SEQUENCE LISTING

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Aoki, Kei Roger

<120> Immuno-Based Botulinum Toxin Serotype A
Activity Assays

<130> 18383 (BOT)

<150> US 61/036,723
<151> 2008-03-14

<160> 148

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 1296
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<213> Clostridium botulinum

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            20                  25                  30
Val Lys Ala Phe Lys Ile His Asn Lys Ile Trp Val Ile Pro Glu Arg
        35                  40                  45
Asp Thr Phe Thr Asn Pro Glu Glu Gly Asp Leu Asn Pro Pro Pro Glu
    50                  55                  60
Ala Lys Gln Val Pro Val Ser Tyr Tyr Asp Ser Thr Tyr Leu Ser Thr
65                  70                  75                  80
Asp Asn Glu Lys Asp Asn Tyr Leu Lys Gly Val Thr Lys Leu Phe Glu
                85                  90                  95
Arg Ile Tyr Ser Thr Asp Leu Gly Arg Met Leu Leu Thr Ser Ile Val
            100                 105                 110
Arg Gly Ile Pro Phe Trp Gly Gly Ser Thr Ile Asp Thr Glu Leu Lys
        115                 120                 125
Val Ile Asp Thr Asn Cys Ile Asn Val Ile Gln Pro Asp Gly Ser Tyr
    130                 135                 140
Arg Ser Glu Glu Leu Asn Leu Val Ile Ile Gly Pro Ser Ala Asp Ile
145                 150                 155                 160
Ile Gln Phe Glu Cys Lys Ser Phe Gly His Glu Val Leu Asn Leu Thr
                165                 170                 175
Arg Asn Gly Tyr Gly Ser Thr Gln Tyr Ile Arg Phe Ser Pro Asp Phe
            180                 185                 190
Thr Phe Gly Phe Glu Glu Ser Leu Glu Val Asp Thr Asn Pro Leu Leu
        195                 200                 205
Gly Ala Gly Lys Phe Ala Thr Asp Pro Ala Val Thr Leu Ala His Glu
    210                 215                 220
Leu Ile His Ala Gly His Arg Leu Tyr Gly Ile Ala Ile Asn Pro Asn
225                 230                 235                 240
Arg Val Phe Lys Val Asn Thr Asn Ala Tyr Tyr Glu Met Ser Gly Leu
                245                 250                 255
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Glu Val Ser Phe Glu Glu Leu Arg Thr Phe Gly Gly His Asp Ala Lys
260 265 270
Phe Ile Asp Ser Leu Gln Glu Asn Glu Phe Arg Leu Tyr Tyr Tyr Asn
275 280 285
Lys Phe Lys Asp Ile Ala Ser Thr Leu Asn Lys Ala Lys Ser Ile Val
290 295 300
Gly Thr Thr Ala Ser Leu Gln Tyr Met Lys Asn Val Phe Lys Glu Lys
305 310 315 320
Tyr Leu Leu Ser Glu Asp Thr Ser Gly Lys Phe Ser Val Asp Lys Leu
325 330 335
Lys Phe Asp Lys Leu Tyr Lys Met Leu Thr Glu Ile Tyr Thr Glu Asp
340 345 350
Asn Phe Val Lys Phe Phe Lys Val Leu Asn Arg Lys Thr Tyr Leu Asn
355 360 365
Phe Asp Lys Ala Val Phe Lys Ile Asn Ile Val Pro Lys Val Asn Tyr
370 375 380
Thr Ile Tyr Asp Gly Phe Asn Leu Arg Asn Thr Asn Leu Ala Ala Asn
385 390 395 400
Phe Asn Gly Gln Asn Thr Glu Ile Asn Asn Met Asn Phe Thr Lys Leu
405 410 415
Lys Asn Phe Thr Gly Leu Phe Glu Phe Tyr Lys Leu Leu Cys Val Arg
420 425 430
Gly Ile Ile Thr Ser Lys Thr Lys Ser Leu Asp Lys Gly Tyr Asn Lys
435 440 445
Ala Leu Asn Asp Leu Cys Ile Lys Val Asn Asn Trp Asp Leu Phe Phe
450 455 460
Ser Pro Ser Glu Asp Asn Phe Thr Asn Asp Leu Asn Lys Gly Glu Glu
465 470 475 480
Ile Thr Ser Asp Thr Asn Ile Glu Ala Ala Glu Glu Asn Ile Ser Leu
485 490 495
Asp Leu Ile Gln Gln Tyr Tyr Leu Thr Phe Asn Phe Asp Asn Glu Pro
500 505 510
Glu Asn Ile Ser Ile Glu Asn Leu Ser Ser Asp Ile Ile Gly Gln Leu
515 520 525
Glu Leu Met Pro Asn Ile Glu Arg Phe Pro Asn Gly Lys Lys Tyr Glu
530 535 540
Leu Asp Lys Tyr Thr Met Phe His Tyr Leu Arg Ala Gln Glu Phe Glu
545 550 555 560
His Gly Lys Ser Arg Ile Ala Leu Thr Asn Ser Val Asn Glu Ala Leu
565 570 575
Leu Asn Pro Ser Arg Val Tyr Thr Phe Phe Ser Ser Asp Tyr Val Lys
580 585 590
Lys Val Asn Lys Ala Thr Glu Ala Ala Met Phe Leu Gly Trp Val Glu
595 600 605
Gln Leu Val Tyr Asp Phe Thr Asp Glu Thr Ser Glu Val Ser Thr Thr
610 615 620
Asp Lys Ile Ala Asp Ile Thr Ile Ile Ile Pro Tyr Ile Gly Pro Ala
625 630 635 640
Leu Asn Ile Gly Asn Met Leu Tyr Lys Asp Asp Phe Val Gly Ala Leu
645 650 655
Ile Phe Ser Gly Ala Val Ile Leu Leu Glu Phe Ile Pro Glu Ile Ala
660 665 670
Ile Pro Val Leu Gly Thr Phe Ala Leu Val Ser Tyr Ile Ala Asn Lys
675 680 685
Val Leu Thr Val Gln Thr Ile Asp Asn Ala Leu Ser Lys Arg Asn Glu
690 695 700
Lys Trp Asp Glu Val Tyr Lys Tyr Ile Val Thr Asn Trp Leu Ala Lys
705 710 715 720
Val Asn Thr Gln Ile Asp Leu Ile Arg Lys Lys Met Lys Glu Ala Leu

```
                725                 730                 735
Glu Asn Gln Ala Glu Ala Thr Lys Ala Ile Ile Asn Tyr Gln Tyr Asn
            740                 745                 750
Gln Tyr Thr Glu Glu Glu Lys Asn Asn Ile Asn Phe Asn Ile Asp Asp
        755                 760                 765
Leu Ser Ser Lys Leu Asn Glu Ser Ile Asn Lys Ala Met Ile Asn Ile
    770                 775                 780
Asn Lys Phe Leu Asn Gln Cys Ser Val Ser Tyr Leu Met Asn Ser Met
785                 790                 795                 800
Ile Pro Tyr Gly Val Lys Arg Leu Glu Asp Phe Asp Ala Ser Leu Lys
                805                 810                 815
Asp Ala Leu Leu Lys Tyr Ile Tyr Asp Asn Arg Gly Thr Leu Ile Gly
            820                 825                 830
Gln Val Asp Arg Leu Lys Asp Lys Val Asn Asn Thr Leu Ser Thr Asp
        835                 840                 845
Ile Pro Phe Gln Leu Ser Lys Tyr Val Asp Asn Gln Arg Leu Leu Ser
    850                 855                 860
Thr Phe Thr Glu Tyr Ile Lys Asn Ile Ile Asn Thr Ser Ile Leu Asn
865                 870                 875                 880
Leu Arg Tyr Glu Ser Asn His Leu Ile Asp Leu Ser Arg Tyr Ala Ser
                885                 890                 895
Lys Ile Asn Ile Gly Ser Lys Val Asn Phe Asp Pro Ile Asp Lys Asn
            900                 905                 910
Gln Ile Gln Leu Phe Asn Leu Glu Ser Ser Lys Ile Glu Val Ile Leu
        915                 920                 925
Lys Asn Ala Ile Val Tyr Asn Ser Met Tyr Glu Asn Phe Ser Thr Ser
    930                 935                 940
Phe Trp Ile Arg Ile Pro Lys Tyr Phe Asn Ser Ile Ser Leu Asn Asn
945                 950                 955                 960
Glu Tyr Thr Ile Ile Asn Cys Met Glu Asn Asn Ser Gly Trp Lys Val
                965                 970                 975
Ser Leu Asn Tyr Gly Glu Ile Ile Trp Thr Leu Gln Asp Thr Gln Glu
            980                 985                 990
Ile Lys Gln Arg Val Val Phe Lys Tyr Ser Gln Met Ile Asn Ile Ser
        995                 1000                1005
Asp Tyr Ile Asn Arg Trp Ile Phe Val Thr Ile Thr Asn Asn Arg Leu
    1010                1015                1020
Asn Asn Ser Lys Ile Tyr Ile Asn Gly Arg Leu Ile Asp Gln Lys Pro
1025                1030                1035                1040
Ile Ser Asn Leu Gly Asn Ile His Ala Ser Asn Asn Ile Met Phe Lys
                1045                1050                1055
Leu Asp Gly Cys Arg Asp Thr His Arg Tyr Ile Trp Ile Lys Tyr Phe
            1060                1065                1070
Asn Leu Phe Asp Lys Glu Leu Asn Glu Lys Glu Ile Lys Asp Leu Tyr
        1075                1080                1085
Asp Asn Gln Ser Asn Ser Gly Ile Leu Lys Asp Phe Trp Gly Asp Tyr
    1090                1095                1100
Leu Gln Tyr Asp Lys Pro Tyr Tyr Met Leu Asn Leu Tyr Asp Pro Asn
1105                1110                1115                1120
Lys Tyr Val Asp Val Asn Asn Val Gly Ile Arg Gly Tyr Met Tyr Leu
                1125                1130                1135
Lys Gly Pro Arg Gly Ser Val Met Thr Thr Asn Ile Tyr Leu Asn Ser
            1140                1145                1150
Ser Leu Tyr Arg Gly Thr Lys Phe Ile Ile Lys Lys Tyr Ala Ser Gly
        1155                1160                1165
Asn Lys Asp Asn Ile Val Arg Asn Asn Asp Arg Val Tyr Ile Asn Val
    1170                1175                1180
Val Val Lys Asn Lys Glu Tyr Arg Leu Ala Thr Asn Ala Ser Gln Ala
1185                1190                1195                1200
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Gly Val Glu Lys Ile Leu Ser Ala Leu Glu Ile Pro Asp Val Gly Asn
                1205                1210                1215
Leu Ser Gln Val Val Val Met Lys Ser Lys Asn Asp Gln Gly Ile Thr
            1220                1225                1230
Asn Lys Cys Lys Met Asn Leu Gln Asp Asn Asn Gly Asn Asp Ile Gly
        1235                1240                1245
Phe Ile Gly Phe His Gln Phe Asn Asn Ile Ala Lys Leu Val Ala Ser
    1250                1255                1260
Asn Trp Tyr Asn Arg Gln Ile Glu Arg Ser Ser Arg Thr Leu Gly Cys
1265                1270                1275                1280
Ser Trp Glu Phe Ile Pro Val Asp Asp Gly Trp Gly Glu Arg Pro Leu
                1285                1290                1295


<210> 2
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<213> Clostridium botulinum

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Met Pro Phe Val Asn Lys Gln Phe Asn Tyr Lys Asp Pro Val Asn Gly
 1               5                  10                  15
Val Asp Ile Ala Tyr Ile Lys Ile Pro Asn Ala Gly Gln Met Gln Pro
            20                  25                  30
Val Lys Ala Phe Lys Ile His Asn Lys Ile Trp Val Ile Pro Glu Arg
        35                  40                  45
Asp Thr Phe Thr Asn Pro Glu Glu Gly Asp Leu Asn Pro Pro Pro Glu
    50                  55                  60
Ala Lys Gln Val Pro Val Ser Tyr Tyr Asp Ser Thr Tyr Leu Ser Thr
65                  70                  75                  80
Asp Asn Glu Lys Asp Asn Tyr Leu Lys Gly Val Thr Lys Leu Phe Glu
                85                  90                  95
Arg Ile Tyr Ser Thr Asp Leu Gly Arg Met Leu Leu Thr Ser Ile Val
            100                 105                 110
Arg Gly Ile Pro Phe Trp Gly Gly Ser Thr Ile Asp Thr Glu Leu Lys
        115                 120                 125
Val Ile Asp Thr Asn Cys Ile Asn Val Ile Gln Pro Asp Gly Ser Tyr
    130                 135                 140
Arg Ser Glu Glu Leu Asn Leu Val Ile Ile Gly Pro Ser Ala Asp Ile
145                 150                 155                 160
Ile Gln Phe Glu Cys Lys Ser Phe Gly His Asp Val Leu Asn Leu Thr
                165                 170                 175
Arg Asn Gly Tyr Gly Ser Thr Gln Tyr Ile Arg Phe Ser Pro Asp Phe
            180                 185                 190
Thr Phe Gly Phe Glu Glu Ser Leu Glu Val Asp Thr Asn Pro Leu Leu
        195                 200                 205
Gly Ala Gly Lys Phe Ala Thr Asp Pro Ala Val Thr Leu Ala His Glu
    210                 215                 220
Leu Ile His Ala Glu His Arg Leu Tyr Gly Ile Ala Ile Asn Pro Asn
225                 230                 235                 240
Arg Val Phe Lys Val Asn Thr Asn Ala Tyr Tyr Glu Met Ser Gly Leu
                245                 250                 255
Glu Val Ser Phe Glu Glu Leu Arg Thr Phe Gly Gly His Asp Ala Lys
            260                 265                 270
Phe Ile Asp Ser Leu Gln Glu Asn Glu Phe Arg Leu Tyr Tyr Tyr Asn
        275                 280                 285
Lys Phe Lys Asp Val Ala Ser Thr Leu Asn Lys Ala Lys Ser Ile Ile
    290                 295                 300
Gly Thr Thr Ala Ser Leu Gln Tyr Met Lys Asn Val Phe Lys Glu Lys
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305 310 315 320
Tyr Leu Leu Ser Glu Asp Thr Ser Gly Lys Phe Ser Val Asp Lys Leu
325 330 335
Lys Phe Asp Lys Leu Tyr Lys Met Leu Thr Glu Ile Tyr Thr Glu Asp
340 345 350
Asn Phe Val Asn Phe Phe Lys Val Ile Asn Arg Lys Thr Tyr Leu Asn
355 360 365
Phe Asp Lys Ala Val Phe Arg Ile Asn Ile Val Pro Asp Glu Asn Tyr
370 375 380
Thr Ile Lys Asp Gly Phe Asn Leu Lys Gly Ala Asn Leu Ser Thr Asn
385 390 395 400
Phe Asn Gly Gln Asn Thr Glu Ile Asn Ser Arg Asn Phe Thr Arg Leu
405 410 415
Lys Asn Phe Thr Gly Leu Phe Glu Phe Tyr Lys Leu Leu Cys Val Arg
420 425 430
Gly Ile Ile Pro Phe Lys Thr Lys Ser Leu Asp Glu Gly Tyr Asn Lys
435 440 445
Ala Leu Asn Asp Leu Cys Ile Lys Val Asn Asn Trp Asp Leu Phe Phe
450 455 460
Ser Pro Ser Glu Asp Asn Phe Thr Asn Asp Leu Asp Lys Val Glu Glu
465 470 475 480
Ile Thr Ala Asp Thr Asn Ile Glu Ala Ala Glu Glu Asn Ile Ser Leu
485 490 495
Asp Leu Ile Gln Gln Tyr Tyr Leu Thr Phe Asp Phe Asp Asn Glu Pro
500 505 510
Glu Asn Ile Ser Ile Glu Asn Leu Ser Ser Asp Ile Ile Gly Gln Leu
515 520 525
Glu Pro Met Pro Asn Ile Glu Arg Phe Pro Asn Gly Lys Lys Tyr Glu
530 535 540
Leu Asp Lys Tyr Thr Met Phe His Tyr Leu Arg Ala Gln Glu Phe Glu
545 550 555 560
His Gly Asp Ser Arg Ile Ile Leu Thr Asn Ser Ala Glu Glu Ala Leu
565 570 575
Leu Lys Pro Asn Val Ala Tyr Thr Phe Phe Ser Ser Lys Tyr Val Lys
580 585 590
Lys Ile Asn Lys Ala Val Glu Ala Phe Met Phe Leu Asn Trp Ala Glu
595 600 605
Glu Leu Val Tyr Asp Phe Thr Asp Glu Thr Asn Glu Val Thr Thr Met
610 615 620
Asp Lys Ile Ala Asp Ile Thr Ile Ile Val Pro Tyr Ile Gly Pro Ala
625 630 635 640
Leu Asn Ile Gly Asn Met Leu Ser Lys Gly Glu Phe Val Glu Ala Ile
645 650 655
Ile Phe Thr Gly Val Val Ala Met Leu Glu Phe Ile Pro Glu Tyr Ala
660 665 670
Leu Pro Val Phe Gly Thr Phe Ala Ile Val Ser Tyr Ile Ala Asn Lys
675 680 685
Val Leu Thr Val Gln Thr Ile Asn Asn Ala Leu Ser Lys Arg Asn Glu
690 695 700
Lys Trp Asp Glu Val Tyr Lys Tyr Thr Val Thr Asn Trp Leu Ala Lys
705 710 715 720
Val Asn Thr Gln Ile Asp Leu Ile Arg Glu Lys Met Lys Lys Ala Leu
725 730 735
Glu Asn Gln Ala Glu Ala Thr Lys Ala Ile Ile Asn Tyr Gln Tyr Asn
740 745 750
Gln Tyr Thr Glu Glu Glu Lys Asn Asn Ile Asn Phe Asn Ile Asp Asp
755 760 765
Leu Ser Ser Lys Leu Asn Glu Ser Ile Asn Ser Ala Met Ile Asn Ile
770 775 780

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Asn Lys Phe Leu Asp Gln Cys Ser Val Ser Tyr Leu Met Asn Ser Met
785                 790                 795                 800
Ile Pro Tyr Ala Val Lys Arg Leu Lys Asp Phe Asp Ala Ser Val Arg
                805                 810                 815
Asp Val Leu Leu Lys Tyr Ile Tyr Asp Asn Arg Gly Thr Leu Val Leu
            820                 825                 830
Gln Val Asp Arg Leu Lys Asp Glu Val Asn Asn Thr Leu Ser Ala Asp
        835                 840                 845
Ile Pro Phe Gln Leu Ser Lys Tyr Val Asp Asn Lys Lys Leu Leu Ser
    850                 855                 860
Thr Phe Thr Glu Tyr Ile Lys Asn Ile Val Asn Thr Ser Ile Leu Ser
865                 870                 875                 880
Ile Val Tyr Lys Lys Asp Asp Leu Ile Asp Leu Ser Arg Tyr Gly Ala
                885                 890                 895
Lys Ile Asn Ile Gly Asp Arg Val Tyr Tyr Asp Ser Ile Asp Lys Asn
            900                 905                 910
Gln Ile Lys Leu Ile Asn Leu Glu Ser Ser Thr Ile Glu Val Ile Leu
        915                 920                 925
Lys Asn Ala Ile Val Tyr Asn Ser Met Tyr Glu Asn Phe Ser Thr Ser
    930                 935                 940
Phe Trp Ile Lys Ile Pro Lys Tyr Phe Ser Lys Ile Asn Leu Asn Asn
945                 950                 955                 960
Glu Tyr Thr Ile Ile Asn Cys Ile Glu Asn Asn Ser Gly Trp Lys Val
                965                 970                 975
Ser Leu Asn Tyr Gly Glu Ile Ile Trp Thr Leu Gln Asp Asn Lys Gln
            980                 985                 990
Asn Ile Gln Arg Val Val Phe Lys Tyr Ser Gln Met Val Asn Ile Ser
        995                 1000                1005
Asp Tyr Ile Asn Arg Trp Ile Phe Val Thr Ile Thr Asn Asn Arg Leu
    1010                1015                1020
Thr Lys Ser Lys Ile Tyr Ile Asn Gly Arg Leu Ile Asp Gln Lys Pro
1025                1030                1035                1040
Ile Ser Asn Leu Gly Asn Ile His Ala Ser Asn Lys Ile Met Phe Lys
                1045                1050                1055
Leu Asp Gly Cys Arg Asp Pro Arg Arg Tyr Ile Met Ile Lys Tyr Phe
            1060                1065                1070
Asn Leu Phe Asp Lys Glu Leu Asn Glu Lys Glu Ile Lys Asp Leu Tyr
        1075                1080                1085
Asp Ser Gln Ser Asn Ser Gly Ile Leu Lys Asp Phe Trp Gly Asn Tyr
    1090                1095                1100
Leu Gln Tyr Asp Lys Pro Tyr Tyr Met Leu Asn Leu Phe Asp Pro Asn
1105                1110                1115                1120
Lys Tyr Val Asp Val Asn Asn Ile Gly Ile Arg Gly Tyr Met Tyr Leu
                1125                1130                1135
Lys Gly Pro Arg Gly Ser Val Val Thr Thr Asn Ile Tyr Leu Asn Ser
            1140                1145                1150
Thr Leu Tyr Glu Gly Thr Lys Phe Ile Ile Lys Lys Tyr Ala Ser Gly
        1155                1160                1165
Asn Glu Asp Asn Ile Val Arg Asn Asn Asp Arg Val Tyr Ile Asn Val
    1170                1175                1180
Val Val Lys Asn Lys Glu Tyr Arg Leu Ala Thr Asn Ala Ser Gln Ala
1185                1190                1195                1200
Gly Val Glu Lys Ile Leu Ser Ala Leu Glu Ile Pro Asp Val Gly Asn
                1205                1210                1215
Leu Ser Gln Val Val Val Met Lys Ser Lys Asp Asp Gln Gly Ile Arg
            1220                1225                1230
Asn Lys Cys Lys Met Asn Leu Gln Asp Asn Asn Gly Asn Asp Ile Gly
        1235                1240                1245
Phe Ile Gly Phe His Leu Tyr Asp Asn Ile Ala Lys Leu Val Ala Ser
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    1250                1255                1260
Asn Trp Tyr Asn Arg Gln Val Gly Lys Ala Ser Arg Thr Phe Gly Cys
1265                1270                1275                1280
Ser Trp Glu Phe Ile Pro Val Asp Asp Gly Trp Gly Glu Ser Ser Leu
                1285                1290                1295


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<212> PRT
<213> Clostridium botulinum

<400> 3
Met Pro Phe Val Asn Lys Pro Phe Asn Tyr Arg Asp Pro Gly Asn Gly
 1               5                  10                  15
Val Asp Ile Ala Tyr Ile Lys Ile Pro Asn Ala Gly Gln Met Gln Pro
            20                  25                  30
Val Lys Ala Phe Lys Ile His Glu Gly Val Trp Val Ile Pro Glu Arg
        35                  40                  45
Asp Thr Phe Thr Asn Pro Glu Glu Gly Asp Leu Asn Pro Pro Pro Glu
    50                  55                  60
Ala Lys Gln Val Pro Val Ser Tyr Tyr Asp Ser Thr Tyr Leu Ser Thr
65                  70                  75                  80
Asp Asn Glu Lys Asp Asn Tyr Leu Lys Gly Val Ile Lys Leu Phe Asp
                85                  90                  95
Arg Ile Tyr Ser Thr Gly Leu Gly Arg Met Leu Leu Ser Phe Ile Val
            100                 105                 110
Lys Gly Ile Pro Phe Trp Gly Gly Ser Thr Ile Asp Thr Glu Leu Lys
        115                 120                 125
Val Ile Asp Thr Asn Cys Ile Asn Val Ile Glu Pro Gly Gly Ser Tyr
    130                 135                 140
Arg Ser Glu Glu Leu Asn Leu Val Ile Thr Gly Pro Ser Ala Asp Ile
145                 150                 155                 160
Ile Gln Phe Glu Cys Lys Ser Phe Gly His Asp Val Phe Asn Leu Thr
                165                 170                 175
Arg Asn Gly Tyr Gly Ser Thr Gln Tyr Ile Arg Phe Ser Pro Asp Phe
            180                 185                 190
Thr Phe Gly Phe Glu Glu Ser Leu Glu Val Asp Thr Asn Pro Leu Leu
        195                 200                 205
Gly Ala Gly Thr Phe Ala Thr Asp Pro Ala Val Thr Leu Ala His Glu
    210                 215                 220
Leu Ile His Ala Ala His Arg Leu Tyr Gly Ile Ala Ile Asn Pro Asn
225                 230                 235                 240
Arg Val Leu Lys Val Lys Thr Asn Ala Tyr Tyr Glu Met Ser Gly Leu
                245                 250                 255
Glu Val Ser Phe Glu Glu Leu Arg Thr Phe Gly Gly Asn Asp Thr Asn
            260                 265                 270
Phe Ile Asp Ser Leu Trp Gln Lys Lys Phe Ser Arg Asp Ala Tyr Asp
        275                 280                 285
Asn Leu Gln Asn Ile Ala Arg Ile Leu Asn Glu Ala Lys Thr Ile Val
    290                 295                 300
Gly Thr Thr Thr Pro Leu Gln Tyr Met Lys Asn Ile Phe Ile Arg Lys
305                 310                 315                 320
Tyr Phe Leu Ser Glu Asp Ala Ser Gly Lys Ile Ser Val Asn Lys Ala
                325                 330                 335
Ala Phe Lys Glu Phe Tyr Arg Val Leu Thr Arg Gly Phe Thr Glu Leu
            340                 345                 350
Glu Phe Val Asn Pro Phe Lys Val Ile Asn Arg Lys Thr Tyr Leu Asn
        355                 360                 365
```

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Phe Asp Lys Ala Val Phe Arg Ile Asn Ile Val Pro Asp Glu Asn Tyr
    370                 375                 380
Thr Ile Asn Glu Gly Phe Asn Leu Glu Gly Ala Asn Ser Asn Gly Gln
385                 390                 395                 400
Asn Thr Glu Ile Asn Ser Arg Asn Phe Thr Arg Leu Lys Asn Phe Thr
                405                 410                 415
Gly Leu Phe Glu Phe Tyr Lys Leu Leu Cys Val Arg Gly Ile Ile Pro
            420                 425                 430
Phe Lys Thr Lys Ser Leu Asp Glu Gly Tyr Asn Lys Ala Leu Asn Tyr
        435                 440                 445
Leu Cys Ile Lys Val Asn Asn Trp Asp Leu Phe Phe Ser Pro Ser Glu
    450                 455                 460
Asp Asn Phe Thr Asn Asp Leu Asp Lys Val Glu Glu Ile Thr Ala Asp
465                 470                 475                 480
Thr Asn Ile Glu Ala Ala Glu Glu Asn Ile Ser Ser Asp Leu Ile Gln
                485                 490                 495
Gln Tyr Tyr Leu Thr Phe Asp Phe Asp Asn Glu Pro Glu Asn Ile Ser
            500                 505                 510
Ile Glu Asn Leu Ser Ser Asp Ile Ile Gly Gln Leu Glu Pro Met Pro
        515                 520                 525
Asn Ile Glu Arg Phe Pro Asn Gly Lys Lys Tyr Glu Leu Asp Lys Tyr
    530                 535                 540
Thr Met Phe His Tyr Leu Arg Ala Gln Glu Phe Glu His Gly Asp Ser
545                 550                 555                 560
Arg Ile Ile Leu Thr Asn Ser Ala Glu Glu Ala Leu Leu Lys Pro Asn
                565                 570                 575
Val Ala Tyr Thr Phe Phe Ser Ser Lys Tyr Val Lys Lys Ile Asn Lys
            580                 585                 590
Ala Val Glu Ala Val Ile Phe Leu Ser Trp Ala Glu Glu Leu Val Tyr
        595                 600                 605
Asp Phe Thr Asp Glu Thr Asn Glu Val Thr Thr Met Asp Lys Ile Ala
    610                 615                 620
Asp Ile Thr Ile Ile Val Pro Tyr Ile Gly Pro Ala Leu Asn Ile Gly
625                 630                 635                 640
Asn Met Val Ser Lys Gly Glu Phe Val Glu Ala Ile Leu Phe Thr Gly
                645                 650                 655
Val Val Ala Leu Leu Glu Phe Ile Pro Glu Tyr Ser Leu Pro Val Phe
            660                 665                 670
Gly Thr Phe Ala Ile Val Ser Tyr Ile Ala Asn Lys Val Leu Thr Val
        675                 680                 685
Gln Thr Ile Asn Asn Ala Leu Ser Lys Arg Asn Glu Lys Trp Asp Glu
    690                 695                 700
Val Tyr Lys Tyr Thr Val Thr Asn Trp Leu Ala Lys Val Asn Thr Gln
705                 710                 715                 720
Ile Asp Leu Ile Arg Glu Lys Met Lys Lys Ala Leu Glu Asn Gln Ala
                725                 730                 735
Glu Ala Thr Arg Ala Ile Ile Asn Tyr Gln Tyr Asn Gln Tyr Thr Glu
            740                 745                 750
Glu Glu Lys Asn Asn Ile Asn Phe Asn Ile Asp Asp Leu Ser Ser Lys
        755                 760                 765
Leu Asn Arg Ser Ile Asn Arg Ala Met Ile Asn Ile Asn Lys Phe Leu
    770                 775                 780
Asp Gln Cys Ser Val Ser Tyr Leu Met Asn Ser Met Ile Pro Tyr Ala
785                 790                 795                 800
Val Lys Arg Leu Lys Asp Phe Asp Ala Ser Val Arg Asp Val Leu Leu
                805                 810                 815
Lys Tyr Ile Tyr Asp Asn Arg Gly Thr Leu Ile Leu Gln Val Asp Arg
            820                 825                 830
Leu Lys Asp Glu Val Asn Asn Thr Leu Ser Ala Asp Ile Pro Phe Gln
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```
        835                 840                 845
Leu Ser Lys Tyr Val Asn Asp Lys Lys Leu Leu Ser Thr Phe Thr Glu
    850                 855                 860
Tyr Ile Lys Asn Ile Val Asn Thr Ser Ile Leu Ser Ile Val Tyr Lys
865                 870                 875                 880
Lys Asp Asp Leu Ile Asp Leu Ser Arg Tyr Gly Ala Lys Ile Asn Ile
                885                 890                 895
Gly Asp Arg Val Tyr Tyr Asp Ser Ile Asp Lys Asn Gln Ile Lys Leu
            900                 905                 910
Ile Asn Leu Glu Ser Ser Thr Ile Glu Val Ile Leu Lys Asn Ala Ile
        915                 920                 925
Val Tyr Asn Ser Met Tyr Glu Asn Phe Ser Thr Ser Phe Trp Ile Lys
    930                 935                 940
Ile Pro Lys Tyr Phe Ser Lys Ile Asn Leu Asn Asn Glu Tyr Thr Ile
945                 950                 955                 960
Ile Asn Cys Ile Glu Asn Asn Ser Gly Trp Lys Val Ser Leu Asn Tyr
                965                 970                 975
Gly Glu Ile Ile Trp Thr Leu Gln Asp Asn Lys Gln Asn Ile Gln Arg
            980                 985                 990
Val Val Phe Lys Tyr Ser Gln Met Val Asn Ile Ser Asp Tyr Ile Asn
        995                 1000                1005
Arg Trp Met Phe Val Thr Ile Thr Asn Asn Arg Leu Thr Lys Ser Lys
    1010                1015                1020
Ile Tyr Ile Asn Gly Arg Leu Ile Asp Gln Lys Pro Ile Ser Asn Leu
1025                1030                1035                1040
Gly Asn Ile His Ala Ser Asn Lys Ile Met Phe Lys Leu Asp Gly Cys
                1045                1050                1055
Arg Asp Pro Arg Arg Tyr Ile Met Ile Lys Tyr Phe Asn Leu Phe Asp
            1060                1065                1070
Lys Glu Leu Asn Glu Lys Glu Ile Lys Asp Leu Tyr Asp Ser Gln Ser
        1075                1080                1085
Asn Pro Gly Ile Leu Lys Asp Phe Trp Gly Asn Tyr Leu Gln Tyr Asp
    1090                1095                1100
Lys Pro Tyr Tyr Met Leu Asn Leu Phe Asp Pro Asn Lys Tyr Val Asp
1105                1110                1115                1120
Val Asn Asn Ile Gly Ile Arg Gly Tyr Met Tyr Leu Lys Gly Pro Arg
                1125                1130                1135
Gly Ser Val Met Thr Thr Asn Ile Tyr Leu Asn Ser Thr Leu Tyr Met
            1140                1145                1150
Gly Thr Lys Phe Ile Ile Lys Lys Tyr Ala Ser Gly Asn Glu Asp Asn
        1155                1160                1165
Ile Val Arg Asn Asn Asp Arg Val Tyr Ile Asn Val Val Val Lys Asn
    1170                1175                1180
Lys Glu Tyr Arg Leu Ala Thr Asn Ala Ser Gln Ala Gly Val Glu Lys
1185                1190                1195                1200
Ile Leu Ser Ala Leu Glu Ile Pro Asp Val Gly Asn Leu Ser Gln Val
                1205                1210                1215
Val Val Met Lys Ser Lys Asp Asp Gln Gly Ile Arg Asn Lys Cys Lys
            1220                1225                1230
Met Asn Leu Gln Asp Asn Asn Gly Asn Asp Ile Gly Phe Val Gly Phe
        1235                1240                1245
His Leu Tyr Asp Asn Ile Ala Lys Leu Val Ala Ser Asn Trp Tyr Asn
    1250                1255                1260
Arg Gln Val Gly Lys Ala Ser Arg Thr Phe Gly Cys Ser Trp Glu Phe
1265                1270                1275                1280
Ile Pro Val Asp Asp Gly Trp Gly Glu Ser Ser Leu
                1285                1290
```

<210> 4
<211> 1296
<212> PRT
<213> Clostridium botulinum

<400> 4

```
Met Pro Leu Val Asn Gln Gln Ile Asn Tyr Tyr Asp Pro Val Asn Gly
 1               5                  10                  15
Val Asp Ile Ala Tyr Ile Lys Ile Pro Asn Ala Gly Lys Met Gln Pro
            20                  25                  30
Val Lys Ala Phe Lys Ile His Asn Lys Val Trp Val Ile Pro Glu Arg
        35                  40                  45
Asp Ile Phe Thr Asn Pro Glu Glu Val Asp Leu Asn Pro Pro Pro Glu
    50                  55                  60
Ala Lys Gln Val Pro Ile Ser Tyr Tyr Asp Ser Ala Tyr Leu Ser Thr
65                  70                  75                  80
Asp Asn Glu Lys Asp Asn Tyr Leu Lys Gly Val Ile Lys Leu Phe Glu
                85                  90                  95
Arg Ile Tyr Ser Thr Asp Leu Gly Arg Met Leu Leu Ile Ser Ile Val
            100                 105                 110
Arg Gly Ile Pro Phe Trp Gly Gly Gly Lys Ile Asp Thr Glu Leu Lys
        115                 120                 125
Val Ile Asp Thr Asn Cys Ile Asn Ile Ile Gln Leu Asp Asp Ser Tyr
    130                 135                 140
Arg Ser Glu Glu Leu Asn Leu Ala Ile Ile Gly Pro Ser Ala Asn Ile
145                 150                 155                 160
Ile Glu Ser Gln Cys Ser Ser Phe Arg Asp Asp Val Leu Asn Leu Thr
                165                 170                 175
Arg Asn Gly Tyr Gly Ser Thr Gln Tyr Ile Arg Phe Ser Pro Asp Phe
            180                 185                 190
Thr Val Gly Phe Glu Glu Ser Leu Glu Val Asp Thr Asn Pro Leu Leu
        195                 200                 205
Gly Ala Gly Lys Phe Ala Gln Asp Pro Ala Val Ala Leu Ala His Glu
    210                 215                 220
Leu Ile His Ala Glu His Arg Leu Tyr Gly Ile Ala Ile Asn Thr Asn
225                 230                 235                 240
Arg Val Phe Lys Val Asn Thr Asn Ala Tyr Tyr Glu Met Ala Gly Leu
                245                 250                 255
Glu Val Ser Leu Glu Glu Leu Ile Thr Phe Gly Gly Asn Asp Ala Lys
            260                 265                 270
Phe Ile Asp Ser Leu Gln Lys Lys Glu Phe Ser Leu Tyr Tyr Tyr Asn
        275                 280                 285
Lys Phe Lys Asp Ile Ala Ser Thr Leu Asn Lys Ala Lys Ser Ile Val
    290                 295                 300
Gly Thr Thr Ala Ser Leu Gln Tyr Met Lys Asn Val Phe Lys Glu Lys
305                 310                 315                 320
Tyr Leu Leu Ser Glu Asp Ala Thr Gly Lys Phe Leu Val Asp Arg Leu
                325                 330                 335
Lys Phe Asp Glu Leu Tyr Lys Leu Leu Thr Glu Ile Tyr Thr Glu Asp
            340                 345                 350
Asn Phe Val Lys Phe Phe Lys Val Leu Asn Arg Lys Thr Tyr Leu Asn
        355                 360                 365
Phe Asp Lys Ala Val Phe Lys Ile Asn Ile Val Pro Asp Val Asn Tyr
    370                 375                 380
Thr Ile His Asp Gly Phe Asn Leu Arg Asn Thr Asn Leu Ala Ala Asn
385                 390                 395                 400
Phe Asn Gly Gln Asn Ile Glu Ile Asn Asn Lys Asn Phe Asp Lys Leu
                405                 410                 415
Lys Asn Phe Thr Gly Leu Phe Glu Phe Tyr Lys Leu Leu Cys Val Arg
```

```
            420                 425                 430
Gly Ile Ile Thr Ser Lys Thr Lys Ser Leu Asp Glu Gly Tyr Asn Lys
        435                 440                 445
Ala Leu Asn Glu Leu Cys Ile Lys Val Asn Asn Trp Asp Leu Phe Phe
    450                 455                 460
Ser Pro Ser Glu Asp Asn Phe Thr Asn Asp Leu Asp Lys Val Glu Glu
465                 470                 475                 480
Ile Thr Ser Asp Thr Asn Ile Glu Ala Ala Glu Glu Asn Ile Ser Leu
                485                 490                 495
Asp Leu Ile Gln Gln Tyr Tyr Leu Asn Phe Asn Phe Asp Asn Glu Pro
            500                 505                 510
Glu Asn Thr Ser Ile Glu Asn Leu Ser Ser Asp Ile Ile Gly Gln Leu
        515                 520                 525
Glu Pro Met Pro Asn Ile Glu Arg Phe Pro Asn Gly Lys Lys Tyr Glu
    530                 535                 540
Leu Asn Lys Tyr Thr Met Phe His Tyr Leu Arg Ala Gln Glu Phe Lys
545                 550                 555                 560
His Ser Asn Ser Arg Ile Ile Leu Thr Asn Ser Ala Lys Glu Ala Leu
                565                 570                 575
Leu Lys Pro Asn Ile Val Tyr Thr Phe Phe Ser Ser Lys Tyr Ile Lys
            580                 585                 590
Ala Ile Asn Lys Ala Val Glu Ala Val Thr Phe Val Asn Trp Ile Glu
        595                 600                 605
Asn Leu Val Tyr Asp Phe Thr Asp Glu Thr Asn Glu Val Ser Thr Met
    610                 615                 620
Asp Lys Ile Ala Asp Ile Thr Ile Val Ile Pro Tyr Ile Gly Pro Ala
625                 630                 635                 640
Leu Asn Ile Gly Asn Met Ile Tyr Lys Gly Glu Phe Val Glu Ala Ile
                645                 650                 655
Ile Phe Ser Gly Ala Val Ile Leu Leu Glu Ile Val Pro Glu Ile Ala
            660                 665                 670
Leu Pro Val Leu Gly Thr Phe Ala Leu Val Ser Tyr Val Ser Asn Lys
        675                 680                 685
Val Leu Thr Val Gln Thr Ile Asp Asn Ala Leu Ser Lys Arg Asn Glu
    690                 695                 700
Lys Trp Asp Glu Val Tyr Lys Tyr Ile Val Thr Asn Trp Leu Ala Ile
705                 710                 715                 720
Val Asn Thr Gln Ile Asn Leu Ile Arg Glu Lys Met Lys Lys Ala Leu
                725                 730                 735
Glu Asn Gln Ala Glu Ala Thr Lys Ala Ile Ile Asn Tyr Gln Tyr Asn
            740                 745                 750
Gln Tyr Thr Glu Glu Glu Lys Asn Asn Ile Asn Phe Asn Ile Asp Asp
        755                 760                 765
Leu Ser Ser Lys Leu Asn Glu Ser Ile Asn Ser Ala Met Ile Asn Ile
    770                 775                 780
Asn Lys Phe Leu Asp Gln Cys Ser Val Ser Tyr Leu Met Asn Ser Met
785                 790                 795                 800
Ile Pro Tyr Ala Val Lys Arg Leu Lys Asp Phe Asp Ala Ser Val Arg
                805                 810                 815
Asp Val Leu Leu Lys Tyr Ile Tyr Asp Asn Arg Gly Thr Leu Ile Gly
            820                 825                 830
Gln Val Asn Arg Leu Lys Asp Lys Val Asn Asn Thr Leu Ser Ala Asp
        835                 840                 845
Ile Pro Phe Gln Leu Ser Lys Tyr Val Asp Asn Lys Lys Leu Leu Ser
    850                 855                 860
Thr Phe Thr Glu Tyr Ile Lys Asn Ile Thr Asn Ala Ser Ile Leu Ser
865                 870                 875                 880
Ile Val Tyr Lys Asp Asp Asp Leu Ile Asp Leu Ser Arg Tyr Gly Ala
                885                 890                 895
```

Glu Ile Tyr Asn Gly Asp Lys Val Tyr Tyr Asn Ser Ile Asp Lys Asn
900 905 910
Gln Ile Arg Leu Ile Asn Leu Glu Ser Ser Thr Ile Glu Val Ile Leu
915 920 925
Lys Lys Ala Ile Val Tyr Asn Ser Met Tyr Glu Asn Phe Ser Thr Ser
930 935 940
Phe Trp Ile Arg Ile Pro Lys Tyr Phe Asn Ser Ile Ser Leu Asn Asn
945 950 955 960
Glu Tyr Thr Ile Ile Asn Cys Met Glu Asn Asn Ser Gly Trp Lys Val
965 970 975
Ser Leu Asn Tyr Gly Glu Ile Ile Trp Thr Phe Gln Asp Thr Gln Glu
980 985 990
Ile Lys Gln Arg Val Val Phe Lys Tyr Ser Gln Met Ile Asn Ile Ser
995 1000 1005
Asp Tyr Ile Asn Arg Trp Ile Phe Val Thr Ile Thr Asn Asn Arg Ile
1010 1015 1020
Thr Lys Ser Lys Ile Tyr Ile Asn Gly Arg Leu Ile Asp Gln Lys Pro
1025 1030 1035 1040
Ile Ser Asn Leu Gly Asn Ile His Ala Ser Asn Lys Ile Met Phe Lys
1045 1050 1055
Leu Asp Gly Cys Arg Asp Pro His Arg Tyr Ile Val Ile Lys Tyr Phe
1060 1065 1070
Asn Leu Phe Asp Lys Glu Leu Ser Glu Lys Glu Ile Lys Asp Leu Tyr
1075 1080 1085
Asp Asn Gln Ser Asn Ser Gly Ile Leu Lys Asp Phe Trp Gly Asp Tyr
1090 1095 1100
Leu Gln Tyr Asp Lys Ser Tyr Tyr Met Leu Asn Leu Tyr Asp Pro Asn
1105 1110 1115 1120
Lys Tyr Val Asp Val Asn Asn Val Gly Ile Arg Gly Tyr Met Tyr Leu
1125 1130 1135
Lys Gly Pro Arg Asp Asn Val Met Thr Thr Asn Ile Tyr Leu Asn Ser
1140 1145 1150
Ser Leu Tyr Met Gly Thr Lys Phe Ile Ile Lys Lys Tyr Ala Ser Gly
1155 1160 1165
Asn Lys Asp Asn Ile Val Arg Asn Asn Asp Arg Val Tyr Ile Asn Val
1170 1175 1180
Val Val Lys Asn Lys Glu Tyr Arg Leu Ala Thr Asn Ala Ser Gln Ala
1185 1190 1195 1200
Gly Val Glu Lys Ile Leu Ser Ala Leu Glu Ile Pro Asp Val Gly Asn
1205 1210 1215
Leu Ser Gln Val Val Val Met Lys Ser Lys Asn Asp Gln Gly Ile Thr
1220 1225 1230
Asn Lys Cys Lys Met Asn Leu Gln Asp Asn Asn Gly Asn Asp Ile Gly
1235 1240 1245
Phe Ile Gly Phe His Gln Phe Asn Asn Ile Ala Lys Leu Val Ala Ser
1250 1255 1260
Asn Trp Tyr Asn Arg Gln Ile Glu Arg Ser Ser Arg Thr Leu Gly Cys
1265 1270 1275 1280
Ser Trp Glu Phe Ile Pro Val Asp Asp Gly Trp Arg Glu Arg Pro Leu
1285 1290 1295

<210> 5
<211> 206
<212> PRT
<213> Homo sapiens

<400> 5
Met Ala Glu Asp Ala Asp Met Arg Asn Glu Leu Glu Glu Met Gln Arg

```
 1               5                  10                  15
Arg Ala Asp Gln Leu Ala Asp Glu Ser Leu Glu Ser Thr Arg Arg Met
            20                  25                  30
Leu Gln Leu Val Glu Glu Ser Lys Asp Ala Gly Ile Arg Thr Leu Val
        35                  40                  45
Met Leu Asp Glu Gln Gly Glu Gln Leu Asp Arg Val Glu Glu Gly Met
    50                  55                  60
Asn His Ile Asn Gln Asp Met Lys Glu Ala Glu Lys Asn Leu Lys Asp
65                  70                  75                  80
Leu Gly Lys Cys Cys Gly Leu Phe Ile Cys Pro Cys Asn Lys Leu Lys
                85                  90                  95
Ser Ser Asp Ala Tyr Lys Lys Ala Trp Gly Asn Asn Gln Asp Gly Val
            100                 105                 110
Val Ala Ser Gln Pro Ala Arg Val Val Asp Glu Arg Glu Gln Met Ala
        115                 120                 125
Ile Ser Gly Gly Phe Ile Arg Arg Val Thr Asn Asp Ala Arg Glu Asn
    130                 135                 140
Glu Met Asp Glu Asn Leu Glu Gln Val Ser Gly Ile Ile Gly Asn Leu
145                 150                 155                 160
Arg His Met Ala Leu Asp Met Gly Asn Glu Ile Asp Thr Gln Asn Arg
                165                 170                 175
Gln Ile Asp Arg Ile Met Glu Lys Ala Asp Ser Asn Lys Thr Arg Ile
            180                 185                 190
Asp Glu Ala Asn Gln Arg Ala Thr Lys Met Leu Gly Ser Gly
        195                 200                 205
```

<210> 6
<211> 206
<212> PRT
<213> Homo sapiens

<400> 6

```
Met Ala Glu Asp Ala Asp Met Arg Asn Glu Leu Glu Glu Met Gln Arg
 1               5                  10                  15
Arg Ala Asp Gln Leu Ala Asp Glu Ser Leu Glu Ser Thr Arg Arg Met
            20                  25                  30
Leu Gln Leu Val Glu Glu Ser Lys Asp Ala Gly Ile Arg Thr Leu Val
        35                  40                  45
Met Leu Asp Glu Gln Gly Glu Gln Leu Glu Arg Ile Glu Glu Gly Met
    50                  55                  60
Asp Gln Ile Asn Lys Asp Met Lys Glu Ala Glu Lys Asn Leu Thr Asp
65                  70                  75                  80
Leu Gly Lys Phe Cys Gly Leu Cys Val Cys Pro Cys Asn Lys Leu Lys
                85                  90                  95
Ser Ser Asp Ala Tyr Lys Lys Ala Trp Gly Asn Asn Gln Asp Gly Val
            100                 105                 110
Val Ala Ser Gln Pro Ala Arg Val Val Asp Glu Arg Glu Gln Met Ala
        115                 120                 125
Ile Ser Gly Gly Phe Ile Arg Arg Val Thr Asn Asp Ala Arg Glu Asn
    130                 135                 140
Glu Met Asp Glu Asn Leu Glu Gln Val Ser Gly Ile Ile Gly Asn Leu
145                 150                 155                 160
Arg His Met Ala Leu Asp Met Gly Asn Glu Ile Asp Thr Gln Asn Arg
                165                 170                 175
Gln Ile Asp Arg Ile Met Glu Lys Ala Asp Ser Asn Lys Thr Arg Ile
            180                 185                 190
Asp Glu Ala Asn Gln Arg Ala Thr Lys Met Leu Gly Ser Gly
        195                 200                 205
```

<210> 7
<211> 206
<212> PRT
<213> Macaca mulatta

<400> 7
Met Ala Glu Asp Ala Asp Met Arg Asn Glu Leu Glu Glu Met Gln Arg
1 5 10 15
Arg Ala Asp Gln Leu Ala Asp Glu Ser Leu Glu Ser Thr Arg Arg Met
20 25 30
Leu Gln Leu Val Glu Glu Ser Lys Asp Ala Gly Ile Arg Thr Leu Val
35 40 45
Met Leu Asp Glu Gln Gly Glu Gln Leu Glu Arg Ile Glu Glu Gly Met
50 55 60
Asp Gln Ile Asn Lys Asp Met Lys Glu Ala Glu Lys Asn Leu Thr Asp
65 70 75 80
Leu Gly Lys Phe Cys Gly Leu Cys Val Cys Pro Cys Asn Lys Leu Lys
85 90 95
Ser Ser Asp Ala Tyr Lys Lys Ala Trp Gly Asn Asn Gln Asp Gly Val
100 105 110
Val Ala Ser Gln Pro Ala Arg Val Val Asp Glu Arg Glu Gln Met Ala
115 120 125
Ile Ser Gly Gly Phe Ile Arg Arg Val Thr Asn Asp Ala Arg Glu Asn
130 135 140
Glu Met Asp Glu Asn Leu Glu Gln Val Ser Gly Ile Ile Gly Asn Leu
145 150 155 160
Arg His Met Ala Leu Asp Met Gly Asn Glu Ile Asp Thr Gln Asn Arg
165 170 175
Gln Ile Asp Arg Ile Met Glu Lys Ala Asp Ser Asn Lys Thr Arg Ile
180 185 190
Asp Glu Ala Asn Gln Arg Ala Thr Lys Met Leu Gly Ser Gly
195 200 205

<210> 8
<211> 206
<212> PRT
<213> Rattus norvegicus

<400> 8
Met Ala Glu Asp Ala Asp Met Arg Asn Glu Leu Glu Glu Met Gln Arg
1 5 10 15
Arg Ala Asp Gln Leu Ala Asp Glu Ser Leu Glu Ser Thr Arg Arg Met
20 25 30
Leu Gln Leu Val Glu Glu Ser Lys Asp Ala Gly Ile Arg Thr Leu Val
35 40 45
Met Leu Asp Glu Gln Gly Glu Gln Leu Asp Arg Val Glu Glu Gly Met
50 55 60
Asn His Ile Asn Gln Asp Met Lys Glu Ala Glu Lys Asn Leu Lys Asp
65 70 75 80
Leu Gly Lys Cys Cys Gly Leu Phe Ile Cys Pro Cys Asn Lys Leu Lys
85 90 95
Ser Ser Asp Ala Tyr Lys Lys Ala Trp Gly Asn Asn Gln Asp Gly Val
100 105 110
Val Ala Ser Gln Pro Ala Arg Val Val Asp Glu Arg Glu Gln Met Ala
115 120 125
Ile Ser Gly Gly Phe Ile Arg Arg Val Thr Asn Asp Ala Arg Glu Asn

```
    130                 135                 140
Glu Met Asp Glu Asn Leu Glu Gln Val Ser Gly Ile Ile Gly Asn Leu
145                 150                 155                 160
Arg His Met Ala Leu Asp Met Gly Asn Glu Ile Asp Thr Gln Asn Arg
                165                 170                 175
Gln Ile Asp Arg Ile Met Glu Lys Ala Asp Ser Asn Lys Thr Arg Ile
            180                 185                 190
Asp Glu Ala Asn Gln Arg Ala Thr Lys Met Leu Gly Ser Gly
        195                 200                 205


<210> 9
<211> 206
<212> PRT
<213> Rattus norvegicus

<400> 9
Met Ala Glu Asp Ala Asp Met Arg Asn Glu Leu Glu Glu Met Gln Arg
 1               5                  10                  15
Arg Ala Asp Gln Leu Ala Asp Glu Ser Leu Glu Ser Thr Arg Arg Met
            20                  25                  30
Leu Gln Leu Val Glu Glu Ser Lys Asp Ala Gly Ile Arg Thr Leu Val
        35                  40                  45
Met Leu Asp Glu Gln Gly Glu Gln Leu Glu Arg Ile Glu Glu Gly Met
    50                  55                  60
Asp Gln Ile Asn Lys Asp Met Lys Glu Ala Glu Lys Asn Leu Thr Asp
65                  70                  75                  80
Leu Gly Lys Phe Cys Gly Leu Cys Val Cys Pro Cys Asn Lys Leu Lys
                85                  90                  95
Ser Ser Asp Ala Tyr Lys Lys Ala Trp Gly Asn Asn Gln Asp Gly Val
            100                 105                 110
Val Ala Ser Gln Pro Ala Arg Val Val Asp Glu Arg Glu Gln Met Ala
        115                 120                 125
Ile Ser Gly Gly Phe Ile Arg Arg Val Thr Asn Asp Ala Arg Glu Asn
    130                 135                 140
Glu Met Asp Glu Asn Leu Glu Gln Val Ser Gly Ile Ile Gly Asn Leu
145                 150                 155                 160
Arg His Met Ala Leu Asp Met Gly Asn Glu Ile Asp Thr Gln Asn Arg
                165                 170                 175
Gln Ile Asp Arg Ile Met Glu Lys Ala Asp Ser Asn Lys Thr Arg Ile
            180                 185                 190
Asp Glu Ala Asn Gln Arg Ala Thr Lys Met Leu Gly Ser Gly
        195                 200                 205


<210> 10
<211> 206
<212> PRT
<213> Mus musculus

<400> 10
Met Ala Glu Asp Ala Asp Met Arg Asn Glu Leu Glu Glu Met Gln Arg
 1               5                  10                  15
Arg Ala Asp Gln Leu Ala Asp Glu Ser Leu Glu Ser Thr Arg Arg Met
            20                  25                  30
Leu Gln Leu Val Glu Glu Ser Lys Asp Ala Gly Ile Arg Thr Leu Val
        35                  40                  45
Met Leu Asp Glu Gln Gly Glu Gln Leu Glu Arg Ile Glu Glu Gly Met
    50                  55                  60
```

```
Asp Gln Ile Asn Lys Asp Met Lys Glu Ala Glu Lys Asn Leu Thr Asp
65                  70                  75                  80
Leu Gly Lys Phe Cys Gly Leu Cys Val Cys Pro Cys Asn Lys Leu Lys
                85                  90                  95
Ser Ser Asp Ala Tyr Lys Lys Ala Trp Gly Asn Asn Gln Asp Gly Val
            100                 105                 110
Val Ala Ser Gln Pro Ala Arg Val Val Asp Glu Arg Glu Gln Met Ala
        115                 120                 125
Ile Ser Gly Gly Phe Ile Arg Arg Val Thr Asn Asp Ala Arg Glu Asn
    130                 135                 140
Glu Met Asp Glu Asn Leu Glu Gln Val Ser Gly Ile Ile Gly Asn Leu
145                 150                 155                 160
Arg His Met Ala Leu Asp Met Gly Asn Glu Ile Asp Thr Gln Asn Arg
                165                 170                 175
Gln Ile Asp Arg Ile Met Glu Lys Ala Asp Ser Asn Lys Thr Arg Ile
            180                 185                 190
Asp Glu Ala Asn Gln Arg Ala Thr Lys Met Leu Gly Ser Gly
        195                 200                 205


<210> 11
<211> 206
<212> PRT
<213> Gallus gallus

<400> 11
Met Ala Glu Asp Ala Asp Met Arg Asn Glu Leu Glu Glu Met Gln Arg
 1               5                  10                  15
Arg Ala Asp Gln Leu Ala Asp Glu Ser Leu Glu Ser Thr Arg Arg Met
            20                  25                  30
Leu Gln Leu Val Glu Glu Ser Lys Asp Ala Gly Ile Arg Thr Leu Val
        35                  40                  45
Met Leu Asp Glu Gln Gly Glu Gln Leu Glu Arg Ile Glu Glu Gly Met
    50                  55                  60
Asp Gln Ile Asn Lys Asp Met Lys Glu Ala Glu Lys Asn Leu Thr Asp
65                  70                  75                  80
Leu Gly Lys Phe Cys Gly Leu Cys Val Cys Pro Cys Asn Lys Leu Lys
                85                  90                  95
Ser Ser Asp Ala Tyr Lys Lys Ala Trp Gly Asn Asn Gln Asp Gly Val
            100                 105                 110
Val Ala Ser Gln Pro Ala Arg Val Val Asp Glu Arg Glu Gln Met Ala
        115                 120                 125
Ile Ser Gly Gly Phe Ile Arg Arg Val Thr Asn Asp Ala Arg Glu Asn
    130                 135                 140
Glu Met Asp Glu Asn Leu Glu Gln Val Ser Gly Ile Ile Gly Asn Leu
145                 150                 155                 160
Arg His Met Ala Leu Asp Met Gly Asn Glu Ile Asp Thr Gln Asn Arg
                165                 170                 175
Gln Ile Asp Arg Ile Met Glu Lys Ala Asp Ser Asn Lys Thr Arg Ile
            180                 185                 190
Asp Glu Ala Asn Gln Arg Ala Thr Lys Met Leu Gly Ser Gly
        195                 200                 205


<210> 12
<211> 204
<212> PRT
<213> Carassius auratus
```

<400> 12
Met Ala Glu Asp Ala Asp Met Arg Asn Glu Leu Ser Asp Met Gln Gln
1 5 10 15
Arg Ala Asp Gln Leu Ala Asp Glu Ser Leu Glu Ser Thr Arg Arg Met
20 25 30
Leu Gln Leu Val Glu Glu Ser Lys Asp Ala Gly Ile Arg Thr Leu Val
35 40 45
Met Leu Asp Glu Gln Gly Glu Gln Leu Glu Arg Ile Glu Glu Gly Met
50 55 60
Asp Gln Ile Asn Lys Asp Met Lys Asp Ala Glu Lys Asn Leu Asn Asp
65 70 75 80
Leu Gly Lys Phe Cys Gly Leu Cys Ser Cys Pro Cys Asn Lys Met Lys
85 90 95
Ser Gly Gly Ser Lys Ala Trp Gly Asn Asn Gln Asp Gly Val Val Ala
100 105 110
Ser Gln Pro Ala Arg Val Val Asp Glu Arg Glu Gln Met Ala Ile Ser
115 120 125
Gly Gly Phe Ile Arg Arg Val Thr Asp Asp Ala Arg Glu Asn Glu Met
130 135 140
Asp Glu Asn Leu Glu Gln Val Gly Gly Ile Ile Gly Asn Leu Arg His
145 150 155 160
Met Ala Leu Asp Met Gly Asn Glu Ile Asp Thr Gln Asn Arg Gln Ile
165 170 175
Asp Arg Ile Met Glu Lys Ala Asp Ser Asn Lys Thr Arg Ile Asp Glu
180 185 190
Ala Asn Gln Arg Ala Thr Lys Met Leu Gly Ser Gly
195 200

<210> 13
<211> 203
<212> PRT
<213> Carassius auratus

<400> 13
Met Ala Asp Glu Ala Asp Met Arg Asn Glu Leu Thr Asp Met Gln Ala
1 5 10 15
Arg Ala Asp Gln Leu Gly Asp Glu Ser Leu Glu Ser Thr Arg Arg Met
20 25 30
Leu Gln Leu Val Glu Glu Ser Lys Asp Ala Gly Ile Arg Thr Leu Val
35 40 45
Met Leu Asp Glu Gln Gly Glu Gln Leu Glu Arg Ile Glu Glu Gly Met
50 55 60
Asp Gln Ile Asn Lys Asp Met Lys Glu Ala Glu Lys Asn Leu Thr Asp
65 70 75 80
Leu Gly Asn Leu Cys Gly Leu Cys Pro Cys Pro Cys Asn Lys Leu Lys
85 90 95
Gly Gly Gly Gln Ser Trp Gly Asn Asn Gln Asp Gly Val Val Ser Ser
100 105 110
Gln Pro Ala Arg Val Val Asp Glu Arg Glu Gln Met Ala Ile Ser Gly
115 120 125
Gly Phe Ile Arg Arg Val Thr Asn Asp Ala Arg Glu Asn Glu Met Asp
130 135 140
Glu Asn Leu Glu Gln Val Gly Ser Ile Ile Gly Asn Leu Arg His Met
145 150 155 160
Ala Leu Asp Met Gly Asn Glu Ile Asp Thr Gln Asn Arg Gln Ile Asp
165 170 175
Arg Ile Met Asp Met Ala Asp Ser Asn Lys Thr Arg Ile Asp Glu Ala
180 185 190

```
Asn Gln Arg Ala Thr Lys Met Leu Gly Ser Gly
        195                 200


<210> 14
<211> 204
<212> PRT
<213> Danio rerio

<400> 14
Met Ala Glu Asp Ser Asp Met Arg Asn Glu Leu Ala Asp Met Gln Gln
 1               5                  10                  15
Arg Ala Asp Gln Leu Ala Asp Glu Ser Leu Glu Ser Thr Arg Arg Met
            20                  25                  30
Leu Gln Leu Val Glu Glu Ser Lys Asp Ala Gly Ile Arg Thr Leu Val
        35                  40                  45
Met Leu Asp Glu Gln Gly Glu Gln Leu Glu Arg Ile Glu Glu Gly Met
    50                  55                  60
Asp Gln Ile Asn Lys Asp Met Lys Asp Ala Glu Lys Asn Leu Asn Asp
65                  70                  75                  80
Leu Gly Lys Phe Cys Gly Leu Cys Ser Cys Pro Cys Asn Lys Met Lys
                85                  90                  95
Ser Gly Ala Ser Lys Ala Trp Gly Asn Asn Gln Asp Gly Val Val Ala
            100                 105                 110
Ser Gln Pro Ala Arg Val Val Asp Glu Arg Glu Gln Met Ala Ile Ser
        115                 120                 125
Gly Gly Phe Ile Arg Arg Val Thr Asp Asp Ala Arg Glu Asn Glu Met
    130                 135                 140
Asp Glu Asn Leu Glu Gln Val Gly Gly Ile Ile Gly Asn Leu Arg His
145                 150                 155                 160
Met Ala Leu Asp Met Gly Asn Glu Ile Asp Thr Gln Asn Arg Gln Ile
                165                 170                 175
Asp Arg Ile Met Glu Lys Ala Asp Ser Asn Lys Thr Arg Ile Asp Glu
            180                 185                 190
Ala Asn Gln Arg Ala Thr Lys Met Leu Gly Ser Gly
        195                 200


<210> 15
<211> 203
<212> PRT
<213> Danio rerio

<400> 15
Met Ala Asp Glu Ser Asp Met Arg Asn Glu Leu Asn Asp Met Gln Ala
 1               5                  10                  15
Arg Ala Asp Gln Leu Gly Asp Glu Ser Leu Glu Ser Thr Arg Arg Met
            20                  25                  30
Leu Gln Leu Val Glu Glu Ser Lys Asp Ala Gly Ile Arg Thr Leu Val
        35                  40                  45
Met Leu Asp Glu Gln Gly Glu Gln Leu Glu Arg Ile Glu Glu Gly Met
    50                  55                  60
Asp Gln Ile Asn Lys Asp Met Lys Glu Ala Glu Lys Asn Leu Thr Asp
65                  70                  75                  80
Leu Gly Asn Leu Cys Gly Leu Cys Pro Cys Pro Cys Asn Lys Leu Lys
                85                  90                  95
Gly Gly Gly Gln Ser Trp Gly Asn Asn Gln Asp Gly Val Val Ser Ser
            100                 105                 110
Gln Pro Ala Arg Val Val Asp Glu Arg Glu Gln Met Ala Ile Ser Gly
```

```
        115                 120                 125
Gly Phe Ile Arg Arg Val Thr Asn Asp Ala Arg Glu Asn Glu Met Asp
    130                 135                 140
Glu Asn Leu Glu Gln Val Gly Ser Ile Ile Gly Asn Leu Arg His Met
145                 150                 155                 160
Ala Leu Asp Met Gly Asn Glu Ile Asp Thr Gln Asn Arg Gln Ile Asp
                165                 170                 175
Arg Ile Met Asp Met Ala Asp Ser Asn Lys Thr Arg Ile Asp Glu Ala
            180                 185                 190
Asn Gln Arg Ala Thr Lys Met Leu Gly Ser Gly
        195                 200
```

<210> 16
<211> 210
<212> PRT
<213> Torpedo marmorata

<400> 16

```
Met Glu Asn Ser Val Glu Asn Ser Met Asp Pro Arg Ser Glu Gln Glu
 1               5                  10                  15
Glu Met Gln Arg Cys Ala Asp Gln Ile Thr Asp Glu Ser Leu Glu Ser
            20                  25                  30
Thr Arg Arg Met Leu Gln Leu Val Glu Glu Ser Lys Asp Ala Gly Ile
        35                  40                  45
Arg Thr Leu Val Met Leu Asp Glu Gln Gly Glu Gln Leu Glu Arg Ile
    50                  55                  60
Glu Glu Gly Met Asp Gln Ile Asn Lys Asp Met Lys Glu Ala Glu Lys
65                  70                  75                  80
Asn Leu Ser Asp Leu Gly Lys Cys Cys Gly Leu Cys Ser Cys Pro Cys
                85                  90                  95
Asn Lys Leu Lys Asn Phe Glu Ala Gly Gly Ala Tyr Lys Lys Val Trp
            100                 105                 110
Gly Asn Asn Gln Asp Gly Val Val Ala Ser Gln Pro Ala Arg Val Met
        115                 120                 125
Asp Asp Arg Glu Gln Met Ala Met Ser Gly Gly Tyr Ile Arg Arg Ile
    130                 135                 140
Thr Asp Asp Ala Arg Glu Asn Glu Met Glu Glu Asn Leu Asp Gln Val
145                 150                 155                 160
Gly Ser Ile Ile Gly Asn Leu Arg His Met Ala Leu Asp Met Ser Asn
                165                 170                 175
Glu Ile Gly Ser Gln Asn Ala Gln Ile Asp Arg Ile Val Val Lys Gly
            180                 185                 190
Asp Met Asn Lys Ala Arg Ile Asp Glu Ala Asn Lys His Ala Thr Lys
        195                 200                 205
Met Leu
    210
```

<210> 17
<211> 206
<212> PRT
<213> Xenopus laevis

<400> 17

```
Met Ala Asp Asp Ala Asp Met Arg Asn Glu Leu Glu Glu Met Gln Arg
 1               5                  10                  15
Arg Ala Asp Gln Leu Ala Asp Glu Ser Leu Glu Ser Thr Arg Arg Met
            20                  25                  30
```

```
Leu Gln Tyr Val Glu Gly Ser Lys Asp Ala Gly Ile Arg Thr Leu Val
        35                  40                  45
Met Leu Asp Glu Gln Gly Glu Gln Leu Asp Arg Val Glu Glu Gly Met
    50                  55                  60
Asn His Ile Asn Gln Asp Met Lys Glu Ala Glu Lys Asn Leu Lys Asp
65                  70                  75                  80
Leu Gly Lys Cys Cys Gly Leu Phe Ile Cys Pro Cys Asn Lys Leu Lys
                85                  90                  95
Ser Ser Gly Ala Tyr Asn Lys Ala Trp Gly Asn Asn Gln Asp Gly Val
            100                 105                 110
Val Ala Ser Gln Pro Ala Arg Val Val Asp Glu Arg Glu Gln Met Ala
        115                 120                 125
Ile Ser Gly Gly Phe Val Arg Arg Val Thr Asn Asp Ala Arg Glu Thr
    130                 135                 140
Glu Met Asp Glu Asn Leu Glu Gln Val Gly Gly Ile Ile Gly Asn Leu
145                 150                 155                 160
Arg His Met Ala Leu Asp Met Gly Asn Glu Ile Asp Thr Gln Asn Arg
                165                 170                 175
Gln Ile Asp Arg Ile Met Glu Lys Ala Asp Ser Asn Lys Ala Arg Ile
            180                 185                 190
Asp Glu Ala Asn Lys His Ala Thr Lys Met Leu Gly Ser Gly
        195                 200                 205


<210> 18
<211> 206
<212> PRT
<213> Xenopus laevis

<400> 18
Met Ala Asp Asp Ala Asp Met Arg Asn Glu Leu Glu Glu Met Gln Arg
 1               5                  10                  15
Arg Ala Asp Gln Leu Ala Asp Glu Ser Leu Glu Ser Thr Arg Arg Met
            20                  25                  30
Leu Gln Tyr Val Glu Gly Ser Lys Asp Ala Gly Ile Arg Thr Leu Val
        35                  40                  45
Met Leu Asp Glu Gln Gly Glu Gln Leu Glu Arg Ile Glu Glu Gly Met
    50                  55                  60
Glu Gln Ile Asn Lys Asp Met Lys Glu Ala Glu Lys Asn Leu Thr Asp
65                  70                  75                  80
Leu Gly Lys Phe Cys Gly Leu Cys Val Cys Pro Cys Asn Lys Leu Lys
                85                  90                  95
Ser Ser Asp Ala Tyr Lys Lys Ala Trp Gly Asn Asn Gln Asp Gly Val
            100                 105                 110
Val Ala Ser Gln Pro Ala Arg Val Val Asp Glu Arg Glu Gln Met Ala
        115                 120                 125
Ile Ser Gly Gly Phe Val Arg Arg Val Thr Asn Asp Ala Arg Glu Thr
    130                 135                 140
Glu Met Asp Glu Asn Leu Glu Gln Val Gly Gly Ile Ile Gly Asn Leu
145                 150                 155                 160
Arg His Met Ala Leu Asp Met Gly Asn Glu Ile Asp Thr Gln Asn Arg
                165                 170                 175
Gln Ile Asp Arg Ile Met Glu Lys Ala Asp Ser Asn Lys Ala Arg Ile
            180                 185                 190
Asp Glu Ala Asn Lys His Ala Thr Lys Met Leu Gly Ser Gly
        195                 200                 205


<210> 19
```

<211> 212
<212> PRT
<213> Strongylocentrotus purpuratus

<400> 19
Met Glu Asp Gln Asn Asp Met Asn Met Arg Ser Glu Leu Glu Glu Ile
1 5 10 15
Gln Met Gln Ser Asn Met Gln Thr Asp Glu Ser Leu Glu Ser Thr Arg
20 25 30
Arg Met Leu Gln Met Ala Glu Glu Ser Gln Asp Met Gly Ile Lys Thr
35 40 45
Leu Val Met Leu Asp Glu Gln Gly Glu Gln Leu Asp Arg Ile Glu Glu
50 55 60
Gly Met Asp Gln Ile Asn Thr Asp Met Arg Glu Ala Glu Lys Asn Leu
65 70 75 80
Thr Gly Leu Glu Lys Cys Cys Gly Ile Cys Val Cys Pro Trp Lys Lys
85 90 95
Leu Gly Asn Phe Glu Lys Gly Asp Asp Tyr Lys Lys Thr Trp Lys Gly
100 105 110
Asn Asp Asp Gly Lys Val Asn Ser His Gln Pro Met Arg Met Glu Asp
115 120 125
Asp Arg Asp Gly Cys Gly Gly Asn Ala Ser Met Ile Thr Arg Ile Thr
130 135 140
Asn Asp Ala Arg Glu Asp Glu Met Asp Glu Asn Leu Thr Gln Val Ser
145 150 155 160
Ser Ile Val Gly Asn Leu Arg His Met Ala Ile Asp Met Gln Ser Glu
165 170 175
Ile Gly Ala Gln Asn Ser Gln Val Gly Arg Ile Thr Ser Lys Ala Glu
180 185 190
Ser Asn Glu Gly Arg Ile Asn Ser Ala Asp Lys Arg Ala Lys Asn Ile
195 200 205
Leu Arg Asn Lys
210

<210> 20
<211> 212
<212> PRT
<213> Drosophila melanogaster

<400> 20
Met Pro Ala Asp Pro Ser Glu Glu Val Ala Pro Gln Val Pro Lys Thr
1 5 10 15
Glu Leu Glu Glu Leu Gln Ile Asn Ala Gln Gly Val Ala Asp Glu Ser
20 25 30
Leu Glu Ser Thr Arg Arg Met Leu Ala Leu Cys Glu Glu Ser Lys Glu
35 40 45
Ala Gly Ile Arg Thr Leu Val Ala Leu Asp Asp Gln Gly Glu Gln Leu
50 55 60
Asp Arg Ile Glu Glu Gly Met Asp Gln Ile Asn Ala Asp Met Arg Glu
65 70 75 80
Ala Glu Lys Asn Leu Ser Gly Met Glu Lys Cys Cys Gly Ile Cys Val
85 90 95
Leu Pro Cys Asn Lys Ser Gln Ser Phe Lys Glu Asp Asp Gly Thr Trp
100 105 110
Lys Gly Asn Asp Asp Gly Lys Val Val Asn Asn Gln Pro Gln Arg Val
115 120 125
Met Asp Asp Arg Asn Gly Met Met Ala Gln Ala Gly Tyr Ile Gly Arg
130 135 140

```
Ile Thr Asn Asp Ala Arg Glu Asp Glu Met Glu Glu Asn Met Gly Gln
145                 150                 155                 160
Val Asn Thr Met Ile Gly Asn Leu Arg Asn Met Ala Leu Asp Met Gly
                165                 170                 175
Ser Glu Leu Glu Asn Gln Asn Arg Gln Ile Asp Arg Ile Asn Arg Lys
            180                 185                 190
Gly Glu Ser Asn Glu Ala Arg Ile Ala Val Ala Asn Gln Arg Ala His
        195                 200                 205
Gln Leu Leu Lys
    210


<210> 21
<211> 212
<212> PRT
<213> Hirudo medicinalis

<400> 21
Met Ala Lys Asp Ile Lys Pro Lys Pro Ala Asn Gly Arg Asp Ser Pro
 1               5                  10                  15
Thr Asp Leu Gln Glu Ile Gln Leu Gln Met Asn Ala Ile Thr Asp Asp
            20                  25                  30
Ser Leu Glu Ser Thr Arg Arg Met Leu Ala Met Cys Glu Glu Ser Lys
        35                  40                  45
Asp Ala Gly Ile Arg Thr Leu Val Met Leu Asp Glu Gln Gly Glu Gln
    50                  55                  60
Leu Asp Arg Ile Glu Glu Gly Met Asp Gln Ile Asn Gln Asp Met Arg
65                  70                  75                  80
Asp Ala Glu Lys Asn Leu Glu Gly Met Glu Lys Cys Cys Gly Leu Cys
                85                  90                  95
Ile Leu Pro Trp Lys Arg Thr Lys Asn Phe Asp Lys Gly Ala Glu Trp
            100                 105                 110
Asn Lys Gly Asp Glu Gly Lys Val Asn Thr Asp Gly Pro Arg Leu Val
        115                 120                 125
Val Gly Asp Gly Asn Met Gly Pro Ser Gly Gly Phe Ile Thr Lys Ile
    130                 135                 140
Thr Asn Asp Ala Arg Glu Glu Glu Met Glu Gln Asn Met Gly Glu Val
145                 150                 155                 160
Ser Asn Met Ile Ser Asn Leu Arg Asn Met Ala Val Asp Met Gly Ser
                165                 170                 175
Glu Ile Asp Ser Gln Asn Arg Gln Val Asp Arg Ile Asn Asn Lys Met
            180                 185                 190
Thr Ser Asn Gln Leu Arg Ile Ser Asp Ala Asn Lys Arg Ala Ser Lys
        195                 200                 205
Leu Leu Lys Glu
    210


<210> 22
<211> 212
<212> PRT
<213> Loligo pealei

<400> 22
Met Ser Ala Asn Gly Glu Val Glu Val Pro Lys Thr Glu Leu Glu Glu
 1               5                  10                  15
Ile Gln Gln Gln Cys Asn Gln Val Thr Asp Asp Ser Leu Glu Ser Thr
            20                  25                  30
Arg Arg Met Leu Asn Met Cys Glu Glu Ser Lys Glu Ala Gly Ile Arg
```

```
        35                  40                  45
Thr Leu Val Met Leu Asp Glu Gln Gly Glu Gln Leu Asp Arg Ile Glu
    50                  55                  60
Glu Gly Leu Asp Gln Ile Asn Gln Asp Met Lys Asp Ala Glu Lys Asn
65                  70                  75                  80
Leu Glu Gly Met Glu Lys Cys Cys Gly Leu Cys Val Leu Pro Trp Lys
                85                  90                  95
Arg Gly Lys Ser Phe Glu Lys Ser Gly Asp Tyr Ala Asn Thr Trp Lys
            100                 105                 110
Lys Asp Asp Asp Gly Pro Thr Asn Thr Asn Gly Pro Arg Val Thr Val
        115                 120                 125
Gly Asp Gln Asn Gly Met Gly Pro Ser Ser Gly Tyr Val Thr Arg Ile
    130                 135                 140
Thr Asn Asp Ala Arg Glu Asp Asp Met Glu Asn Asn Met Lys Glu Val
145                 150                 155                 160
Ser Ser Met Ile Gly Asn Leu Arg Asn Met Ala Ile Asp Met Gly Asn
                165                 170                 175
Glu Ile Gly Ser Gln Asn Arg Gln Val Asp Arg Ile Gln Gln Lys Ala
            180                 185                 190
Glu Ser Asn Glu Ser Arg Ile Asp Glu Ala Asn Lys Lys Ala Thr Lys
        195                 200                 205
Leu Leu Lys Asn
    210
```

<210> 23
<211> 220
<212> PRT
<213> Lymnaea stagnalis

<400> 23

```
Met Thr Thr Asn Gly Glu Ile Leu Pro Val Gly Glu Glu Glu Glu Glu
 1               5                  10                  15
Glu Leu Gly Glu Asp Ala Leu Leu Arg Lys Gln Ile Asp Cys Asn Thr
            20                  25                  30
Asn Glu Ser Leu Glu Ser Thr Arg Arg Met Leu Ser Leu Cys Glu Glu
        35                  40                  45
Ser Lys Glu Ala Gly Ile Lys Thr Leu Val Met Leu Asp Glu Gln Gly
    50                  55                  60
Glu Gln Leu Asp Arg Ile Glu Glu Gly Met Gly Gln Ile Asn Gln Asp
65                  70                  75                  80
Met Arg Asp Ala Glu Lys Asn Leu Glu Gly Leu Glu Lys Cys Cys Gly
                85                  90                  95
Leu Cys Val Leu Pro Trp Lys Arg Ser Lys Asn Phe Glu Lys Gly Ser
            100                 105                 110
Asp Tyr Asn Lys Thr Trp Lys Ala Ser Glu Asp Gly Lys Ile Asn Thr
        115                 120                 125
Asn Gly Pro Arg Leu Val Val Asp Gln Gly Asn Gly Ser Gly Pro Thr
    130                 135                 140
Gly Gly Tyr Ile Thr Arg Ile Thr Asn Asp Ala Arg Glu Asp Glu Met
145                 150                 155                 160
Glu Gln Asn Ile Gly Glu Val Ala Gly Met Val Ser Asn Leu Arg Asn
                165                 170                 175
Met Ala Val Asp Met Gly Asn Glu Ile Glu Ser Gln Asn Lys Gln Leu
            180                 185                 190
Asp Arg Ile Asn Gln Lys Gly Gly Ser Leu Asn Val Arg Val Asp Glu
        195                 200                 205
Ala Asn Lys Arg Ala Asn Arg Ile Leu Arg Lys Gln
    210                 215                 220
```

<210> 24
<211> 207
<212> PRT
<213> Caenorhabditis elegans

<400> 24
Met Ser Gly Asp Asp Asp Ile Pro Glu Gly Leu Glu Ala Ile Asn Leu
1 5 10 15
Lys Met Asn Ala Thr Thr Asp Asp Ser Leu Glu Ser Thr Arg Arg Met
20 25 30
Leu Ala Leu Cys Glu Glu Ser Lys Glu Ala Gly Ile Lys Thr Leu Val
35 40 45
Met Leu Asp Asp Gln Gly Glu Gln Leu Glu Arg Cys Glu Gly Ala Leu
50 55 60
Asp Thr Ile Asn Gln Asp Met Lys Glu Ala Glu Asp His Leu Lys Gly
65 70 75 80
Met Glu Lys Cys Cys Gly Leu Cys Val Leu Pro Trp Asn Lys Thr Asp
85 90 95
Asp Phe Glu Lys Thr Glu Phe Ala Lys Ala Trp Lys Lys Asp Asp Asp
100 105 110
Gly Gly Val Ile Ser Asp Gln Pro Arg Ile Thr Val Gly Asp Ser Ser
115 120 125
Met Gly Pro Gln Gly Gly Tyr Ile Thr Lys Ile Thr Asn Asp Ala Arg
130 135 140
Glu Asp Glu Met Asp Glu Asn Val Gln Gln Val Ser Thr Met Val Gly
145 150 155 160
Asn Leu Arg Asn Met Ala Ile Asp Met Ser Thr Glu Val Ser Asn Gln
165 170 175
Asn Arg Gln Leu Asp Arg Ile His Asp Lys Ala Gln Ser Asn Glu Val
180 185 190
Arg Val Glu Ser Ala Asn Lys Arg Ala Lys Asn Leu Ile Thr Lys
195 200 205

<210> 25
<211> 808
<212> PRT
<213> Homo sapiens

<400> 25
Met Gly Ala Pro Ala Cys Ala Leu Ala Leu Cys Val Ala Val Ala Ile
1 5 10 15
Val Ala Gly Ala Ser Ser Glu Ser Leu Gly Thr Glu Gln Arg Val Val
20 25 30
Gly Arg Ala Ala Glu Val Pro Gly Pro Glu Pro Gly Gln Gln Glu Gln
35 40 45
Leu Val Phe Gly Ser Gly Asp Ala Val Glu Leu Ser Cys Pro Pro Pro
50 55 60
Gly Gly Gly Pro Met Gly Pro Thr Val Trp Val Lys Asp Gly Thr Gly
65 70 75 80
Leu Val Pro Ser Glu Arg Val Leu Val Gly Pro Gln Arg Leu Gln Val
85 90 95
Leu Asn Ala Ser His Glu Asp Ser Gly Ala Tyr Ser Cys Arg Gln Arg
100 105 110
Leu Thr Gln Arg Val Leu Cys His Phe Ser Val Arg Val Thr Asp Ala
115 120 125
Pro Ser Ser Gly Asp Asp Glu Asp Gly Glu Asp Glu Ala Glu Asp Thr

```
    130                 135                 140
Gly Val Asp Thr Gly Ala Pro Tyr Trp Thr Arg Pro Glu Arg Met Asp
145                 150                 155                 160
Lys Lys Leu Leu Ala Val Pro Ala Ala Asn Thr Val Arg Phe Arg Cys
                165                 170                 175
Pro Ala Ala Gly Asn Pro Thr Pro Ser Ile Ser Trp Leu Lys Asn Gly
            180                 185                 190
Arg Glu Phe Arg Gly Glu His Arg Ile Gly Gly Ile Lys Leu Arg His
        195                 200                 205
Gln Gln Trp Ser Leu Val Met Glu Ser Val Val Pro Ser Asp Arg Gly
    210                 215                 220
Asn Tyr Thr Cys Val Val Glu Asn Lys Phe Gly Ser Ile Arg Gln Thr
225                 230                 235                 240
Tyr Thr Leu Asp Val Leu Glu Arg Ser Pro His Arg Pro Ile Leu Gln
                245                 250                 255
Ala Gly Leu Pro Ala Asn Gln Thr Ala Val Leu Gly Ser Asp Val Glu
            260                 265                 270
Phe His Cys Lys Val Tyr Ser Asp Ala Gln Pro His Ile Gln Trp Leu
        275                 280                 285
Lys His Val Glu Val Asn Gly Ser Lys Val Gly Pro Asp Gly Thr Pro
    290                 295                 300
Tyr Val Thr Val Leu Lys Ser Trp Ile Ser Glu Ser Val Glu Ala Asp
305                 310                 315                 320
Val Arg Leu Arg Leu Ala Asn Val Ser Glu Arg Asp Gly Gly Glu Tyr
                325                 330                 335
Leu Cys Arg Ala Thr Asn Phe Ile Gly Val Ala Glu Lys Ala Phe Trp
            340                 345                 350
Leu Ser Val His Gly Pro Arg Ala Ala Glu Glu Glu Leu Val Glu Ala
        355                 360                 365
Asp Glu Ala Gly Ser Val Tyr Ala Gly Ile Leu Ser Tyr Gly Val Gly
    370                 375                 380
Phe Phe Leu Phe Ile Leu Val Val Ala Ala Val Thr Leu Cys Arg Leu
385                 390                 395                 400
Arg Ser Pro Pro Lys Lys Gly Leu Gly Ser Pro Thr Val His Lys Ile
                405                 410                 415
Ser Arg Phe Pro Leu Lys Arg Gln Val Ser Leu Glu Ser Asn Ala Ser
            420                 425                 430
Met Ser Ser Asn Thr Pro Leu Val Arg Ile Ala Arg Leu Ser Ser Gly
        435                 440                 445
Glu Gly Pro Thr Leu Ala Asn Val Ser Glu Leu Glu Leu Pro Ala Asp
    450                 455                 460
Pro Lys Trp Glu Leu Ser Arg Ala Arg Leu Thr Leu Gly Lys Pro Leu
465                 470                 475                 480
Gly Glu Gly Cys Phe Gly Gln Val Val Met Ala Glu Ala Ile Gly Ile
                485                 490                 495
Asp Lys Asp Arg Ala Ala Lys Pro Val Thr Val Ala Val Lys Met Leu
            500                 505                 510
Lys Asp Asp Ala Thr Asp Lys Asp Leu Ser Asp Leu Val Ser Glu Met
        515                 520                 525
Glu Met Met Lys Met Ile Gly Lys His Lys Asn Ile Ile Asn Leu Leu
    530                 535                 540
Gly Ala Cys Thr Gln Gly Gly Pro Leu Tyr Val Leu Val Glu Tyr Ala
545                 550                 555                 560
Ala Lys Gly Asn Leu Arg Glu Phe Leu Arg Ala Arg Arg Pro Pro Gly
                565                 570                 575
Leu Asp Tyr Ser Phe Asp Thr Cys Lys Pro Pro Glu Glu Gln Leu Thr
            580                 585                 590
Phe Lys Asp Leu Val Ser Cys Ala Tyr Gln Val Ala Arg Gly Met Glu
        595                 600                 605
```

```
Tyr Leu Ala Ser Gln Lys Cys Ile His Arg Asp Leu Ala Ala Arg Asn
    610                 615                 620
Val Leu Val Thr Glu Asp Asn Val Met Lys Ile Ala Asp Phe Gly Leu
625                 630                 635                 640
Ala Arg Asp Val His Asn Leu Asp Tyr Tyr Lys Lys Thr Thr Asn Gly
                645                 650                 655
Arg Leu Pro Val Lys Trp Met Ala Pro Glu Ala Leu Phe Asp Arg Val
            660                 665                 670
Tyr Thr His Gln Ser Asp Val Trp Ser Phe Gly Val Leu Leu Trp Glu
        675                 680                 685
Ile Phe Thr Leu Gly Gly Ser Pro Tyr Pro Gly Ile Pro Val Glu Glu
    690                 695                 700
Leu Phe Lys Leu Leu Lys Glu Gly His Arg Met Asp Lys Pro Ala Asn
705                 710                 715                 720
Cys Thr His Asp Leu Tyr Met Ile Met Arg Glu Cys Trp His Ala Ala
                725                 730                 735
Pro Ser Gln Arg Pro Thr Phe Lys Gln Leu Val Glu Asp Leu Asp Arg
            740                 745                 750
Val Leu Thr Val Thr Ser Thr Asp Glu Tyr Leu Asp Leu Ser Ala Pro
        755                 760                 765
Phe Glu Gln Tyr Ser Pro Gly Gly Gln Asp Thr Pro Ser Ser Ser Ser
    770                 775                 780
Ser Gly Asp Asp Ser Val Phe Ala His Asp Leu Leu Pro Pro Ala Pro
785                 790                 795                 800
Pro Ser Ser Gly Gly Ser Arg Thr
                805
```

<210> 26
<211> 806
<212> PRT
<213> Homo sapiens

<400> 26

```
Met Gly Ala Pro Ala Cys Ala Leu Ala Leu Cys Val Ala Val Ala Ile
 1                5                  10                  15
Val Ala Gly Ala Ser Ser Glu Ser Leu Gly Thr Glu Gln Arg Val Val
            20                  25                  30
Gly Arg Ala Ala Glu Val Pro Gly Pro Glu Pro Gly Gln Gln Glu Gln
        35                  40                  45
Leu Val Phe Gly Ser Gly Asp Ala Val Glu Leu Ser Cys Pro Pro Pro
    50                  55                  60
Gly Gly Gly Pro Met Gly Pro Thr Val Trp Val Lys Asp Gly Thr Gly
65                  70                  75                  80
Leu Val Pro Ser Glu Arg Val Leu Val Gly Pro Gln Arg Leu Gln Val
                85                  90                  95
Leu Asn Ala Ser His Glu Asp Ser Gly Ala Tyr Ser Cys Arg Gln Arg
            100                 105                 110
Leu Thr Gln Arg Val Leu Cys His Phe Ser Val Arg Val Thr Asp Ala
        115                 120                 125
Pro Ser Ser Gly Asp Asp Glu Asp Gly Glu Asp Glu Ala Glu Asp Thr
    130                 135                 140
Gly Val Asp Thr Gly Ala Pro Tyr Trp Thr Arg Pro Glu Arg Met Asp
145                 150                 155                 160
Lys Lys Leu Leu Ala Val Pro Ala Ala Asn Thr Val Arg Phe Arg Cys
                165                 170                 175
Pro Ala Ala Gly Asn Pro Thr Pro Ser Ile Ser Trp Leu Lys Asn Gly
            180                 185                 190
Arg Glu Phe Arg Gly Glu His Arg Ile Gly Gly Ile Lys Leu Arg His
```

```
        195                 200                 205
Gln Gln Trp Ser Leu Val Met Glu Ser Val Val Pro Ser Asp Arg Gly
    210                 215                 220
Asn Tyr Thr Cys Val Val Glu Asn Lys Phe Gly Ser Ile Arg Gln Thr
225                 230                 235                 240
Tyr Thr Leu Asp Val Leu Glu Arg Ser Pro His Arg Pro Ile Leu Gln
                245                 250                 255
Ala Gly Leu Pro Ala Asn Gln Thr Ala Val Leu Gly Ser Asp Val Glu
            260                 265                 270
Phe His Cys Lys Val Tyr Ser Asp Ala Gln Pro His Ile Gln Trp Leu
        275                 280                 285
Lys His Val Glu Val Asn Gly Ser Lys Val Gly Pro Asp Gly Thr Pro
    290                 295                 300
Tyr Val Thr Val Leu Lys Thr Ala Gly Ala Asn Thr Thr Asp Lys Glu
305                 310                 315                 320
Leu Glu Val Leu Ser Leu His Asn Val Thr Phe Glu Asp Ala Gly Glu
                325                 330                 335
Tyr Thr Cys Leu Ala Gly Asn Ser Ile Gly Phe Ser His His Ser Ala
            340                 345                 350
Trp Leu Val Val Leu Pro Ala Glu Glu Glu Leu Val Glu Ala Asp Glu
        355                 360                 365
Ala Gly Ser Val Tyr Ala Gly Ile Leu Ser Tyr Gly Val Gly Phe Phe
    370                 375                 380
Leu Phe Ile Leu Val Val Ala Ala Val Thr Leu Cys Arg Leu Arg Ser
385                 390                 395                 400
Pro Pro Lys Lys Gly Leu Gly Ser Pro Thr Val His Lys Ile Ser Arg
                405                 410                 415
Phe Pro Leu Lys Arg Gln Val Ser Leu Glu Ser Asn Ala Ser Met Ser
            420                 425                 430
Ser Asn Thr Pro Leu Val Arg Ile Ala Arg Leu Ser Ser Gly Glu Gly
        435                 440                 445
Pro Thr Leu Ala Asn Val Ser Glu Leu Glu Leu Pro Ala Asp Pro Lys
    450                 455                 460
Trp Glu Leu Ser Arg Ala Arg Leu Thr Leu Gly Lys Pro Leu Gly Glu
465                 470                 475                 480
Gly Cys Phe Gly Gln Val Val Met Ala Glu Ala Ile Gly Ile Asp Lys
                485                 490                 495
Asp Arg Ala Ala Lys Pro Val Thr Val Ala Val Lys Met Leu Lys Asp
            500                 505                 510
Asp Ala Thr Asp Lys Asp Leu Ser Asp Leu Val Ser Glu Met Glu Met
        515                 520                 525
Met Lys Met Ile Gly Lys His Lys Asn Ile Ile Asn Leu Leu Gly Ala
    530                 535                 540
Cys Thr Gln Gly Gly Pro Leu Tyr Val Leu Val Glu Tyr Ala Ala Lys
545                 550                 555                 560
Gly Asn Leu Arg Glu Phe Leu Arg Ala Arg Arg Pro Pro Gly Leu Asp
                565                 570                 575
Tyr Ser Phe Asp Thr Cys Lys Pro Pro Glu Glu Gln Leu Thr Phe Lys
            580                 585                 590
Asp Leu Val Ser Cys Ala Tyr Gln Val Ala Arg Gly Met Glu Tyr Leu
        595                 600                 605
Ala Ser Gln Lys Cys Ile His Arg Asp Leu Ala Ala Arg Asn Val Leu
    610                 615                 620
Val Thr Glu Asp Asn Val Met Lys Ile Ala Asp Phe Gly Leu Ala Arg
625                 630                 635                 640
Asp Val His Asn Leu Asp Tyr Tyr Lys Lys Thr Thr Asn Gly Arg Leu
                645                 650                 655
Pro Val Lys Trp Met Ala Pro Glu Ala Leu Phe Asp Arg Val Tyr Thr
            660                 665                 670
```

```
His Gln Ser Asp Val Trp Ser Phe Gly Val Leu Leu Trp Glu Ile Phe
        675                 680                 685
Thr Leu Gly Gly Ser Pro Tyr Pro Gly Ile Pro Val Glu Glu Leu Phe
    690                 695                 700
Lys Leu Leu Lys Glu Gly His Arg Met Asp Lys Pro Ala Asn Cys Thr
705                 710                 715                 720
His Asp Leu Tyr Met Ile Met Arg Glu Cys Trp His Ala Ala Pro Ser
                725                 730                 735
Gln Arg Pro Thr Phe Lys Gln Leu Val Glu Asp Leu Asp Arg Val Leu
            740                 745                 750
Thr Val Thr Ser Thr Asp Glu Tyr Leu Asp Leu Ser Ala Pro Phe Glu
        755                 760                 765
Gln Tyr Ser Pro Gly Gly Gln Asp Thr Pro Ser Ser Ser Ser Ser Gly
    770                 775                 780
Asp Asp Ser Val Phe Ala His Asp Leu Leu Pro Pro Ala Pro Pro Ser
785                 790                 795                 800
Ser Gly Gly Ser Arg Thr
                805
```

<210> 27
<211> 694
<212> PRT
<213> Homo sapiens

<400> 27

```
Met Gly Ala Pro Ala Cys Ala Leu Ala Leu Cys Val Ala Val Ala Ile
 1               5                  10                  15
Val Ala Gly Ala Ser Ser Glu Ser Leu Gly Thr Glu Gln Arg Val Val
            20                  25                  30
Gly Arg Ala Ala Glu Val Pro Gly Pro Glu Pro Gly Gln Gln Glu Gln
        35                  40                  45
Leu Val Phe Gly Ser Gly Asp Ala Val Glu Leu Ser Cys Pro Pro Pro
    50                  55                  60
Gly Gly Gly Pro Met Gly Pro Thr Val Trp Val Lys Asp Gly Thr Gly
65                  70                  75                  80
Leu Val Pro Ser Glu Arg Val Leu Val Gly Pro Gln Arg Leu Gln Val
                85                  90                  95
Leu Asn Ala Ser His Glu Asp Ser Gly Ala Tyr Ser Cys Arg Gln Arg
            100                 105                 110
Leu Thr Gln Arg Val Leu Cys His Phe Ser Val Arg Val Thr Asp Ala
        115                 120                 125
Pro Ser Ser Gly Asp Asp Glu Asp Gly Glu Asp Glu Ala Glu Asp Thr
    130                 135                 140
Gly Val Asp Thr Gly Ala Pro Tyr Trp Thr Arg Pro Glu Arg Met Asp
145                 150                 155                 160
Lys Lys Leu Leu Ala Val Pro Ala Ala Asn Thr Val Arg Phe Arg Cys
                165                 170                 175
Pro Ala Ala Gly Asn Pro Thr Pro Ser Ile Ser Trp Leu Lys Asn Gly
            180                 185                 190
Arg Glu Phe Arg Gly Glu His Arg Ile Gly Gly Ile Lys Leu Arg His
        195                 200                 205
Gln Gln Trp Ser Leu Val Met Glu Ser Val Val Pro Ser Asp Arg Gly
    210                 215                 220
Asn Tyr Thr Cys Val Val Glu Asn Lys Phe Gly Ser Ile Arg Gln Thr
225                 230                 235                 240
Tyr Thr Leu Asp Val Leu Glu Arg Ser Pro His Arg Pro Ile Leu Gln
                245                 250                 255
Ala Gly Leu Pro Ala Asn Gln Thr Ala Val Leu Gly Ser Asp Val Glu
```

```
            260                 265                 270
Phe His Cys Lys Val Tyr Ser Asp Ala Gln Pro His Ile Gln Trp Leu
        275                 280                 285
Lys His Val Glu Val Asn Gly Ser Lys Val Gly Pro Asp Gly Thr Pro
    290                 295                 300
Tyr Val Thr Val Leu Lys Val Ser Leu Glu Ser Asn Ala Ser Met Ser
305                 310                 315                 320
Ser Asn Thr Pro Leu Val Arg Ile Ala Arg Leu Ser Ser Gly Glu Gly
                325                 330                 335
Pro Thr Leu Ala Asn Val Ser Glu Leu Glu Leu Pro Ala Asp Pro Lys
            340                 345                 350
Trp Glu Leu Ser Arg Ala Arg Leu Thr Leu Gly Lys Pro Leu Gly Glu
        355                 360                 365
Gly Cys Phe Gly Gln Val Val Met Ala Glu Ala Ile Gly Ile Asp Lys
    370                 375                 380
Asp Arg Ala Ala Lys Pro Val Thr Val Ala Val Lys Met Leu Lys Asp
385                 390                 395                 400
Asp Ala Thr Asp Lys Asp Leu Ser Asp Leu Val Ser Glu Met Glu Met
                405                 410                 415
Met Lys Met Ile Gly Lys His Lys Asn Ile Ile Asn Leu Leu Gly Ala
            420                 425                 430
Cys Thr Gln Gly Gly Pro Leu Tyr Val Leu Val Glu Tyr Ala Ala Lys
        435                 440                 445
Gly Asn Leu Arg Glu Phe Leu Arg Ala Arg Arg Pro Pro Gly Leu Asp
    450                 455                 460
Tyr Ser Phe Asp Thr Cys Lys Pro Pro Glu Glu Gln Leu Thr Phe Lys
465                 470                 475                 480
Asp Leu Val Ser Cys Ala Tyr Gln Val Ala Arg Gly Met Glu Tyr Leu
                485                 490                 495
Ala Ser Gln Lys Cys Ile His Arg Asp Leu Ala Ala Arg Asn Val Leu
            500                 505                 510
Val Thr Glu Asp Asn Val Met Lys Ile Ala Asp Phe Gly Leu Ala Arg
        515                 520                 525
Asp Val His Asn Leu Asp Tyr Tyr Lys Lys Thr Thr Asn Gly Arg Leu
    530                 535                 540
Pro Val Lys Trp Met Ala Pro Glu Ala Leu Phe Asp Arg Val Tyr Thr
545                 550                 555                 560
His Gln Ser Asp Val Trp Ser Phe Gly Val Leu Leu Trp Glu Ile Phe
                565                 570                 575
Thr Leu Gly Gly Ser Pro Tyr Pro Gly Ile Pro Val Glu Glu Leu Phe
            580                 585                 590
Lys Leu Leu Lys Glu Gly His Arg Met Asp Lys Pro Ala Asn Cys Thr
        595                 600                 605
His Asp Leu Tyr Met Ile Met Arg Glu Cys Trp His Ala Ala Pro Ser
    610                 615                 620
Gln Arg Pro Thr Phe Lys Gln Leu Val Glu Asp Leu Asp Arg Val Leu
625                 630                 635                 640
Thr Val Thr Ser Thr Asp Glu Tyr Leu Asp Leu Ser Ala Pro Phe Glu
                645                 650                 655
Gln Tyr Ser Pro Gly Gly Gln Asp Thr Pro Ser Ser Ser Ser Ser Gly
            660                 665                 670
Asp Asp Ser Val Phe Ala His Asp Leu Leu Pro Pro Ala Pro Pro Ser
        675                 680                 685
Ser Gly Gly Ser Arg Thr
    690
```

<210> 28
<211> 604

<212> PRT
<213> Homo sapiens

<400> 28

```
Ala Gln Arg Arg Lys Glu Arg Glu Glu Leu Ala Gln Gln Tyr Glu Ala
 1               5                  10                  15
Ile Leu Arg Glu Cys Gly His Gly Arg Phe Gln Trp Thr Leu Tyr Phe
            20                  25                  30
Val Leu Gly Leu Ala Leu Met Ala Asp Gly Val Glu Val Phe Val Val
        35                  40                  45
Gly Phe Val Leu Pro Ser Ala Glu Lys Asp Met Cys Leu Ser Asp Ser
    50                  55                  60
Asn Lys Gly Met Leu Gly Leu Ile Val Tyr Leu Gly Met Met Val Gly
65                  70                  75                  80
Ala Phe Leu Trp Gly Gly Leu Ala Asp Arg Leu Gly Arg Arg Gln Cys
                85                  90                  95
Leu Leu Ile Ser Leu Ser Val Asn Ser Val Phe Ala Phe Phe Ser Ser
            100                 105                 110
Phe Val Gln Gly Tyr Gly Thr Phe Leu Phe Cys Arg Leu Leu Ser Gly
        115                 120                 125
Val Gly Ile Gly Gly Ser Ile Pro Ile Val Phe Ser Tyr Phe Ser Glu
    130                 135                 140
Phe Leu Ala Gln Glu Lys Arg Gly Glu His Leu Ser Trp Leu Cys Met
145                 150                 155                 160
Phe Trp Met Ile Gly Gly Val Tyr Ala Ala Ala Met Ala Trp Ala Ile
                165                 170                 175
Ile Pro His Tyr Gly Trp Ser Phe Gln Met Gly Ser Ala Tyr Gln Phe
            180                 185                 190
His Ser Trp Arg Val Phe Val Leu Val Cys Ala Phe Pro Ser Val Phe
        195                 200                 205
Ala Ile Gly Ala Leu Thr Thr Gln Pro Glu Ser Pro Arg Phe Phe Leu
    210                 215                 220
Glu Asn Gly Lys His Asp Glu Ala Trp Met Val Leu Lys Gln Val His
225                 230                 235                 240
Asp Thr Asn Met Arg Ala Lys Gly His Pro Glu Arg Val Phe Ser Val
                245                 250                 255
Thr His Ile Lys Thr Ile His Gln Glu Asp Glu Leu Ile Glu Ile Gln
            260                 265                 270
Ser Asp Thr Gly Thr Trp Tyr Gln Arg Trp Gly Val Arg Ala Leu Ser
        275                 280                 285
Leu Gly Gly Gln Val Trp Gly Asn Phe Leu Ser Cys Phe Gly Pro Glu
    290                 295                 300
Tyr Arg Arg Ile Thr Leu Met Met Met Gly Val Trp Phe Thr Met Ser
305                 310                 315                 320
Phe Ser Tyr Tyr Gly Leu Thr Val Trp Phe Pro Asp Met Ile Arg His
                325                 330                 335
Leu Gln Ala Val Asp Tyr Ala Ser Arg Thr Lys Val Phe Pro Gly Glu
            340                 345                 350
Arg Val Glu His Val Thr Phe Asn Phe Thr Leu Glu Asn Gln Ile His
        355                 360                 365
Arg Gly Gly Gln Tyr Phe Asn Asp Lys Phe Ile Gly Leu Arg Leu Lys
    370                 375                 380
Ser Val Ser Phe Glu Asp Ser Leu Phe Glu Glu Cys Tyr Phe Glu Asp
385                 390                 395                 400
Val Thr Ser Ser Asn Thr Phe Phe Arg Asn Cys Thr Phe Ile Asn Thr
                405                 410                 415
Val Phe Tyr Asn Thr Asp Leu Phe Glu Tyr Lys Phe Val Asn Ser Arg
            420                 425                 430
Leu Ile Asn Ser Thr Phe Leu His Asn Lys Glu Gly Cys Pro Leu Asp
```

```
         435                 440                 445
Val Thr Gly Thr Gly Glu Gly Ala Tyr Met Val Tyr Phe Val Ser Phe
    450                 455                 460
Leu Gly Thr Leu Ala Val Leu Pro Gly Asn Ile Val Ser Ala Leu Leu
465                 470                 475                 480
Met Asp Lys Ile Gly Arg Leu Arg Met Leu Ala Gly Ser Ser Val Met
                485                 490                 495
Ser Cys Val Ser Cys Phe Phe Leu Ser Phe Gly Asn Ser Glu Ser Ala
            500                 505                 510
Met Ile Ala Leu Leu Cys Leu Phe Gly Gly Val Ser Ile Ala Ser Trp
        515                 520                 525
Asn Ala Leu Asp Val Leu Thr Val Glu Leu Tyr Pro Ser Asp Lys Arg
    530                 535                 540
Thr Thr Ala Phe Gly Phe Leu Asn Ala Leu Cys Lys Leu Ala Ala Val
545                 550                 555                 560
Leu Gly Ile Ser Ile Phe Thr Ser Phe Val Gly Ile Thr Lys Ala Ala
                565                 570                 575
Pro Ile Leu Phe Ala Ser Ala Ala Leu Ala Leu Gly Ser Ser Leu Ala
            580                 585                 590
Leu Lys Leu Pro Glu Thr Arg Gly Gln Val Leu Gln
        595                 600
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<210> 29
<211> 683
<212> PRT
<213> Homo sapiens

<400> 29

```
Met Asp Asp Tyr Lys Tyr Gln Asp Asn Tyr Gly Gly Tyr Ala Pro Ser
 1               5                  10                  15
Asp Gly Tyr Tyr Arg Gly Asn Glu Ser Asn Pro Glu Glu Asp Ala Gln
            20                  25                  30
Ser Asp Val Thr Glu Gly His Asp Glu Glu Asp Glu Ile Tyr Glu Gly
        35                  40                  45
Glu Tyr Gln Gly Ile Pro His Pro Asp Asp Val Lys Ala Lys Gln Ala
    50                  55                  60
Lys Met Ala Pro Ser Arg Met Asp Ser Leu Arg Gly Gln Thr Asp Leu
65                  70                  75                  80
Met Ala Glu Arg Leu Glu Asp Glu Glu Gln Leu Ala His Gln Tyr Glu
                85                  90                  95
Thr Ile Met Asp Glu Cys Gly His Gly Arg Phe Gln Trp Ile Leu Phe
            100                 105                 110
Phe Val Leu Gly Leu Ala Leu Met Ala Asp Gly Val Glu Val Phe Val
        115                 120                 125
Val Ser Phe Ala Leu Pro Ser Ala Glu Lys Asp Met Cys Leu Ser Ser
    130                 135                 140
Ser Lys Lys Gly Met Leu Gly Met Ile Val Tyr Leu Gly Met Met Ala
145                 150                 155                 160
Gly Ala Phe Ile Leu Gly Gly Leu Ala Asp Lys Leu Gly Arg Lys Arg
                165                 170                 175
Val Leu Ser Met Ser Leu Ala Val Asn Ala Ser Phe Ala Ser Leu Ser
            180                 185                 190
Ser Phe Val Gln Gly Tyr Gly Ala Phe Leu Phe Cys Arg Leu Ile Ser
        195                 200                 205
Gly Ile Gly Ile Gly Gly Ala Leu Pro Ile Val Phe Ala Tyr Phe Ser
    210                 215                 220
Glu Phe Leu Ser Arg Glu Lys Arg Gly Glu His Leu Ser Trp Leu Gly
225                 230                 235                 240
```

```
Ile Phe Trp Met Thr Gly Gly Leu Tyr Ala Ser Ala Met Ala Trp Ser
                245                 250                 255
Ile Ile Pro His Tyr Gly Trp Gly Phe Ser Met Gly Thr Asn Tyr His
            260                 265                 270
Phe His Ser Trp Arg Val Phe Val Ile Val Cys Ala Leu Pro Cys Thr
        275                 280                 285
Val Ser Met Val Ala Leu Lys Phe Met Pro Glu Ser Pro Arg Phe Leu
    290                 295                 300
Leu Glu Met Gly Lys His Asp Glu Ala Trp Met Ile Leu Lys Gln Val
305                 310                 315                 320
His Asp Thr Asn Met Arg Ala Lys Gly Thr Pro Glu Lys Val Phe Thr
                325                 330                 335
Val Ser Asn Ile Lys Thr Pro Lys Gln Met Asp Glu Phe Ile Glu Ile
            340                 345                 350
Gln Ser Ser Thr Gly Thr Trp Tyr Gln Arg Trp Leu Val Arg Phe Lys
        355                 360                 365
Thr Ile Phe Lys Gln Val Trp Asp Asn Ala Leu Tyr Cys Val Met Gly
    370                 375                 380
Pro Tyr Arg Met Asn Thr Leu Ile Leu Ala Val Val Trp Phe Ala Met
385                 390                 395                 400
Ala Phe Ser Tyr Tyr Gly Leu Thr Val Trp Phe Pro Asp Met Ile Arg
                405                 410                 415
Tyr Phe Gln Asp Glu Glu Tyr Lys Ser Lys Met Lys Val Phe Phe Gly
            420                 425                 430
Glu His Val Tyr Gly Ala Thr Ile Asn Phe Thr Met Glu Asn Gln Ile
        435                 440                 445
His Gln His Gly Lys Leu Val Asn Asp Lys Phe Thr Arg Met Tyr Phe
    450                 455                 460
Lys His Val Leu Phe Glu Asp Thr Phe Phe Asp Glu Cys Tyr Phe Glu
465                 470                 475                 480
Asp Val Thr Ser Thr Asp Thr Tyr Phe Lys Asn Cys Thr Ile Glu Ser
                485                 490                 495
Thr Ile Phe Tyr Asn Thr Asp Leu Tyr Glu His Lys Phe Ile Asn Cys
            500                 505                 510
Arg Phe Ile Asn Ser Thr Phe Leu Glu Gln Lys Glu Gly Cys His Met
        515                 520                 525
Asp Leu Glu Gln Asp Asn Asp Phe Leu Ile Tyr Leu Val Ser Phe Leu
    530                 535                 540
Gly Ser Leu Ser Val Leu Pro Gly Asn Ile Ile Ser Ala Leu Leu Met
545                 550                 555                 560
Asp Arg Ile Gly Arg Leu Lys Met Ile Gly Gly Ser Met Leu Ile Ser
                565                 570                 575
Ala Val Cys Cys Phe Phe Leu Phe Phe Gly Asn Ser Glu Ser Ala Met
            580                 585                 590
Ile Gly Trp Gln Cys Leu Phe Cys Gly Thr Ser Ile Ala Ala Trp Asn
        595                 600                 605
Ala Leu Asp Val Ile Thr Val Glu Leu Tyr Pro Thr Asn Gln Arg Ala
    610                 615                 620
Thr Ala Phe Gly Ile Leu Asn Gly Leu Cys Lys Phe Gly Ala Ile Leu
625                 630                 635                 640
Gly Asn Thr Ile Phe Ala Ser Phe Val Gly Ile Thr Lys Val Val Pro
                645                 650                 655
Ile Leu Leu Ala Ala Ala Ser Leu Val Gly Gly Gly Leu Ile Ala Leu
            660                 665                 670
Arg Leu Pro Glu Thr Arg Glu Gln Val Leu Ile
        675                 680
```

<210> 30

<211> 727
<212> PRT
<213> Homo sapiens

<400> 30

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Met Glu Asp Ser Tyr Lys Asp Arg Thr Ser Leu Met Lys Gly Ala Lys
 1               5                  10                  15
Asp Ile Ala Arg Glu Val Lys Lys Gln Thr Val Lys Lys Val Asn Gln
            20                  25                  30
Ala Val Asp Arg Ala Gln Asp Glu Tyr Thr Gln Arg Ser Tyr Ser Arg
        35                  40                  45
Phe Gln Asp Glu Glu Asp Asp Asp Asp Tyr Tyr Pro Ala Gly Glu Thr
    50                  55                  60
Tyr Asn Gly Glu Ala Asn Asp Asp Glu Gly Ser Ser Glu Ala Thr Glu
65                  70                  75                  80
Gly His Asp Glu Asp Asp Glu Ile Tyr Glu Gly Glu Tyr Gln Gly Ile
                85                  90                  95
Pro Ser Met Asn Gln Ala Lys Asp Ser Ile Val Ser Val Gly Gln Pro
            100                 105                 110
Lys Gly Asp Glu Tyr Lys Asp Arg Arg Glu Leu Glu Ser Glu Arg Arg
        115                 120                 125
Ala Asp Glu Glu Glu Leu Ala Gln Gln Tyr Glu Leu Ile Ile Gln Glu
    130                 135                 140
Cys Gly His Gly Arg Phe Gln Trp Ala Leu Phe Phe Val Leu Gly Met
145                 150                 155                 160
Ala Leu Met Ala Asp Gly Val Glu Val Phe Val Val Gly Phe Val Leu
                165                 170                 175
Pro Ser Ala Glu Thr Asp Leu Cys Ile Pro Asn Ser Gly Ser Gly Trp
            180                 185                 190
Leu Gly Ser Ile Val Tyr Leu Gly Met Met Val Gly Ala Phe Phe Trp
        195                 200                 205
Gly Gly Leu Ala Asp Lys Val Gly Arg Lys Gln Ser Leu Leu Ile Cys
    210                 215                 220
Met Ser Val Asn Gly Phe Phe Ala Phe Leu Ser Ser Phe Val Gln Gly
225                 230                 235                 240
Tyr Gly Phe Phe Leu Phe Cys Arg Leu Leu Ser Gly Phe Gly Ile Gly
                245                 250                 255
Gly Ala Ile Pro Thr Val Phe Ser Tyr Phe Ala Glu Val Leu Ala Arg
            260                 265                 270
Glu Lys Arg Gly Glu His Leu Ser Trp Leu Cys Met Phe Trp Met Ile
        275                 280                 285
Gly Gly Ile Tyr Ala Ser Ala Met Ala Trp Ala Ile Ile Pro His Tyr
    290                 295                 300
Gly Trp Ser Phe Ser Met Gly Ser Ala Tyr Gln Phe His Ser Trp Arg
305                 310                 315                 320
Val Phe Val Ile Val Cys Ala Leu Pro Cys Val Ser Ser Val Val Ala
                325                 330                 335
Leu Thr Phe Met Pro Glu Ser Pro Arg Phe Leu Leu Glu Val Gly Lys
            340                 345                 350
His Asp Glu Ala Trp Met Ile Leu Lys Leu Ile His Asp Thr Asn Met
        355                 360                 365
Arg Ala Arg Gly Gln Pro Glu Lys Val Phe Thr Val Asn Lys Ile Lys
    370                 375                 380
Thr Pro Lys Gln Ile Asp Glu Leu Ile Glu Ile Glu Ser Asp Thr Gly
385                 390                 395                 400
Thr Trp Tyr Arg Arg Cys Phe Val Arg Ile Arg Thr Glu Leu Tyr Gly
                405                 410                 415
Ile Trp Leu Thr Phe Met Arg Cys Phe Asn Tyr Pro Val Arg Asp Asn
            420                 425                 430
```

```
Thr Ile Lys Leu Thr Ile Val Trp Phe Thr Leu Ser Phe Gly Tyr Tyr
        435                 440                 445
Gly Leu Ser Val Trp Phe Pro Asp Val Ile Lys Pro Leu Gln Ser Asp
    450                 455                 460
Glu Tyr Ala Leu Leu Thr Arg Asn Val Glu Arg Asp Lys Tyr Ala Asn
465                 470                 475                 480
Phe Thr Ile Asn Phe Thr Met Glu Asn Gln Ile His Thr Gly Met Glu
                485                 490                 495
Tyr Asp Asn Gly Arg Phe Ile Gly Val Lys Phe Lys Ser Val Thr Phe
            500                 505                 510
Lys Asp Ser Val Phe Lys Ser Cys Thr Phe Glu Asp Val Thr Ser Val
        515                 520                 525
Asn Thr Tyr Phe Lys Asn Cys Thr Phe Ile Asp Thr Val Phe Asp Asn
    530                 535                 540
Thr Asp Phe Glu Pro Tyr Lys Phe Ile Asp Ser Glu Phe Lys Asn Cys
545                 550                 555                 560
Ser Phe Phe His Asn Lys Thr Gly Cys Gln Ile Thr Phe Asp Asp Asp
                565                 570                 575
Tyr Ser Ala Tyr Trp Ile Tyr Phe Val Asn Phe Leu Gly Thr Leu Ala
            580                 585                 590
Val Leu Pro Gly Asn Ile Val Ser Ala Leu Leu Met Asp Arg Ile Gly
        595                 600                 605
Arg Leu Thr Met Leu Gly Gly Ser Met Val Leu Ser Gly Ile Ser Cys
    610                 615                 620
Phe Phe Leu Trp Phe Gly Thr Ser Glu Ser Met Met Ile Gly Met Leu
625                 630                 635                 640
Cys Leu Tyr Asn Gly Leu Thr Ile Ser Ala Trp Asn Ser Leu Asp Val
                645                 650                 655
Val Thr Val Glu Leu Tyr Pro Thr Asp Arg Arg Ala Thr Gly Phe Gly
            660                 665                 670
Phe Leu Asn Ala Leu Cys Lys Ala Ala Ala Val Leu Gly Asn Leu Ile
        675                 680                 685
Phe Gly Ser Leu Val Ser Ile Thr Lys Ser Ile Pro Ile Leu Leu Ala
    690                 695                 700
Ser Thr Val Leu Val Cys Gly Gly Leu Val Gly Leu Cys Leu Pro Asp
705                 710                 715                 720
Thr Arg Thr Gln Val Leu Met
                725
```

<210> 31
<211> 742
<212> PRT
<213> Homo sapiens

<400> 31

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Met Glu Glu Gly Phe Arg Asp Arg Ala Ala Phe Ile Arg Gly Ala Lys
 1               5                  10                  15
Asp Ile Ala Lys Glu Val Lys Lys His Ala Ala Lys Lys Val Val Lys
            20                  25                  30
Gly Leu Asp Arg Val Gln Asp Glu Tyr Ser Arg Arg Ser Tyr Ser Arg
        35                  40                  45
Phe Glu Glu Glu Asp Asp Asp Asp Asp Phe Pro Ala Pro Ser Asp Gly
    50                  55                  60
Tyr Tyr Arg Gly Glu Gly Thr Gln Asp Glu Glu Glu Gly Gly Ala Ser
65                  70                  75                  80
Ser Asp Ala Thr Glu Gly His Asp Glu Asp Asp Glu Ile Tyr Glu Gly
                85                  90                  95
Glu Tyr Gln Asp Ile Pro Arg Ala Glu Ser Gly Gly Lys Gly Glu Arg
```

```
           100                 105                 110
Met Ala Asp Gly Ala Pro Leu Ala Gly Val Arg Gly Gly Leu Ser Asp
        115                 120                 125
Gly Glu Gly Pro Pro Gly Gly Arg Gly Glu Ala Gln Arg Arg Lys Glu
    130                 135                 140
Arg Glu Glu Leu Ala Gln Gln Tyr Glu Ala Ile Leu Arg Glu Cys Gly
145                 150                 155                 160
His Gly Arg Phe Gln Trp Thr Leu Tyr Phe Val Leu Gly Leu Ala Leu
                165                 170                 175
Met Ala Asp Gly Val Glu Val Phe Val Val Gly Phe Val Leu Pro Ser
            180                 185                 190
Ala Glu Lys Asp Met Cys Leu Ser Asp Ser Asn Lys Gly Met Leu Gly
        195                 200                 205
Leu Ile Val Tyr Leu Gly Met Met Val Gly Ala Phe Leu Trp Gly Gly
    210                 215                 220
Leu Ala Asp Arg Leu Gly Arg Arg Gln Cys Leu Leu Ile Ser Leu Ser
225                 230                 235                 240
Val Asn Ser Val Phe Ala Phe Phe Ser Ser Phe Val Gln Gly Tyr Gly
                245                 250                 255
Thr Phe Leu Phe Cys Arg Leu Leu Ser Gly Val Gly Ile Gly Gly Ser
            260                 265                 270
Ile Pro Ile Val Phe Ser Tyr Phe Ser Glu Phe Leu Ala Gln Glu Lys
        275                 280                 285
Arg Gly Glu His Leu Ser Trp Leu Cys Met Phe Trp Met Ile Gly Gly
    290                 295                 300
Val Tyr Ala Ala Ala Met Ala Trp Ala Ile Ile Pro His Tyr Gly Trp
305                 310                 315                 320
Ser Phe Gln Met Gly Ser Ala Tyr Gln Phe His Ser Trp Arg Val Phe
                325                 330                 335
Val Leu Val Cys Ala Phe Pro Ser Val Phe Ala Ile Gly Ala Leu Thr
            340                 345                 350
Thr Gln Pro Glu Ser Pro Arg Phe Phe Leu Glu Asn Gly Lys His Asp
        355                 360                 365
Glu Ala Trp Met Val Leu Lys Gln Val His Asp Thr Asn Met Arg Ala
    370                 375                 380
Lys Gly His Pro Glu Arg Val Phe Ser Val Thr His Ile Lys Thr Ile
385                 390                 395                 400
His Gln Glu Asp Glu Leu Ile Glu Ile Gln Ser Asp Thr Gly Thr Trp
                405                 410                 415
Tyr Gln Arg Trp Gly Val Arg Ala Leu Ser Leu Gly Gly Gln Val Trp
            420                 425                 430
Gly Asn Phe Leu Ser Cys Phe Gly Pro Glu Tyr Arg Arg Ile Thr Leu
        435                 440                 445
Met Met Met Gly Val Trp Phe Thr Met Ser Phe Ser Tyr Tyr Gly Leu
    450                 455                 460
Thr Val Trp Phe Pro Asp Met Ile Arg His Leu Gln Ala Val Asp Tyr
465                 470                 475                 480
Ala Ser Arg Thr Lys Val Phe Pro Gly Glu Arg Val Gly His Val Thr
                485                 490                 495
Phe Asn Phe Thr Leu Glu Asn Gln Ile His Arg Gly Gly Gln Tyr Phe
            500                 505                 510
Asn Asp Lys Phe Ile Gly Leu Arg Leu Lys Ser Val Ser Phe Glu Asp
        515                 520                 525
Ser Leu Phe Glu Glu Cys Tyr Phe Glu Asp Val Thr Ser Ser Asn Thr
    530                 535                 540
Phe Phe Arg Asn Cys Thr Phe Ile Asn Thr Val Phe Tyr Asn Thr Asp
545                 550                 555                 560
Leu Phe Glu Tyr Lys Phe Val Asn Ser Arg Leu Ile Asn Ser Thr Phe
                565                 570                 575
```

```
Leu His Asn Lys Glu Gly Cys Pro Leu Asp Val Thr Gly Thr Gly Glu
            580                 585                 590
Gly Ala Tyr Met Val Tyr Phe Val Ser Phe Leu Gly Thr Leu Ala Val
        595                 600                 605
Leu Pro Gly Asn Ile Val Ser Ala Leu Leu Met Asp Lys Ile Gly Arg
    610                 615                 620
Leu Arg Met Leu Ala Gly Ser Ser Val Met Ser Cys Val Ser Cys Phe
625                 630                 635                 640
Phe Leu Ser Phe Gly Asn Ser Glu Ser Ala Met Ile Ala Leu Leu Cys
                645                 650                 655
Leu Phe Gly Gly Val Ser Ile Ala Ser Trp Asn Ala Leu Asp Val Leu
            660                 665                 670
Thr Val Glu Leu Tyr Pro Ser Asp Lys Arg Thr Thr Ala Phe Gly Phe
        675                 680                 685
Leu Asn Ala Leu Cys Lys Leu Ala Ala Val Leu Gly Ile Ser Ile Phe
    690                 695                 700
Thr Ser Phe Val Gly Ile Thr Lys Ala Ala Pro Ile Leu Phe Ala Ser
705                 710                 715                 720
Ala Ala Leu Ala Leu Gly Ser Ser Leu Ala Leu Lys Leu Pro Glu Thr
                725                 730                 735
Arg Gly Gln Val Leu Gln
            740
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<210> 32
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxyl-terminus at the P1 residue of the scissile bond of the BoNT/A cleavage site

<400> 32
Arg Ile Asp Glu Ala Asn Gln
1 5

<210> 33
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxyl-terminus at the P1 residue of the scissile bond of the BoNT/A cleavage site

<400> 33
Thr Arg Ile Asp Glu Ala Asn Gln
1 5

<210> 34
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxyl-terminus at the P1 residue of the scissile bond of the BoNT/A cleavage site

<400> 34
Lys Thr Arg Ile Asp Glu Ala Asn Gln
1 5

<210> 35
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxyl-terminus at the P1 residue of the scissile bond of the BoNT/A cleavage site

<400> 35
Asn Lys Thr Arg Ile Asp Glu Ala Asn Gln
1 5 10

<210> 36
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxyl-terminus at the P1 residue of the scissile bond of the BoNT/A cleavage site

<400> 36
Ser Asn Lys Thr Arg Ile Asp Glu Ala Asn Gln
1 5 10

<210> 37
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxyl-terminus at the P1 residue of the scissile bond of the BoNT/A cleavage site

<400> 37
Asp Ser Asn Lys Thr Arg Ile Asp Glu Ala Asn Gln
1 5 10

<210> 38
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxylated carboxyl-terminus at the P1 residue of the scissile bond of the BoNT/A cleavage site

<221> SITE
<222> (13)...(13)
<223> carboxylated glutamine

<400> 38
Cys Asp Ser Asn Lys Thr Arg Ile Asp Glu Ala Asn Gln
1 5 10

<210> 39
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxyl-terminus at the P1 residue of the scissile bond of the BoNT/A cleavage site

<400> 39
Arg Ile Asp Glu Ala Asn Lys
1 5

<210> 40
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxyl-terminus at the P1 residue of the scissile bond of the BoNT/A cleavage site

<400> 40
Ala Arg Ile Asp Glu Ala Asn Lys
1 5

<210> 41
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxyl-terminus at the P1 residue of the scissile bond of the BoNT/A cleavage site

<400> 41
Lys Ala Arg Ile Asp Glu Ala Asn Lys
1 5

<210> 42
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxyl-terminus at the P1 residue of the scissile bond of the BoNT/A cleavage site

<400> 42
Asn Lys Ala Arg Ile Asp Glu Ala Asn Lys
1 5 10

<210> 43
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxyl-terminus at the P1 residue of the scissile bond of the BoNT/A cleavage site

<400> 43
Met Asn Lys Ala Arg Ile Asp Glu Ala Asn Lys
1 5 10

<210> 44
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxyl-terminus at the P1 residue of the scissile bond of the BoNT/A cleavage site

<400> 44
Asp Met Asn Lys Ala Arg Ile Asp Glu Ala Asn Lys
1 5 10

<210> 45
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxylated carboxyl-terminus at the P1 residue of the scissile bond of the BoNT/A cleavage site

<221> SITE
<222> (13)...(13)
<223> Carboxylated lysine

<400> 45
Cys Asp Met Asn Lys Ala Arg Ile Asp Glu Ala Asn Lys
1 5 10

<210> 46
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen

<400> 46
Cys Gly Gly Gly Arg Ile Asp Glu Ala Asn Gln
1 5 10

<210> 47
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen

<400> 47
Cys Gly Gly Gly Arg Ile Asp Glu Ala Asn Lys
1 5 10

<210> 48
<211> 88
<212> PRT
<213> Artificial Sequence

<220>
<223> BirA-HisTag®-SNAP-25-134-197

<400> 48
Met Gly Gly Gly Leu Asn Asp Ile Phe Glu Ala Gln Lys Ile Glu Trp
1 5 10 15
His His His His His His His His Ile Arg Arg Val Thr Asn Asp Ala
20 25 30
Arg Glu Asn Glu Met Asp Glu Asn Leu Glu Gln Val Ser Gly Ile Ile
35 40 45
Gly Asn Leu Arg His Met Ala Leu Asp Met Gly Asn Glu Ile Asp Thr
50 55 60
Gln Asn Arg Gln Ile Asp Arg Ile Met Glu Lys Ala Asp Ser Asn Lys
65 70 75 80
Thr Arg Ile Asp Glu Ala Asn Gln
85

<210> 49
<211> 97
<212> PRT
<213> Artificial Sequence

<220>
<223> BirA-HisTag®-SNAP-25-134-206

<400> 49
Met Gly Gly Gly Leu Asn Asp Ile Phe Glu Ala Gln Lys Ile Glu Trp
1 5 10 15
His His His His His His His His Ile Arg Arg Val Thr Asn Asp Ala
20 25 30
Arg Glu Asn Glu Met Asp Glu Asn Leu Glu Gln Val Ser Gly Ile Ile
35 40 45
Gly Asn Leu Arg His Met Ala Leu Asp Met Gly Asn Glu Ile Asp Thr
50 55 60
Gln Asn Arg Gln Ile Asp Arg Ile Met Glu Lys Ala Asp Ser Asn Lys
65 70 75 80
Thr Arg Ile Asp Glu Ala Asn Gln Arg Ala Thr Lys Met Leu Gly Ser
85 90 95
Gly

<210> 50
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> BirA peptide

<400> 50
Gly Gly Gly Leu Asn Asp Ile Phe Glu Ala Gln Lys Ile Glu Trp His
1 5 10 15

<210> 51
<211> 7570
<212> DNA
<213> Artificial Sequence

<220>
<223> pQBI-25/GFP-BoNT/A-LC expression construct.

<400> 51
gacggatcgg gagatctccc gatcccctat ggtcgactct cagtacaatc tgctctgatg 60
ccgcatagtt aagccagtat ctgctccctg cttgtgtgtt ggaggtcgct gagtagtgcg 120
cgagcaaaat ttaagctaca acaaggcaag gcttgaccga caattgcatg aagaatctgc 180
ttagggttag gcgttttgcg ctgcttcgcc tcgaggcctg gccattgcat acgttgtatc 240
catatcataa tatgtacatt tatattggct catgtccaac attaccgcca tgttgacatt 300
gattattgac tagttattaa tagtaatcaa ttacggggtc attagttcat agcccatata 360
tggagttccg cgttacataa cttacggtaa atggcccgcc tggctgaccg cccaacgacc 420
cccgcccatt gacgtcaata atgacgtatg ttcccatagt aacgccaata gggactttcc 480
attgacgtca atgggtggag tatttacggt aaactgccca cttggcagta catcaagtgt 540
atcatatgcc aagtacgccc cctattgacg tcaatgacgg taaatggccc gcctggcatt 600
atgcccagta catgacctta tgggactttc ctacttggca gtacatctac gtattagtca 660
tcgctattac catggtgatg cggttttggc agtacatcaa tgggcgtgga tagcggtttg 720
actcacgggg atttccaagt ctccacccca ttgacgtcaa tgggagtttg ttttggcacc 780
aaaatcaacg ggactttcca aaatgtcgta acaactccgc cccattgacg caaatgggcg 840
gtaggcgtgt acggtgggag gtctatataa gcagagctcg tttagtgaac cgtcagatcg 900
cctggagacg ccatccacgc tgttttgacc tccatagaag acaccgggac cgatccagcc 960

tccgcgggcc accatggagg gcccggttac cggtaccgga tccagatatc tgggcggccg 1020
ctcagcaagc ttcgcgaatt cgggaggcgg aggtggagct agcaaaggag aagaactctt 1080
cactggagtt gtcccaattc ttgttgaatt agatggtgat gttaacggcc acaagttctc 1140
tgtcagtgga gagggtgaag gtgatgcaac atacggaaaa cttaccctga agttcatctg 1200
cactactggc aaactgcctg ttccatggcc aacactagtc actactctgt gctatggtgt 1260
tcaatgcttt tcaagatacc cggatcatat gaaacggcat gacttttca agagtgccat 1320
gcccgaaggt tatgtacagg aaaggaccat cttcttcaaa gatgacggca actacaagac 1380
acgtgctgaa gtcaagtttg aaggtgatac ccttgttaat agaatcgagt taaaaggtat 1440
tgacttcaag gaagatggca acattctggg acacaaattg gaatacaact ataactcaca 1500
caatgtatac atcatggcag acaaacaaaa gaatggaatc aaagtgaact tcaagacccg 1560
ccacaacatt gaagatggaa gcgttcaact agcagaccat tatcaacaaa atactccaat 1620
tggcgatggc cctgtccttt taccagacaa ccattacctg tccacacaat ctgccctttc 1680
gaaagatccc aacgaaaaga gagaccacat ggtccttctt gagtttgtaa cagctgctgg 1740
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gcgagaccca cgctcaccgg ctccagattt atcagcaata aaccagccag ccggaagggc 5460
cgagcgcaga agtggtcctg caactttatc cgcctccatc cagtctatta attgttgccg 5520
ggaagctaga gtaagtagtt cgccagttaa tagtttgcgc aacgttgttg ccattgctac 5580
aggcatcgtg gtgtcacgct cgtcgtttgg tatggcttca ttcagctccg gttcccaacg 5640
atcaaggcga gttacatgat cccccatgtt gtgcaaaaaa gcggttagct ccttcggtcc 5700
tccgatcgtt gtcagaagta agttggccgc agtgttatca ctcatggtta tggcagcact 5760
gcataattct cttactgtca tgccatccgt aagatgcttt tctgtgactg gtgagtactc 5820
aaccaagtca ttctgagaat agtgtatgcg gcgaccgagt tgctcttgcc cggcgtcaat 5880
acgggataat accgcgccac atagcagaac tttaaaagtg ctcatcattg gaaaacgttc 5940
ttcggggcga aaactctcaa ggatcttacc gctgttgaga tccagttcga tgtaacccac 6000
tcgtgcaccc aactgatctt cagcatcttt tactttcacc agcgtttctg ggtgagcaaa 6060
aacaggaagg caaaatgccg caaaaaaggg aataagggcg acacggaaat gttgaatact 6120
catactcttc ctttttcaat attattgaag catttatcag ggttattgtc tcatgagcgg 6180
atacatattt gaatgtattt agaaaaataa acaaataggg gttccgcgca catttccccg 6240
aaaagtgcca cctgacgtc                                            6259
```

<210> 54
<211> 245
<212> PRT
<213> Artificial Sequence

<220>
<223> GFP amino acid sequence.

<400> 54

```
Ala Ser Lys Gly Glu Glu Leu Phe Thr Gly Val Val Pro Ile Leu Val
 1               5                  10                  15
Glu Leu Asp Gly Asp Val Asn Gly His Lys Phe Ser Val Ser Gly Glu
            20                  25                  30
Gly Glu Gly Asp Ala Thr Tyr Gly Lys Leu Thr Leu Lys Phe Ile Cys
        35                  40                  45
Thr Thr Gly Lys Leu Pro Val Pro Trp Pro Thr Leu Val Thr Thr Leu
    50                  55                  60
Cys Tyr Gly Val Gln Cys Phe Ser Arg Tyr Pro Asp His Met Lys Arg
65                  70                  75                  80
His Asp Phe Phe Lys Ser Ala Met Pro Glu Gly Tyr Val Gln Glu Arg
                85                  90                  95
Thr Ile Phe Phe Lys Asp Asp Gly Asn Tyr Lys Thr Arg Ala Glu Val
            100                 105                 110
Lys Phe Glu Gly Asp Thr Leu Val Asn Arg Ile Glu Leu Lys Gly Ile
        115                 120                 125
Asp Phe Lys Glu Asp Gly Asn Ile Leu Gly His Lys Leu Glu Tyr Asn
```

```
    130                 135                 140
Tyr Asn Ser His Asn Val Tyr Ile Met Ala Asp Lys Gln Lys Asn Gly
145                 150                 155                 160
Ile Lys Val Asn Phe Lys Thr Arg His Asn Ile Glu Asp Gly Ser Val
                165                 170                 175
Gln Leu Ala Asp His Tyr Gln Gln Asn Thr Pro Ile Gly Asp Gly Pro
            180                 185                 190
Val Leu Leu Pro Asp Asn His Tyr Leu Ser Thr Gln Ser Ala Leu Ser
        195                 200                 205
Lys Asp Pro Asn Glu Lys Arg Asp His Met Val Leu Leu Glu Phe Val
    210                 215                 220
Thr Ala Ala Gly Ile Thr His Gly Met Asp Glu Leu Tyr Asn Ile Asp
225                 230                 235                 240
Gly Gly Gly Gly Gly
                245
```

<210> 55
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> G-spacer flexible spacer

<400> 55
Gly Gly Gly Gly
 1

<210> 56
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> G-spacer flexible spacer

<400> 56
Gly Gly Gly Gly Ser
 1   5

<210> 57
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> A-spacer flexible spacer

<400> 57
Ala Ala Ala Ala
 1

<210> 58
<211> 5
<212> PRT

<213> Artificial Sequence

<220>
<223> A-spacer flexible spacer

<400> 58
Ala Ala Ala Ala Val
1 5

<210> 59
<211> 821
<212> PRT
<213> Homo sapiens

<400> 59
Met Val Ser Trp Gly Arg Phe Ile Cys Leu Val Val Val Thr Met Ala
1 5 10 15
Thr Leu Ser Leu Ala Arg Pro Ser Phe Ser Leu Val Glu Asp Thr Thr
20 25 30
Leu Glu Pro Glu Glu Pro Pro Thr Lys Tyr Gln Ile Ser Gln Pro Glu
35 40 45
Val Tyr Val Ala Ala Pro Gly Glu Ser Leu Glu Val Arg Cys Leu Leu
50 55 60
Lys Asp Ala Ala Val Ile Ser Trp Thr Lys Asp Gly Val His Leu Gly
65 70 75 80
Pro Asn Asn Arg Thr Val Leu Ile Gly Glu Tyr Leu Gln Ile Lys Gly
85 90 95
Ala Thr Pro Arg Asp Ser Gly Leu Tyr Ala Cys Thr Ala Ser Arg Thr
100 105 110
Val Asp Ser Glu Thr Trp Tyr Phe Met Val Asn Val Thr Asp Ala Ile
115 120 125
Ser Ser Gly Asp Asp Glu Asp Asp Thr Asp Gly Ala Glu Asp Phe Val
130 135 140
Ser Glu Asn Ser Asn Asn Lys Arg Ala Pro Tyr Trp Thr Asn Thr Glu
145 150 155 160
Lys Met Glu Lys Arg Leu His Ala Val Pro Ala Ala Asn Thr Val Lys
165 170 175
Phe Arg Cys Pro Ala Gly Gly Asn Pro Met Pro Thr Met Arg Trp Leu
180 185 190
Lys Asn Gly Lys Glu Phe Lys Gln Glu His Arg Ile Gly Gly Tyr Lys
195 200 205
Val Arg Asn Gln His Trp Ser Leu Ile Met Glu Ser Val Val Pro Ser
210 215 220
Asp Lys Gly Asn Tyr Thr Cys Val Val Glu Asn Glu Tyr Gly Ser Ile
225 230 235 240
Asn His Thr Tyr His Leu Asp Val Val Glu Arg Ser Pro His Arg Pro
245 250 255
Ile Leu Gln Ala Gly Leu Pro Ala Asn Ala Ser Thr Val Val Gly Gly
260 265 270
Asp Val Glu Phe Val Cys Lys Val Tyr Ser Asp Ala Gln Pro His Ile
275 280 285
Gln Trp Ile Lys His Val Glu Lys Asn Gly Ser Lys Tyr Gly Pro Asp
290 295 300
Gly Leu Pro Tyr Leu Lys Val Leu Lys Ala Ala Gly Val Asn Thr Thr
305 310 315 320
Asp Lys Glu Ile Glu Val Leu Tyr Ile Arg Asn Val Thr Phe Glu Asp
325 330 335
Ala Gly Glu Tyr Thr Cys Leu Ala Gly Asn Ser Ile Gly Ile Ser Phe

```
            340                 345                 350
His Ser Ala Trp Leu Thr Val Leu Pro Ala Pro Gly Arg Glu Lys Glu
        355                 360                 365
Ile Thr Ala Ser Pro Asp Tyr Leu Glu Ile Ala Ile Tyr Cys Ile Gly
    370                 375                 380
Val Phe Leu Ile Ala Cys Met Val Val Thr Val Ile Leu Cys Arg Met
385                 390                 395                 400
Lys Asn Thr Thr Lys Lys Pro Asp Phe Ser Ser Gln Pro Ala Val His
                405                 410                 415
Lys Leu Thr Lys Arg Ile Pro Leu Arg Arg Gln Val Thr Val Ser Ala
            420                 425                 430
Glu Ser Ser Ser Ser Met Asn Ser Asn Thr Pro Leu Val Arg Ile Thr
        435                 440                 445
Thr Arg Leu Ser Ser Thr Ala Asp Thr Pro Met Leu Ala Gly Val Ser
    450                 455                 460
Glu Tyr Glu Leu Pro Glu Asp Pro Lys Trp Glu Phe Pro Arg Asp Lys
465                 470                 475                 480
Leu Thr Leu Gly Lys Pro Leu Gly Glu Gly Cys Phe Gly Gln Val Val
                485                 490                 495
Met Ala Glu Ala Val Gly Ile Asp Lys Asp Lys Pro Lys Glu Ala Val
            500                 505                 510
Thr Val Ala Val Lys Met Leu Lys Asp Asp Ala Thr Glu Lys Asp Leu
        515                 520                 525
Ser Asp Leu Val Ser Glu Met Glu Met Met Lys Met Ile Gly Lys His
    530                 535                 540
Lys Asn Ile Ile Asn Leu Leu Gly Ala Cys Thr Gln Asp Gly Pro Leu
545                 550                 555                 560
Tyr Val Ile Val Glu Tyr Ala Ser Lys Gly Asn Leu Arg Glu Tyr Leu
                565                 570                 575
Arg Ala Arg Arg Pro Pro Gly Met Glu Tyr Ser Tyr Asp Ile Asn Arg
            580                 585                 590
Val Pro Glu Glu Gln Met Thr Phe Lys Asp Leu Val Ser Cys Thr Tyr
        595                 600                 605
Gln Leu Ala Arg Gly Met Glu Tyr Leu Ala Ser Gln Lys Cys Ile His
    610                 615                 620
Arg Asp Leu Ala Ala Arg Asn Val Leu Val Thr Glu Asn Asn Val Met
625                 630                 635                 640
Lys Ile Ala Asp Phe Gly Leu Ala Arg Asp Ile Asn Asn Ile Asp Tyr
                645                 650                 655
Tyr Lys Lys Thr Thr Asn Gly Arg Leu Pro Val Lys Trp Met Ala Pro
            660                 665                 670
Glu Ala Leu Phe Asp Arg Val Tyr Thr His Gln Ser Asp Val Trp Ser
        675                 680                 685
Phe Gly Val Leu Met Trp Glu Ile Phe Thr Leu Gly Gly Ser Pro Tyr
    690                 695                 700
Pro Gly Ile Pro Val Glu Glu Leu Phe Lys Leu Leu Lys Glu Gly His
705                 710                 715                 720
Arg Met Asp Lys Pro Ala Asn Cys Thr Asn Glu Leu Tyr Met Met Met
                725                 730                 735
Arg Asp Cys Trp His Ala Val Pro Ser Gln Arg Pro Thr Phe Lys Gln
            740                 745                 750
Leu Val Glu Asp Leu Asp Arg Ile Leu Thr Leu Thr Thr Asn Glu Glu
        755                 760                 765
Tyr Leu Asp Leu Ser Gln Pro Leu Glu Gln Tyr Ser Pro Ser Tyr Pro
    770                 775                 780
Asp Thr Arg Ser Ser Cys Ser Ser Gly Asp Asp Ser Val Phe Ser Pro
785                 790                 795                 800
Asp Pro Met Pro Tyr Glu Pro Cys Leu Pro Gln Tyr Pro His Ile Asn
                805                 810                 815
```

```
Gly Ser Val Lys Thr
            820


<210> 60
<211> 822
<212> PRT
<213> Homo sapiens

<400> 60
Met Val Ser Trp Gly Arg Phe Ile Cys Leu Val Val Val Thr Met Ala
 1               5                  10                  15
Thr Leu Ser Leu Ala Arg Pro Ser Phe Ser Leu Val Glu Asp Thr Thr
            20                  25                  30
Leu Glu Pro Glu Glu Pro Pro Thr Lys Tyr Gln Ile Ser Gln Pro Glu
        35                  40                  45
Val Tyr Val Ala Ala Pro Gly Glu Ser Leu Glu Val Arg Cys Leu Leu
    50                  55                  60
Lys Asp Ala Ala Val Ile Ser Trp Thr Lys Asp Gly Val His Leu Gly
65                  70                  75                  80
Pro Asn Asn Arg Thr Val Leu Ile Gly Glu Tyr Leu Gln Ile Lys Gly
                85                  90                  95
Ala Thr Pro Arg Asp Ser Gly Leu Tyr Ala Cys Thr Ala Ser Arg Thr
            100                 105                 110
Val Asp Ser Glu Thr Trp Tyr Phe Met Val Asn Val Thr Asp Ala Ile
        115                 120                 125
Ser Ser Gly Asp Asp Glu Asp Asp Thr Asp Gly Ala Glu Asp Phe Val
    130                 135                 140
Ser Glu Asn Ser Asn Asn Lys Arg Ala Pro Tyr Trp Thr Asn Thr Glu
145                 150                 155                 160
Lys Met Glu Lys Arg Leu His Ala Val Pro Ala Ala Asn Thr Val Lys
                165                 170                 175
Phe Arg Cys Pro Ala Gly Gly Asn Pro Met Pro Thr Met Arg Trp Leu
            180                 185                 190
Lys Asn Gly Lys Glu Phe Lys Gln Glu His Arg Ile Gly Gly Tyr Lys
        195                 200                 205
Val Arg Asn Gln His Trp Ser Leu Ile Met Glu Ser Val Val Pro Ser
    210                 215                 220
Asp Lys Gly Asn Tyr Thr Cys Val Val Glu Asn Glu Tyr Gly Ser Ile
225                 230                 235                 240
Asn His Thr Tyr His Leu Asp Val Val Glu Arg Ser Pro His Arg Pro
                245                 250                 255
Ile Leu Gln Ala Gly Leu Pro Ala Asn Ala Ser Thr Val Val Gly Gly
            260                 265                 270
Asp Val Glu Phe Val Cys Lys Val Tyr Ser Asp Ala Gln Pro His Ile
        275                 280                 285
Gln Trp Ile Lys His Val Glu Lys Asn Gly Ser Lys Tyr Gly Pro Asp
    290                 295                 300
Gly Leu Pro Tyr Leu Lys Val Leu Lys His Ser Gly Ile Asn Ser Ser
305                 310                 315                 320
Asn Ala Glu Val Leu Ala Leu Phe Asn Val Thr Glu Ala Asp Ala Gly
                325                 330                 335
Glu Tyr Ile Cys Lys Val Ser Asn Tyr Ile Gly Gln Ala Asn Gln Ser
            340                 345                 350
Ala Trp Leu Thr Val Leu Pro Lys Gln Gln Ala Pro Gly Arg Glu Lys
        355                 360                 365
Glu Ile Thr Ala Ser Pro Asp Tyr Leu Glu Ile Ala Ile Tyr Cys Ile
    370                 375                 380
Gly Val Phe Leu Ile Ala Cys Met Val Val Thr Val Ile Leu Cys Arg
```

385 390 395 400
Met Lys Asn Thr Thr Lys Lys Pro Asp Phe Ser Ser Gln Pro Ala Val
405 410 415
His Lys Leu Thr Lys Arg Ile Pro Leu Arg Arg Gln Val Thr Val Ser
420 425 430
Ala Glu Ser Ser Ser Ser Met Asn Ser Asn Thr Pro Leu Val Arg Ile
435 440 445
Thr Thr Arg Leu Ser Ser Thr Ala Asp Thr Pro Met Leu Ala Gly Val
450 455 460
Ser Glu Tyr Glu Leu Pro Glu Asp Pro Lys Trp Glu Phe Pro Arg Asp
465 470 475 480
Lys Leu Thr Leu Gly Lys Pro Leu Gly Glu Gly Cys Phe Gly Gln Val
485 490 495
Val Met Ala Glu Ala Val Gly Ile Asp Lys Asp Lys Pro Lys Glu Ala
500 505 510
Val Thr Val Ala Val Lys Met Leu Lys Asp Asp Ala Thr Glu Lys Asp
515 520 525
Leu Ser Asp Leu Val Ser Glu Met Glu Met Met Lys Met Ile Gly Lys
530 535 540
His Lys Asn Ile Ile Asn Leu Leu Gly Ala Cys Thr Gln Asp Gly Pro
545 550 555 560
Leu Tyr Val Ile Val Glu Tyr Ala Ser Lys Gly Asn Leu Arg Glu Tyr
565 570 575
Leu Arg Ala Arg Arg Pro Pro Gly Met Glu Tyr Ser Tyr Asp Ile Asn
580 585 590
Arg Val Pro Glu Glu Gln Met Thr Phe Lys Asp Leu Val Ser Cys Thr
595 600 605
Tyr Gln Leu Ala Arg Gly Met Glu Tyr Leu Ala Ser Gln Lys Cys Ile
610 615 620
His Arg Asp Leu Ala Ala Arg Asn Val Leu Val Thr Glu Asn Asn Val
625 630 635 640
Met Lys Ile Ala Asp Phe Gly Leu Ala Arg Asp Ile Asn Asn Ile Asp
645 650 655
Tyr Tyr Lys Lys Thr Thr Asn Gly Arg Leu Pro Val Lys Trp Met Ala
660 665 670
Pro Glu Ala Leu Phe Asp Arg Val Tyr Thr His Gln Ser Asp Val Trp
675 680 685
Ser Phe Gly Val Leu Met Trp Glu Ile Phe Thr Leu Gly Gly Ser Pro
690 695 700
Tyr Pro Gly Ile Pro Val Glu Glu Leu Phe Lys Leu Leu Lys Glu Gly
705 710 715 720
His Arg Met Asp Lys Pro Ala Asn Cys Thr Asn Glu Leu Tyr Met Met
725 730 735
Met Arg Asp Cys Trp His Ala Val Pro Ser Gln Arg Pro Thr Phe Lys
740 745 750
Gln Leu Val Glu Asp Leu Asp Arg Ile Leu Thr Leu Thr Thr Asn Glu
755 760 765
Glu Tyr Leu Asp Leu Ser Gln Pro Leu Glu Gln Tyr Ser Pro Ser Tyr
770 775 780
Pro Asp Thr Arg Ser Ser Cys Ser Ser Gly Asp Asp Ser Val Phe Ser
785 790 795 800
Pro Asp Pro Met Pro Tyr Glu Pro Cys Leu Pro Gln Tyr Pro His Ile
805 810 815
Asn Gly Ser Val Lys Thr
820

<210> 61
<211> 769

<212> PRT
<213> Homo sapiens

<400> 61

```
Met Val Ser Trp Gly Arg Phe Ile Cys Leu Val Val Val Thr Met Ala
 1               5                  10                  15
Thr Leu Ser Leu Ala Arg Pro Ser Phe Ser Leu Val Glu Asp Thr Thr
            20                  25                  30
Leu Glu Pro Glu Glu Pro Pro Thr Lys Tyr Gln Ile Ser Gln Pro Glu
        35                  40                  45
Val Tyr Val Ala Ala Pro Gly Glu Ser Leu Glu Val Arg Cys Leu Leu
    50                  55                  60
Lys Asp Ala Ala Val Ile Ser Trp Thr Lys Asp Gly Val His Leu Gly
65                  70                  75                  80
Pro Asn Asn Arg Thr Val Leu Ile Gly Glu Tyr Leu Gln Ile Lys Gly
                85                  90                  95
Ala Thr Pro Arg Asp Ser Gly Leu Tyr Ala Cys Thr Ala Ser Arg Thr
            100                 105                 110
Val Asp Ser Glu Thr Trp Tyr Phe Met Val Asn Val Thr Asp Ala Ile
        115                 120                 125
Ser Ser Gly Asp Asp Glu Asp Asp Thr Asp Gly Ala Glu Asp Phe Val
    130                 135                 140
Ser Glu Asn Ser Asn Asn Lys Arg Ala Pro Tyr Trp Thr Asn Thr Glu
145                 150                 155                 160
Lys Met Glu Lys Arg Leu His Ala Val Pro Ala Ala Asn Thr Val Lys
                165                 170                 175
Phe Arg Cys Pro Ala Gly Gly Asn Pro Met Pro Thr Met Arg Trp Leu
            180                 185                 190
Lys Asn Gly Lys Glu Phe Lys Gln Glu His Arg Ile Gly Gly Tyr Lys
        195                 200                 205
Val Arg Asn Gln His Trp Ser Leu Ile Met Glu Ser Val Val Pro Ser
    210                 215                 220
Asp Lys Gly Asn Tyr Thr Cys Val Val Glu Asn Glu Tyr Gly Ser Ile
225                 230                 235                 240
Asn His Thr Tyr His Leu Asp Val Val Glu Arg Ser Pro His Arg Pro
                245                 250                 255
Ile Leu Gln Ala Gly Leu Pro Ala Asn Ala Ser Thr Val Val Gly Gly
            260                 265                 270
Asp Val Glu Phe Val Cys Lys Val Tyr Ser Asp Ala Gln Pro His Ile
        275                 280                 285
Gln Trp Ile Lys His Val Glu Lys Asn Gly Ser Lys Tyr Gly Pro Asp
    290                 295                 300
Gly Leu Pro Tyr Leu Lys Val Leu Lys His Ser Gly Ile Asn Ser Ser
305                 310                 315                 320
Asn Ala Glu Val Leu Ala Leu Phe Asn Val Thr Glu Ala Asp Ala Gly
                325                 330                 335
Glu Tyr Ile Cys Lys Val Ser Asn Tyr Ile Gly Gln Ala Asn Gln Ser
            340                 345                 350
Ala Trp Leu Thr Val Leu Pro Lys Gln Gln Ala Pro Gly Arg Glu Lys
        355                 360                 365
Glu Ile Thr Ala Ser Pro Asp Tyr Leu Glu Ile Ala Ile Tyr Cys Ile
    370                 375                 380
Gly Val Phe Leu Ile Ala Cys Met Val Val Thr Val Ile Leu Cys Arg
385                 390                 395                 400
Met Lys Asn Thr Thr Lys Lys Pro Asp Phe Ser Ser Gln Pro Ala Val
                405                 410                 415
His Lys Leu Thr Lys Arg Ile Pro Leu Arg Arg Gln Val Thr Val Ser
            420                 425                 430
Ala Glu Ser Ser Ser Ser Met Asn Ser Asn Thr Pro Leu Val Arg Ile
```

```
        435                 440                 445
Thr Thr Arg Leu Ser Ser Thr Ala Asp Thr Pro Met Leu Ala Gly Val
    450                 455                 460
Ser Glu Tyr Glu Leu Pro Glu Asp Pro Lys Trp Glu Phe Pro Arg Asp
465                 470                 475                 480
Lys Leu Thr Leu Gly Lys Pro Leu Gly Glu Gly Cys Phe Gly Gln Val
                485                 490                 495
Val Met Ala Glu Ala Val Gly Ile Asp Lys Asp Lys Pro Lys Glu Ala
            500                 505                 510
Val Thr Val Ala Val Lys Met Leu Lys Asp Asp Ala Thr Glu Lys Asp
        515                 520                 525
Leu Ser Asp Leu Val Ser Glu Met Glu Met Met Lys Met Ile Gly Lys
    530                 535                 540
His Lys Asn Ile Ile Asn Leu Leu Gly Ala Cys Thr Gln Asp Gly Pro
545                 550                 555                 560
Leu Tyr Val Ile Val Glu Tyr Ala Ser Lys Gly Asn Leu Arg Glu Tyr
                565                 570                 575
Leu Arg Ala Arg Arg Pro Pro Gly Met Glu Tyr Ser Tyr Asp Ile Asn
            580                 585                 590
Arg Val Pro Glu Glu Gln Met Thr Phe Lys Asp Leu Val Ser Cys Thr
        595                 600                 605
Tyr Gln Leu Ala Arg Gly Met Glu Tyr Leu Ala Ser Gln Lys Cys Ile
    610                 615                 620
His Arg Asp Leu Ala Ala Arg Asn Val Leu Val Thr Glu Asn Asn Val
625                 630                 635                 640
Met Lys Ile Ala Asp Phe Gly Leu Ala Arg Asp Ile Asn Asn Ile Asp
                645                 650                 655
Tyr Tyr Lys Lys Thr Thr Asn Gly Arg Leu Pro Val Lys Trp Met Ala
            660                 665                 670
Pro Glu Ala Leu Phe Asp Arg Val Tyr Thr His Gln Ser Asp Val Trp
        675                 680                 685
Ser Phe Gly Val Leu Met Trp Glu Ile Phe Thr Leu Gly Gly Ser Pro
    690                 695                 700
Tyr Pro Gly Ile Pro Val Glu Glu Leu Phe Lys Leu Leu Lys Glu Gly
705                 710                 715                 720
His Arg Met Asp Lys Pro Ala Asn Cys Thr Asn Glu Leu Tyr Met Met
                725                 730                 735
Met Arg Asp Cys Trp His Ala Val Pro Ser Gln Arg Pro Thr Phe Lys
            740                 745                 750
Gln Leu Val Glu Asp Leu Asp Arg Ile Leu Thr Leu Thr Thr Asn Glu
        755                 760                 765
Ile
```

<210> 62
<211> 709
<212> PRT
<213> Homo sapiens

<400> 62

```
Met Val Ser Trp Gly Arg Phe Ile Cys Leu Val Val Val Thr Met Ala
 1               5                  10                  15
Thr Leu Ser Leu Ala Arg Pro Ser Phe Ser Leu Val Glu Asp Thr Thr
            20                  25                  30
Leu Glu Pro Glu Glu Pro Pro Thr Lys Tyr Gln Ile Ser Gln Pro Glu
        35                  40                  45
Val Tyr Val Ala Ala Pro Gly Glu Ser Leu Glu Val Arg Cys Leu Leu
    50                  55                  60
```

Lys Asp Ala Ala Val Ile Ser Trp Thr Lys Asp Gly Val His Leu Gly
65 70 75 80
Pro Asn Asn Arg Thr Val Leu Ile Gly Glu Tyr Leu Gln Ile Lys Gly
85 90 95
Ala Thr Pro Arg Asp Ser Gly Leu Tyr Ala Cys Thr Ala Ser Arg Thr
100 105 110
Val Asp Ser Glu Thr Trp Tyr Phe Met Val Asn Val Thr Asp Ala Ile
115 120 125
Ser Ser Gly Asp Asp Glu Asp Asp Thr Asp Gly Ala Glu Asp Phe Val
130 135 140
Ser Glu Asn Ser Asn Asn Lys Arg Ala Pro Tyr Trp Thr Asn Thr Glu
145 150 155 160
Lys Met Glu Lys Arg Leu His Ala Val Pro Ala Ala Asn Thr Val Lys
165 170 175
Phe Arg Cys Pro Ala Gly Gly Asn Pro Met Pro Thr Met Arg Trp Leu
180 185 190
Lys Asn Gly Lys Glu Phe Lys Gln Glu His Arg Ile Gly Gly Tyr Lys
195 200 205
Val Arg Asn Gln His Trp Ser Leu Ile Met Glu Ser Val Val Pro Ser
210 215 220
Asp Lys Gly Asn Tyr Thr Cys Val Val Glu Asn Glu Tyr Gly Ser Ile
225 230 235 240
Asn His Thr Tyr His Leu Asp Val Val Ala Pro Gly Arg Glu Lys Glu
245 250 255
Ile Thr Ala Ser Pro Asp Tyr Leu Glu Ile Ala Ile Tyr Cys Ile Gly
260 265 270
Val Phe Leu Ile Ala Cys Met Val Val Thr Val Ile Leu Cys Arg Met
275 280 285
Lys Asn Thr Thr Lys Lys Pro Asp Phe Ser Ser Gln Pro Ala Val His
290 295 300
Lys Leu Thr Lys Arg Ile Pro Leu Arg Arg Gln Val Thr Val Ser Ala
305 310 315 320
Glu Ser Ser Ser Ser Met Asn Ser Asn Thr Pro Leu Val Arg Ile Thr
325 330 335
Thr Arg Leu Ser Ser Thr Ala Asp Thr Pro Met Leu Ala Gly Val Ser
340 345 350
Glu Tyr Glu Leu Pro Glu Asp Pro Lys Trp Glu Phe Pro Arg Asp Lys
355 360 365
Leu Thr Leu Gly Lys Pro Leu Gly Glu Gly Cys Phe Gly Gln Val Val
370 375 380
Met Ala Glu Ala Val Gly Ile Asp Lys Asp Lys Pro Lys Glu Ala Val
385 390 395 400
Thr Val Ala Val Lys Met Leu Lys Asp Asp Ala Thr Glu Lys Asp Leu
405 410 415
Ser Asp Leu Val Ser Glu Met Glu Met Met Lys Met Ile Gly Lys His
420 425 430
Lys Asn Ile Ile Asn Leu Leu Gly Ala Cys Thr Gln Asp Gly Pro Leu
435 440 445
Tyr Val Ile Val Glu Tyr Ala Ser Lys Gly Asn Leu Arg Glu Tyr Leu
450 455 460
Arg Ala Arg Arg Pro Pro Gly Met Glu Tyr Ser Tyr Asp Ile Asn Arg
465 470 475 480
Val Pro Glu Glu Gln Met Thr Phe Lys Asp Leu Val Ser Cys Thr Tyr
485 490 495
Gln Leu Ala Arg Gly Met Glu Tyr Leu Ala Ser Gln Lys Cys Ile His
500 505 510
Arg Asp Leu Ala Ala Arg Asn Val Leu Val Thr Glu Asn Asn Val Met
515 520 525
Lys Ile Ala Asp Phe Gly Leu Ala Arg Asp Ile Asn Asn Ile Asp Tyr

```
    530                 535                 540
Tyr Lys Lys Thr Thr Asn Gly Arg Leu Pro Val Lys Trp Met Ala Pro
545                 550                 555                 560
Glu Ala Leu Phe Asp Arg Val Tyr Thr His Gln Ser Asp Val Trp Ser
                565                 570                 575
Phe Gly Val Leu Met Trp Glu Ile Phe Thr Leu Gly Gly Ser Pro Tyr
            580                 585                 590
Pro Gly Ile Pro Val Glu Glu Leu Phe Lys Leu Leu Lys Glu Gly His
        595                 600                 605
Arg Met Asp Lys Pro Ala Asn Cys Thr Asn Glu Leu Tyr Met Met Met
    610                 615                 620
Arg Asp Cys Trp His Ala Val Pro Ser Gln Arg Pro Thr Phe Lys Gln
625                 630                 635                 640
Leu Val Glu Asp Leu Asp Arg Ile Leu Thr Leu Thr Thr Asn Glu Glu
                645                 650                 655
Tyr Leu Asp Leu Ser Gln Pro Leu Glu Gln Tyr Ser Pro Ser Tyr Pro
            660                 665                 670
Asp Thr Arg Ser Ser Cys Ser Ser Gly Asp Asp Ser Val Phe Ser Pro
        675                 680                 685
Asp Pro Met Pro Tyr Glu Pro Cys Leu Pro Gln Tyr Pro His Ile Asn
    690                 695                 700
Gly Ser Val Lys Thr
705
```

<210> 63
<211> 707
<212> PRT
<213> Homo sapiens

<400> 63

```
Met Val Ser Trp Gly Arg Phe Ile Cys Leu Val Val Val Thr Met Ala
 1                  5                  10                  15
Thr Leu Ser Leu Ala Arg Pro Ser Phe Ser Leu Val Glu Asp Thr Thr
            20                  25                  30
Leu Glu Pro Glu Asp Ala Ile Ser Ser Gly Asp Asp Glu Asp Asp Thr
        35                  40                  45
Asp Gly Ala Glu Asp Phe Val Ser Glu Asn Ser Asn Asn Lys Arg Ala
    50                  55                  60
Pro Tyr Trp Thr Asn Thr Glu Lys Met Glu Lys Arg Leu His Ala Val
65                  70                  75                  80
Pro Ala Ala Asn Thr Val Lys Phe Arg Cys Pro Ala Gly Gly Asn Pro
                85                  90                  95
Met Pro Thr Met Arg Trp Leu Lys Asn Gly Lys Glu Phe Lys Gln Glu
            100                 105                 110
His Arg Ile Gly Gly Tyr Lys Val Arg Asn Gln His Trp Ser Leu Ile
        115                 120                 125
Met Glu Ser Val Val Pro Ser Asp Lys Gly Asn Tyr Thr Cys Val Val
    130                 135                 140
Glu Asn Glu Tyr Gly Ser Ile Asn His Thr Tyr His Leu Asp Val Val
145                 150                 155                 160
Glu Arg Ser Pro His Arg Pro Ile Leu Gln Ala Gly Leu Pro Ala Asn
                165                 170                 175
Ala Ser Thr Val Val Gly Gly Asp Val Glu Phe Val Cys Lys Val Tyr
            180                 185                 190
Ser Asp Ala Gln Pro His Ile Gln Trp Ile Lys His Val Glu Lys Asn
        195                 200                 205
Gly Ser Lys Tyr Gly Pro Asp Gly Leu Pro Tyr Leu Lys Val Leu Lys
    210                 215                 220
```

```
Ala Ala Gly Val Asn Thr Thr Asp Lys Glu Ile Glu Val Leu Tyr Ile
225                 230                 235                 240
Arg Asn Val Thr Phe Glu Asp Ala Gly Glu Tyr Thr Cys Leu Ala Gly
                245                 250                 255
Asn Ser Ile Gly Ile Ser Phe His Ser Ala Trp Leu Thr Val Leu Pro
            260                 265                 270
Ala Pro Gly Arg Glu Lys Glu Ile Thr Ala Ser Pro Asp Tyr Leu Glu
        275                 280                 285
Ile Ala Ile Tyr Cys Ile Gly Val Phe Leu Ile Ala Cys Met Val Val
    290                 295                 300
Thr Val Ile Leu Cys Arg Met Lys Asn Thr Thr Lys Lys Pro Asp Phe
305                 310                 315                 320
Ser Ser Gln Pro Ala Val His Lys Leu Thr Lys Arg Ile Pro Leu Arg
                325                 330                 335
Arg Gln Val Thr Val Ser Ala Glu Ser Ser Ser Ser Met Asn Ser Asn
            340                 345                 350
Thr Pro Leu Val Arg Ile Thr Thr Arg Leu Ser Ser Thr Ala Asp Thr
        355                 360                 365
Pro Met Leu Ala Gly Val Ser Glu Tyr Glu Leu Pro Glu Asp Pro Lys
    370                 375                 380
Trp Glu Phe Pro Arg Asp Lys Leu Thr Leu Gly Lys Pro Leu Gly Glu
385                 390                 395                 400
Gly Cys Phe Gly Gln Val Val Met Ala Glu Ala Val Gly Ile Asp Lys
                405                 410                 415
Asp Lys Pro Lys Glu Ala Val Thr Val Ala Val Lys Met Leu Lys Asp
            420                 425                 430
Asp Ala Thr Glu Lys Asp Leu Ser Asp Leu Val Ser Glu Met Glu Met
        435                 440                 445
Met Lys Met Ile Gly Lys His Lys Asn Ile Ile Asn Leu Leu Gly Ala
    450                 455                 460
Cys Thr Gln Asp Gly Pro Leu Tyr Val Ile Val Glu Tyr Ala Ser Lys
465                 470                 475                 480
Gly Asn Leu Arg Glu Tyr Leu Arg Ala Arg Arg Pro Pro Gly Met Glu
                485                 490                 495
Tyr Ser Tyr Asp Ile Asn Arg Val Pro Glu Glu Gln Met Thr Phe Lys
            500                 505                 510
Asp Leu Val Ser Cys Thr Tyr Gln Leu Ala Arg Gly Met Glu Tyr Leu
        515                 520                 525
Ala Ser Gln Lys Cys Ile His Arg Asp Leu Ala Ala Arg Asn Val Leu
    530                 535                 540
Val Thr Glu Asn Asn Val Met Lys Ile Ala Asp Phe Gly Leu Ala Arg
545                 550                 555                 560
Asp Ile Asn Asn Ile Asp Tyr Tyr Lys Lys Thr Thr Asn Gly Arg Leu
                565                 570                 575
Pro Val Lys Trp Met Ala Pro Glu Ala Leu Phe Asp Arg Val Tyr Thr
            580                 585                 590
His Gln Ser Asp Val Trp Ser Phe Gly Val Leu Met Trp Glu Ile Phe
        595                 600                 605
Thr Leu Gly Gly Ser Pro Tyr Pro Gly Ile Pro Val Glu Glu Leu Phe
    610                 615                 620
Lys Leu Leu Lys Glu Gly His Arg Met Asp Lys Pro Ala Asn Cys Thr
625                 630                 635                 640
Asn Glu Leu Tyr Met Met Met Arg Asp Cys Trp His Ala Val Pro Ser
                645                 650                 655
Gln Arg Pro Thr Phe Lys Gln Leu Val Glu Asp Leu Asp Arg Ile Leu
            660                 665                 670
Thr Leu Thr Thr Asn Glu Glu Glu Lys Lys Val Ser Gly Ala Val Asp
        675                 680                 685
Cys His Lys Pro Pro Cys Asn Pro Ser His Leu Pro Cys Val Leu Ala
```

690 695 700
Val Asp Gln
705

<210> 64
<211> 706
<212> PRT
<213> Homo sapiens

<400> 64
Met Val Ser Trp Gly Arg Phe Ile Cys Leu Val Val Val Thr Met Ala
1 5 10 15
Thr Leu Ser Leu Ala Arg Pro Ser Phe Ser Leu Val Glu Asp Thr Thr
20 25 30
Leu Glu Pro Glu Gly Ala Pro Tyr Trp Thr Asn Thr Glu Lys Met Glu
35 40 45
Lys Arg Leu His Ala Val Pro Ala Ala Asn Thr Val Lys Phe Arg Cys
50 55 60
Pro Ala Gly Gly Asn Pro Met Pro Thr Met Arg Trp Leu Lys Asn Gly
65 70 75 80
Lys Glu Phe Lys Gln Glu His Arg Ile Gly Gly Tyr Lys Val Arg Asn
85 90 95
Gln His Trp Ser Leu Ile Met Glu Ser Val Val Pro Ser Asp Lys Gly
100 105 110
Asn Tyr Thr Cys Val Val Glu Asn Glu Tyr Gly Ser Ile Asn His Thr
115 120 125
Tyr His Leu Asp Val Val Glu Arg Ser Pro His Arg Pro Ile Leu Gln
130 135 140
Ala Gly Leu Pro Ala Asn Ala Ser Thr Val Val Gly Gly Asp Val Glu
145 150 155 160
Phe Val Cys Lys Val Tyr Ser Asp Ala Gln Pro His Ile Gln Trp Ile
165 170 175
Lys His Val Glu Lys Asn Gly Ser Lys Tyr Gly Pro Asp Gly Leu Pro
180 185 190
Tyr Leu Lys Val Leu Lys Ala Ala Gly Val Asn Thr Thr Asp Lys Glu
195 200 205
Ile Glu Val Leu Tyr Ile Arg Asn Val Thr Phe Glu Asp Ala Gly Glu
210 215 220
Tyr Thr Cys Leu Ala Gly Asn Ser Ile Gly Ile Ser Phe His Ser Ala
225 230 235 240
Trp Leu Thr Val Leu Pro Ala Pro Gly Arg Glu Lys Glu Ile Thr Ala
245 250 255
Ser Pro Asp Tyr Leu Glu Ile Ala Ile Tyr Cys Ile Gly Val Phe Leu
260 265 270
Ile Ala Cys Met Val Val Thr Val Ile Leu Cys Arg Met Lys Asn Thr
275 280 285
Thr Lys Lys Pro Asp Phe Ser Ser Gln Pro Ala Val His Lys Leu Thr
290 295 300
Lys Arg Ile Pro Leu Arg Arg Gln Val Thr Val Ser Ala Glu Ser Ser
305 310 315 320
Ser Ser Met Asn Ser Asn Thr Pro Leu Val Arg Ile Thr Thr Arg Leu
325 330 335
Ser Ser Thr Ala Asp Thr Pro Met Leu Ala Gly Val Ser Glu Tyr Glu
340 345 350
Leu Pro Glu Asp Pro Lys Trp Glu Phe Pro Arg Asp Lys Leu Thr Leu
355 360 365
Gly Lys Pro Leu Gly Glu Gly Cys Phe Gly Gln Val Val Met Ala Glu
370 375 380

```
Ala Val Gly Ile Asp Lys Asp Lys Pro Lys Glu Ala Val Thr Val Ala
385                 390                 395                 400
Val Lys Met Leu Lys Asp Asp Ala Thr Glu Lys Asp Leu Ser Asp Leu
                405                 410                 415
Val Ser Glu Met Glu Met Met Lys Met Ile Gly Lys His Lys Asn Ile
            420                 425                 430
Ile Asn Leu Leu Gly Ala Cys Thr Gln Asp Gly Pro Leu Tyr Val Ile
        435                 440                 445
Val Glu Tyr Ala Ser Lys Gly Asn Leu Arg Glu Tyr Leu Arg Ala Arg
    450                 455                 460
Arg Pro Pro Gly Met Glu Tyr Ser Tyr Asp Ile Asn Arg Val Pro Glu
465                 470                 475                 480
Glu Gln Met Thr Phe Lys Asp Leu Val Ser Cys Thr Tyr Gln Leu Ala
                485                 490                 495
Arg Gly Met Glu Tyr Leu Ala Ser Gln Lys Cys Ile His Arg Asp Leu
            500                 505                 510
Ala Ala Arg Asn Val Leu Val Thr Glu Asn Asn Val Met Lys Ile Ala
        515                 520                 525
Asp Phe Gly Leu Ala Arg Asp Ile Asn Asn Ile Asp Tyr Tyr Lys Lys
    530                 535                 540
Thr Thr Asn Gly Arg Leu Pro Val Lys Trp Met Ala Pro Glu Ala Leu
545                 550                 555                 560
Phe Asp Arg Val Tyr Thr His Gln Ser Asp Val Trp Ser Phe Gly Val
                565                 570                 575
Leu Met Trp Glu Ile Phe Thr Leu Gly Gly Ser Pro Tyr Pro Gly Ile
            580                 585                 590
Pro Val Glu Glu Leu Phe Lys Leu Leu Lys Glu Gly His Arg Met Asp
        595                 600                 605
Lys Pro Ala Asn Cys Thr Asn Glu Leu Tyr Met Met Met Arg Asp Cys
    610                 615                 620
Trp His Ala Val Pro Ser Gln Arg Pro Thr Phe Lys Gln Leu Val Glu
625                 630                 635                 640
Asp Leu Asp Arg Ile Leu Thr Leu Thr Thr Asn Glu Glu Tyr Leu Asp
                645                 650                 655
Leu Ser Gln Pro Leu Glu Gln Tyr Ser Pro Ser Tyr Pro Asp Thr Arg
            660                 665                 670
Ser Ser Cys Ser Ser Gly Asp Asp Ser Val Phe Ser Pro Asp Pro Met
        675                 680                 685
Pro Tyr Glu Pro Cys Leu Pro Gln Tyr Pro His Ile Asn Gly Ser Val
    690                 695                 700
Lys Thr
705
```

<210> 65
<211> 705
<212> PRT
<213> Homo sapiens

<400> 65

```
Met Val Ser Trp Gly Arg Phe Ile Cys Leu Val Val Val Thr Met Ala
 1               5                  10                  15
Thr Leu Ser Leu Ala Arg Pro Ser Phe Ser Leu Val Glu Asp Thr Thr
            20                  25                  30
Leu Glu Pro Glu Glu Pro Pro Thr Lys Tyr Gln Ile Ser Gln Pro Glu
        35                  40                  45
Val Tyr Val Ala Ala Pro Gly Glu Ser Leu Glu Val Arg Cys Leu Leu
    50                  55                  60
Lys Asp Ala Ala Val Ile Ser Trp Thr Lys Asp Gly Val His Leu Gly
```

65 70 75 80
Pro Asn Asn Arg Thr Val Leu Ile Gly Glu Tyr Leu Gln Ile Lys Gly
85 90 95
Ala Thr Pro Arg Asp Ser Gly Leu Tyr Ala Cys Thr Ala Ser Arg Thr
100 105 110
Val Asp Ser Glu Thr Trp Tyr Phe Met Val Asn Val Thr Asp Ala Ile
115 120 125
Ser Ser Gly Asp Asp Glu Asp Asp Thr Asp Gly Ala Glu Asp Phe Val
130 135 140
Ser Glu Asn Ser Asn Asn Lys Arg Ala Pro Tyr Trp Thr Asn Thr Glu
145 150 155 160
Lys Met Glu Lys Arg Leu His Ala Val Pro Ala Ala Asn Thr Val Lys
165 170 175
Phe Arg Cys Pro Ala Gly Gly Asn Pro Met Pro Thr Met Arg Trp Leu
180 185 190
Lys Asn Gly Lys Glu Phe Lys Gln Glu His Arg Ile Gly Gly Tyr Lys
195 200 205
Val Arg Asn Gln His Trp Ser Leu Ile Met Glu Ser Val Val Pro Ser
210 215 220
Asp Lys Gly Asn Tyr Thr Cys Val Val Glu Asn Glu Tyr Gly Ser Ile
225 230 235 240
Asn His Thr Tyr His Leu Asp Val Val Glu Arg Ser Pro His Arg Pro
245 250 255
Ile Leu Gln Ala Gly Leu Pro Ala Asn Ala Ser Thr Val Val Gly Gly
260 265 270
Asp Val Glu Phe Val Cys Lys Val Tyr Ser Asp Ala Gln Pro His Ile
275 280 285
Gln Trp Ile Lys His Val Glu Lys Asn Gly Ser Lys Tyr Gly Pro Asp
290 295 300
Gly Leu Pro Tyr Leu Lys Val Leu Lys Val Ser Ala Glu Ser Ser Ser
305 310 315 320
Ser Met Asn Ser Asn Thr Pro Leu Val Arg Ile Thr Thr Arg Leu Ser
325 330 335
Ser Thr Ala Asp Thr Pro Met Leu Ala Gly Val Ser Glu Tyr Glu Leu
340 345 350
Pro Glu Asp Pro Lys Trp Glu Phe Pro Arg Asp Lys Leu Thr Leu Gly
355 360 365
Lys Pro Leu Gly Glu Gly Cys Phe Gly Gln Val Val Met Ala Glu Ala
370 375 380
Val Gly Ile Asp Lys Asp Lys Pro Lys Glu Ala Val Thr Val Ala Val
385 390 395 400
Lys Met Leu Lys Asp Asp Ala Thr Glu Lys Asp Leu Ser Asp Leu Val
405 410 415
Ser Glu Met Glu Met Met Lys Met Ile Gly Lys His Lys Asn Ile Ile
420 425 430
Asn Leu Leu Gly Ala Cys Thr Gln Asp Gly Pro Leu Tyr Val Ile Val
435 440 445
Glu Tyr Ala Ser Lys Gly Asn Leu Arg Glu Tyr Leu Arg Ala Arg Arg
450 455 460
Pro Pro Gly Met Glu Tyr Ser Tyr Asp Ile Asn Arg Val Pro Glu Glu
465 470 475 480
Gln Met Thr Phe Lys Asp Leu Val Ser Cys Thr Tyr Gln Leu Ala Arg
485 490 495
Gly Met Glu Tyr Leu Ala Ser Gln Lys Cys Ile His Arg Asp Leu Ala
500 505 510
Ala Arg Asn Val Leu Val Thr Glu Asn Asn Val Met Lys Ile Ala Asp
515 520 525
Phe Gly Leu Ala Arg Asp Ile Asn Asn Ile Asp Tyr Tyr Lys Lys Thr
530 535 540

```
Thr Asn Gly Arg Leu Pro Val Lys Trp Met Ala Pro Glu Ala Leu Phe
545                 550                 555                 560
Asp Arg Val Tyr Thr His Gln Ser Asp Val Trp Ser Phe Gly Val Leu
                565                 570                 575
Met Trp Glu Ile Phe Thr Leu Gly Gly Ser Pro Tyr Pro Gly Ile Pro
            580                 585                 590
Val Glu Glu Leu Phe Lys Leu Leu Lys Glu Gly His Arg Met Asp Lys
        595                 600                 605
Pro Ala Asn Cys Thr Asn Glu Leu Tyr Met Met Met Arg Asp Cys Trp
    610                 615                 620
His Ala Val Pro Ser Gln Arg Pro Thr Phe Lys Gln Leu Val Glu Asp
625                 630                 635                 640
Leu Asp Arg Ile Leu Thr Leu Thr Thr Asn Glu Glu Tyr Leu Asp Leu
                645                 650                 655
Ser Gln Pro Leu Glu Gln Tyr Ser Pro Ser Tyr Pro Asp Thr Arg Ser
            660                 665                 670
Ser Cys Ser Ser Gly Asp Asp Ser Val Phe Ser Pro Asp Pro Met Pro
        675                 680                 685
Tyr Glu Pro Cys Leu Pro Gln Tyr Pro His Ile Asn Gly Ser Val Lys
    690                 695                 700
Thr
705
```

<210> 66
<211> 704
<212> PRT
<213> Homo sapiens

<400> 66

```
Met Val Ser Trp Gly Arg Phe Ile Cys Leu Val Val Val Thr Met Ala
 1               5                  10                  15
Thr Leu Ser Leu Ala Arg Pro Ser Phe Ser Leu Val Glu Asp Thr Thr
            20                  25                  30
Leu Glu Pro Glu Gly Ala Pro Tyr Trp Thr Asn Thr Glu Lys Met Glu
        35                  40                  45
Lys Arg Leu His Ala Val Pro Ala Ala Asn Thr Val Lys Phe Arg Cys
    50                  55                  60
Pro Ala Gly Gly Asn Pro Met Pro Thr Met Arg Trp Leu Lys Asn Gly
65                  70                  75                  80
Lys Glu Phe Lys Gln Glu His Arg Ile Gly Gly Tyr Lys Val Arg Asn
                85                  90                  95
Gln His Trp Ser Leu Ile Met Glu Ser Val Val Pro Ser Asp Lys Gly
            100                 105                 110
Asn Tyr Thr Cys Val Val Glu Asn Glu Tyr Gly Ser Ile Asn His Thr
        115                 120                 125
Tyr His Leu Asp Val Val Glu Arg Ser Pro His Arg Pro Ile Leu Gln
    130                 135                 140
Ala Gly Leu Pro Ala Asn Ala Ser Thr Val Val Gly Gly Asp Val Glu
145                 150                 155                 160
Phe Val Cys Lys Val Tyr Ser Asp Ala Gln Pro His Ile Gln Trp Ile
                165                 170                 175
Lys His Val Glu Lys Asn Gly Ser Lys Tyr Gly Pro Asp Gly Leu Pro
            180                 185                 190
Tyr Leu Lys Val Leu Lys Ala Ala Gly Val Asn Thr Thr Asp Lys Glu
        195                 200                 205
Ile Glu Val Leu Tyr Ile Arg Asn Val Thr Phe Glu Asp Ala Gly Glu
    210                 215                 220
Tyr Thr Cys Leu Ala Gly Asn Ser Ile Gly Ile Ser Phe His Ser Ala
```

```
225                 230                 235                 240
Trp Leu Thr Val Leu Pro Ala Pro Gly Arg Glu Lys Glu Ile Thr Ala
                245                 250                 255
Ser Pro Asp Tyr Leu Glu Ile Ala Ile Tyr Cys Ile Gly Val Phe Leu
            260                 265                 270
Ile Ala Cys Met Val Val Thr Val Ile Leu Cys Arg Met Lys Asn Thr
        275                 280                 285
Thr Lys Lys Pro Asp Phe Ser Ser Gln Pro Ala Val His Lys Leu Thr
    290                 295                 300
Lys Arg Ile Pro Leu Arg Arg Gln Val Ser Ala Glu Ser Ser Ser Ser
305                 310                 315                 320
Met Asn Ser Asn Thr Pro Leu Val Arg Ile Thr Thr Arg Leu Ser Ser
                325                 330                 335
Thr Ala Asp Thr Pro Met Leu Ala Gly Val Ser Glu Tyr Glu Leu Pro
            340                 345                 350
Glu Asp Pro Lys Trp Glu Phe Pro Arg Asp Lys Leu Thr Leu Gly Lys
        355                 360                 365
Pro Leu Gly Glu Gly Cys Phe Gly Gln Val Val Met Ala Glu Ala Val
    370                 375                 380
Gly Ile Asp Lys Asp Lys Pro Lys Glu Ala Val Thr Val Ala Val Lys
385                 390                 395                 400
Met Leu Lys Asp Asp Ala Thr Glu Lys Asp Leu Ser Asp Leu Val Ser
                405                 410                 415
Glu Met Glu Met Met Lys Met Ile Gly Lys His Lys Asn Ile Ile Asn
            420                 425                 430
Leu Leu Gly Ala Cys Thr Gln Asp Gly Pro Leu Tyr Val Ile Val Glu
        435                 440                 445
Tyr Ala Ser Lys Gly Asn Leu Arg Glu Tyr Leu Arg Ala Arg Arg Pro
    450                 455                 460
Pro Gly Met Glu Tyr Ser Tyr Asp Ile Asn Arg Val Pro Glu Glu Gln
465                 470                 475                 480
Met Thr Phe Lys Asp Leu Val Ser Cys Thr Tyr Gln Leu Ala Arg Gly
                485                 490                 495
Met Glu Tyr Leu Ala Ser Gln Lys Cys Ile His Arg Asp Leu Ala Ala
            500                 505                 510
Arg Asn Val Leu Val Thr Glu Asn Asn Val Met Lys Ile Ala Asp Phe
        515                 520                 525
Gly Leu Ala Arg Asp Ile Asn Asn Ile Asp Tyr Tyr Lys Lys Thr Thr
    530                 535                 540
Asn Gly Arg Leu Pro Val Lys Trp Met Ala Pro Glu Ala Leu Phe Asp
545                 550                 555                 560
Arg Val Tyr Thr His Gln Ser Asp Val Trp Ser Phe Gly Val Leu Met
                565                 570                 575
Trp Glu Ile Phe Thr Leu Gly Gly Ser Pro Tyr Pro Gly Ile Pro Val
            580                 585                 590
Glu Glu Leu Phe Lys Leu Leu Lys Glu Gly His Arg Met Asp Lys Pro
        595                 600                 605
Ala Asn Cys Thr Asn Glu Leu Tyr Met Met Met Arg Asp Cys Trp His
    610                 615                 620
Ala Val Pro Ser Gln Arg Pro Thr Phe Lys Gln Leu Val Glu Asp Leu
625                 630                 635                 640
Asp Arg Ile Leu Thr Leu Thr Thr Asn Glu Glu Tyr Leu Asp Leu Ser
                645                 650                 655
Gln Pro Leu Glu Gln Tyr Ser Pro Ser Tyr Pro Asp Thr Arg Ser Ser
            660                 665                 670
Cys Ser Ser Gly Asp Asp Ser Val Phe Ser Pro Asp Pro Met Pro Tyr
        675                 680                 685
Glu Pro Cys Leu Pro Gln Tyr Pro His Ile Asn Gly Ser Val Lys Thr
    690                 695                 700
```

<210> 67
<211> 680
<212> PRT
<213> Homo sapiens

<400> 67

```
Met Val Ser Trp Gly Arg Phe Ile Cys Leu Val Val Val Thr Met Ala
 1               5                  10                  15
Thr Leu Ser Leu Ala Arg Pro Ser Phe Ser Leu Val Glu Asp Thr Thr
            20                  25                  30
Leu Glu Pro Glu Asp Ala Ile Ser Ser Gly Asp Asp Glu Asp Asp Thr
        35                  40                  45
Asp Gly Ala Glu Asp Phe Val Ser Glu Asn Ser Asn Asn Lys Arg Ala
    50                  55                  60
Pro Tyr Trp Thr Asn Thr Glu Lys Met Glu Lys Arg Leu His Ala Val
65                  70                  75                  80
Pro Ala Ala Asn Thr Val Lys Phe Arg Cys Pro Ala Gly Gly Asn Pro
                85                  90                  95
Met Pro Thr Met Arg Trp Leu Lys Asn Gly Lys Glu Phe Lys Gln Glu
            100                 105                 110
His Arg Ile Gly Gly Tyr Lys Val Arg Asn Gln His Trp Ser Leu Ile
        115                 120                 125
Met Glu Ser Val Val Pro Ser Asp Lys Gly Asn Tyr Thr Cys Val Val
    130                 135                 140
Glu Asn Glu Tyr Gly Ser Ile Asn His Thr Tyr His Leu Asp Val Val
145                 150                 155                 160
Glu Arg Ser Pro His Arg Pro Ile Leu Gln Ala Gly Leu Pro Ala Asn
                165                 170                 175
Ala Ser Thr Val Val Gly Gly Asp Val Glu Phe Val Cys Lys Val Tyr
            180                 185                 190
Ser Asp Ala Gln Pro His Ile Gln Trp Ile Lys His Val Glu Lys Asn
        195                 200                 205
Gly Ser Lys Tyr Gly Pro Asp Gly Leu Pro Tyr Leu Lys Val Leu Lys
    210                 215                 220
His Ser Gly Ile Asn Ser Ser Asn Ala Glu Val Leu Ala Leu Phe Asn
225                 230                 235                 240
Val Thr Glu Ala Asp Ala Gly Glu Tyr Ile Cys Lys Val Ser Asn Tyr
                245                 250                 255
Ile Gly Gln Ala Asn Gln Ser Ala Trp Leu Thr Val Leu Pro Lys Gln
            260                 265                 270
Gln Ala Pro Gly Arg Glu Lys Glu Ile Thr Ala Ser Pro Asp Tyr Leu
        275                 280                 285
Glu Ile Ala Ile Tyr Cys Ile Gly Val Phe Leu Ile Ala Cys Met Val
    290                 295                 300
Val Thr Val Ile Leu Cys Arg Met Lys Asn Thr Thr Lys Lys Pro Asp
305                 310                 315                 320
Phe Ser Ser Gln Pro Ala Val His Lys Leu Thr Lys Arg Ile Pro Leu
                325                 330                 335
Arg Arg Gln Val Thr Val Ser Ala Glu Ser Ser Ser Ser Met Asn Ser
            340                 345                 350
Asn Thr Pro Leu Val Arg Ile Thr Thr Arg Leu Ser Ser Thr Ala Asp
        355                 360                 365
Thr Pro Met Leu Ala Gly Val Ser Glu Tyr Glu Leu Pro Glu Asp Pro
    370                 375                 380
Lys Trp Glu Phe Pro Arg Asp Lys Leu Thr Leu Gly Lys Pro Leu Gly
385                 390                 395                 400
Glu Gly Cys Phe Gly Gln Val Val Met Ala Glu Ala Val Gly Ile Asp
```

```
                405                 410                 415
Lys Asp Lys Pro Lys Glu Ala Val Thr Val Ala Val Lys Met Leu Lys
            420                 425                 430
Asp Asp Ala Thr Glu Lys Asp Leu Ser Asp Leu Val Ser Glu Met Glu
        435                 440                 445
Met Met Lys Met Ile Gly Lys His Lys Asn Ile Ile Asn Leu Leu Gly
    450                 455                 460
Ala Cys Thr Gln Asp Gly Pro Leu Tyr Val Ile Val Glu Tyr Ala Ser
465                 470                 475                 480
Lys Gly Asn Leu Arg Glu Tyr Leu Arg Ala Arg Arg Pro Pro Gly Met
                485                 490                 495
Glu Tyr Ser Tyr Asp Ile Asn Arg Val Pro Glu Glu Gln Met Thr Phe
            500                 505                 510
Lys Asp Leu Val Ser Cys Thr Tyr Gln Leu Ala Arg Gly Met Glu Tyr
        515                 520                 525
Leu Ala Ser Gln Lys Cys Ile His Arg Asp Leu Ala Ala Arg Asn Val
    530                 535                 540
Leu Val Thr Glu Asn Asn Val Met Lys Ile Ala Asp Phe Gly Leu Ala
545                 550                 555                 560
Arg Asp Ile Asn Asn Ile Asp Tyr Tyr Lys Lys Thr Thr Asn Gly Arg
                565                 570                 575
Leu Pro Val Lys Trp Met Ala Pro Glu Ala Leu Phe Asp Arg Val Tyr
            580                 585                 590
Thr His Gln Ser Asp Val Trp Ser Phe Gly Val Leu Met Trp Glu Ile
        595                 600                 605
Phe Thr Leu Gly Gly Ser Pro Tyr Pro Gly Ile Pro Val Glu Glu Leu
    610                 615                 620
Phe Lys Leu Leu Lys Glu Gly His Arg Met Asp Lys Pro Ala Asn Cys
625                 630                 635                 640
Thr Asn Glu Leu Tyr Met Met Met Arg Asp Cys Trp His Ala Val Pro
                645                 650                 655
Ser Gln Arg Pro Thr Phe Lys Gln Leu Val Glu Asp Leu Asp Arg Ile
            660                 665                 670
Leu Thr Leu Thr Thr Asn Glu Ile
        675                 680
```

<210> 68
<211> 396
<212> PRT
<213> Homo sapiens

<400> 68

```
Met Val Ser Trp Gly Arg Phe Ile Cys Leu Val Val Val Thr Met Ala
 1               5                  10                  15
Thr Leu Ser Leu Ala Arg Pro Ser Phe Ser Leu Val Glu Asp Thr Thr
            20                  25                  30
Leu Glu Pro Glu Glu Pro Pro Thr Lys Tyr Gln Ile Ser Gln Pro Glu
        35                  40                  45
Val Tyr Val Ala Ala Pro Gly Glu Ser Leu Glu Val Arg Cys Leu Leu
    50                  55                  60
Lys Asp Ala Ala Val Ile Ser Trp Thr Lys Asp Gly Val His Leu Gly
65                  70                  75                  80
Pro Asn Asn Arg Thr Val Leu Ile Gly Glu Tyr Leu Gln Ile Lys Gly
                85                  90                  95
Ala Thr Pro Arg Asp Ser Gly Leu Tyr Ala Cys Thr Ala Ser Arg Thr
            100                 105                 110
Val Asp Ser Glu Thr Trp Tyr Phe Met Val Asn Val Thr Asp Ala Ile
        115                 120                 125
```

```
Ser Ser Gly Asp Asp Glu Asp Asp Thr Asp Gly Ala Glu Asp Phe Val
    130                 135                 140
Ser Glu Asn Ser Asn Asn Lys Arg Ala Pro Tyr Trp Thr Asn Thr Glu
145                 150                 155                 160
Lys Thr Glu Lys Arg Leu His Ala Val Pro Ala Ala Asn Thr Val Lys
                165                 170                 175
Phe Arg Cys Pro Ala Gly Gly Asn Pro Met Pro Thr Met Arg Trp Leu
            180                 185                 190
Lys Asn Gly Lys Glu Phe Lys Gln Glu His Arg Ile Gly Gly Tyr Lys
        195                 200                 205
Val Arg Asn Gln His Trp Ser Leu Ile Met Glu Ser Val Val Pro Ser
    210                 215                 220
Asp Lys Gly Asn Tyr Thr Cys Val Val Glu Asn Glu Tyr Gly Ser Ile
225                 230                 235                 240
Asn His Thr Tyr His Leu Asp Val Val Glu Arg Ser Pro His Arg Pro
                245                 250                 255
Ile Leu Gln Ala Gly Leu Pro Ala Asn Ala Ser Thr Val Val Gly Gly
            260                 265                 270
Asp Val Glu Phe Val Cys Lys Val Tyr Ser Asp Ala Gln Pro His Ile
        275                 280                 285
Gln Trp Ile Lys His Val Glu Lys Asn Gly Ser Lys Tyr Gly Pro Asp
    290                 295                 300
Gly Leu Pro Tyr Leu Lys Val Leu Lys Ala Ala Gly Val Asn Thr Thr
305                 310                 315                 320
Asp Lys Glu Ile Glu Val Leu Tyr Ile Arg Asn Val Thr Phe Glu Asp
                325                 330                 335
Ala Gly Glu Tyr Thr Cys Leu Ala Gly Asn Ser Ile Gly Ile Ser Phe
            340                 345                 350
His Ser Ala Trp Leu Thr Val Leu Pro Gly Ile Tyr Cys Ser Phe Ser
        355                 360                 365
Leu Gly Phe Phe Pro Phe Ser Trp Leu Thr Ala Ile Lys Leu Thr Gln
    370                 375                 380
Leu Leu Leu Ser Glu Met Ala Pro Phe Ile Leu Ala
385                 390                 395


<210> 69
<211> 317
<212> PRT
<213> Homo sapiens

<400> 69
Met Val Ser Trp Gly Arg Phe Ile Cys Leu Val Val Val Thr Met Ala
 1               5                  10                  15
Thr Leu Ser Leu Ala Arg Pro Ser Phe Ser Leu Val Glu Asp Thr Thr
            20                  25                  30
Leu Glu Pro Glu Glu Pro Pro Thr Lys Tyr Gln Ile Ser Gln Pro Glu
        35                  40                  45
Val Tyr Val Ala Ala Pro Gly Glu Ser Leu Glu Val Arg Cys Leu Leu
    50                  55                  60
Lys Asp Ala Ala Val Ile Ser Trp Thr Lys Asp Gly Val His Leu Gly
65                  70                  75                  80
Pro Asn Asn Arg Thr Val Leu Ile Gly Glu Tyr Leu Gln Ile Lys Gly
                85                  90                  95
Ala Thr Pro Arg Asp Ser Gly Leu Tyr Ala Cys Thr Ala Ser Arg Thr
            100                 105                 110
Val Asp Ser Glu Thr Trp Tyr Phe Met Val Asn Val Thr Asp Ala Ile
        115                 120                 125
Ser Ser Gly Asp Asp Glu Asp Asp Thr Asp Gly Ala Glu Asp Phe Val
```

```
    130                 135                 140
Ser Glu Asn Ser Asn Asn Lys Arg Ala Pro Tyr Trp Thr Asn Thr Glu
145                 150                 155                 160
Lys Met Glu Lys Arg Leu His Ala Val Pro Ala Ala Asn Thr Val Lys
                165                 170                 175
Phe Arg Cys Pro Ala Gly Gly Asn Pro Met Pro Thr Met Arg Trp Leu
            180                 185                 190
Lys Asn Gly Lys Glu Phe Lys Gln Glu His Arg Ile Gly Gly Tyr Lys
        195                 200                 205
Val Arg Asn Gln His Trp Ser Leu Ile Met Glu Ser Val Val Pro Ser
    210                 215                 220
Asp Lys Gly Asn Tyr Thr Cys Val Val Glu Asn Glu Tyr Gly Ser Ile
225                 230                 235                 240
Asn His Thr Tyr His Leu Asp Val Val Glu Arg Ser Pro His Arg Pro
                245                 250                 255
Ile Leu Gln Ala Gly Leu Pro Ala Asn Ala Ser Thr Val Val Gly Gly
            260                 265                 270
Asp Val Glu Phe Val Cys Lys Val Tyr Ser Asp Ala Gln Pro His Ile
        275                 280                 285
Gln Trp Ile Lys His Val Glu Lys Asn Gly Ser Lys Tyr Gly Pro Asp
    290                 295                 300
Gly Leu Pro Tyr Leu Lys Val Leu Lys Val Arg Thr Phe
305                 310                 315


<210> 70
<211> 266
<212> PRT
<213> Homo sapiens

<400> 70
Met Val Ser Trp Gly Arg Phe Ile Cys Leu Val Val Val Thr Met Ala
 1               5                  10                  15
Thr Leu Ser Leu Ala Arg Pro Ser Phe Ser Leu Val Glu Asp Thr Thr
            20                  25                  30
Leu Glu Pro Glu Glu Pro Pro Thr Lys Tyr Gln Ile Ser Gln Pro Glu
        35                  40                  45
Val Tyr Val Ala Ala Pro Gly Glu Ser Leu Glu Val Arg Cys Leu Leu
    50                  55                  60
Lys Asp Ala Ala Val Ile Ser Trp Thr Lys Asp Gly Val His Leu Gly
65                  70                  75                  80
Pro Asn Asn Arg Thr Val Leu Ile Gly Glu Tyr Leu Gln Ile Lys Gly
                85                  90                  95
Ala Thr Pro Arg Asp Ser Gly Leu Tyr Ala Cys Thr Ala Ser Arg Thr
            100                 105                 110
Val Asp Ser Glu Thr Trp Tyr Phe Met Val Asn Val Thr Asp Ala Ile
        115                 120                 125
Ser Ser Gly Asp Asp Glu Asp Asp Thr Asp Gly Ala Glu Asp Phe Val
    130                 135                 140
Ser Glu Asn Ser Asn Asn Lys Arg Ala Pro Tyr Trp Thr Asn Thr Glu
145                 150                 155                 160
Lys Met Glu Lys Arg Leu His Ala Val Pro Ala Ala Asn Thr Val Lys
                165                 170                 175
Phe Arg Cys Pro Ala Gly Gly Asn Pro Met Pro Thr Met Arg Trp Leu
            180                 185                 190
Lys Asn Gly Lys Glu Phe Lys Gln Glu His Arg Ile Gly Gly Tyr Lys
        195                 200                 205
Val Arg Asn Gln His Trp Ser Leu Ile Met Glu Ser Val Val Pro Ser
    210                 215                 220
```

```
Asp Lys Gly Asn Tyr Thr Cys Val Val Glu Asn Glu Tyr Gly Ser Ile
225                 230                 235                 240
Asn His Thr Tyr His Leu Asp Val Val Gly Glu Ser Ala Ser Pro Arg
                245                 250                 255
Val Ala Ala Ala Tyr Gln Pro Ile Leu Ala
            260                 265
```

<210> 71
<211> 336
<212> DNA
<213> Mus musculus

<400> 71
caggtgaagc tgcaggagtc tggcgctgag ttggtgaaac ctggggcttc agtgaagata 60
tcctgcaagg cttctggcta catcttcact gaccatgctc ttcactgggt gaggcagaag 120
cctgaacagg gcctggaatg gattgggtat atttttcccg gaaatggtaa tattgagtac 180
aatgagaagt tcaagggcaa ggccacactg actgcagaca aatcctccag tactgcctac 240
atgcagctca acagcctgac atctggagat tctgcaatgt atttctgtaa aaagatggac 300
tactggggcc aagggaccac ggtcaccgtc tcctca 336

<210> 72
<211> 111
<212> PRT
<213> Mus musculus

<400> 72
```
Val Lys Leu Gln Glu Ser Gly Ala Glu Leu Val Lys Pro Gly Ala Ser
 1               5                  10                  15
Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Ile Phe Thr Asp His Ala
            20                  25                  30
Leu His Trp Val Arg Gln Lys Pro Glu Gln Gly Leu Glu Trp Ile Gly
        35                  40                  45
Tyr Ile Phe Pro Gly Asn Gly Asn Ile Glu Tyr Asn Glu Lys Phe Lys
    50                  55                  60
Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr Met
65                  70                  75                  80
Gln Leu Asn Ser Leu Thr Ser Gly Asp Ser Ala Met Tyr Phe Cys Lys
                85                  90                  95
Lys Met Asp Tyr Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
            100                 105                 110
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<210> 73
<211> 336
<212> DNA
<213> Mus musculus

<400> 73
caggtgaagc tgcaggagtc tggcgctgag ttggtgaaac ctggggcttc agtgaagatc 60
tcctgcaagg cttctggtta caccttcact gaccattcta ttcactgggt gaagcagaag 120
cctggacagg gcctagaatg gattggatat ctttttcccg gaaatggtaa ttttgaatat 180
aatgagaaat tcaagggcaa ggccacactg actgcagaca aatcctccag cactgcctac 240
atgcacctca acagcctgac atctgaggat tctgcagtgt atttctgtaa aaagatggac 300
tactggggcc aagggaccac ggtcaccgtc tcctca 336

<210> 74
<211> 111
<212> PRT

<213> Mus musculus

<400> 74
Val Lys Leu Gln Glu Ser Gly Ala Glu Leu Val Lys Pro Gly Ala Ser
1 5 10 15
Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asp His Ser
20 25 30
Ile His Trp Val Lys Gln Lys Pro Gly Gln Gly Leu Glu Trp Ile Gly
35 40 45
Tyr Leu Phe Pro Gly Asn Gly Asn Phe Glu Tyr Asn Glu Lys Phe Lys
50 55 60
Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr Met
65 70 75 80
His Leu Asn Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Phe Cys Lys
85 90 95
Lys Met Asp Tyr Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
100 105 110

<210> 75
<211> 336
<212> DNA
<213> Mus musculus

<400> 75
caggttcagc tgcagcagtc cgacgctgag ttggtgaaac ctggggcttc agtgaagata 60
tcctgcaggg cttctggcta caccttcact gaccattcta ttcactgggt gaagcagcag 120
cctggccagg gcctggaatg gatcggatat atttttcccg gaaatggaaa tattgaatac 180
aatgacaaat tcaagggcaa ggccacactg actgcagaca aatcctccgg cactgcctac 240
atgcagctca acagcctgac atctgaggat tctgcagtgt atttctgtaa aaggatgggg 300
tactggggtc aaggaacctc agtcaccgtc tcctca 336

<210> 76
<211> 111
<212> PRT
<213> Mus musculus

<400> 76
Val Gln Leu Gln Gln Ser Asp Ala Glu Leu Val Lys Pro Gly Ala Ser
1 5 10 15
Val Lys Ile Ser Cys Arg Ala Ser Gly Tyr Thr Phe Thr Asp His Ser
20 25 30
Ile His Trp Val Lys Gln Gln Pro Gly Gln Gly Leu Glu Trp Ile Gly
35 40 45
Tyr Ile Phe Pro Gly Asn Gly Asn Ile Glu Tyr Asn Asp Lys Phe Lys
50 55 60
Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Gly Thr Ala Tyr Met
65 70 75 80
Gln Leu Asn Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Phe Cys Lys
85 90 95
Arg Met Gly Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser
100 105 110

<210> 77
<211> 360
<212> DNA
<213> Mus musculus

<400> 77
caggtcaagc tgcaggagtc tggacctgaa ctggtaaagc ctggggcttc agtgaagatg 60
tcctgcaagg cttctggata cacattcact aactatgtta tacactgggt gaagcaaaag 120
cctgggcagg gccttgagtg gattggatat attaatcctt acaatgatgg ctctaagtac 180
aatgagaagt tcaaaggcaa ggcctcactg acttcagaca aatcctccag cacagcctac 240
atggagctca gcagcctgac ctctgaggac tctgcggtct attactgtgc aagacatctc 300
gctaatacct actactactt tgactactgg ggccaaggga ccacggtcac cgtctcctca 360

<210> 78
<211> 119
<212> PRT
<213> Mus musculus

<400> 78
Val Lys Leu Gln Glu Ser Gly Pro Glu Leu Val Lys Pro Gly Ala Ser
 1   5   10   15
Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asn Tyr Val
            20   25   30
Ile His Trp Val Lys Gln Lys Pro Gly Gln Gly Leu Glu Trp Ile Gly
        35   40   45
Tyr Ile Asn Pro Tyr Asn Asp Gly Ser Lys Tyr Asn Glu Lys Phe Lys
    50   55   60
Gly Lys Ala Ser Leu Thr Ser Asp Lys Ser Ser Ser Thr Ala Tyr Met
65   70   75   80
Glu Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys Ala
                85   90   95
Arg His Leu Ala Asn Thr Tyr Tyr Tyr Phe Asp Tyr Trp Gly Gln Gly
            100   105   110
Thr Thr Val Thr Val Ser Ser
        115

<210> 79
<211> 336
<212> DNA
<213> Mus musculus

<400> 79
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tcctgcaagg cttctggcta caccttcact gaccattcta ttcactgggt gaagcagaag 120
cctggacagg gcctagaatg gattggatat ctttttcccg gaaatggtaa ttttgagtac 180
aatgaaaaat tcaagggcaa ggccacactg actgcagaca aatcctccag cactgtctac 240
atgtacctca acagcctgac atctgaggat tctgcagtgt atttctgtaa aaggatgggg 300
tactggggcc aagggaccac ggtcaccgtc tcctca 336

<210> 80
<211> 111
<212> PRT
<213> Mus musculus

<400> 80
Val Lys Leu Gln Glu Ser Gly Ala Glu Leu Val Lys Pro Gly Ala Ser
 1   5   10   15
Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asp His Ser
            20   25   30
Ile His Trp Val Lys Gln Lys Pro Gly Gln Gly Leu Glu Trp Ile Gly
        35   40   45
Tyr Leu Phe Pro Gly Asn Gly Asn Phe Glu Tyr Asn Glu Lys Phe Lys

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    50                  55                  60
Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Val Tyr Met
65                  70                  75                  80
Tyr Leu Asn Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Phe Cys Lys
                85                  90                  95
Arg Met Gly Tyr Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
            100                 105                 110


<210> 81
<211> 357
<212> DNA
<213> Mus musculus

<400> 81
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tgcaaggctt ctggatacac attcactaac tatgttatac actgggtgaa gcaaaagcct 120
gggcagggcc ttgagtggat tggatatatt aatccttaca atgatggctc taagtacaat 180
gagaagttca aaggcaaggc ctcactgact tcagacaaat cctccagcac agcctacatg 240
gagctcagca gcctgacctc tgaggactct gcggtctatt actgtgcaag acatctcgct 300
aatacctact actactttga ctactggggc caaggcacca ctctcacagt ctcctca    357

<210> 82
<211> 120
<212> PRT
<213> Mus musculus

<400> 82
Gln Val Gln Leu Gln Glu Ser Gly Pro Glu Leu Val Lys Pro Gly Ala
 1               5                  10                  15
Ser Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asn Tyr
            20                  25                  30
Val Ile His Trp Val Lys Gln Lys Pro Gly Gln Gly Leu Glu Trp Ile
        35                  40                  45
Gly Tyr Ile Asn Pro Tyr Asn Asp Gly Ser Lys Tyr Asn Glu Lys Phe
    50                  55                  60
Lys Gly Lys Ala Ser Leu Thr Ser Asp Lys Ser Ser Ser Thr Ala Tyr
65                  70                  75                  80
Met Glu Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys
                85                  90                  95
Ala Arg His Leu Ala Asn Thr Tyr Tyr Tyr Phe Asp Tyr Trp Gly Gln
            100                 105                 110
Gly Thr Thr Leu Thr Val Ser Ser
        115                 120


<210> 83
<211> 342
<212> DNA
<213> Mus musculus

<400> 83
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atctcttgca gatctagtca gagcattgta catagtaatg gaaacaccta tttagaatgg 120
tacctgcaga aaccaggcca gtctccaaag ctcctgatct acaaagtttc caaccgattt 180
tctggggtcc cagacaggtt cagtggcagt ggatcaggga cagatttcac actcaagatc 240
agcagagtgg aggctgagga tctgggagtt tattactgct ttcaaggttc acatgttcct 300
cctacgttcg gtgctgggac caagctggag ctgaaacggg ct                    342
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<210> 84
<211> 113
<212> PRT
<213> Mus musculus

<400> 84
Asp Val Leu Met Thr Gln Thr Pro Leu Ser Leu Pro Val Ser Leu Gly
1 5 10 15
Asp Gln Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Ile Val His Ser
20 25 30
Asn Gly Asn Thr Tyr Leu Glu Trp Tyr Leu Gln Lys Pro Gly Gln Ser
35 40 45
Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
50 55 60
Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65 70 75 80
Ser Arg Val Glu Ala Glu Asp Leu Gly Val Tyr Tyr Cys Phe Gln Gly
85 90 95
Ser His Val Pro Pro Thr Phe Gly Ala Gly Thr Lys Leu Glu Leu Lys
100 105 110
Arg

<210> 85
<211> 324
<212> DNA
<213> Mus musculus

<400> 85
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atcacatgtc gaacaactga aaatatttac agttattttg tatggtctca gcagagacag 120
ggaaaatctc ctcagctccg ggtctataat gcaaaatcct tagcagaagg tgtgccatca 180
agtttcaatg tcagtgtatc aggcacacag ttttctctga agatcaatag cctgcagcct 240
gaagattttg ggacttatca ctgtcaacac cattatggta ctccgtacac gttcggaggg 300
gggaccaggc tggaaataag acgg 324

<210> 86
<211> 108
<212> PRT
<213> Mus musculus

<400> 86
Asp Ile Gln Met Thr Gln Ser Pro Ala Ser Leu Ser Ala Ser Val Gly
1 5 10 15
Glu Thr Val Thr Ile Thr Cys Arg Thr Thr Glu Asn Ile Tyr Ser Tyr
20 25 30
Phe Val Trp Ser Gln Gln Arg Gln Gly Lys Ser Pro Gln Leu Arg Val
35 40 45
Tyr Asn Ala Lys Ser Leu Ala Glu Gly Val Pro Ser Ser Phe Asn Val
50 55 60
Ser Val Ser Gly Thr Gln Phe Ser Leu Lys Ile Asn Ser Leu Gln Pro
65 70 75 80
Glu Asp Phe Gly Thr Tyr His Cys Gln His His Tyr Gly Thr Pro Tyr
85 90 95
Thr Phe Gly Gly Gly Thr Arg Leu Glu Ile Arg Arg
100 105

<210> 87
<211> 336
<212> DNA
<213> Mus musculus

<400> 87
gacattgtgc tgacacagtc tcctgcttcc ttagctgtat ctctggggca gagggccacc 60
atctcgtaca gggccagcaa aagtgtcagt acatctggct atagttatat gcactggaac 120
caacagaaac caggacagcc acccagactc ctcatctatc ttgtatccaa cctagaatct 180
ggggtccctg ccaggttcag tggcagtggg tctgggacag acttcaccct caacatccat 240
cctgtggagg aggaggatgc tgcaacctat tactgtcagc acattaggga gcttacacgt 300
tcggaggggg gcaccaagct ggaaatcaaa cggaga 336

<210> 88
<211> 112
<212> PRT
<213> Mus musculus

<400> 88
Asp Ile Val Leu Thr Gln Ser Pro Ala Ser Leu Ala Val Ser Leu Gly
1 5 10 15
Gln Arg Ala Thr Ile Ser Tyr Arg Ala Ser Lys Ser Val Ser Thr Ser
20 25 30
Gly Tyr Ser Tyr Met His Trp Asn Gln Gln Lys Pro Gly Gln Pro Pro
35 40 45
Arg Leu Leu Ile Tyr Leu Val Ser Asn Leu Glu Ser Gly Val Pro Ala
50 55 60
Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Asn Ile His
65 70 75 80
Pro Val Glu Glu Glu Asp Ala Ala Thr Tyr Tyr Cys Gln His Ile Arg
85 90 95
Glu Leu Thr Arg Ser Glu Gly Gly Thr Lys Leu Glu Ile Lys Arg Arg
100 105 110

<210> 89
<211> 327
<212> DNA
<213> Mus musculus

<400> 89
gacatcaaga tgacccagtc tccatcctcc atgtatgcat cgctgggaga gagagtcact 60
atcacttgca aggcgagtca ggacattaaa agctatttaa gctggtacca gcagaaacca 120
tggaaatctc ctaagaccct gatctattat gcaacaagct tggcagatgg ggtcccatca 180
agattcagtg gcagtggatc tgggcaagat tattctctaa ccatcagcag cctggagtct 240
gacgatacag caacttatta ctgtctacag catggtgaga gcccgtacac gttcggaggg 300
gggaccaagc tggaaataaa acgggct 327

<210> 90
<211> 108
<212> PRT
<213> Mus musculus

<400> 90
Asp Ile Lys Met Thr Gln Ser Pro Ser Ser Met Tyr Ala Ser Leu Gly
1 5 10 15
Glu Arg Val Thr Ile Thr Cys Lys Ala Ser Gln Asp Ile Lys Ser Tyr
20 25 30
Leu Ser Trp Tyr Gln Gln Lys Pro Trp Lys Ser Pro Lys Thr Leu Ile

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        35                  40                  45
Tyr Tyr Ala Thr Ser Leu Ala Asp Gly Val Pro Ser Arg Phe Ser Gly
    50                  55                  60
Ser Gly Ser Gly Gln Asp Tyr Ser Leu Thr Ile Ser Ser Leu Glu Ser
65                  70                  75                  80
Asp Asp Thr Ala Thr Tyr Tyr Cys Leu Gln His Gly Glu Ser Pro Phe
                85                  90                  95
Thr Phe Gly Ser Gly Thr Lys Leu Glu Ile Lys Arg
            100                 105
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<210> 91
<211> 327
<212> DNA
<213> Mus musculus

<400> 91
gatgttgtgc taactcagtc tcctgccacc ctgtctgtga ctccaggaga tagagtcagt 60
ctttcctgca gggccagcca aaatattggc aactacctac actggtatca acagaaatca 120
catgagtctc caaggcttct catcaagtat gcttcccagt ccatctctgg gatcccctcc 180
aggttcagtg gcagtggatc agtcacagat ttcactctca atatcaacag tgtggagact 240
gaagattttg gaatgtattt ctgtcaacag agtgacacct ggcctctcac gttcggtgct 300
gggaccaagc tggagctgaa acgggct 327

<210> 92
<211> 108
<212> PRT
<213> Mus musculus

<400> 92
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Asp Val Val Leu Thr Gln Ser Pro Ala Thr Leu Ser Val Thr Pro Gly
 1               5                  10                  15
Asp Arg Val Ser Leu Ser Cys Arg Ala Ser Gln Asn Ile Gly Asn Tyr
            20                  25                  30
Leu His Trp Tyr Gln Gln Lys Ser His Glu Ser Pro Arg Leu Leu Ile
        35                  40                  45
Lys Tyr Ala Ser Gln Ser Ile Ser Gly Ile Pro Ser Arg Phe Ser Gly
    50                  55                  60
Ser Gly Ser Val Thr Asp Phe Thr Leu Asn Ile Asn Ser Val Glu Thr
65                  70                  75                  80
Glu Asp Phe Gly Met Tyr Phe Cys Gln Gln Ser Asp Thr Trp Pro Leu
                85                  90                  95
Thr Phe Gly Ala Gly Thr Lys Leu Glu Leu Lys Arg
            100                 105
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<210> 93
<211> 8
<212> PRT
<213> Mus musculus

<400> 93
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Thr Phe Thr Asp His Ser Ile His
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<210> 94
<211> 8
<212> PRT

<213> Mus musculus

<400> 94
Thr Phe Thr Asn Tyr Val Ile His
1 5

<210> 95
<211> 8
<212> PRT
<213> Mus musculus

<400> 95
Ile Phe Thr Asp His Ala Leu His
1 5

<210> 96
<211> 17
<212> PRT
<213> Mus musculus

<400> 96
Tyr Ile Phe Pro Gly Asn Gly Asn Ile Glu Tyr Asn Asp Lys Phe Lys
1 5 10 15
Gly

<210> 97
<211> 17
<212> PRT
<213> Mus musculus

<400> 97
Tyr Leu Phe Pro Gly Asn Gly Asn Phe Glu Tyr Asn Glu Lys Phe Lys
1 5 10 15
Gly

<210> 98
<211> 17
<212> PRT
<213> Mus musculus

<400> 98
Tyr Ile Asn Pro Tyr Asn Asp Gly Ser Lys Tyr Asn Glu Lys Phe Lys
1 5 10 15
Gly

<210> 99
<211> 17
<212> PRT
<213> Mus musculus

<400> 99

Tyr Ile Phe Pro Gly Asn Gly Asn Ile Glu Tyr Asn Glu Lys Phe Lys
1 5 10 15
Gly

<210> 100
<211> 5
<212> PRT
<213> Mus musculus

<400> 100
Lys Arg Met Gly Tyr
1 5

<210> 101
<211> 5
<212> PRT
<213> Mus musculus

<400> 101
Lys Lys Met Asp Tyr
1 5

<210> 102
<211> 13
<212> PRT
<213> Mus musculus

<400> 102
Ala Arg His Leu Ala Asn Thr Tyr Tyr Tyr Phe Asp Tyr
1 5 10

<210> 103
<211> 16
<212> PRT
<213> Mus musculus

<400> 103
Arg Ser Ser Gln Ser Ile Val His Ser Asn Gly Asn Thr Tyr Leu Glu
1 5 10 15

<210> 104
<211> 11
<212> PRT
<213> Mus musculus

<400> 104
Arg Thr Thr Glu Asn Ile Tyr Ser Tyr Phe Val
1 5 10

<210> 105
<211> 15
<212> PRT

<213> Mus musculus

<400> 105
Arg Ala Ser Lys Ser Val Ser Thr Ser Gly Tyr Ser Tyr Met His
1 5 10 15

<210> 106
<211> 11
<212> PRT
<213> Mus musculus

<400> 106
Lys Ala Ser Gln Asp Ile Lys Ser Tyr Leu Ser
1 5 10

<210> 107
<211> 11
<212> PRT
<213> Mus musculus

<400> 107
Arg Ala Ser Gln Asn Ile Gly Asn Tyr Leu His
1 5 10

<210> 108
<211> 7
<212> PRT
<213> Mus musculus

<400> 108
Lys Val Ser Asn Arg Phe Ser
1 5

<210> 109
<211> 7
<212> PRT
<213> Mus musculus

<400> 109
Asn Ala Lys Ser Leu Ala Glu
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<210> 110
<211> 7
<212> PRT
<213> Mus musculus

<400> 110
Leu Val Ser Asn Leu Glu Ser
1 5

<210> 111
<211> 7

<212> PRT
<213> Mus musculus

<400> 111
Tyr Ala Thr Ser Leu Ala Asp
1 5

<210> 112
<211> 7
<212> PRT
<213> Mus musculus

<400> 112
Tyr Ala Ser Gln Ser Ile Ser
1 5

<210> 113
<211> 9
<212> PRT
<213> Mus musculus

<400> 113
Phe Gln Gly Ser His Val Pro Pro Thr
1 5

<210> 114
<211> 9
<212> PRT
<213> Mus musculus

<400> 114
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1 5

<210> 115
<211> 9
<212> PRT
<213> Mus musculus

<400> 115
Gln His Ile Arg Glu Leu Thr Arg Ser
1 5

<210> 116
<211> 9
<212> PRT
<213> Mus musculus

<400> 116
Leu Gln His Gly Glu Ser Pro Phe Thr
1 5

<210> 117

<211> 9
<212> PRT
<213> Mus musculus

<400> 117
Gln Gln Ser Asp Thr Trp Pro Leu Thr
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<210> 118
<211> 5
<212> PRT
<213> Mus musculus

<400> 118
Asp His Ala Leu His
 1   5

<210> 119
<211> 5
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<213> Mus musculus

<400> 119
Asp His Ser Ile His
 1   5

<210> 120
<211> 5
<212> PRT
<213> Mus musculus

<400> 120
Asn Tyr Val Ile His
 1   5

<210> 121
<211> 9
<212> PRT
<213> Mus musculus

<400> 121
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 1   5

<210> 122
<211> 9
<212> PRT
<213> Mus musculus

<400> 122
Leu Phe Pro Gly Asn Gly Asn Phe Glu
 1   5

<210> 123
<211> 9
<212> PRT
<213> Mus musculus

<400> 123
Ile Asn Pro Tyr Asn Asp Gly Ser Lys
1 5

<210> 124
<211> 11
<212> PRT
<213> Mus musculus

<400> 124
His Leu Ala Asn Thr Tyr Tyr Tyr Phe Asp Tyr
1 5 10

<210> 125
<211> 5
<212> PRT
<213> Mus musculus

<400> 125
Ser Asn Gly Asn Thr
1 5

<210> 126
<211> 5
<212> PRT
<213> Mus musculus

<400> 126
Glu Asn Ile Tyr Ser
1 5

<210> 127
<211> 5
<212> PRT
<213> Mus musculus

<400> 127
Thr Ser Gly Tyr Ser
1 5

<210> 128
<211> 5
<212> PRT
<213> Mus musculus

<400> 128
Gln Asp Ile Lys Ser
1 5

<210> 129
<211> 5
<212> PRT
<213> Mus musculus

<400> 129
Gln Asn Ile Gly Asn
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<210> 130
<211> 4654
<212> DNA
<213> Homo sapiens

<400> 130
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cctggcccgg cgcggcgact gctctccggg ctggcggggg ccggccgcga gccccggggg 180
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gagcgttgcc attcaagtga ctgcagcagc agcggcagcg cctcggttcc tgagcccacc 540
gcaggctgaa ggcattgcgc gtagtccatg cccgtagagg aagtgtgcag atgggattaa 600
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agaagccaga cttcagcagc cagccggctg tgcacaagct gaccaaacgt atccccctgc 1920
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agtatgaact tccagaggac ccaaaatggg agtttccaag agataagctg acactgggca 2100
agcccctggg agaaggttgc tttgggcaag tggtcatggc ggaagcagtg ggaattgaca 2160
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<211> 2053
<212> DNA
<213> Homo sapiens

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<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxyl-terminus at
the P1 residue of the scissile bond of the BoNT/A
cleavage site

<400> 147
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<210> 148
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxyl-terminus at the P1 residue of the scissile bond of the BoNT/A cleavage site

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