SEQUENCE LISTING

<110> BIOGEN IDEC MA INC.

<120> METHODS FOR THE DETECTION OF JC POLYOMA VIRUS

<130> SG2579A

<140> NOT YET ASSIGNED
<141> 2010-02-05

<150> US 61/150,310
<151> 2009-02-05

<160> 62

<170> PatentIn version 3.5

<210> 1
<211> 354
<212> PRT
<213> JC virus

<400> 1

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Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                  10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Ile Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
        115                 120                 125

His Asp Asn Gly Ala Ala Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Thr Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
```

```
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Ile Glu Glu Val Arg Val Phe Glu Gly Thr Glu Gln Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 2
<211> 349
<212> PRT
<213> Simian Virus 40

<400> 2

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

Gly Gly Ile Glu Val Leu Gly Val Lys Thr Gly Val Asp Ser Phe Thr
            20                  25                  30

Glu Val Glu Cys Phe Leu Asn Pro Gln Met Gly Asn Pro Asp Glu His
        35                  40                  45
```

```
Gln Lys Gly Leu Ser Lys Ser Leu Ala Ala Glu Lys Gln Phe Thr Asp
    50                  55                  60

Asp Ser Pro Asp Lys Glu Gln Leu Pro Cys Tyr Ser Val Ala Arg Ile
65                  70                  75                  80

Pro Leu Pro Asn Ile Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met
                85                  90                  95

Trp Glu Ala Val Thr Val Lys Thr Glu Val Ile Gly Val Thr Ala Met
            100                 105                 110

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

Lys Pro Ile Gln Gly Ser Asn Phe His Phe Phe Ala Val Gly Gly Glu
    130                 135                 140

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

Ala Gln Thr Val Thr Pro Lys Asn Ala Thr Val Asp Ser Gln Gln Met
                165                 170                 175

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

Glu Cys Trp Val Pro Asp Pro Ser Lys Asn Glu Asn Thr Arg Tyr Phe
        195                 200                 205

Gly Thr Tyr Thr Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr
    210                 215                 220

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

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

Leu Phe Thr Asn Thr Ser Gly Thr Gln Gln Trp Lys Gly Leu Pro Arg
            260                 265                 270

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

Ile Ser Phe Leu Leu Ser Asp Leu Ile Asn Arg Arg Thr Gln Arg Val
    290                 295                 300

Asp Gly Gln Pro Met Ile Gly Met Ser Ser Gln Val Glu Glu Val Arg
305                 310                 315                 320
```

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

Tyr Ile Asp Glu Phe Gly Gln Thr Thr Thr Arg Met Gln
            340                 345
```

<210> 3
<211> 133
<212> PRT
<213> JC virus

<400> 3

```
Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu
1               5                   10                  15

Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr
            20                  25                  30

Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser
        35                  40                  45

Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys
    50                  55                  60

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

Ile Asn Arg Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met
                85                  90                  95

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

Pro Gly Asp Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu
        115                 120                 125

Gln Thr Lys Met Leu
    130
```

<210> 4
<211> 133
<212> PRT
<213> JC virus

<400> 4

```
Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu
1               5                   10                  15

Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr
            20                  25                  30
```

Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser
35 40 45

Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys
50 55 60

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

Ile Asn Arg Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met
85 90 95

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

Pro Gly Asp Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu
115 120 125

Gln Thr Lys Met Leu
130

<210> 5
<211> 354
<212> PRT
<213> JC virus

<400> 5

Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1 5 10 15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
35 40 45

Gly Asp Pro Asp Glu His Phe Arg Gly Phe Ser Lys Ser Ile Ser Ile
50 55 60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65 70 75 80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
85 90 95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
100 105 110

Ile Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Ala
115 120 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe

```
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu


<210>  6
<211>  354
<212>  PRT
<213>  JC virus

<400>  6

Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                   10                  15
```

```
Pro Lys Leu Leu Ile Arg Gly Gly Val Glu Val Leu Glu Val Lys Thr
            20                  25                  30

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Phe Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Ile Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Thr Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285
```

```
Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 7
<211> 354
<212> PRT
<213> JC virus

<400> 7

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                   10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Ile Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Ala
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160
```

```
Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Phe Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 8
<211> 354
<212> PRT
<213> JC virus

<400> 8

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                   10                  15

Pro Lys Leu Leu Ile Arg Gly Gly Val Glu Val Leu Glu Val Lys Thr
            20                  25                  30
```

```
Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser His Thr Phe Glu Ser Asp Ser Pro Asn Arg Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Ile Gly Val Thr Ser Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Leu Phe Asn
145                 150                 155                 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300
```

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305 310 315 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
325 330 335

Pro Asp Met Met Arg Tyr Val Asp Lys Tyr Gly Gln Leu Gln Thr Lys
340 345 350

Met Leu

<210> 9
<211> 354
<212> PRT
<213> JC virus

<400> 9

Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1 5 10 15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
35 40 45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
50 55 60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65 70 75 80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
85 90 95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
100 105 110

Ile Gly Val Thr Ser Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
115 120 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
130 135 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Leu Phe Asn
145 150 155 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
165 170 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys

```
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Leu Gly Ser Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Lys Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu


<210>  10
<211>  354
<212>  PRT
<213>  JC virus

<400>  10

Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                   10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60
```

```
Ser Asp Thr Phe Glu Ser Asp Ser Pro Ser Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Ile Gly Val Thr Ser Leu Met Asn Val His Ser Asn Gly Gln Ala Ala
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335
```

```
Pro Asp Met Met Arg Tyr Val Asp Lys Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 11
<211> 354
<212> PRT
<213> JC virus

<400> 11

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                  10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Leu Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205
```

```
Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Phe Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 12
<211> 354
<212> PRT
<213> JC virus

<400> 12

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                   10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65                  70                  75                  80
```

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

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Leu Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350
```

Met Leu

<210> 13
<211> 354
<212> PRT
<213> JC virus

<400> 13

Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1 5 10 15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
35 40 45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
50 55 60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65 70 75 80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
85 90 95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
100 105 110

Leu Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
115 120 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
130 135 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145 150 155 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
165 170 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
180 185 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
195 200 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
210 215 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu

225 230 235 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
245 250 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
260 265 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
275 280 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
290 295 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305 310 315 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
325 330 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
340 345 350

Met Leu

<210> 14
<211> 354
<212> PRT
<213> JC virus

<400> 14

Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1 5 10 15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
35 40 45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
50 55 60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65 70 75 80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
85 90 95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
100 105 110

```
Leu Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Phe Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 15
<211> 354

<212> PRT
<213> JC virus

<400> 15

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                  10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Ile Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255
```

```
Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Tyr Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 16
<211> 354
<212> PRT
<213> JC virus

<400> 16

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                   10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Leu Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
        115                 120                 125
```

```
His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Phe Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 17
<211> 354
<212> PRT
<213> JC virus

<400> 17

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
```

```
1               5                   10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Ile Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Tyr Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
```

```
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 18
<211> 354
<212> PRT
<213> JC virus

<400> 18

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                   10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Ser Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Ile Gly Val Thr Ser Leu Met Asn Val His Ser Asn Gly Gln Ala Ala
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160
```

```
Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Lys Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 19
<211> 354
<212> PRT
<213> JC virus

<400> 19

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                   10                  15

Pro Lys Leu Leu Ile Arg Gly Gly Val Glu Val Leu Glu Val Lys Thr
            20                  25                  30
```

```
Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Ser Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Ile Gly Val Thr Ser Leu Met Asn Val His Ser Asn Gly Gln Ala Ala
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Phe Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300
```

```
Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Lys Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 20
<211> 354
<212> PRT
<213> JC virus

<400> 20

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                   10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Ser Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Ile Gly Val Thr Ser Leu Met Asn Val His Ser Asn Gly Gln Ala Ala
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175
```

```
Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Phe Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Lys Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 21
<211> 344
<212> PRT
<213> JC virus

<400> 21

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

Glu Ala Ala Ala Ala Thr Gly Phe Ser Val Ala Glu Ile Ala Ala Gly
            20                  25                  30

Glu Ala Ala Ala Thr Ile Glu Val Glu Ile Ala Ser Leu Ala Thr Val
        35                  40                  45

Glu Gly Ile Thr Ser Thr Ser Glu Ala Ile Ala Ala Ile Gly Leu Thr
```

```
    50                  55                  60

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

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

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

Gly Leu Phe Gln Gln Pro Ala Met Ala Leu Gln Leu Phe Asn Pro Glu
        115                 120                 125

Asp Tyr Tyr Asp Ile Leu Phe Pro Gly Val Asn Ala Phe Val Asn Asn
    130                 135                 140

Ile His Tyr Leu Asp Pro Arg His Trp Gly Pro Ser Leu Phe Ser Thr
145                 150                 155                 160

Ile Ser Gln Ala Phe Trp Asn Leu Val Arg Asp Asp Leu Pro Ser Leu
                165                 170                 175

Thr Ser Gln Glu Ile Gln Arg Arg Thr Gln Lys Leu Phe Val Glu Ser
            180                 185                 190

Leu Ala Arg Phe Leu Glu Glu Thr Thr Trp Ala Ile Val Asn Ser Pro
        195                 200                 205

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

Val Arg Pro Ser Met Val Arg Gln Val Ala Gln Arg Glu Gly Thr Tyr
225                 230                 235                 240

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

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

Ser Gly Glu Phe Ile Glu Lys Ser Ile Ala Pro Gly Gly Ala Asn Gln
        275                 280                 285

Arg Ser Ala Pro Gln Trp Met Leu Pro Leu Leu Leu Gly Leu Tyr Gly
    290                 295                 300

Thr Val Thr Pro Ala Leu Glu Ala Tyr Glu Asp Gly Pro Asn Lys Lys
305                 310                 315                 320

Lys Arg Arg Lys Glu Gly Pro Arg Ala Ser Ser Lys Thr Ser Tyr Lys
```

```
                325                 330                 335

Arg Arg Ser Arg Ser Ser Arg Ser
            340
```

<210> 22
<211> 354
<212> PRT
<213> JC virus

<400> 22

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                  10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Ile Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220
```

```
Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 23
<211> 354
<212> PRT
<213> JC virus

<400> 23

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                   10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Leu Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65                  70                  75                  80

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

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
100 105 110

Ile Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
115 120 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
130 135 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145 150 155 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
165 170 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
180 185 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
195 200 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
210 215 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225 230 235 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
245 250 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
260 265 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
275 280 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
290 295 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305 310 315 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
325 330 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
340 345 350

Met Leu

<210> 24
<211> 354
<212> PRT
<213> JC virus

<400> 24

Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1 5 10 15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
35 40 45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
50 55 60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65 70 75 80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
85 90 95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
100 105 110

Ile Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
115 120 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
130 135 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145 150 155 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
165 170 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
180 185 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
195 200 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
210 215 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225 230 235 240

```
Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 25
<211> 354
<212> PRT
<213> JC virus

<400> 25

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                   10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Leu Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
```

115 120 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
130 135 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145 150 155 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
165 170 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
180 185 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
195 200 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
210 215 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225 230 235 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
245 250 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
260 265 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
275 280 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
290 295 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305 310 315 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
325 330 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
340 345 350

Met Leu

<210> 26
<211> 354
<212> PRT
<213> JC virus

<400> 26

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                  10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Leu Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Tyr Gln Gln Trp
            260                 265                 270
```

```
Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 27
<211> 354
<212> PRT
<213> JC virus

<400> 27

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                   10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Met Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Leu Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140
```

```
Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 28
<211> 354
<212> PRT
<213> JC virus

<400> 28

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                   10                  15
```

```
Pro Lys Leu Leu Ile Arg Gly Gly Val Glu Val Leu Glu Val Lys Thr
            20                  25                  30

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Leu Gly Val Thr Thr Leu Met Asn Val His Cys Asn Gly Gln Ala Thr
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285
```

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
290 295 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305 310 315 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
325 330 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
340 345 350

Met Leu

<210> 29
<211> 354
<212> PRT
<213> JC virus

<400> 29

Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1 5 10 15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
35 40 45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
50 55 60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65 70 75 80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
85 90 95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
100 105 110

Leu Gly Val Thr Thr Leu Met Asn Val His Cys Asn Gly Gln Ala Thr
115 120 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
130 135 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145 150 155 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr

```
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 30
<211> 245
<212> PRT
<213> JC virus

<400> 30

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

Ser Lys Ser Ile Ser Ile Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn
            20                  25                  30

Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
        35                  40                  45
```

```
Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
    50                  55                  60

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

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
                85                  90                  95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
            100                 105                 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
        115                 120                 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
    130                 135                 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145                 150                 155                 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
                165                 170                 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
            180                 185                 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
        195                 200                 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg
    210                 215                 220

Ser Gly Ser Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225                 230                 235                 240

Leu Arg Lys Arg Arg
                245
```

<210> 31
<211> 245
<212> PRT
<213> JC virus

<400> 31

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

Ser Lys Ser Ile Ser Ile Ser His Thr Phe Glu Ser Asp Ser Pro Asn
            20                  25                  30
```

```
Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
        35                  40                  45

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
    50                  55                  60

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

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
                85                  90                  95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
            100                 105                 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
        115                 120                 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
    130                 135                 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145                 150                 155                 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
                165                 170                 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
            180                 185                 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
        195                 200                 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg
    210                 215                 220

Ser Gly Ser Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225                 230                 235                 240

Leu Arg Lys Arg Arg
                245
```

<210> 32
<211> 245
<212> PRT
<213> JC virus

<400> 32

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

Ser Lys Ser Ile Ser Ile Ser Asn Thr Phe Glu Ser Asp Ser Pro Asn
20 25 30

Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
35 40 45

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
50 55 60

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

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
85 90 95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
100 105 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
115 120 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
130 135 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145 150 155 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
165 170 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
180 185 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
195 200 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg
210 215 220

Ser Gly Ser Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225 230 235 240

Leu Arg Lys Arg Arg
245

<210> 33
<211> 245
<212> PRT
<213> JC virus

<400> 33

Phe Leu Thr Pro Glu Met Gly Asp Pro Asp Glu His Leu Arg Gly Phe

1 5 10 15

Ser Glu Ser Ile Ser Ile Ser His Thr Phe Glu Ser Asp Ser Pro Asn
20 25 30

Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
35 40 45

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
50 55 60

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

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
85 90 95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
100 105 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
115 120 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
130 135 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145 150 155 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
165 170 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
180 185 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
195 200 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg
210 215 220

Ser Gly Ser Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225 230 235 240

Leu Arg Lys Arg Arg
245

<210> 34
<211> 245
<212> PRT
<213> JC virus

<400> 34

Phe Leu Thr Pro Glu Met Gly Asp Pro Asp Glu His Leu Arg Gly Phe
1 5 10 15

Ser Lys Ser Ile Ser Ile Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn
20 25 30

Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
35 40 45

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
50 55 60

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

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
85 90 95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
100 105 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
115 120 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
130 135 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145 150 155 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
165 170 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
180 185 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
195 200 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg
210 215 220

Phe Gly Ser Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225 230 235 240

Leu Arg Lys Arg Arg
245

<210> 35
<211> 245

<212> PRT
<213> JC virus

<400> 35

Phe Leu Thr Pro Glu Met Gly Asp Pro Asp Glu His Leu Arg Gly Phe
1 5 10 15

Ser Met Ser Ile Ser Ile Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn
20 25 30

Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
35 40 45

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
50 55 60

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

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
85 90 95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
100 105 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
115 120 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
130 135 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145 150 155 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
165 170 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
180 185 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
195 200 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg
210 215 220

Ser Gly Ser Gln His Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225 230 235 240

Leu Arg Lys Arg Arg
245

<210> 36
<211> 245
<212> PRT
<213> JC virus

<400> 36

Phe Leu Thr Pro Glu Met Gly Asp Pro Asp Glu His Leu Arg Gly Phe
1 5 10 15

Ser Lys Ser Ile Ser Ile Ser His Thr Phe Glu Ser Asp Ser Pro Asn
20 25 30

Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
35 40 45

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
50 55 60

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

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
85 90 95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
100 105 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
115 120 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
130 135 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145 150 155 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
165 170 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
180 185 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
195 200 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg
210 215 220

Ser Gly Ser Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225 230 235 240

Leu Arg Lys Arg Arg
245

<210> 37
<211> 245
<212> PRT
<213> JC virus

<400> 37

Phe Leu Thr Pro Glu Met Gly Asp Pro Asp Glu His Leu Arg Gly Phe
1 5 10 15

Ser Lys Ser Ile Ser Ile Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn
20 25 30

Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
35 40 45

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
50 55 60

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

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
85 90 95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
100 105 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
115 120 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
130 135 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145 150 155 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
165 170 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
180 185 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
195 200 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg
210 215 220

Ser Gly Phe Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln

225 230 235 240

Leu Arg Lys Arg Arg
245

<210> 38
<211> 245
<212> PRT
<213> JC virus

<400> 38

Phe Leu Thr Pro Glu Met Gly Asp Pro Asp Glu His Leu Arg Gly Phe
1 5 10 15

Ser Lys Ser Ile Ser Ile Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn
20 25 30

Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
35 40 45

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
50 55 60

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

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
85 90 95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
100 105 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
115 120 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
130 135 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145 150 155 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
165 170 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
180 185 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
195 200 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg
210 215 220

```
Phe Gly Ser Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225                 230                 235                 240

Leu Arg Lys Arg Arg
            245
```

<210> 39
<211> 245
<212> PRT
<213> JC virus

<400> 39

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

Ser Lys Ser Ile Ser Ile Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn
            20                  25                  30

Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
        35                  40                  45

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
    50                  55                  60

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

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
                85                  90                  95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
            100                 105                 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
        115                 120                 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
    130                 135                 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145                 150                 155                 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
                165                 170                 175

Gly Gly Glu Asn Ala Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
            180                 185                 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
        195                 200                 205
```

```
Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg
    210                 215                 220

Ser Gly Ser Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225                 230                 235                 240

Leu Arg Lys Arg Arg
                245
```

<210> 40
<211> 245
<212> PRT
<213> JC virus

<400> 40

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

Ser Lys Ser Ile Ser Ile Ser Asp Thr Phe Asp Ser Asp Ser Pro Asn
            20                  25                  30

Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
        35                  40                  45

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
    50                  55                  60

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

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
                85                  90                  95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
            100                 105                 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
        115                 120                 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
    130                 135                 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145                 150                 155                 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
                165                 170                 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
            180                 185                 190
```

```
Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
        195                 200                 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg
    210                 215                 220

Ser Gly Phe Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225                 230                 235                 240

Leu Arg Lys Arg Arg
                245
```

<210> 41
<211> 354
<212> PRT
<213> JC virus

<400> 41

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                   10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Ile Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Ala
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
```

```
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Val Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 42
<211> 354
<212> PRT
<213> JC virus

<400> 42

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                   10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60
```

```
Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Leu Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
        115                 120                 125

His Asp Asn Gly Ala Gly Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Thr Arg Ser Gly Ser Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Ile Glu Glu Val Arg Val Phe Glu Gly Thr Glu Glu Leu Pro Gly Asp
                325                 330                 335
```

```
Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350

Met Leu
```

<210> 43
<211> 354
<212> PRT
<213> JC virus

<400> 43

```
Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1               5                   10                  15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
        35                  40                  45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Lys Ser Ile Ser Ile
    50                  55                  60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65                  70                  75                  80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
                85                  90                  95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Ile Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
        115                 120                 125

His Asp Asn Gly Ala Ala Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Thr Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205
```

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
210 215 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225 230 235 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
245 250 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Phe Gly Ser Gln Gln Trp
260 265 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
275 280 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
290 295 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305 310 315 320

Ile Glu Glu Val Arg Val Phe Glu Gly Thr Glu Gln Leu Pro Gly Asp
325 330 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
340 345 350

Met Leu

<210> 44
<211> 354
<212> PRT
<213> JC virus

<400> 44

Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1 5 10 15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
35 40 45

Gly Asp Pro Asp Glu His Phe Arg Gly Phe Ser Lys Ser Ile Ser Ile
50 55 60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65 70 75 80

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

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
            100                 105                 110

Ile Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
        115                 120                 125

His Asp Asn Gly Ala Ala Lys Pro Val Gln Gly Thr Ser Phe His Phe
    130                 135                 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145                 150                 155                 160

Tyr Arg Thr Thr Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
                165                 170                 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
            180                 185                 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
        195                 200                 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
    210                 215                 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu
225                 230                 235                 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
                245                 250                 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
            260                 265                 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
        275                 280                 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
    290                 295                 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305                 310                 315                 320

Ile Glu Glu Val Arg Val Phe Glu Gly Thr Glu Gln Leu Pro Gly Asp
                325                 330                 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
            340                 345                 350
```

Met Leu

<210> 45
<211> 354
<212> PRT
<213> JC virus

<400> 45

Met Ala Pro Thr Lys Arg Lys Gly Glu Arg Lys Asp Pro Val Gln Val
1 5 10 15

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

Gly Val Asp Ser Ile Thr Glu Val Glu Cys Phe Leu Thr Pro Glu Met
35 40 45

Gly Asp Pro Asp Glu His Leu Arg Gly Phe Ser Asn Ser Ile Ser Ile
50 55 60

Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn Lys Asp Met Leu Pro Cys
65 70 75 80

Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn Leu Asn Glu Asp Leu Thr
85 90 95

Cys Gly Asn Ile Leu Met Trp Glu Ala Val Thr Leu Lys Thr Glu Val
100 105 110

Ile Gly Val Thr Thr Leu Met Asn Val His Ser Asn Gly Gln Ala Thr
115 120 125

His Asp Asn Gly Ala Ala Lys Pro Val Gln Gly Thr Ser Phe His Phe
130 135 140

Phe Ser Val Gly Gly Glu Ala Leu Glu Leu Gln Gly Val Val Phe Asn
145 150 155 160

Tyr Arg Thr Thr Tyr Pro Asp Gly Thr Ile Phe Pro Lys Asn Ala Thr
165 170 175

Val Gln Ser Gln Val Met Asn Thr Glu His Lys Ala Tyr Leu Asp Lys
180 185 190

Asn Lys Ala Tyr Pro Val Glu Cys Trp Val Pro Asp Pro Thr Arg Asn
195 200 205

Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr Gly Gly Glu Asn Val Pro
210 215 220

Pro Val Leu His Ile Thr Asn Thr Ala Thr Thr Val Leu Leu Asp Glu

225 230 235 240

Phe Gly Val Gly Pro Leu Cys Lys Gly Asp Asn Leu Tyr Leu Ser Ala
245 250 255

Val Asp Val Cys Gly Met Phe Thr Asn Arg Ser Gly Ser Gln Gln Trp
260 265 270

Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln Leu Arg Lys Arg Arg Val
275 280 285

Lys Asn Pro Tyr Pro Ile Ser Phe Leu Leu Thr Asp Leu Ile Asn Arg
290 295 300

Arg Thr Pro Arg Val Asp Gly Gln Pro Met Tyr Gly Met Asp Ala Gln
305 310 315 320

Ile Glu Glu Val Arg Val Phe Glu Gly Thr Glu Gln Leu Pro Gly Asp
325 330 335

Pro Asp Met Met Arg Tyr Val Asp Arg Tyr Gly Gln Leu Gln Thr Lys
340 345 350

Met Leu

<210> 46
<211> 245
<212> PRT
<213> JC virus

<400> 46

Phe Leu Thr Pro Glu Met Gly Asp Pro Asp Glu His Leu Arg Gly Phe
1 5 10 15

Ser Lys Ser Ile Ser Ile Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn
20 25 30

Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
35 40 45

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
50 55 60

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

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
85 90 95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
100 105 110

```
Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
        115                 120                 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
    130                 135                 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145                 150                 155                 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
                165                 170                 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
            180                 185                 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
        195                 200                 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asp Arg
    210                 215                 220

Ser Gly Ser Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225                 230                 235                 240

Leu Arg Lys Arg Arg
                245
```

<210> 47
<211> 245
<212> PRT
<213> JC virus

<400> 47

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

Ser Lys Ser Ile Ser Ile Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn
            20                  25                  30

Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
        35                  40                  45

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
    50                  55                  60

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

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
                85                  90                  95
```

```
Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
            100                 105                 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
        115                 120                 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
    130                 135                 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145                 150                 155                 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
                165                 170                 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
            180                 185                 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
        195                 200                 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg
    210                 215                 220

Ser Gly Ser Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225                 230                 235                 240

Leu Arg Lys Arg Arg
                245
```

<210> 48
<211> 245
<212> PRT
<213> JC virus

<400> 48

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

Ser Lys Ser Ile Ser Ile Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn
            20                  25                  30

Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
        35                  40                  45

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
    50                  55                  60

Thr Leu Lys Thr Glu Val Leu Gly Val Thr Thr Leu Met Asn Val His
65                  70                  75                  80
```

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
85 90 95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
100 105 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
115 120 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
130 135 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145 150 155 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
165 170 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
180 185 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
195 200 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asp Arg
210 215 220

Ser Gly Ser Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225 230 235 240

Leu Arg Lys Arg Arg
245

<210> 49
<211> 245
<212> PRT
<213> JC virus

<400> 49

Phe Leu Thr Pro Glu Met Gly Asp Pro Asp Glu His Leu Arg Gly Phe
1 5 10 15

Ser Lys Ser Ile Ser Ile Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn
20 25 30

Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
35 40 45

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
50 55 60

Thr Leu Lys Thr Glu Val Leu Gly Val Thr Thr Leu Met Asn Val His

65 70 75 80

Cys Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
85 90 95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
100 105 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
115 120 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
130 135 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145 150 155 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
165 170 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
180 185 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
195 200 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg
210 215 220

Ser Gly Ser Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225 230 235 240

Leu Arg Lys Arg Arg
245

<210> 50
<211> 245
<212> PRT
<213> JC virus

<400> 50

Phe Leu Thr Pro Glu Met Gly Asp Pro Asp Glu His Leu Arg Gly Phe
1 5 10 15

Ser Lys Ser Ile Ser Ile Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn
20 25 30

Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
35 40 45

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
50 55 60

```
Thr Leu Lys Thr Glu Val Ile Gly Val Thr Thr Leu Met Asn Val His
65                  70                  75                  80

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
                85                  90                  95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
            100                 105                 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
        115                 120                 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
    130                 135                 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145                 150                 155                 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
                165                 170                 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
            180                 185                 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
        195                 200                 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg
    210                 215                 220

Ser Gly Phe Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225                 230                 235                 240

Leu Arg Lys Arg Arg
                245
```

<210> 51
<211> 245
<212> PRT
<213> JC virus

<400> 51

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

Ser Lys Ser Ile Ser Ile Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn
            20                  25                  30

Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
        35                  40                  45
```

```
Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
    50                  55                  60

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

Cys Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
                85                  90                  95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
            100                 105                 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
        115                 120                 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
    130                 135                 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145                 150                 155                 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
                165                 170                 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
            180                 185                 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
        195                 200                 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg
    210                 215                 220

Ser Gly Ser Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225                 230                 235                 240

Leu Arg Lys Arg Arg
                245
```

<210> 52
<211> 245
<212> PRT
<213> JC virus

<400> 52

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

Ser Lys Ser Ile Ser Ile Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn
            20                  25                  30
```

```
Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
        35                  40                  45

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
    50                  55                  60

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

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
                85                  90                  95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
            100                 105                 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
        115                 120                 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
    130                 135                 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145                 150                 155                 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
                165                 170                 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
            180                 185                 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
        195                 200                 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg
    210                 215                 220

Ser Gly Ser Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225                 230                 235                 240

Leu Arg Lys Arg Arg
                245
```

<210> 53
<211> 245
<212> PRT
<213> JC virus

<400> 53

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

Ser Lys Ser Ile Ser Ile Ser Asp Thr Phe Glu Ser Asp Ser Pro Asn
```

20 25 30

Lys Asp Met Leu Pro Cys Tyr Ser Val Ala Arg Ile Pro Leu Pro Asn
35 40 45

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
50 55 60

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

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
85 90 95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
100 105 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
115 120 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
130 135 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145 150 155 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
165 170 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
180 185 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
195 200 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asn Arg
210 215 220

Ser Gly Ser Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
225 230 235 240

Leu Arg Lys Arg Arg
245

<210> 54
<211> 245
<212> PRT
<213> JC virus

<400> 54

Phe Leu Thr Pro Glu Met Gly Asp Pro Asp Glu His Leu Arg Gly Phe
1 5 10 15

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

Leu Asn Glu Asp Leu Thr Cys Gly Asn Ile Leu Met Trp Glu Ala Val
    50                  55                  60

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

Ser Asn Gly Gln Ala Thr His Asp Asn Gly Ala Gly Lys Pro Val Gln
                85                  90                  95

Gly Thr Ser Phe His Phe Phe Ser Val Gly Gly Glu Ala Leu Glu Leu
            100                 105                 110

Gln Gly Val Val Phe Asn Tyr Arg Thr Lys Tyr Pro Asp Gly Thr Ile
        115                 120                 125

Phe Pro Lys Asn Ala Thr Val Gln Ser Gln Val Met Asn Thr Glu His
    130                 135                 140

Lys Ala Tyr Leu Asp Lys Asn Lys Ala Tyr Pro Val Glu Cys Trp Val
145                 150                 155                 160

Pro Asp Pro Thr Arg Asn Glu Asn Thr Arg Tyr Phe Gly Thr Leu Thr
                165                 170                 175

Gly Gly Glu Asn Val Pro Pro Val Leu His Ile Thr Asn Thr Ala Thr
            180                 185                 190

Thr Val Leu Leu Asp Glu Phe Gly Val Gly Pro Leu Cys Lys Gly Asp
        195                 200                 205

Asn Leu Tyr Leu Ser Ala Val Asp Val Cys Gly Met Phe Thr Asp Arg
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Ser Gly Ser Gln Gln Trp Arg Gly Leu Ser Arg Tyr Phe Lys Val Gln
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Leu Arg Lys Arg Arg
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