagacag atactctatt gctatgggtt ttgttattat gggtgccggg ttccacggga 60

attcgtcgtg ctgacattgt tttaacacag tctccaggta ccctatcatt gtcccctggt 120

gagcgtgcca cgcttagttg cagagcctct cagtctgtgg gatcaagtta tttagcttgg 180

tatcaacaaa aacctggaca agcacctcgt ttgttaatat atggtgcatt cagtagagca 240

actggaattc ctgatcgatt ctcaggatct ggatctggaa cagacttcac acttaccatc 300

tcacgtcttg aacccgagga ctttgcggtc tactactgcc agcagtatgg ttcgtcgcct 360

tggactttcg gacaaggaac caaagttgaa atcaagcgag gaggaggtgg atcgggtggt 420

ggaggatccg gtggaggtgg aagtgaagcg aagctagtcg aatctggagg tggtgtagtg 480

cagcctggac gttcgcttcg actatcctgt gctgcttcag gatttacctt ttcatcttac 540

acgatgcact gggtgcgtca agcgcctggt aaaggactag agtgggtcac gtttatctca 600

tacgacggta ataacaagta ttatgctgat tccgtaaagg gacgtttcac catatcgcgt 660

gacaattcta agaatacctt gtatcttcaa atgaatagtc ttagagctga agacactgcc 720

atttactatt gtgcacgaac gggatggctt ggacctttg attattgggg tcagggtact 780

ttggtcaccg tctccacagc gaagacaaca cctccctcag tctatccact tgctccgcgt 840

agttaa 846

<210> 580
<211> 281
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 580
Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro
1 5 10 15

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

Gly Thr Leu Ser Leu Ser Pro Gly Glu Arg Ala Thr Leu Ser Cys Arg
35 40 45

Ala Ser Gln Ser Val Gly Ser Ser Tyr Leu Ala Trp Tyr Gln Gln Lys
50 55 60

Pro Gly Gln Ala Pro Arg Leu Leu Ile Tyr Gly Ala Phe Ser Arg Ala
65 70 75 80

Thr Gly Ile Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe
85 90 95

Thr Leu Thr Ile Ser Arg Leu Glu Pro Glu Asp Phe Ala Val Tyr Tyr
100 105 110

Cys Gln Gln Tyr Gly Ser Ser Pro Trp Thr Phe Gly Gln Gly Thr Lys
115 120 125

Val Glu Ile Lys Arg Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
130 135 140

Gly Gly Gly Ser Glu Ala Lys Leu Val Glu Ser Gly Gly Gly Val Val
145 150 155 160

Gln Pro Gly Arg Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr
165 170 175

Phe Ser Ser Tyr Thr Met His Trp Val Arg Gln Ala Pro Gly Lys Gly
180 185 190

```
Leu Glu Trp Val Thr Phe Ile Ser Tyr Asp Gly Asn Asn Lys Tyr Tyr
        195                 200                 205

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

Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala
225                 230                 235                 240

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

Gly Gln Gly Thr Leu Val Thr Val Ser Thr Ala Lys Thr Thr Pro Pro
            260                 265                 270

Ser Val Tyr Pro Leu Ala Pro Arg Ser
        275                 280
```

<210> 581
<211> 855
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 581
atggaaaccg atactttgct tctatgggtc cttttgctat gggtgcccgg atcaaccgga 60

ataagacgtg ctgatatcgt tatgacccag accacgctat cattaccagt tagtctaggt 120

gaccaggcca gtatcagttg ccgttcatct cagtccattg tacactcaaa cggaaacacc 180

tacttggagt ggtatcttca gaaacctggt caatctccca agcttctaat ttacaaagtg 240

tctaaccgat tttctggtgt gccggatcga ttttcgggtt ctggtagtgg aacggatttc 300

acgctaaaaa tatcccgagt cgaagctgaa gacctaggag tatattattg ctttcaagga 360

tctcacgtcc cgtacacctt tggtggagga accaagcttg aaataaagcg aggaggtgga 420

ggatcaggag gaggtggttc gggtggtggt ggttccgagg cgaagttaca ggagtcggga 480

cccgtattag tgaagcctgg tgcgagtgtc aaaatgagtt gcaaagccag tggttacacc 540

ttcacagact attacatgaa ctgggtgaag cagtctcacg gaaaatcttt agagtggata 600

ggagtaatta acccgtacaa tggtgatacg agttacaacc agaagttcaa aggtaaggcg 660

accttgacgg tcgataaatc ctctagtact gcgtacatgg aactaaactc tttaacctct 720

gaggattctg ccgtatatta ttgtgccaga tattatggtt cgtggttcgc atattgggga 780

cagggaactt taattacggt ctcgacagcc aaaacgactc ccccctcagt ttatcccctt 840

gctcctagaa gttaa 855

<210> 582
<211> 284
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 582
Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro
1 5 10 15

Gly Ser Thr Gly Ile Arg Arg Ala Asp Ile Val Met Thr Gln Thr Thr
20 25 30

Leu Ser Leu Pro Val Ser Leu Gly Asp Gln Ala Ser Ile Ser Cys Arg
35 40 45

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

Tyr Leu Gln Lys Pro Gly Gln Ser Pro Lys Leu Leu Ile Tyr Lys Val
65 70 75 80

Ser Asn Arg Phe Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser
85 90 95

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

Gly Val Tyr Tyr Cys Phe Gln Gly Ser His Val Pro Tyr Thr Phe Gly
115 120 125

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Gly Gly Thr Lys Leu Glu Ile Lys Arg Gly Gly Gly Gly Ser Gly Gly
    130                 135                 140

Gly Gly Ser Gly Gly Gly Gly Ser Glu Ala Lys Leu Gln Glu Ser Gly
145                 150                 155                 160

Pro Val Leu Val Lys Pro Gly Ala Ser Val Lys Met Ser Cys Lys Ala
                165                 170                 175

Ser Gly Tyr Thr Phe Thr Asp Tyr Tyr Met Asn Trp Val Lys Gln Ser
            180                 185                 190

His Gly Lys Ser Leu Glu Trp Ile Gly Val Ile Asn Pro Tyr Asn Gly
        195                 200                 205

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

Asp Lys Ser Ser Ser Thr Ala Tyr Met Glu Leu Asn Ser Leu Thr Ser
225                 230                 235                 240

Glu Asp Ser Ala Val Tyr Tyr Cys Ala Arg Tyr Tyr Gly Ser Trp Phe
                245                 250                 255

Ala Tyr Trp Gly Gln Gly Thr Leu Ile Thr Val Ser Thr Ala Lys Thr
            260                 265                 270

Thr Pro Pro Ser Val Tyr Pro Leu Ala Pro Arg Ser
        275                 280
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<210> 583
<211> 1734
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<220>
<221> misc_feature

<222> (1654)..(1716)
<223> B7-1 transmembrane domain

<220>
<221> misc_feature
<222> (1654)..(1731)
<223> B7-1 cytoplasmic domain

<400> 583
atgtgtcacc agcagttggt catctcttgg ttttccctgg tttttctggc atctcccctc 60

gtggccatat gggaactgaa gaaagatgtt tatgtcgtag aattggattg gtatccggat 120

gcccctggag aaatggtggt cctcacctgt gacacccctg aagaagatgg tatcacctgg 180

accttggacc agagcagtga ggtcttaggc tctggcaaaa ccctgaccat ccaagtcaaa 240

gagtttggag atgctggcca gtacacctgt cacaaaggag gcgaggttct aagccattcg 300

ctcctgctgc ttcacaaaaa ggaagatgga atttggtcca ctgatatttt aaaggaccag 360

aaagaaccca aaaataagac ctttctaaga tgcgaggcca agaattattc tggacgtttc 420

acctgctggt ggctgacgac aatcagtact gatttgacat tcagtgtcaa aagcagcaga 480

ggctcttctg acccccaagg ggtgacgtgc ggagctgcta cactctctgc agagagagtc 540

agaggggaca acaaggagta tgagtactca gtggagtgcc aggaggacag tgcctgccca 600

gctgctgagg agagtctgcc cattgaggtc atggtggatg ccgttcacaa gctcaagtat 660

gaaaactaca ccagcagctt cttcatcagg gacatcatca aacctgaccc acccaagaac 720

ttgcagctga agccattaaa gaattctcgg caggtggagg tcagctggga gtaccctgac 780

acctggagta ctccacattc ctacttctcc ctgacattct gcgttcaggt ccagggcaag 840

agcaagagag aaaagaaaga tagagtcttc acggacaaga cctcagccac ggtcatctgc 900

cgcaaaaatg ccagcattag cgtgcgggcc caggaccgct actatagctc atcttggagc 960

gaatgggcat ctgtgccctg cagtgttcct ggagtagggg tacctggggt gggcgccaga 1020

aacctccccg tggccactcc agacccagga atgttcccat gccttcacca ctcccaaaac 1080

ctgctgaggg ccgtcagcaa catgctccag aaggccagac aaactctaga attttaccct 1140

tgcacttctg aagagattga tcatgaagat atcacaaaag ataaaaccag cacagtggag 1200

gcctgtttac cattggaatt aaccaagaat gagagttgcc taaattccag agagacctct 1260

ttcataacta atgggagttg cctggcctcc agaaagacct cttttatgat ggccctgtgc 1320

cttagtagta tttatgaaga cttgaagatg taccaggtgg agttcaagac catgaatgca 1380

aagctgctga tggaccctaa gaggcagatc tttctagatc aaaacatgct ggcagttatt 1440

gatgagctga tgcaggccct gaatttcaac agtgagactg tgccacaaaa atcctccctt 1500

gaagaaccgg atttttataa aactaaaatc aagctctgca tacttcttca tgctttcaga 1560

attcgggcag tgactattga tagagtgatg agctatctga atgcttccgg aggaggtgga 1620

tcgggtggtg gaggatctgg tggaggtgga agtctgctcc catcctgggc cattacctta 1680

atctcagtaa atggaatttt tgtgatatgc tgcctgacct actgctttgc ctaa 1734

<210> 584
<211> 577
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<220>
<221> MISC_FEATURE
<222> (552)..(572)
<223> B7-1 transmembrane domain

<220>
<221> MISC_FEATURE
<222> (552)..(577)
<223> B7-1 cytoplasmic domain

<400> 584
Met Cys His Gln Gln Leu Val Ile Ser Trp Phe Ser Leu Val Phe Leu
1 5 10 15

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

Val Glu Leu Asp Trp Tyr Pro Asp Ala Pro Gly Glu Met Val Val Leu
35 40 45

Thr Cys Asp Thr Pro Glu Glu Asp Gly Ile Thr Trp Thr Leu Asp Gln
50 55 60

Ser Ser Glu Val Leu Gly Ser Gly Lys Thr Leu Thr Ile Gln Val Lys

```
65                  70                  75                  80

Glu Phe Gly Asp Ala Gly Gln Tyr Thr Cys His Lys Gly Gly Glu Val
                85                  90                  95

Leu Ser His Ser Leu Leu Leu Leu His Lys Lys Glu Asp Gly Ile Trp
            100                 105                 110

Ser Thr Asp Ile Leu Lys Asp Gln Lys Glu Pro Lys Asn Lys Thr Phe
        115                 120                 125

Leu Arg Cys Glu Ala Lys Asn Tyr Ser Gly Arg Phe Thr Cys Trp Trp
    130                 135                 140

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

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

Ala Glu Arg Val Arg Gly Asp Asn Lys Glu Tyr Glu Tyr Ser Val Glu
            180                 185                 190

Cys Gln Glu Asp Ser Ala Cys Pro Ala Ala Glu Glu Ser Leu Pro Ile
        195                 200                 205

Glu Val Met Val Asp Ala Val His Lys Leu Lys Tyr Glu Asn Tyr Thr
    210                 215                 220

Ser Ser Phe Phe Ile Arg Asp Ile Ile Lys Pro Asp Pro Pro Lys Asn
225                 230                 235                 240

Leu Gln Leu Lys Pro Leu Lys Asn Ser Arg Gln Val Glu Val Ser Trp
                245                 250                 255

Glu Tyr Pro Asp Thr Trp Ser Thr Pro His Ser Tyr Phe Ser Leu Thr
            260                 265                 270

Phe Cys Val Gln Val Gln Gly Lys Ser Lys Arg Glu Lys Lys Asp Arg
        275                 280                 285
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Val Phe Thr Asp Lys Thr Ser Ala Thr Val Ile Cys Arg Lys Asn Ala
    290                 295                 300

Ser Ile Ser Val Arg Ala Gln Asp Arg Tyr Tyr Ser Ser Ser Trp Ser
305                 310                 315                 320

Glu Trp Ala Ser Val Pro Cys Ser Val Pro Gly Val Gly Val Pro Gly
                325                 330                 335

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

Pro Cys Leu His His Ser Gln Asn Leu Leu Arg Ala Val Ser Asn Met
        355                 360                 365

Leu Gln Lys Ala Arg Gln Thr Leu Glu Phe Tyr Pro Cys Thr Ser Glu
    370                 375                 380

Glu Ile Asp His Glu Asp Ile Thr Lys Asp Lys Thr Ser Thr Val Glu
385                 390                 395                 400

Ala Cys Leu Pro Leu Glu Leu Thr Lys Asn Glu Ser Cys Leu Asn Ser
                405                 410                 415

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

Thr Ser Phe Met Met Ala Leu Cys Leu Ser Ser Ile Tyr Glu Asp Leu
        435                 440                 445

Lys Met Tyr Gln Val Glu Phe Lys Thr Met Asn Ala Lys Leu Leu Met
    450                 455                 460

Asp Pro Lys Arg Gln Ile Phe Leu Asp Gln Asn Met Leu Ala Val Ile
465                 470                 475                 480

Asp Glu Leu Met Gln Ala Leu Asn Phe Asn Ser Glu Thr Val Pro Gln
                485                 490                 495
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Lys Ser Ser Leu Glu Glu Pro Asp Phe Tyr Lys Thr Lys Ile Lys Leu
500 505 510

Cys Ile Leu Leu His Ala Phe Arg Ile Arg Ala Val Thr Ile Asp Arg
515 520 525

Val Met Ser Tyr Leu Asn Ala Ser Gly Gly Gly Gly Ser Gly Gly Gly
530 535 540

Gly Ser Gly Gly Gly Gly Ser Leu Leu Pro Ser Trp Ala Ile Thr Leu
545 550 555 560

Ile Ser Val Asn Gly Ile Phe Val Ile Cys Cys Leu Thr Tyr Cys Phe
565 570 575

Ala

<210> 585
<211> 774
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<220>
<221> misc_feature
<222> (691)..(771)
<223> transmembrane and cytoplasmic domain

<400> 585
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ttagcgcgtg tcattccggt ctccggtccc gcccgttgcc tttcgcaaag tcgtaacttg 120

cttaagacta cggatgatat ggtcaaaact gctagagaaa agttaaaaca ctactcgtgt 180

acggctgaag acatagacca cgaagacatc acgcgagatc aaacaagtac cctaaagact 240

tgcttaccgc tagagcttca taaaaacgag agttgcctag cgacccgaga gacatcttca 300

acaaccagag gatcttgtct acccccctcag aagacttctc taatgatgac cttgtgcctt 360

ggtagtatat atgaagattt aaagatgtac cagactgaat ttcaggcaat caatgcggca 420

ttacaaaacc acaaccatca gcagataata ttagataaag gaatgcttgt agccattgac 480

gaacttatgc agtctctaaa ccacaacggt gagacacttc gtcagaaacc tccggttggt 540

gaggcagatc cttaccgtgt gaaaatgaag ttgtgcattc tattgcatgc attttcgacg 600

cgtgtggtca ccatcaacag agtcatgggt tatctaagtt ctgctggtgg aggtggaagt 660

ggaggtggag gaagtggtgg aggaggaagt accttagtgt tgtttggagc aggtttcggt 720

gcagtcataa cggttgtcgt tatcgtggtg atcataaaat gtttctgcaa gtga 774

<210> 586
<211> 257
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<220>
<221> MISC_FEATURE
<222> (231)..(257)
<223> transmembrane and cytoplasmic domain

<400> 586
Met Cys Gln Ser Arg Tyr Leu Leu Phe Leu Ala Thr Leu Ala Leu Leu
1 5 10 15

Asn His Leu Ser Leu Ala Arg Val Ile Pro Val Ser Gly Pro Ala Arg
20 25 30

Cys Leu Ser Gln Ser Arg Asn Leu Leu Lys Thr Thr Asp Asp Met Val
35 40 45

Lys Thr Ala Arg Glu Lys Leu Lys His Tyr Ser Cys Thr Ala Glu Asp
50 55 60

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

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

```
Glu Thr Ser Ser Thr Thr Arg Gly Ser Cys Leu Pro Pro Gln Lys Thr
            100                 105                 110

Ser Leu Met Met Thr Leu Cys Leu Gly Ser Ile Tyr Glu Asp Leu Lys
        115                 120                 125

Met Tyr Gln Thr Glu Phe Gln Ala Ile Asn Ala Ala Leu Gln Asn His
    130                 135                 140

Asn His Gln Gln Ile Ile Leu Asp Lys Gly Met Leu Val Ala Ile Asp
145                 150                 155                 160

Glu Leu Met Gln Ser Leu Asn His Asn Gly Glu Thr Leu Arg Gln Lys
                165                 170                 175

Pro Pro Val Gly Glu Ala Asp Pro Tyr Arg Val Lys Met Lys Leu Cys
            180                 185                 190

Ile Leu Leu His Ala Phe Ser Thr Arg Val Val Thr Ile Asn Arg Val
        195                 200                 205

Met Gly Tyr Leu Ser Ser Ala Gly Gly Gly Gly Ser Gly Gly Gly Gly
    210                 215                 220

Ser Gly Gly Gly Gly Ser Thr Leu Val Leu Phe Gly Ala Gly Phe Gly
225                 230                 235                 240

Ala Val Ile Thr Val Val Val Ile Val Val Ile Ile Lys Cys Phe Cys
                245                 250                 255

Lys
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<210> 587
<211> 1743
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

polynucleotide

<220>
<221> misc_feature
<222> (1660)..(1740)
<223> transmembrane and cytoplasmic domain

<400> 587
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atggcaatgt gggagcttga aaaggacgtc tatgtggtgg aggttgactg gacgcccgat 120

gcgccaggag aaacagtgaa tctaacttgc gacacacctg aagaggatga cataacgtgg 180

acatctgatc aaagacatgg tgtgataggt tctggtaaga cacttacgat taccgtcaag 240

gaatttttgg acgctggaca atacacttgt cacaaaggag gtgaaacact atcgcattca 300

cacctacttt tacacaagaa ggaaaatggt atttggagta cggagatcct aaagaatttt 360

aaaaataaga ccttttaaa gtgcgaagca ccaaattatt ccggacgatt tacatgttca 420

tggttagttc aacgaaatat ggatttaaaa ttcaatatca agtcaagttc tagttccccg 480

gattcccgag cggttacttg cggtatggcc agtttgagtg ccgagaaagt cacactagac 540

cagcgagatt atgagaaata ttccgtttcc tgccaggagg acgtaacttg tccgactgcc 600

gaggagactt tgccgataga gcttgcctta gaggcccgac agcagaataa gtacgagaat 660

tactctacct ctttttcat ccgagacatc atcaaacctg acccaccaaa gaatttgcaa 720

atgaaaccct taaaaaactc acaggtggag gtgtcctggg aatatcctga ctcttggtct 780

acccccatt cttacttttc ccttaagttc ttcgttagaa tacaacgtaa aaaagagaag 840

atgaaagaaa cggaagaagg ttgcaaccag aaaggagcat ttctagttga aaagacctct 900

acggaagtcc agtgtaaagg tggaaatgtg tgtgtgcaag cccaggaccg atattacaac 960

agttcgtgtt cgaagtgggc ttgcgtgccg tgtcgtgtcc gatctgtacc aggagtcgga 1020

gttcctggag taggtcgtgt aataccggta tccggaccag ctcgttgctt atctcaatcg 1080

cgaaacctac ttaaaacaac cgatgacatg gtgaagacag cgagagaaaa gcttaaacat 1140

tattcctgta ccgccgaaga catcgatcat gaggatatca cgagagacca gacctcgaca 1200

cttaagacat gcttgccact agaacttcat aaaaatgagt cttgcttagc aacgcgagaa 1260

acgtcgtcta cgacgcgtgg ttcatgtttg ccgccccaaa agacatcctt gatgatgacg 1320

ttgtgtcttg gatccatcta tgaggattta aaaatgtacc agacagaatt tcaggctatc 1380

aatgcagctc tacagaatca taatcaccag cagattatct tagacaaggg aatgttagta 1440

gcaatcgatg agcttatgca atccttgaat cataacggag aaacattacg acaaaagcct 1500

ccggtcggtg aagcggatcc atatcgtgtg aagatgaaat tatgtatatt gttgcacgcc 1560

tttagtacgc gtgtggtcac cataaaccga gtaatgggat acttgtcctc ggcgggaggt 1620

ggtggttctg gtggaggtgg atcaggtggt ggtggttcaa ccttggttct ttttggtgcg 1680

ggtttcggtg ccgtgattac tgtcgtcgtc atagtcgtca ttattaaatg tttttgtaag 1740

taa 1743

<210> 588
<211> 580
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<220>
<221> MISC_FEATURE
<222> (554)..(580)
<223> transmembrane and cytoplasmic domain

<400> 588
Met Cys Pro Gln Lys Leu Thr Ile Ser Trp Phe Ala Ile Val Leu Leu
1 5 10 15

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

Val Glu Val Asp Trp Thr Pro Asp Ala Pro Gly Glu Thr Val Asn Leu
35 40 45

Thr Cys Asp Thr Pro Glu Glu Asp Asp Ile Thr Trp Thr Ser Asp Gln
50 55 60

Arg His Gly Val Ile Gly Ser Gly Lys Thr Leu Thr Ile Thr Val Lys
65 70 75 80

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Glu Phe Leu Asp Ala Gly Gln Tyr Thr Cys His Lys Gly Gly Glu Thr
                85                  90                  95

Leu Ser His Ser His Leu Leu Leu His Lys Lys Glu Asn Gly Ile Trp
            100                 105                 110

Ser Thr Glu Ile Leu Lys Asn Phe Lys Asn Lys Thr Phe Leu Lys Cys
        115                 120                 125

Glu Ala Pro Asn Tyr Ser Gly Arg Phe Thr Cys Ser Trp Leu Val Gln
    130                 135                 140

Arg Asn Met Asp Leu Lys Phe Asn Ile Lys Ser Ser Ser Ser Ser Pro
145                 150                 155                 160

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

Val Thr Leu Asp Gln Arg Asp Tyr Glu Lys Tyr Ser Val Ser Cys Gln
            180                 185                 190

Glu Asp Val Thr Cys Pro Thr Ala Glu Glu Thr Leu Pro Ile Glu Leu
        195                 200                 205

Ala Leu Glu Ala Arg Gln Gln Asn Lys Tyr Glu Asn Tyr Ser Thr Ser
    210                 215                 220

Phe Phe Ile Arg Asp Ile Ile Lys Pro Asp Pro Pro Lys Asn Leu Gln
225                 230                 235                 240

Met Lys Pro Leu Lys Asn Ser Gln Val Glu Val Ser Trp Glu Tyr Pro
                245                 250                 255

Asp Ser Trp Ser Thr Pro His Ser Tyr Phe Ser Leu Lys Phe Phe Val
            260                 265                 270

Arg Ile Gln Arg Lys Lys Glu Lys Met Lys Glu Thr Glu Glu Gly Cys
        275                 280                 285

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

Cys Lys Gly Gly Asn Val Cys Val Gln Ala Gln Asp Arg Tyr Tyr Asn
305                 310                 315                 320

Ser Ser Cys Ser Lys Trp Ala Cys Val Pro Cys Arg Val Arg Ser Val
                325                 330                 335

Pro Gly Val Gly Val Pro Gly Val Gly Arg Val Ile Pro Val Ser Gly
            340                 345                 350

Pro Ala Arg Cys Leu Ser Gln Ser Arg Asn Leu Leu Lys Thr Thr Asp
        355                 360                 365

Asp Met Val Lys Thr Ala Arg Glu Lys Leu Lys His Tyr Ser Cys Thr
    370                 375                 380

Ala Glu Asp Ile Asp His Glu Asp Ile Thr Arg Asp Gln Thr Ser Thr
385                 390                 395                 400

Leu Lys Thr Cys Leu Pro Leu Glu Leu His Lys Asn Glu Ser Cys Leu
                405                 410                 415

Ala Thr Arg Glu Thr Ser Ser Thr Thr Arg Gly Ser Cys Leu Pro Pro
            420                 425                 430

Gln Lys Thr Ser Leu Met Met Thr Leu Cys Leu Gly Ser Ile Tyr Glu
        435                 440                 445

Asp Leu Lys Met Tyr Gln Thr Glu Phe Gln Ala Ile Asn Ala Ala Leu
    450                 455                 460

Gln Asn His Asn His Gln Gln Ile Ile Leu Asp Lys Gly Met Leu Val
465                 470                 475                 480

Ala Ile Asp Glu Leu Met Gln Ser Leu Asn His Asn Gly Glu Thr Leu
                485                 490                 495

Arg Gln Lys Pro Pro Val Gly Glu Ala Asp Pro Tyr Arg Val Lys Met
            500                 505                 510
```

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

Asn Arg Val Met Gly Tyr Leu Ser Ser Ala Gly Gly Gly Gly Ser Gly
530 535 540

Gly Gly Gly Ser Gly Gly Gly Gly Ser Thr Leu Val Leu Phe Gly Ala
545 550 555 560

Gly Phe Gly Ala Val Ile Thr Val Val Val Ile Val Val Ile Ile Lys
565 570 575

Cys Phe Cys Lys
580

<210> 589
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 589
Pro Arg Gly Ser Gly
1 5

<210> 590
<211> 191737
<212> DNA
<213> Vaccinia virus

<400> 590
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agtaatacat aaattttagt atattaatat tatattttaa atatttattt agtgtctaga 120

aaaaaatgtg tgaccaacga ccgtaggaaa ctctagaggg taagaaaaat caatcgcttt 180

atagagacca tcagaaagag gtttaatatt tttgtgagac catcgaagga gaaagagata 240

aaacttttt acgactccat cagaaagagg tttaatattt ttgtgagacc atcgaaggag 300

aaagagataa aacttttta cgactccatc agaaagaggt ttaatatttt tgtgagacca 360

tcgaaggaga aagagataaa actttttac gactccatca gaaagaggtt taatattttt 420

gtgagaaagg agaaagagat aaaacttttt tacgactcca tcagaaagag gtttaatatt 480

tttgtgagac catcgaagga gaaagagata aaacttttt acgactccat cagaaagagg 540

tttaatattt ttgtgagacc atcgaaggag aaagagataa aacttttta cgactccatc 600

agaaagaggt ttaatatttt tgtgagacca tcgaaggaga aagagataaa actttttac 660

gactccatca gaaagaggtt taatattttt gtgagaccat cgaaggagac tccatcagaa 720

agaggtttaa tatttttgtg agaaaggaga aagagataaa actttttac gactccatca 780

gaaagaggtt taatattttt gtgagaaagg agaaagagat aaaacttttt tacgactcca 840

tcagaaagag gtttaatatt tttgtgagac catcgaagga gaaagagata aaacttttt 900

acgactccat cagaaagagg tttaatattt ttgtgagacc atcgaaggag aaagagataa 960

aacttttta cgactccatc agaaagaggt ttaatatttt tgtgagacca tcgaagagag 1020

aaagagataa aacttttta cgactccatc agaaagaggt ttaatatttt tgtgagacca 1080

tcgaagagag aaagagataa aacttttta cgactccatc agaaagaggt ttaatatttt 1140

tgtgagacca tcgaagagag aaagagataa aacttttta cgactccatc agaaagaggt 1200

ttaatatttt tgtgagacca tcgaagagag aaagagataa aacttttta cgactactcc 1260

atcagaaaga ggtttaatat ttttgtgaga ccatcgaaga gagaaagaga taaaactttt 1320

ttacgactcc atcagaaaga ggtttaatat ttttgtgaga ccatcgaaga gagaaagaga 1380

taaaactttt ttacgactcc atcagaaaga ggtttaatat ttttgtgaga ccatcgaaga 1440

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ccatcgaaga gagaaagaga taaaactttt ttacgactcc atcagaaaga ggtttaatat 1980

ttttgtgaga ccatcgaaga gagaaagaga taaaactttt ttacgactcc atcagaaaga 2040

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atcagaaaga ggtttaatat ttttgtgaga ccatcgaaga gagaaagaga taaaactttt 2160

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taaaactttt ttacgactcc atcagaaaga ggtttaatat ttttgtgaga ccatcgaaga 2280

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ttttgtgaga ccatcgaaga gagaaagaga taaaactttt ttacgactcc atcagaaaga 2460

ggtttaatat ttttgtgaga ccatcgaaga gagaaagaga taaaactttt ttacgactcc 2520

atcagaaaga ggtttaatat ttttgtgaga ccatcgaaga gagaaagaga taaaactttt 2580

ttacgactcc atcagaaaga ggtttaatat ttttgtgaga ccatcgaaga gagaaagata 2640

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gaaagagata aaacttttt acgactccat cagaaagagg tttaatattt ttgtgagacc 2760

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ttgtgagacc atcgaagaga gaaagagaaa gagatagtta gtctagatat ttttcttagt 2880

acaaaagtca atgttttaaa atatatggac aagaatttgt ctgtataaaa acttgtgtga 2940

aattttgtac caaagaaaaa atgtgagcag tatcccctac atggatttta ctagatcatt 3000

tatataccaa aaaatattat acgatctacg ttttattata tgattttaac gtgtaaatta 3060

taaacattat tttatgatat acaattgtct ggtaacctag atgggcatag gggatgttga 3120

taagctcgac gagtatatgt tgttggacgt tattgtttaa gaaatagttg atgcatcaga 3180

aagagaataa aaaatatttt agtgagacca tcgaagagag aaagagataa aacttttta 3240

cgactccatc agaaagaggt ttaatatttt tgtgagacca tcgaagagag aaagagaata 3300

aaaatatttt atgactccat tgaagagaga aagagaaaat gagaatgaga ataaaaatat 3360

tttagtgaca ccatcagaaa gaggtttaat atttttgtga gaccatcgaa gagagaaaga 3420

gaataaaaat attttatgac tccattgaag agagaaagag aaaatgagaa tgagaataaa 3480

aatattttag tgacaccatc agaaagaggt ttaatatttt ttatgagacc atcaaagaga 3540

gaaagagaat aaaaatattt ttgtaaaact ttttttatga gaccatcaaa gagagaaaga 3600

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cacgtttata aaccaggtga gtgtagaaaa ccgataacga taaaaaaggc caagcgaatt 600

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aatatttata cccgctatga aggaaagaca ttattacacg tagcatgtga atataataat 1020

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<210> 597
<211> 1062
<212> DNA
<213> Vaccinia virus

<400> 597
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agtcttttat cgcacagata taaagactat gtggttaaat gggagaggct agaaaagaat 300

agacggcgac aggtttctaa taaacgtgtt aaacatggtg atttatggat agccaactat 360

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gttcagggta tagttagatc tcatattaaa aaacctcctt catgcattcc aaaaacatat 480

gaactaggta ctcatgataa gtatggcata gacttatact gtggaattct ttacgcaaaa 540

cattataata atataacttg gtataaagat aataaggaaa ttaatatcga cgacattaag 600

tattcacaaa cgggaaagga attaattatt cataatccag agttagaaga tagcggaaga 660

tacgactgtt acgttcatta cgacgacgtt agaatcaaga atgatatcgt agtatcaaga 720

tgtaaaatac ttacggttat accgtcacaa gaccacaggt ttaaactaat actagatccg 780

aaaatcaacg taacgatagg agaacctgcc aatataacat gcactgctgt gtcaacgtca 840

ttattgattg acgatgtact gattgaatgg gaaaatccat ccggatggct tataggattc 900

gattttgatg tatactctgt tttaactagt agaggcggta tcaccgaggc gaccttgtac 960

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tattttgaaa aaacccttac aactacagta gtattggagt aa 1062

<210> 598
<211> 384
<212> DNA
<213> Vaccinia virus

<400> 598
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tgtacggctt tacatgagta cttttataat tatagatcag tcaacggaaa atacaagtat 180

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tattatgatg attatgatag aactggtatg aacagcgaga gcgatagtga gagtgataat 300

atatcaatca aaacagaata tgagaatgaa tatgaattct atgatgaaac acaagatcaa 360

agtacacaac acaatgactt ataa 384

<210> 599
<211> 276
<212> DNA
<213> Vaccinia virus

<400> 599
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gaatgctgtg atataaacaa actagtagaa ggtacgactc cgttacactg ttatctaatg 180

aatgaaggat ttgaatcatc tgttttaaaa aacctattaa aggagtatgt catgaatacg 240

tttaatgttc atgacatcca ttacacaaat atttaa 276

<210> 600
<211> 546
<212> DNA
<213> Vaccinia virus

<400> 600
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ccctgtcatt gccacgctac taaggactcc ctgaataccg tggccgacgt cagacattgt 180

ctgactgaat acatcctgtg ggtttctcat agatggaccc atagagaaag cgcagggtct 240

ctctacaggc ttctcatctc tttcagaact gatgcaacgg agctctttgg tggtgagttg 300

aaggattcac ttccgtggga caatatcgac aattgcgtgg agatcattaa atgtttcatc 360

agaaatgact ccatgaaaac cgccgaagaa cttcgtgcaa tcattggact ttgtactcaa 420

tcagctatcg tctctggaag agtcttcaac gataagtata tcgacatact acttatgctg 480

cgaaagattc tgaacgagaa cgactatctc accctcttgg atcatatccg cactgctaaa 540

tactaa 546

<210> 601
<211> 1161
<212> DNA

<213> Vaccinia virus

<400> 601
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aaaataaaac tagagattga aacgtgtcac aacttatcaa aacatataga tagacgagga 180

aacaatgcgc tacattgtta cgtctccaat aaatgcgata cagacattaa gattgttcga 240

ctgttactct ctcgcggagt cgagagactt tgtagaaaca acgaaggatt aactccgcta 300

ggagcataca gtaagcatag atacgtaaaa tctcagattg tgcatctact gatatccagc 360

tattcgaatt cctctaacga actcaagtcg aatataaatg atttcgatct gtcttcggat 420

aatatcgact tacgtctgct aaaataccta attgtggata aacggatacg tccgtccaag 480

aatacgaatt atgcaatcaa tggtctcgga ttggtggata tatacgtaac gacgcctaat 540

ccgagaccag aagtattgct atggcttctt aaatcagaat gttacagcac cggttacgta 600

tttcgtacct gtatgtacaa cagtgatatg tgtaagaact ctcttcatta ctatatatcg 660

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gtttccatcc atggcagaga cgaaggagga tctttaccca tccaatacta ctggtctttc 780

tcaaccatag atatagagat tgttaaatta ttattaataa aggatgtgga cacgtgtaga 840

gtatacgacg tcagccctat attagaggcg tattatctaa acaagcgatt tagagtaacc 900

ccatataatg tagacatgga aatcgttaat cttcttattg agagacgtca tactcttgtc 960

gacgtaatgc gtagtattac ttcgtacgat tccagagaat ataaccacta catcatcgat 1020

aacattctaa agagatttag acaacaggat gaatccatcg tacaagccat gttgataaac 1080

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tctgcacgac tactttgtta a 1161

<210> 602
<211> 453
<212> DNA
<213> Vaccinia virus

<400> 602
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gagaataaaa ctctactata ttacgcggtc gatgtcaata atatacaatt tgcaaagcgg 180

ttattggaat atggagcgag tgttacaaca tcacgctcga taatcaatac ggccatccag 240

aaaagcagtt accaaagaga aaacaaaacg aggatagttg atttattact tagctaccat 300

cccactctag agactatgat tgacgcattt aatagagata tacgctatct atatcctgaa 360

ccattattcg cctgtatcag atacgcctta atcctagatg atgattttcc ttctaaagta 420

agtatgatat cgccggtcat cataaggaac taa 453

<210> 603
<211> 780
<212> DNA
<213> Vaccinia virus

<400> 603
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atggacgaga ttgtgagcat cgttcgcgac agtatgtggt acatacctaa cgtatttatg 180

gacgacggta agaatgaagg tcacgtttct gtcaacaatg tttgtcatat gtattttacg 240

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gatgaactca cttctcttca ttactactgt aaacacatat ccacgttcta caaaagcaat 660

tattacaagt taagtcacac taagatgcga gccgagaagc gattcatcta cgcgataata 720

gattatggag caaacattaa cgcggttaca cacttacctt caacagtata ccaaacatag 780

<210> 604
<211> 312
<212> DNA
<213> Vaccinia virus

<400> 604

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tggaacgatt gtgcaacagg tcatattctc ataatgttac tcaattggca cgaacaaaag 180

gaagaaggac aacatctact ttatctattc ataaaacata atcaaggata cactctcaat 240

atactacggt atctactaga taggttcgac attcagaaag acgaatacat ataccgcctt 300

tcaaaattgt aa 312

<210> 605
<211> 342
<212> DNA
<213> Vaccinia virus

<400> 605
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gtgtttgaaa acagaaacat catatacaag gcggatgttg tgaatgacat catccaccac 120

agactgaaag tatctctacc tatgattaaa tcgttgttct acaagatgtc agaattctct 180

ccctacgacg attactacgt aaaaaagata ctagcctact gcctattaag ggacgagtca 240

ttcgcggaac tacatagtaa attctgttta aacgaggact ataaaagtgt atttatgaaa 300

aatatatcat tcgataagat agattccatc atcgtgacat aa 342

<210> 606
<211> 369
<212> DNA
<213> Vaccinia virus

<400> 606
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gatatagcac cgcatgcacc atccgatgga aagtgtaaag acaacgaata caaacgccat 120

aatttgtgtc cgggaacata cgcttccaga ttatgcgata gcaagactaa cacacaatgt 180

acgccgtgtg gttcgggtac cttcacatct cgcaataatc atttacccgc ttgtctaagt 240

tgtaacggaa gacgcgatcg tgtaacacta ctcacaatag aatctgtgaa tgctctcccg 300

gatattattg tcttctcaaa ggatcatccg gatgcaaggc atgtgtttcc caaacaaaat 360

gtggaatag 369

<210> 607
<211> 735
<212> DNA
<213> Vaccinia virus

<400> 607
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gaaaacaaac atcatatggg aatcgatgtt attatcaaag tcacaaagca agaccaaaca 120

ccgaccaatg ataagatttg ccaatccgta acggaaatta cagagtccga gtcagatcca 180

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atcatcggtt caacgatcgt cgatacaaaa tgtgtcaaga atctagagtt tagcgttcgt 600

atcggagaca tgtgcaagga atcatctgaa cttgaggtca aggatggatt caagtatgtc 660

gacggatcgg catctgaagg tgcaaccgat gatacttcac tcatcgattc aacaaaactc 720

aaagcgtgtg tctga 735

<210> 608
<211> 675
<212> DNA
<213> Vaccinia virus

<400> 608
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ttagttagtg agatcgtaga agaatatccg gatgattgta ataaaatatt agctattata 240

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ttttgtagaa attcgatagg ctttttagcg gttctatcgc ctacgatagg acacgtaaaa 600

gcattttata aattcataga atatgtttct atagatgata gacgcaaatt taaaaaggaa 660

ttaatgtcga aatga 675

<210> 609
<211> 1539
<212> DNA
<213> Vaccinia virus

<400> 609
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attatattga atggtataaa ctatcacgcg tttgaatcgc tattagacta tatgcgctgg 180

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aattgtataa ggatgtttaa cttttctaaa agatatggaa ttaaaaaact atataatgcg 360

tcgatgtcag aaataatcaa caatattact gcggtgacat ccgatccaga atttggaaaa 420

ttatcaaagg atgaactgac aactatctta tcccacgaag acgttaacgt aaatcatgag 480

gatgttacag ctatgatatt attaaagtgg atacataaaa atccaaacga tgtagatatc 540

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ggattaacta tatccaaatc tacaaagcca gtgacacgaa atggtataaa acataatata 660

gtagtcatta aaaactctga ttatatatcc acaataaccc attactctcc taggacagaa 720

tattggacga tagtcggtaa tacagataga caattctata atgcaaatgt tttacataat 780

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<210> 610
<211> 681
<212> DNA
<213> Vaccinia virus

<400> 610
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cttccagaaa atatggtata tagatttgac aagtccacta acatactcga ttatctatca 180

acggaacggg accatgtaat gatggctgtt cgatactata tgagtaaaca acgtttagac 240

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acaaaatcat ttacagttta tgacataaat aacgaagtta atactatact aatggataac 420

aaggggttgg gtgtaagatt ggcgacaatt tcatttataa ccgaattggg tagacgatgt 480

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<210> 611
<211> 444
<212> DNA
<213> Vaccinia virus

<400> 611
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tattatccag aactggaaga agtacaatct ctagatagta caaatagagg agatcaaggg 420

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<210> 612
<211> 1443
<212> DNA
<213> Vaccinia virus

<400> 612
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aaaaagttat ctccttactt tcgcacacat ttacgtcaaa aatacacgaa aaataaagat 180

ccagttacaa gggtttgtct agaccttgac attcacagtt taacttctat agttatttac 240

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agaaaggaat attgtgtcga gtgttacatg atgggtatag aatacggact atccaatctc 420

ttatgtcata ctaaaaactt tattgccaaa cacttttgg aactggaaga tgacatcata 480

gacaattttg attatctatc tatgaaactt attctagaaa gcgatgaact aaatgttcca 540

gatgaggatt atgtagttga ttttgtcatt aagtggtata taaagcgaag aaataaatta 600

ggaaatctgc tactccttat caaaaatgta atcaggtcaa attatctttc tcccagaggt 660

ataaataatg taaaatggat actagactgt accaaaatat ttcattgtga taaacaacca 720

cgcaaatcat acaagtatcc attcatagag tatcctatga acatggatca aattatagat 780

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atgaacaatg aaatacataa caatgctata gctgtaaatt atatatcaaa caattggatt 900

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<210> 613
<211> 855
<212> DNA
<213> Vaccinia virus

<400> 613
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aataacgtgc gtctagtatg tacgttgttg aacgctggag cattgaaaaa tcttctagag 180

aatgaatttc cattacatca ggcagccaca ttagaagata ccaaaatagt aaagattttg 240

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tactctgtta atctggaaaa tgtactattg gatgatgccg aaataactaa gatgattata 720

gaaaagcatg ttgaatacaa gtctgactcc tatacaaaag atctcgatat cgtcaagaat 780

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<213> Vaccinia virus

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ccgtttggtt attcgttttc tatgtttatg tcgctattgc ctgcatcagg taatactaga 180

atagaattat tgaagactat ggatttgaga aaaagagatc tgggtccagc atttacagaa 240

ttaatatcag gattagctaa gctgaaaaca tctaaatata cgtacactga tctaacttat 300

caaagtttcg tagataatac tgtgtgcatt aaaccgttgt attatcaaca atatcataga 360

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gaacgtagat ccggtatgtc taatgtagta gattctaata tgctcgacaa taatactcta 480

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<210> 615
<211> 267

<212> DNA
<213> Vaccinia virus

<400> 615
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gcagagagtg ttaagatgca tatggataga tatgttgaat atagggataa actggtaggg 180

aaaactgtaa aagttaaagt gattagagtt gattatacaa aaggatatat agatgtcaat 240

tacaaaagga tgtgtagaca tcaataa 267

<210> 616
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<213> Vaccinia virus

<400> 616
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<211> 411
<212> DNA
<213> Vaccinia virus

<400> 617
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<211> 246
<212> DNA
<213> Vaccinia virus

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gaactagctg aaaacatatc atcgttagga attttagtat tctcacatga tcatattgga 180

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<211> 450

<212> DNA
<213> Vaccinia virus

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gatgatgtcg ctatacggta ctatggtatt gataaaatta atgagattgt cgaagctatg 240

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atacttttc tagaaaaaaa attgaattga 450

<210> 620
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<212> DNA
<213> Vaccinia virus

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<210> 621
<211> 663
<212> DNA
<213> Vaccinia virus

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gaatcaattc ataaatcatc atcgtgtgat ataactataa atggatcatg tgtgacatgt 480

gttaacttag agactgatcc aacaaagatt aatccccatt acctacaccc caaggataaa 540

tatctttatc ataattctga gtatggcatg cgtggtagtt atggcgtgac atttatagat 600

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taa 663

<210> 622
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<212> DNA
<213> Vaccinia virus

<400> 622
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acattgatta agaacatgag aatgacgctg tccgacggtc cattgctaga tagattgaat 180

caaccagtta ataatataga agacgctaag cgaatgatcg ctattagtgc caaagtggct 240

agagacattg gtgaacgttc agaaattaga tgggaagagt cattcaccat actctttagg 300

atgattgaaa catattttga tgatctaatg attgatctat atggtgaaaa ataa 354

<210> 623
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<212> DNA
<213> Vaccinia virus

<400> 623
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atcaatatgt gtatacaacg cacctatagt tctagtataa ttgccatttt gaatagattc 180

ctaacaatga acaaggatga actaaacaat acacagtgtc atataattaa agaatttatg 240

acatacgaac aaatggcgat tgaccattat ggagaatatg taaacgctat tctatatcaa 300

attcgtaaaa gacctaatca acatcacacc attgatctgt ttaaaaaaat aaaaagaacc 360

ccgtatgaca cttttaaagt ggatcccgta gaattcgtaa aaaaagttat cggatttgta 420

tctatcttga acaaatataa accggtttat agttacgtcc tgtacgagaa cgtcctgtac 480

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<210> 624
<211> 157529
<212> DNA
<213> Artificial Sequence

<220>
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polynucleotide

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<223> remaining portion of the F3L gene

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<223> sequence that is deleted and replaced in SEQ ID NO: 210

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Asn Gly Ser Asn Met Leu Ile Leu Asn Pro Thr Gln Ser Asp Ser Gly
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Ile Tyr Ile Cys Ile Thr Thr Asn Glu Thr Tyr Cys Asp Met Met Ser
65   70   75   80

Leu Asn Leu Thr Ile Val Ser Val Ser Glu Ser Asn Ile Asp Phe Ile
                85   90   95

Ser Tyr Pro Gln Ile Val Asn Glu Arg Ser Thr Gly Glu Met Val Cys
            100   105   110

Pro Asn Ile Asn Ala Phe Ile Ala Ser Asn Val Asn Ala Asp Ile Ile
        115   120   125

Trp Ser Gly His Arg Arg Leu Arg Asn Lys Arg Leu Lys Gln Arg Thr
    130   135   140

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

Tyr Thr Cys Val Leu Glu Tyr Ile Tyr Gly Gly Lys Thr Tyr Asn Val
                165   170   175

Thr Arg Ile Val Lys Leu Glu Val Arg Asp Lys Ile Ile His Pro Thr
            180   185   190

Met Gln Leu Pro Glu Gly Val Val Thr Ser Ile Gly Ser Asn Leu Thr
195 200 205

Ile Ala Cys Arg Val Ser Leu Arg Pro Pro Thr Thr Asp Ala Asp Val
210 215 220

Phe Trp Ile Ser Asn Gly Met Tyr Tyr Glu Glu Asp Asp Gly Asp Gly
225 230 235 240

Asp Gly Arg Ile Ser Val Ala Asn Lys Ile Tyr Met Thr Asp Lys Arg
245 250 255

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

Ala Thr Thr Phe Thr Cys Met Ala Phe Thr Ile Pro Ser Ile Ser Lys
275 280 285

Thr Val Thr Val Ser Ile Thr
290 295

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attctttatt ctatacttaa aaaatgaaaa taaatacaaa ggttcttgag ggttgtgtta 120

aattgaaagc gagaaataat cataaattat ttcattatcg cgatatccgt taagtttgta 180

tcgta 185

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1   5

<210> 628
<211> 9
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<212> PRT
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1   5   10   15

Leu Val Leu Arg Thr Gln Ser Ile Ile Leu His Thr Ile Asn Asn Ala
            20   25   30

Ser Ile Lys Asn Arg
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