SEQUENCE LISTING

<110> NVIP Pty Ltd

<120> Therapeutic Canine Immunoglobulins and Methods of Using the Same

<130> P122572.WO.01

<150> GB1114858.2
<151> 2011-08-29

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<151> 2011-09-06

<160> 15

<170> PatentIn version 3.5

<210> 1
<211> 453
<212> PRT
<213> Artificial Sequence

<220>
<223> Caninised anti-NGF VH canine IgG-A heavy chain (caN-HCA)

<400> 1

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

Thr Leu Thr Leu Ser Cys Val Val Ser Gly Phe Ser Leu Thr Asn Asn
20 25 30

Asn Val Asn Trp Val Arg Gln Ala Leu Gly Arg Gly Leu Glu Trp Val
35 40 45

Gly Gly Val Trp Ala Gly Gly Ala Thr Asp Tyr Asn Ser Ala Leu Lys
50 55 60

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

Lys Met His Ser Leu Gln Ser Glu Asp Thr Ala Thr Tyr Tyr Cys Ala
85 90 95

Arg Asp Gly Gly Tyr Ser Ser Ser Thr Leu Tyr Ala Met Asp Ala Trp
100 105 110

```
Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Thr Ala Pro
        115                 120                 125

Ser Val Phe Pro Leu Ala Pro Ser Cys Gly Ser Thr Ser Gly Ser Thr
    130                 135                 140

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

Val Ser Trp Asn Ser Gly Ser Leu Thr Ser Gly Val His Thr Phe Pro
                165                 170                 175

Ser Val Leu Gln Ser Ser Gly Leu His Ser Leu Ser Ser Met Val Thr
            180                 185                 190

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

His Pro Ala Ser Asn Thr Lys Val Asp Lys Pro Val Phe Asn Glu Cys
    210                 215                 220

Arg Cys Thr Asp Thr Pro Pro Cys Pro Val Pro Glu Pro Leu Gly Gly
225                 230                 235                 240

Pro Ser Val Leu Ile Phe Pro Pro Lys Pro Lys Asp Ile Leu Arg Ile
                245                 250                 255

Thr Arg Thr Pro Glu Val Thr Cys Val Val Leu Asp Leu Gly Arg Glu
            260                 265                 270

Asp Pro Glu Val Gln Ile Ser Trp Phe Val Asp Gly Lys Glu Val His
        275                 280                 285

Thr Ala Lys Thr Gln Ser Arg Glu Gln Gln Phe Asn Gly Thr Tyr Arg
    290                 295                 300

Val Val Ser Val Leu Pro Ile Glu His Gln Asp Trp Leu Thr Gly Lys
305                 310                 315                 320

Glu Phe Lys Cys Arg Val Asn His Ile Asp Leu Pro Ser Pro Ile Glu
                325                 330                 335
```

```
Arg Thr Ile Ser Lys Ala Arg Gly Arg Ala His Lys Pro Ser Val Tyr
            340                 345                 350

Val Leu Pro Pro Ser Pro Lys Glu Leu Ser Ser Ser Asp Thr Val Ser
        355                 360                 365

Ile Thr Cys Leu Ile Lys Asp Phe Tyr Pro Pro Asp Ile Asp Val Glu
    370                 375                 380

Trp Gln Ser Asn Gly Gln Gln Glu Pro Glu Arg Lys His Arg Met Thr
385                 390                 395                 400

Pro Pro Gln Leu Asp Glu Asp Gly Ser Tyr Phe Leu Tyr Ser Lys Leu
                405                 410                 415

Ser Val Asp Lys Ser Arg Trp Gln Gln Gly Asp Pro Phe Thr Cys Ala
            420                 425                 430

Val Met His Glu Thr Leu Gln Asn His Tyr Thr Asp Leu Ser Leu Ser
        435                 440                 445

His Ser Pro Gly Lys
    450
```

<210> 2
<211> 457
<212> PRT
<213> Artificial Sequence

<220>
<223> Caninised anti-NGF VH canine IgG-B heavy chain (caN-HCB)

<400> 2

```
Glu Val Gln Leu Val Glu Ser Gly Gly Asp Leu Val Asn Pro Gly Gly
1               5                   10                  15

Thr Leu Thr Leu Ser Cys Val Val Ser Gly Phe Ser Leu Thr Asn Asn
            20                  25                  30

Asn Val Asn Trp Val Arg Gln Ala Leu Gly Arg Gly Leu Glu Trp Val
        35                  40                  45

Gly Gly Val Trp Ala Gly Gly Ala Thr Asp Tyr Asn Ser Ala Leu Lys
    50                  55                  60
```

```
Ser Arg Leu Thr Ile Thr Arg Asp Thr Ser Lys Ser Thr Val Phe Leu
65                  70                  75                  80

Lys Met His Ser Leu Gln Ser Glu Asp Thr Ala Thr Tyr Tyr Cys Ala
                85                  90                  95

Arg Asp Gly Gly Tyr Ser Ser Ser Thr Leu Tyr Ala Met Asp Ala Trp
            100                 105                 110

Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Thr Ala Pro
        115                 120                 125

Ser Val Phe Pro Leu Ala Pro Ser Cys Gly Ser Thr Ser Gly Ser Thr
    130                 135                 140

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

Val Ser Trp Asn Ser Gly Ser Leu Thr Ser Gly Val His Thr Phe Pro
                165                 170                 175

Ser Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Met Val Thr
            180                 185                 190

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

His Pro Ala Ser Lys Thr Lys Val Asp Lys Pro Val Pro Lys Arg Glu
    210                 215                 220

Asn Gly Arg Val Pro Arg Pro Pro Asp Cys Pro Lys Cys Pro Ala Pro
225                 230                 235                 240

Glu Met Leu Gly Gly Pro Ser Val Phe Ile Phe Pro Pro Lys Pro Lys
                245                 250                 255

Asp Thr Leu Leu Ile Ala Arg Thr Pro Glu Val Thr Cys Val Val Val
            260                 265                 270

Asp Leu Asp Pro Glu Asp Pro Glu Val Gln Ile Ser Trp Phe Val Asp
        275                 280                 285
```

```
Gly Lys Gln Met Gln Thr Ala Lys Thr Gln Pro Arg Glu Glu Gln Phe
    290                 295                 300

Asn Gly Thr Tyr Arg Val Val Ser Val Leu Pro Ile Gly His Gln Asp
305                 310                 315                 320

Trp Leu Lys Gly Lys Gln Phe Thr Cys Lys Val Asn Asn Lys Ala Leu
                325                 330                 335

Pro Ser Pro Ile Glu Arg Thr Ile Ser Lys Ala Arg Gly Gln Ala His
            340                 345                 350

Gln Pro Ser Val Tyr Val Leu Pro Pro Ser Arg Glu Glu Leu Ser Lys
        355                 360                 365

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

Ile Asp Val Glu Trp Gln Ser Asn Gly Gln Gln Glu Pro Glu Ser Lys
385                 390                 395                 400

Tyr Arg Thr Thr Pro Pro Gln Leu Asp Glu Asp Gly Ser Tyr Phe Leu
                405                 410                 415

Tyr Ser Lys Leu Ser Val Asp Lys Ser Arg Trp Gln Arg Gly Asp Thr
            420                 425                 430

Phe Ile Cys Ala Val Met His Glu Ala Leu His Asn His Tyr Thr Gln
        435                 440                 445

Glu Ser Leu Ser His Ser Pro Gly Lys
    450                 455
```

<210> 3
<211> 455
<212> PRT
<213> Artificial Sequence

<220>
<223> Caninised anti-NGF VH canine IgG-C heavy chain (caN-HCC)

<400> 3

```
Glu Val Gln Leu Val Glu Ser Gly Gly Asp Leu Val Asn Pro Gly Gly
1               5                   10                  15
```

```
Thr Leu Thr Leu Ser Cys Val Val Ser Gly Phe Ser Leu Thr Asn Asn
            20                  25                  30

Asn Val Asn Trp Val Arg Gln Ala Leu Gly Arg Gly Leu Glu Trp Val
        35                  40                  45

Gly Gly Val Trp Ala Gly Gly Ala Thr Asp Tyr Asn Ser Ala Leu Lys
    50                  55                  60

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

Lys Met His Ser Leu Gln Ser Glu Asp Thr Ala Thr Tyr Tyr Cys Ala
                85                  90                  95

Arg Asp Gly Gly Tyr Ser Ser Ser Thr Leu Tyr Ala Met Asp Ala Trp
            100                 105                 110

Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Thr Ala Pro
        115                 120                 125

Ser Val Phe Pro Leu Ala Pro Ser Cys Gly Ser Gln Ser Gly Ser Thr
    130                 135                 140

Val Ala Leu Ala Cys Leu Val Ser Gly Tyr Ile Pro Glu Pro Val Thr
145                 150                 155                 160

Val Ser Trp Asn Ser Val Ser Leu Thr Ser Gly Val His Thr Phe Pro
                165                 170                 175

Ser Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Met Val Thr
            180                 185                 190

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

His Pro Ala Thr Asn Thr Lys Val Asp Lys Pro Val Ala Lys Glu Cys
    210                 215                 220

Glu Cys Lys Cys Asn Cys Asn Asn Cys Pro Cys Pro Gly Cys Gly Leu
225                 230                 235                 240
```

```
Leu Gly Gly Pro Ser Val Phe Ile Phe Pro Pro Lys Pro Lys Asp Ile
                245                 250                 255

Leu Val Thr Ala Arg Thr Pro Thr Val Thr Cys Val Val Val Asp Leu
            260                 265                 270

Asp Pro Glu Asn Pro Glu Val Gln Ile Ser Trp Phe Val Asp Ser Lys
        275                 280                 285

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

Thr Tyr Arg Val Val Ser Val Leu Pro Ile Gly His Gln Asp Trp Leu
305                 310                 315                 320

Ser Gly Lys Gln Phe Lys Cys Lys Val Asn Asn Lys Ala Leu Pro Ser
                325                 330                 335

Pro Ile Glu Glu Ile Ile Ser Lys Thr Pro Gly Gln Ala His Gln Pro
            340                 345                 350

Asn Val Tyr Val Leu Pro Pro Ser Arg Asp Glu Met Ser Lys Asn Thr
        355                 360                 365

Val Thr Leu Thr Cys Leu Val Lys Asp Phe Phe Pro Pro Glu Ile Asp
    370                 375                 380

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

Met Thr Pro Pro Gln Leu Asp Glu Asp Gly Ser Tyr Phe Leu Tyr Ser
                405                 410                 415

Lys Leu Ser Val Asp Lys Ser Arg Trp Gln Arg Gly Asp Thr Phe Ile
            420                 425                 430

Cys Ala Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Ile Ser
        435                 440                 445

Leu Ser His Ser Pro Gly Lys
    450                 455
```

<210> 4
<211> 453
<212> PRT
<213> Artificial Sequence

<220>
<223> Caninised anti-NGF VH canine IgG-D heavy chain (caN-HCD)

<400> 4

```
Glu Val Gln Leu Val Glu Ser Gly Gly Asp Leu Val Asn Pro Gly Gly
1               5                   10                  15

Thr Leu Thr Leu Ser Cys Val Val Ser Gly Phe Ser Leu Thr Asn Asn
            20                  25                  30

Asn Val Asn Trp Val Arg Gln Ala Leu Gly Arg Gly Leu Glu Trp Val
        35                  40                  45

Gly Gly Val Trp Ala Gly Gly Ala Thr Asp Tyr Asn Ser Ala Leu Lys
    50                  55                  60

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

Lys Met His Ser Leu Gln Ser Glu Asp Thr Ala Thr Tyr Tyr Cys Ala
                85                  90                  95

Arg Asp Gly Gly Tyr Ser Ser Ser Thr Leu Tyr Ala Met Asp Ala Trp
            100                 105                 110

Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Thr Ala Pro
        115                 120                 125

Ser Val Phe Pro Leu Ala Pro Ser Cys Gly Ser Thr Ser Gly Ser Thr
    130                 135                 140

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

Val Ser Trp Asn Ser Gly Ser Leu Thr Ser Gly Val His Thr Phe Pro
                165                 170                 175

Ser Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Thr Val Thr
            180                 185                 190
```

```
Val Pro Ser Ser Arg Trp Pro Ser Glu Thr Phe Thr Cys Asn Val Val
        195                 200                 205

His Pro Ala Ser Asn Thr Lys Val Asp Lys Pro Val Pro Lys Glu Ser
    210                 215                 220

Thr Cys Lys Cys Ile Ser Pro Cys Pro Val Pro Glu Ser Leu Gly Gly
225                 230                 235                 240

Pro Ser Val Phe Ile Phe Pro Pro Lys Pro Lys Asp Ile Leu Arg Ile
                245                 250                 255

Thr Arg Thr Pro Glu Ile Thr Cys Val Val Leu Asp Leu Gly Arg Glu
            260                 265                 270

Asp Pro Glu Val Gln Ile Ser Trp Phe Val Asp Gly Lys Glu Val His
        275                 280                 285

Thr Ala Lys Thr Gln Pro Arg Glu Gln Gln Phe Asn Ser Thr Tyr Arg
    290                 295                 300

Val Val Ser Val Leu Pro Ile Glu His Gln Asp Trp Leu Thr Gly Lys
305                 310                 315                 320

Glu Phe Lys Cys Arg Val Asn His Ile Gly Leu Pro Ser Pro Ile Glu
                325                 330                 335

Arg Thr Ile Ser Lys Ala Arg Gly Gln Ala His Gln Pro Ser Val Tyr
            340                 345                 350

Val Leu Pro Pro Ser Pro Lys Glu Leu Ser Ser Ser Asp Thr Val Thr
        355                 360                 365

Leu Thr Cys Leu Ile Lys Asp Phe Tyr Pro Pro Glu Ile Asp Val Glu
    370                 375                 380

Trp Gln Ser Asn Gly Gln Pro Glu Pro Glu Ser Lys Tyr His Thr Thr
385                 390                 395                 400

Ala Pro Gln Leu Asp Glu Asp Gly Ser Tyr Phe Leu Tyr Ser Lys Leu
                405                 410                 415
```

```
Ser Val Asp Lys Ser Arg Trp Gln Gln Gly Asp Thr Phe Thr Cys Ala
            420                 425                 430

Val Met His Glu Ala Leu Gln Asn His Tyr Thr Asp Leu Ser Leu Ser
        435                 440                 445

His Ser Pro Gly Lys
    450
```

<210> 5
<211> 217
<212> PRT
<213> Artificial Sequence

<220>
<223> Caninised anti-NGF VL canine kappa light chain (caN-kLC)

<400> 5

```
Asp Ile Gln Met Thr Gln Ser Pro Ala Ser Leu Ser Leu Ser Gln Glu
1               5                   10                  15

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

Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Lys Leu Leu Ile
        35                  40                  45

Tyr Asn Thr Asp Thr Leu His Thr Gly Val Pro Ser Arg Phe Ser Gly
    50                  55                  60

Ser Gly Ser Gly Thr Glu Tyr Ser Leu Thr Ile Asn Ser Leu Glu Ser
65                  70                  75                  80

Glu Asp Val Ala Val Tyr Phe Cys Gln His Tyr Phe His Tyr Pro Arg
                85                  90                  95

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

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

Ser Ala Ser Val Val Cys Leu Leu Asn Ser Phe Tyr Pro Lys Asp Ile
    130                 135                 140
```

```
Asn Val Lys Trp Lys Val Asp Gly Val Ile Gln Asp Thr Gly Ile Gln
145                 150                 155                 160

Glu Ser Val Thr Glu Gln Asp Lys Asp Ser Thr Tyr Ser Leu Ser Ser
                165                 170                 175

Thr Leu Thr Met Ser Ser Thr Glu Tyr Leu Ser His Glu Leu Tyr Ser
            180                 185                 190

Cys Glu Ile Thr His Lys Ser Leu Pro Ser Thr Leu Ile Lys Ser Phe
        195                 200                 205

Gln Arg Ser Glu Cys Gln Arg Val Asp
    210                 215
```

<210> 6
<211> 457
<212> PRT
<213> Artificial Sequence

<220>
<223> Caninised anti-NGF VH Aglycosyl canine immunoglobulin heavy chain type B (caN-HCB*)

<400> 6

```
Glu Val Gln Leu Val Glu Ser Gly Gly Asp Leu Val Asn Pro Gly Gly
1               5                   10                  15

Thr Leu Thr Leu Ser Cys Val Val Ser Gly Phe Ser Leu Thr Asn Asn
            20                  25                  30

Asn Val Asn Trp Val Arg Gln Ala Leu Gly Arg Gly Leu Glu Trp Val
        35                  40                  45

Gly Gly Val Trp Ala Gly Gly Ala Thr Asp Tyr Asn Ser Ala Leu Lys
    50                  55                  60

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

Lys Met His Ser Leu Gln Ser Glu Asp Thr Ala Thr Tyr Tyr Cys Ala
                85                  90                  95

Arg Asp Gly Gly Tyr Ser Ser Ser Thr Leu Tyr Ala Met Asp Ala Trp
```

```
           100                 105                 110

Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Thr Ala Pro
        115                 120                 125

Ser Val Phe Pro Leu Ala Pro Ser Cys Gly Ser Thr Ser Gly Ser Thr
    130                 135                 140

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

Val Ser Trp Asn Ser Gly Ser Leu Thr Ser Gly Val His Thr Phe Pro
                165                 170                 175

Ser Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Met Val Thr
            180                 185                 190

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

His Pro Ala Ser Lys Thr Lys Val Asp Lys Pro Val Pro Lys Arg Glu
    210                 215                 220

Asn Gly Arg Val Pro Arg Pro Pro Asp Cys Pro Lys Cys Pro Ala Pro
225                 230                 235                 240

Glu Met Leu Gly Gly Pro Ser Val Phe Ile Phe Pro Pro Lys Pro Lys
                245                 250                 255

Asp Thr Leu Leu Ile Ala Arg Thr Pro Glu Val Thr Cys Val Val Val
            260                 265                 270

Asp Leu Asp Pro Glu Asp Pro Glu Val Gln Ile Ser Trp Phe Val Asp
        275                 280                 285

Gly Lys Gln Met Gln Thr Ala Lys Thr Gln Pro Arg Glu Glu Gln Phe
    290                 295                 300

Ala Gly Thr Tyr Arg Val Val Ser Val Leu Pro Ile Gly His Gln Asp
305                 310                 315                 320

Trp Leu Lys Gly Lys Gln Phe Thr Cys Lys Val Asn Asn Lys Ala Leu
                325                 330                 335
```

```
Pro Ser Pro Ile Glu Arg Thr Ile Ser Lys Ala Arg Gly Gln Ala His
            340                 345                 350

Gln Pro Ser Val Tyr Val Leu Pro Pro Ser Arg Glu Glu Leu Ser Lys
        355                 360                 365

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

Ile Asp Val Glu Trp Gln Ser Asn Gly Gln Gln Glu Pro Glu Ser Lys
385                 390                 395                 400

Tyr Arg Thr Thr Pro Pro Gln Leu Asp Glu Asp Gly Ser Tyr Phe Leu
                405                 410                 415

Tyr Ser Lys Leu Ser Val Asp Lys Ser Arg Trp Gln Arg Gly Asp Thr
            420                 425                 430

Phe Ile Cys Ala Val Met His Glu Ala Leu His Asn His Tyr Thr Gln
        435                 440                 445

Glu Ser Leu Ser His Ser Pro Gly Lys
    450                 455
```

<210> 7
<211> 455
<212> PRT
<213> Artificial Sequence

<220>
<223> Caninised anti-NGF VH aglycosyl canine immunoglobulin heavy chain type C (caN-HCC*)

<400> 7

```
Glu Val Gln Leu Val Glu Ser Gly Gly Asp Leu Val Asn Pro Gly Gly
1               5                   10                  15

Thr Leu Thr Leu Ser Cys Val Val Ser Gly Phe Ser Leu Thr Asn Asn
            20                  25                  30

Asn Val Asn Trp Val Arg Gln Ala Leu Gly Arg Gly Leu Glu Trp Val
        35                  40                  45
```

```
Gly Gly Val Trp Ala Gly Gly Ala Thr Asp Tyr Asn Ser Ala Leu Lys
    50                  55                  60

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

Lys Met His Ser Leu Gln Ser Glu Asp Thr Ala Thr Tyr Tyr Cys Ala
                85                  90                  95

Arg Asp Gly Gly Tyr Ser Ser Ser Thr Leu Tyr Ala Met Asp Ala Trp
            100                 105                 110

Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Thr Ala Pro
        115                 120                 125

Ser Val Phe Pro Leu Ala Pro Ser Cys Gly Ser Gln Ser Gly Ser Thr
    130                 135                 140

Val Ala Leu Ala Cys Leu Val Ser Gly Tyr Ile Pro Glu Pro Val Thr
145                 150                 155                 160

Val Ser Trp Asn Ser Val Ser Leu Thr Ser Gly Val His Thr Phe Pro
                165                 170                 175

Ser Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Met Val Thr
            180                 185                 190

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

His Pro Ala Thr Asn Thr Lys Val Asp Lys Pro Val Ala Lys Glu Cys
    210                 215                 220

Glu Cys Lys Cys Asn Cys Asn Asn Cys Pro Cys Pro Gly Cys Gly Leu
225                 230                 235                 240

Leu Gly Gly Pro Ser Val Phe Ile Phe Pro Pro Lys Pro Lys Asp Ile
                245                 250                 255

Leu Val Thr Ala Arg Thr Pro Thr Val Thr Cys Val Val Val Asp Leu
            260                 265                 270

Asp Pro Glu Asn Pro Glu Val Gln Ile Ser Trp Phe Val Asp Ser Lys
```

```
        275                 280                 285

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

Thr Tyr Arg Val Val Ser Val Leu Pro Ile Gly His Gln Asp Trp Leu
305                 310                 315                 320

Ser Gly Lys Gln Phe Lys Cys Lys Val Asn Asn Lys Ala Leu Pro Ser
                325                 330                 335

Pro Ile Glu Glu Ile Ile Ser Lys Thr Pro Gly Gln Ala His Gln Pro
            340                 345                 350

Asn Val Tyr Val Leu Pro Pro Ser Arg Asp Glu Met Ser Lys Asn Thr
        355                 360                 365

Val Thr Leu Thr Cys Leu Val Lys Asp Phe Phe Pro Pro Glu Ile Asp
    370                 375                 380

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

Met Thr Pro Pro Gln Leu Asp Glu Asp Gly Ser Tyr Phe Leu Tyr Ser
                405                 410                 415

Lys Leu Ser Val Asp Lys Ser Arg Trp Gln Arg Gly Asp Thr Phe Ile
            420                 425                 430

Cys Ala Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Ile Ser
        435                 440                 445

Leu Ser His Ser Pro Gly Lys
    450                 455
```

<210> 8
<211> 331
<212> PRT
<213> Artificial Sequence

<220>
<223> Canine immunoglobulin heavy chain type A Fc domain (HCA)

<400> 8

```
Ala Ser Thr Thr Ala Pro Ser Val Phe Pro Leu Ala Pro Ser Cys Gly
1               5                  10                  15

Ser Thr Ser Gly Ser Thr Val Ala Leu Ala Cys Leu Val Ser Gly Tyr
            20                  25                  30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ser Leu Thr Ser
        35                  40                  45

Gly Val His Thr Phe Pro Ser Val Leu Gln Ser Ser Gly Leu His Ser
    50                  55                  60

Leu Ser Ser Met Val Thr Val Pro Ser Ser Arg Trp Pro Ser Glu Thr
65                  70                  75                  80

Phe Thr Cys Asn Val Val His Pro Ala Ser Asn Thr Lys Val Asp Lys
                85                  90                  95

Pro Val Phe Asn Glu Cys Arg Cys Thr Asp Thr Pro Pro Cys Pro Val
            100                 105                 110

Pro Glu Pro Leu Gly Gly Pro Ser Val Leu Ile Phe Pro Pro Lys Pro
        115                 120                 125

Lys Asp Ile Leu Arg Ile Thr Arg Thr Pro Glu Val Thr Cys Val Val
    130                 135                 140

Leu Asp Leu Gly Arg Glu Asp Pro Glu Val Gln Ile Ser Trp Phe Val
145                 150                 155                 160

Asp Gly Lys Glu Val His Thr Ala Lys Thr Gln Ser Arg Glu Gln Gln
                165                 170                 175

Phe Asn Gly Thr Tyr Arg Val Val Ser Val Leu Pro Ile Glu His Gln
            180                 185                 190

Asp Trp Leu Thr Gly Lys Glu Phe Lys Cys Arg Val Asn His Ile Asp
        195                 200                 205

Leu Pro Ser Pro Ile Glu Arg Thr Ile Ser Lys Ala Arg Gly Arg Ala
    210                 215                 220

His Lys Pro Ser Val Tyr Val Leu Pro Pro Ser Pro Lys Glu Leu Ser
```

225 230 235 240

Ser Ser Asp Thr Val Ser Ile Thr Cys Leu Ile Lys Asp Phe Tyr Pro
245 250 255

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

Arg Lys His Arg Met Thr Pro Pro Gln Leu Asp Glu Asp Gly Ser Tyr
275 280 285

Phe Leu Tyr Ser Lys Leu Ser Val Asp Lys Ser Arg Trp Gln Gln Gly
290 295 300

Asp Pro Phe Thr Cys Ala Val Met His Glu Thr Leu Gln Asn His Tyr
305 310 315 320

Thr Asp Leu Ser Leu Ser His Ser Pro Gly Lys
325 330

<210> 9
<211> 335
<212> PRT
<213> Artificial Sequence

<220>
<223> Canine immunoglobulin heavy chain type B Fc domain (HCB)

<400> 9

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

Ser Thr Ser Gly Ser Thr Val Ala Leu Ala Cys Leu Val Ser Gly Tyr
20 25 30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ser Leu Thr Ser
35 40 45

Gly Val His Thr Phe Pro Ser Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

Leu Ser Ser Met Val Thr Val Pro Ser Ser Arg Trp Pro Ser Glu Thr
65 70 75 80

```
Phe Thr Cys Asn Val Ala His Pro Ala Ser Lys Thr Lys Val Asp Lys
                85                  90                  95

Pro Val Pro Lys Arg Glu Asn Gly Arg Val Pro Arg Pro Pro Asp Cys
            100                 105                 110

Pro Lys Cys Pro Ala Pro Glu Met Leu Gly Gly Pro Ser Val Phe Ile
        115                 120                 125

Phe Pro Pro Lys Pro Lys Asp Thr Leu Leu Ile Ala Arg Thr Pro Glu
    130                 135                 140

Val Thr Cys Val Val Val Asp Leu Asp Pro Glu Asp Pro Glu Val Gln
145                 150                 155                 160

Ile Ser Trp Phe Val Asp Gly Lys Gln Met Gln Thr Ala Lys Thr Gln
                165                 170                 175

Pro Arg Glu Glu Gln Phe Asn Gly Thr Tyr Arg Val Val Ser Val Leu
            180                 185                 190

Pro Ile Gly His Gln Asp Trp Leu Lys Gly Lys Gln Phe Thr Cys Lys
        195                 200                 205

Val Asn Asn Lys Ala Leu Pro Ser Pro Ile Glu Arg Thr Ile Ser Lys
    210                 215                 220

Ala Arg Gly Gln Ala His Gln Pro Ser Val Tyr Val Leu Pro Pro Ser
225                 230                 235                 240

Arg Glu Glu Leu Ser Lys Asn Thr Val Ser Leu Thr Cys Leu Ile Lys
                245                 250                 255

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

Gln Glu Pro Glu Ser Lys Tyr Arg Thr Thr Pro Pro Gln Leu Asp Glu
        275                 280                 285

Asp Gly Ser Tyr Phe Leu Tyr Ser Lys Leu Ser Val Asp Lys Ser Arg
    290                 295                 300

Trp Gln Arg Gly Asp Thr Phe Ile Cys Ala Val Met His Glu Ala Leu
```

305 310 315 320

His Asn His Tyr Thr Gln Glu Ser Leu Ser His Ser Pro Gly Lys
325 330 335

<210> 10
<211> 333
<212> PRT
<213> Artificial Sequence

<220>
<223> Canine immunoglobulin heavy chain type C Fc domain (HCC)

<400> 10

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

Ser Gln Ser Gly Ser Thr Val Ala Leu Ala Cys Leu Val Ser Gly Tyr
20 25 30

Ile Pro Glu Pro Val Thr Val Ser Trp Asn Ser Val Ser Leu Thr Ser
35 40 45

Gly Val His Thr Phe Pro Ser Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

Leu Ser Ser Met Val Thr Val Pro Ser Ser Arg Trp Pro Ser Glu Thr
65 70 75 80

Phe Thr Cys Asn Val Ala His Pro Ala Thr Asn Thr Lys Val Asp Lys
85 90 95

Pro Val Ala Lys Glu Cys Glu Cys Lys Cys Asn Cys Asn Asn Cys Pro
100 105 110

Cys Pro Gly Cys Gly Leu Leu Gly Gly Pro Ser Val Phe Ile Phe Pro
115 120 125

Pro Lys Pro Lys Asp Ile Leu Val Thr Ala Arg Thr Pro Thr Val Thr
130 135 140

Cys Val Val Val Asp Leu Asp Pro Glu Asn Pro Glu Val Gln Ile Ser
145 150 155 160

```
Trp Phe Val Asp Ser Lys Gln Val Gln Thr Ala Asn Thr Gln Pro Arg
                165                 170                 175

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

Gly His Gln Asp Trp Leu Ser Gly Lys Gln Phe Lys Cys Lys Val Asn
        195                 200                 205

Asn Lys Ala Leu Pro Ser Pro Ile Glu Glu Ile Ile Ser Lys Thr Pro
    210                 215                 220

Gly Gln Ala His Gln Pro Asn Val Tyr Val Leu Pro Pro Ser Arg Asp
225                 230                 235                 240

Glu Met Ser Lys Asn Thr Val Thr Leu Thr Cys Leu Val Lys Asp Phe
                245                 250                 255

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

Pro Glu Ser Lys Tyr Arg Met Thr Pro Pro Gln Leu Asp Glu Asp Gly
        275                 280                 285

Ser Tyr Phe Leu Tyr Ser Lys Leu Ser Val Asp Lys Ser Arg Trp Gln
    290                 295                 300

Arg Gly Asp Thr Phe Ile Cys Ala Val Met His Glu Ala Leu His Asn
305                 310                 315                 320

His Tyr Thr Gln Ile Ser Leu Ser His Ser Pro Gly Lys
                325                 330
```

<210> 11
<211> 331
<212> PRT
<213> Artificial Sequence

<220>
<223> Canine immunoglobulin heavy chain type D Fc domain (HCD)

<400> 11

```
Ala Ser Thr Thr Ala Pro Ser Val Phe Pro Leu Ala Pro Ser Cys Gly
1               5                   10                  15
```

```
Ser Thr Ser Gly Ser Thr Val Ala Leu Ala Cys Leu Val Ser Gly Tyr
            20                  25                  30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ser Leu Thr Ser
        35                  40                  45

Gly Val His Thr Phe Pro Ser Val Leu Gln Ser Ser Gly Leu Tyr Ser
    50                  55                  60

Leu Ser Ser Thr Val Thr Val Pro Ser Ser Arg Trp Pro Ser Glu Thr
65                  70                  75                  80

Phe Thr Cys Asn Val Val His Pro Ala Ser Asn Thr Lys Val Asp Lys
                85                  90                  95

Pro Val Pro Lys Glu Ser Thr Cys Lys Cys Ile Ser Pro Cys Pro Val
            100                 105                 110

Pro Glu Ser Leu Gly Gly Pro Ser Val Phe Ile Phe Pro Pro Lys Pro
        115                 120                 125

Lys Asp Ile Leu Arg Ile Thr Arg Thr Pro Glu Ile Thr Cys Val Val
    130                 135                 140

Leu Asp Leu Gly Arg Glu Asp Pro Glu Val Gln Ile Ser Trp Phe Val
145                 150                 155                 160

Asp Gly Lys Glu Val His Thr Ala Lys Thr Gln Pro Arg Glu Gln Gln
                165                 170                 175

Phe Asn Ser Thr Tyr Arg Val Val Ser Val Leu Pro Ile Glu His Gln
            180                 185                 190

Asp Trp Leu Thr Gly Lys Glu Phe Lys Cys Arg Val Asn His Ile Gly
        195                 200                 205

Leu Pro Ser Pro Ile Glu Arg Thr Ile Ser Lys Ala Arg Gly Gln Ala
    210                 215                 220

His Gln Pro Ser Val Tyr Val Leu Pro Pro Ser Pro Lys Glu Leu Ser
225                 230                 235                 240
```

```
Ser Ser Asp Thr Val Thr Leu Thr Cys Leu Ile Lys Asp Phe Tyr Pro
                245                 250                 255

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

Ser Lys Tyr His Thr Thr Ala Pro Gln Leu Asp Glu Asp Gly Ser Tyr
        275                 280                 285

Phe Leu Tyr Ser Lys Leu Ser Val Asp Lys Ser Arg Trp Gln Gln Gly
    290                 295                 300

Asp Thr Phe Thr Cys Ala Val Met His Glu Ala Leu Gln Asn His Tyr
305                 310                 315                 320

Thr Asp Leu Ser Leu Ser His Ser Pro Gly Lys
                325                 330
```

<210> 12
<211> 331
<212> PRT
<213> Artificial Sequence

<220>
<223> Aglycosyl canine immunoglobulin heavy chain type A Fc domain (HCA*)

<400> 12

```
Ala Ser Thr Thr Ala Pro Ser Val Phe Pro Leu Ala Pro Ser Cys Gly
1               5                   10                  15

Ser Thr Ser Gly Ser Thr Val Ala Leu Ala Cys Leu Val Ser Gly Tyr
            20                  25                  30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ser Leu Thr Ser
        35                  40                  45

Gly Val His Thr Phe Pro Ser Val Leu Gln Ser Ser Gly Leu His Ser
    50                  55                  60

Leu Ser Ser Met Val Thr Val Pro Ser Ser Arg Trp Pro Ser Glu Thr
65                  70                  75                  80

Phe Thr Cys Asn Val Val His Pro Ala Ser Asn Thr Lys Val Asp Lys
                85                  90                  95
```

```
Pro Val Phe Asn Glu Cys Arg Cys Thr Asp Thr Pro Pro Cys Pro Val
            100                 105                 110

Pro Glu Pro Leu Gly Gly Pro Ser Val Leu Ile Phe Pro Pro Lys Pro
        115                 120                 125

Lys Asp Ile Leu Arg Ile Thr Arg Thr Pro Glu Val Thr Cys Val Val
    130                 135                 140

Leu Asp Leu Gly Arg Glu Asp Pro Glu Val Gln Ile Ser Trp Phe Val
145                 150                 155                 160

Asp Gly Lys Glu Val His Thr Ala Lys Thr Gln Ser Arg Glu Gln Gln
                165                 170                 175

Phe Ala Gly Thr Tyr Arg Val Val Ser Val Leu Pro Ile Glu His Gln
            180                 185                 190

Asp Trp Leu Thr Gly Lys Glu Phe Lys Cys Arg Val Asn His Ile Asp
        195                 200                 205

Leu Pro Ser Pro Ile Glu Arg Thr Ile Ser Lys Ala Arg Gly Arg Ala
    210                 215                 220

His Lys Pro Ser Val Tyr Val Leu Pro Pro Ser Pro Lys Glu Leu Ser
225                 230                 235                 240

Ser Ser Asp Thr Val Ser Ile Thr Cys Leu Ile Lys Asp Phe Tyr Pro
                245                 250                 255

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

Arg Lys His Arg Met Thr Pro Pro Gln Leu Asp Glu Asp Gly Ser Tyr
        275                 280                 285

Phe Leu Tyr Ser Lys Leu Ser Val Asp Lys Ser Arg Trp Gln Gln Gly
    290                 295                 300

Asp Pro Phe Thr Cys Ala Val Met His Glu Thr Leu Gln Asn His Tyr
305                 310                 315                 320
```

Thr Asp Leu Ser Leu Ser His Ser Pro Gly Lys
325 330

<210> 13
<211> 335
<212> PRT
<213> Artificial Sequence

<220>
<223> Aglycosyl caninised immunoglobulin heavy chain type B Fc domain (HCB*)

<400> 13

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

Ser Thr Ser Gly Ser Thr Val Ala Leu Ala Cys Leu Val Ser Gly Tyr
20 25 30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ser Leu Thr Ser
35 40 45

Gly Val His Thr Phe Pro Ser Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

Leu Ser Ser Met Val Thr Val Pro Ser Ser Arg Trp Pro Ser Glu Thr
65 70 75 80

Phe Thr Cys Asn Val Ala His Pro Ala Ser Lys Thr Lys Val Asp Lys
85 90 95

Pro Val Pro Lys Arg Glu Asn Gly Arg Val Pro Arg Pro Pro Asp Cys
100 105 110

Pro Lys Cys Pro Ala Pro Glu Met Leu Gly Gly Pro Ser Val Phe Ile
115 120 125

Phe Pro Pro Lys Pro Lys Asp Thr Leu Leu Ile Ala Arg Thr Pro Glu
130 135 140

Val Thr Cys Val Val Val Asp Leu Asp Pro Glu Asp Pro Glu Val Gln
145 150 155 160

Ile Ser Trp Phe Val Asp Gly Lys Gln Met Gln Thr Ala Lys Thr Gln

```
                165                 170                 175

Pro Arg Glu Glu Gln Phe Ala Gly Thr Tyr Arg Val Val Ser Val Leu
            180                 185                 190

Pro Ile Gly His Gln Asp Trp Leu Lys Gly Lys Gln Phe Thr Cys Lys
        195                 200                 205

Val Asn Asn Lys Ala Leu Pro Ser Pro Ile Glu Arg Thr Ile Ser Lys
    210                 215                 220

Ala Arg Gly Gln Ala His Gln Pro Ser Val Tyr Val Leu Pro Pro Ser
225                 230                 235                 240

Arg Glu Glu Leu Ser Lys Asn Thr Val Ser Leu Thr Cys Leu Ile Lys
                245                 250                 255

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

Gln Glu Pro Glu Ser Lys Tyr Arg Thr Thr Pro Pro Gln Leu Asp Glu
        275                 280                 285

Asp Gly Ser Tyr Phe Leu Tyr Ser Lys Leu Ser Val Asp Lys Ser Arg
    290                 295                 300

Trp Gln Arg Gly Asp Thr Phe Ile Cys Ala Val Met His Glu Ala Leu
305                 310                 315                 320

His Asn His Tyr Thr Gln Glu Ser Leu Ser His Ser Pro Gly Lys
                325                 330                 335


<210>  14
<211>  333
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Aglycosyl canine immunoglobulin heavy chain type C Fc domain
       (HCC*)

<400>  14

Ala Ser Thr Thr Ala Pro Ser Val Phe Pro Leu Ala Pro Ser Cys Gly
1               5                   10                  15
```

```
Ser Gln Ser Gly Ser Thr Val Ala Leu Ala Cys Leu Val Ser Gly Tyr
            20                  25                  30

Ile Pro Glu Pro Val Thr Val Ser Trp Asn Ser Val Ser Leu Thr Ser
        35                  40                  45

Gly Val His Thr Phe Pro Ser Val Leu Gln Ser Ser Gly Leu Tyr Ser
    50                  55                  60

Leu Ser Ser Met Val Thr Val Pro Ser Ser Arg Trp Pro Ser Glu Thr
65                  70                  75                  80

Phe Thr Cys Asn Val Ala His Pro Ala Thr Asn Thr Lys Val Asp Lys
                85                  90                  95

Pro Val Ala Lys Glu Cys Glu Cys Lys Cys Asn Cys Asn Asn Cys Pro
            100                 105                 110

Cys Pro Gly Cys Gly Leu Leu Gly Gly Pro Ser Val Phe Ile Phe Pro
        115                 120                 125

Pro Lys Pro Lys Asp Ile Leu Val Thr Ala Arg Thr Pro Thr Val Thr
    130                 135                 140

Cys Val Val Val Asp Leu Asp Pro Glu Asn Pro Glu Val Gln Ile Ser
145                 150                 155                 160

Trp Phe Val Asp Ser Lys Gln Val Gln Thr Ala Asn Thr Gln Pro Arg
                165                 170                 175

Glu Glu Gln Ser Ala Gly Thr Tyr Arg Val Val Ser Val Leu Pro Ile
            180                 185                 190

Gly His Gln Asp Trp Leu Ser Gly Lys Gln Phe Lys Cys Lys Val Asn
        195                 200                 205

Asn Lys Ala Leu Pro Ser Pro Ile Glu Glu Ile Ile Ser Lys Thr Pro
    210                 215                 220

Gly Gln Ala His Gln Pro Asn Val Tyr Val Leu Pro Pro Ser Arg Asp
225                 230                 235                 240
```

```
Glu Met Ser Lys Asn Thr Val Thr Leu Thr Cys Leu Val Lys Asp Phe
                245                 250                 255

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

Pro Glu Ser Lys Tyr Arg Met Thr Pro Pro Gln Leu Asp Glu Asp Gly
        275                 280                 285

Ser Tyr Phe Leu Tyr Ser Lys Leu Ser Val Asp Lys Ser Arg Trp Gln
    290                 295                 300

Arg Gly Asp Thr Phe Ile Cys Ala Val Met His Glu Ala Leu His Asn
305                 310                 315                 320

His Tyr Thr Gln Ile Ser Leu Ser His Ser Pro Gly Lys
                325                 330
```

<210> 15
<211> 331
<212> PRT
<213> Artificial Sequence

<220>
<223> Canine immunoglobulin heavy chain type D Fc domain (HCD*)

<400> 15

```
Ala Ser Thr Thr Ala Pro Ser Val Phe Pro Leu Ala Pro Ser Cys Gly
1               5                   10                  15

Ser Thr Ser Gly Ser Thr Val Ala Leu Ala Cys Leu Val Ser Gly Tyr
            20                  25                  30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ser Leu Thr Ser
        35                  40                  45

Gly Val His Thr Phe Pro Ser Val Leu Gln Ser Ser Gly Leu Tyr Ser
    50                  55                  60

Leu Ser Ser Thr Val Thr Val Pro Ser Ser Arg Trp Pro Ser Glu Thr
65                  70                  75                  80

Phe Thr Cys Asn Val Val His Pro Ala Ser Asn Thr Lys Val Asp Lys
                85                  90                  95
```

```
Pro Val Pro Lys Glu Ser Thr Cys Lys Cys Ile Ser Pro Cys Pro Val
            100                 105                 110

Pro Glu Ser Leu Gly Gly Pro Ser Val Phe Ile Phe Pro Pro Lys Pro
        115                 120                 125

Lys Asp Ile Leu Arg Ile Thr Arg Thr Pro Glu Ile Thr Cys Val Val
    130                 135                 140

Leu Asp Leu Gly Arg Glu Asp Pro Glu Val Gln Ile Ser Trp Phe Val
145                 150                 155                 160

Asp Gly Lys Glu Val His Thr Ala Lys Thr Gln Pro Arg Glu Gln Gln
                165                 170                 175

Phe Ala Ser Thr Tyr Arg Val Val Ser Val Leu Pro Ile Glu His Gln
            180                 185                 190

Asp Trp Leu Thr Gly Lys Glu Phe Lys Cys Arg Val Asn His Ile Gly
        195                 200                 205

Leu Pro Ser Pro Ile Glu Arg Thr Ile Ser Lys Ala Arg Gly Gln Ala
    210                 215                 220

His Gln Pro Ser Val Tyr Val Leu Pro Pro Ser Pro Lys Glu Leu Ser
225                 230                 235                 240

Ser Ser Asp Thr Val Thr Leu Thr Cys Leu Ile Lys Asp Phe Tyr Pro
                245                 250                 255

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

Ser Lys Tyr His Thr Thr Ala Pro Gln Leu Asp Glu Asp Gly Ser Tyr
        275                 280                 285

Phe Leu Tyr Ser Lys Leu Ser Val Asp Lys Ser Arg Trp Gln Gln Gly
    290                 295                 300

Asp Thr Phe Thr Cys Ala Val Met His Glu Ala Leu Gln Asn His Tyr
305                 310                 315                 320
```

Thr Asp Leu Ser Leu Ser His Ser Pro Gly Lys
325 330