SEQUENCE LISTING

<110> Wang, Joanne
Zhu, Hong
Hodges, D. Dianne
Fernandez-Salas, Ester

<120> Immuno-Based Retargeted Endopeptidase
Activity Assays

<130> 18496 (BOT)

<150> US 61/160,217
<151> 2009-03-13

<160> 153

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 903
<212> PRT
<213> Artificial Sequence

<220>
<223> Retargeted endopeptidase

<400> 1

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Met Gly Ser Met Glu Phe Val Asn Lys Gln Phe Asn Tyr Lys Asp Pro
 1               5                  10                  15
Val Asn Gly Val Asp Ile Ala Tyr Ile Lys Ile Pro Asn Ala Gly Gln
            20                  25                  30
Met Gln Pro Val Lys Ala Phe Lys Ile His Asn Lys Ile Trp Val Ile
        35                  40                  45
Pro Glu Arg Asp Thr Phe Thr Asn Pro Glu Glu Gly Asp Leu Asn Pro
    50                  55                  60
Pro Pro Glu Ala Lys Gln Val Pro Val Ser Tyr Tyr Asp Ser Thr Tyr
65                  70                  75                  80
Leu Ser Thr Asp Asn Glu Lys Asp Asn Tyr Leu Lys Gly Val Thr Lys
                85                  90                  95
Leu Phe Glu Arg Ile Tyr Ser Thr Asp Leu Gly Arg Met Leu Leu Thr
            100                 105                 110
Ser Ile Val Arg Gly Ile Pro Phe Trp Gly Gly Ser Thr Ile Asp Thr
        115                 120                 125
Glu Leu Lys Val Ile Asp Thr Asn Cys Ile Asn Val Ile Gln Pro Asp
    130                 135                 140
Gly Ser Tyr Arg Ser Glu Glu Leu Asn Leu Val Ile Ile Gly Pro Ser
145                 150                 155                 160
Ala Asp Ile Ile Gln Phe Glu Cys Lys Ser Phe Gly His Glu Val Leu
                165                 170                 175
Asn Leu Thr Arg Asn Gly Tyr Gly Ser Thr Gln Tyr Ile Arg Phe Ser
            180                 185                 190
Pro Asp Phe Thr Phe Gly Phe Glu Glu Ser Leu Glu Val Asp Thr Asn
        195                 200                 205
Pro Leu Leu Gly Ala Gly Lys Phe Ala Thr Asp Pro Ala Val Thr Leu
    210                 215                 220
Ala His Glu Leu Ile His Ala Gly His Arg Leu Tyr Gly Ile Ala Ile
225                 230                 235                 240
Asn Pro Asn Arg Val Phe Lys Val Asn Thr Asn Ala Tyr Tyr Glu Met
                245                 250                 255
Ser Gly Leu Glu Val Ser Phe Glu Glu Leu Arg Thr Phe Gly Gly His
            260                 265                 270
Asp Ala Lys Phe Ile Asp Ser Leu Gln Glu Asn Glu Phe Arg Leu Tyr
        275                 280                 285
Tyr Tyr Asn Lys Phe Lys Asp Ile Ala Ser Thr Leu Asn Lys Ala Lys
    290                 295                 300
Ser Ile Val Gly Thr Thr Ala Ser Leu Gln Tyr Met Lys Asn Val Phe
305                 310                 315                 320
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Lys Glu Lys Tyr Leu Leu Ser Glu Asp Thr Ser Gly Lys Phe Ser Val
325 330 335
Asp Lys Leu Lys Phe Asp Lys Leu Tyr Lys Met Leu Thr Glu Ile Tyr
340 345 350
Thr Glu Asp Asn Phe Val Lys Phe Phe Lys Val Leu Asn Arg Lys Thr
355 360 365
Tyr Leu Asn Phe Asp Lys Ala Val Phe Lys Ile Asn Ile Val Pro Lys
370 375 380
Val Asn Tyr Thr Ile Tyr Asp Gly Phe Asn Leu Arg Asn Thr Asn Leu
385 390 395 400
Ala Ala Asn Phe Asn Gly Gln Asn Thr Glu Ile Asn Asn Met Asn Phe
405 410 415
Thr Lys Leu Lys Asn Phe Thr Gly Leu Phe Glu Phe Tyr Lys Leu Leu
420 425 430
Cys Val Asp Gly Ile Ile Thr Ser Lys Thr Lys Ser Asp Asp Asp Asp
435 440 445
Lys Phe Gly Gly Phe Thr Gly Ala Arg Lys Ser Ala Arg Lys Arg Lys
450 455 460
Asn Gln Ala Leu Ala Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
465 470 475 480
Gly Gly Gly Ser Ala Leu Val Leu Gln Cys Ile Lys Val Asn Asn Trp
485 490 495
Asp Leu Phe Phe Ser Pro Ser Glu Asp Asn Phe Thr Asn Asp Leu Asn
500 505 510
Lys Gly Glu Glu Ile Thr Ser Asp Thr Asn Ile Glu Ala Ala Glu Glu
515 520 525
Asn Ile Ser Leu Asp Leu Ile Gln Gln Tyr Tyr Leu Thr Phe Asn Phe
530 535 540
Asp Asn Glu Pro Glu Asn Ile Ser Ile Glu Asn Leu Ser Ser Asp Ile
545 550 555 560
Ile Gly Gln Leu Glu Leu Met Pro Asn Ile Glu Arg Phe Pro Asn Gly
565 570 575
Lys Lys Tyr Glu Leu Asp Lys Tyr Thr Met Phe His Tyr Leu Arg Ala
580 585 590
Gln Glu Phe Glu His Gly Lys Ser Arg Ile Ala Leu Thr Asn Ser Val
595 600 605
Asn Glu Ala Leu Leu Asn Pro Ser Arg Val Tyr Thr Phe Phe Ser Ser
610 615 620
Asp Tyr Val Lys Lys Val Asn Lys Ala Thr Glu Ala Ala Met Phe Leu
625 630 635 640
Gly Trp Val Glu Gln Leu Val Tyr Asp Phe Thr Asp Glu Thr Ser Glu
645 650 655
Val Ser Thr Thr Asp Lys Ile Ala Asp Ile Thr Ile Ile Ile Pro Tyr
660 665 670
Ile Gly Pro Ala Leu Asn Ile Gly Asn Met Leu Tyr Lys Asp Asp Phe
675 680 685
Val Gly Ala Leu Ile Phe Ser Gly Ala Val Ile Leu Leu Glu Phe Ile
690 695 700
Pro Glu Ile Ala Ile Pro Val Leu Gly Thr Phe Ala Leu Val Ser Tyr
705 710 715 720
Ile Ala Asn Lys Val Leu Thr Val Gln Thr Ile Asp Asn Ala Leu Ser
725 730 735
Lys Arg Asn Glu Lys Trp Asp Glu Val Tyr Lys Tyr Ile Val Thr Asn
740 745 750
Trp Leu Ala Lys Val Asn Thr Gln Ile Asp Leu Ile Arg Lys Lys Met
755 760 765
Lys Glu Ala Leu Glu Asn Gln Ala Glu Ala Thr Lys Ala Ile Ile Asn
770 775 780
Tyr Gln Tyr Asn Gln Tyr Thr Glu Glu Glu Lys Asn Asn Ile Asn Phe
785 790 795 800
Asn Ile Asp Asp Leu Ser Ser Lys Leu Asn Glu Ser Ile Asn Lys Ala
805 810 815
Met Ile Asn Ile Asn Lys Phe Leu Asn Gln Cys Ser Val Ser Tyr Leu
820 825 830
Met Asn Ser Met Ile Pro Tyr Gly Val Lys Arg Leu Glu Asp Phe Asp
835 840 845
Ala Ser Leu Lys Asp Ala Leu Leu Lys Tyr Ile Tyr Asp Asn Arg Gly
850 855 860

Thr Leu Ile Gly Gln Val Asp Arg Leu Lys Asp Lys Val Asn Asn Thr
865 870 875 880
Leu Ser Thr Asp Ile Pro Phe Gln Leu Ser Lys Tyr Val Asp Asn Gln
885 890 895
Arg Leu Leu Ser Thr Leu Asp
900

<210> 2
<211> 908
<212> PRT
<213> Artificial Sequence

<220>
<223> Retargeted endopeptidase

<400> 2
Met Gly Ser Met Glu Phe Val Asn Lys Gln Phe Asn Tyr Lys Asp Pro
1 5 10 15
Val Asn Gly Val Asp Ile Ala Tyr Ile Lys Ile Pro Asn Ala Gly Gln
20 25 30
Met Gln Pro Val Lys Ala Phe Lys Ile His Asn Lys Ile Trp Val Ile
35 40 45
Pro Glu Arg Asp Thr Phe Thr Asn Pro Glu Glu Gly Asp Leu Asn Pro
50 55 60
Pro Pro Glu Ala Lys Gln Val Pro Val Ser Tyr Tyr Asp Ser Thr Tyr
65 70 75 80
Leu Ser Thr Asp Asn Glu Lys Asp Asn Tyr Leu Lys Gly Val Thr Lys
85 90 95
Leu Phe Glu Arg Ile Tyr Ser Thr Asp Leu Gly Arg Met Leu Leu Thr
100 105 110
Ser Ile Val Arg Gly Ile Pro Phe Trp Gly Gly Ser Thr Ile Asp Thr
115 120 125
Glu Leu Lys Val Ile Asp Thr Asn Cys Ile Asn Val Ile Gln Pro Asp
130 135 140
Gly Ser Tyr Arg Ser Glu Glu Leu Asn Leu Val Ile Ile Gly Pro Ser
145 150 155 160
Ala Asp Ile Ile Gln Phe Glu Cys Lys Ser Phe Gly His Glu Val Leu
165 170 175
Asn Leu Thr Arg Asn Gly Tyr Gly Ser Thr Gln Tyr Ile Arg Phe Ser
180 185 190
Pro Asp Phe Thr Phe Gly Phe Glu Glu Ser Leu Glu Val Asp Thr Asn
195 200 205
Pro Leu Leu Gly Ala Gly Lys Phe Ala Thr Asp Pro Ala Val Thr Leu
210 215 220
Ala His Glu Leu Ile His Ala Gly His Arg Leu Tyr Gly Ile Ala Ile
225 230 235 240
Asn Pro Asn Arg Val Phe Lys Val Asn Thr Asn Ala Tyr Tyr Glu Met
245 250 255
Ser Gly Leu Glu Val Ser Phe Glu Glu Leu Arg Thr Phe Gly Gly His
260 265 270
Asp Ala Lys Phe Ile Asp Ser Leu Gln Glu Asn Glu Phe Arg Leu Tyr
275 280 285
Tyr Tyr Asn Lys Phe Lys Asp Ile Ala Ser Thr Leu Asn Lys Ala Lys
290 295 300
Ser Ile Val Gly Thr Thr Ala Ser Leu Gln Tyr Met Lys Asn Val Phe
305 310 315 320
Lys Glu Lys Tyr Leu Leu Ser Glu Asp Thr Ser Gly Lys Phe Ser Val
325 330 335
Asp Lys Leu Lys Phe Asp Lys Leu Tyr Lys Met Leu Thr Glu Ile Tyr
340 345 350
Thr Glu Asp Asn Phe Val Lys Phe Phe Lys Val Leu Asn Arg Lys Thr
355 360 365
Tyr Leu Asn Phe Asp Lys Ala Val Phe Lys Ile Asn Ile Val Pro Lys
370 375 380
Val Asn Tyr Thr Ile Tyr Asp Gly Phe Asn Leu Arg Asn Thr Asn Leu
385 390 395 400
Ala Ala Asn Phe Asn Gly Gln Asn Thr Glu Ile Asn Asn Met Asn Phe

405 410 415
Thr Lys Leu Lys Asn Phe Thr Gly Leu Phe Glu Phe Tyr Lys Leu Leu
420 425 430
Cys Val Asp Gly Ile Ile Thr Ser Lys Thr Lys Ser Asp Asp Asp Asp
435 440 445
Lys Tyr Gly Gly Phe Leu Arg Arg Ile Arg Pro Lys Leu Lys Trp Asp
450 455 460
Asn Gln Ala Leu Ala Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
465 470 475 480
Gly Gly Gly Ser Ala Leu Val Leu Gln Cys Ile Lys Val Asn Asn Trp
485 490 495
Asp Leu Phe Phe Ser Pro Ser Glu Asp Asn Phe Thr Asn Asp Leu Asn
500 505 510
Lys Gly Glu Glu Ile Thr Ser Asp Thr Asn Ile Glu Ala Ala Glu Glu
515 520 525
Asn Ile Ser Leu Asp Leu Ile Gln Gln Tyr Tyr Leu Thr Phe Asn Phe
530 535 540
Asp Asn Glu Pro Glu Asn Ile Ser Ile Glu Asn Leu Ser Ser Asp Ile
545 550 555 560
Ile Gly Gln Leu Glu Leu Met Pro Asn Ile Glu Arg Phe Pro Asn Gly
565 570 575
Lys Lys Tyr Glu Leu Asp Lys Tyr Thr Met Phe His Tyr Leu Arg Ala
580 585 590
Gln Glu Phe Glu His Gly Lys Ser Arg Ile Ala Leu Thr Asn Ser Val
595 600 605
Asn Glu Ala Leu Leu Asn Pro Ser Arg Val Tyr Thr Phe Phe Ser Ser
610 615 620
Asp Tyr Val Lys Lys Val Asn Lys Ala Thr Glu Ala Ala Met Phe Leu
625 630 635 640
Gly Trp Val Glu Gln Leu Val Tyr Asp Phe Thr Asp Glu Thr Ser Glu
645 650 655
Val Ser Thr Thr Asp Lys Ile Ala Asp Ile Thr Ile Ile Ile Pro Tyr
660 665 670
Ile Gly Pro Ala Leu Asn Ile Gly Asn Met Leu Tyr Lys Asp Asp Phe
675 680 685
Val Gly Ala Leu Ile Phe Ser Gly Ala Val Ile Leu Leu Glu Phe Ile
690 695 700
Pro Glu Ile Ala Ile Pro Val Leu Gly Thr Phe Ala Leu Val Ser Tyr
705 710 715 720
Ile Ala Asn Lys Val Leu Thr Val Gln Thr Ile Asp Asn Ala Leu Ser
725 730 735
Lys Arg Asn Glu Lys Trp Asp Glu Val Tyr Lys Tyr Ile Val Thr Asn
740 745 750
Trp Leu Ala Lys Val Asn Thr Gln Ile Asp Leu Ile Arg Lys Lys Met
755 760 765
Lys Glu Ala Leu Glu Asn Gln Ala Glu Ala Thr Lys Ala Ile Ile Asn
770 775 780
Tyr Gln Tyr Asn Gln Tyr Thr Glu Glu Glu Lys Asn Asn Ile Asn Phe
785 790 795 800
Asn Ile Asp Asp Leu Ser Ser Lys Leu Asn Glu Ser Ile Asn Lys Ala
805 810 815
Met Ile Asn Ile Asn Lys Phe Leu Asn Gln Cys Ser Val Ser Tyr Leu
820 825 830
Met Asn Ser Met Ile Pro Tyr Gly Val Lys Arg Leu Glu Asp Phe Asp
835 840 845
Ala Ser Leu Lys Asp Ala Leu Leu Lys Tyr Ile Tyr Asp Asn Arg Gly
850 855 860
Thr Leu Ile Gly Gln Val Asp Arg Leu Lys Asp Lys Val Asn Asn Thr
865 870 875 880
Leu Ser Thr Asp Ile Pro Phe Gln Leu Ser Lys Tyr Val Asp Asn Gln
885 890 895
Arg Leu Leu Ser Thr Leu Glu Ala Leu Ala Ser Gly
900 905

<210> 3
<211> 906
<212> PRT

<213> Artificial Sequence

<220>
<223> Retargeted endopeptidase

<400> 3
Ile Ser Glu Phe Gly Ser Met Glu Phe Val Asn Lys Gln Phe Asn Tyr
1 5 10 15
Lys Asp Pro Val Asn Gly Val Asp Ile Ala Tyr Ile Lys Ile Pro Asn
20 25 30
Ala Gly Gln Met Gln Pro Val Lys Ala Phe Lys Ile His Asn Lys Ile
35 40 45
Trp Val Ile Pro Glu Arg Asp Thr Phe Thr Asn Pro Glu Glu Gly Asp
50 55 60
Leu Asn Pro Pro Pro Glu Ala Lys Gln Val Pro Val Ser Tyr Tyr Asp
65 70 75 80
Ser Thr Tyr Leu Ser Thr Asp Asn Glu Lys Asp Asn Tyr Leu Lys Gly
85 90 95
Val Thr Lys Leu Phe Glu Arg Ile Tyr Ser Thr Asp Leu Gly Arg Met
100 105 110
Leu Leu Thr Ser Ile Val Arg Gly Ile Pro Phe Trp Gly Gly Ser Thr
115 120 125
Ile Asp Thr Glu Leu Lys Val Ile Asp Thr Asn Cys Ile Asn Val Ile
130 135 140
Gln Pro Asp Gly Ser Tyr Arg Ser Glu Glu Leu Asn Leu Val Ile Ile
145 150 155 160
Gly Pro Ser Ala Asp Ile Ile Gln Phe Glu Cys Lys Ser Phe Gly His
165 170 175
Glu Val Leu Asn Leu Thr Arg Asn Gly Tyr Gly Ser Thr Gln Tyr Ile
180 185 190
Arg Phe Ser Pro Asp Phe Thr Phe Gly Phe Glu Glu Ser Leu Glu Val
195 200 205
Asp Thr Asn Pro Leu Leu Gly Ala Gly Lys Phe Ala Thr Asp Pro Ala
210 215 220
Val Thr Leu Ala His Glu Leu Ile His Ala Gly His Arg Leu Tyr Gly
225 230 235 240
Ile Ala Ile Asn Pro Asn Arg Val Phe Lys Val Asn Thr Asn Ala Tyr
245 250 255
Tyr Glu Met Ser Gly Leu Glu Val Ser Phe Glu Glu Leu Arg Thr Phe
260 265 270
Gly Gly His Asp Ala Lys Phe Ile Asp Ser Leu Gln Glu Asn Glu Phe
275 280 285
Arg Leu Tyr Tyr Tyr Asn Lys Phe Lys Asp Ile Ala Ser Thr Leu Asn
290 295 300
Lys Ala Lys Ser Ile Val Gly Thr Thr Ala Ser Leu Gln Tyr Met Lys
305 310 315 320
Asn Val Phe Lys Glu Lys Tyr Leu Leu Ser Glu Asp Thr Ser Gly Lys
325 330 335
Phe Ser Val Asp Lys Leu Lys Phe Asp Lys Leu Tyr Lys Met Leu Thr
340 345 350
Glu Ile Tyr Thr Glu Asp Asn Phe Val Lys Phe Phe Lys Val Leu Asn
355 360 365
Arg Lys Thr Tyr Leu Asn Phe Asp Lys Ala Val Phe Lys Ile Asn Ile
370 375 380
Val Pro Lys Val Asn Tyr Thr Ile Tyr Asp Gly Phe Asn Leu Arg Asn
385 390 395 400
Thr Asn Leu Ala Ala Asn Phe Asn Gly Gln Asn Thr Glu Ile Asn Asn
405 410 415
Met Asn Phe Thr Lys Leu Lys Asn Phe Thr Gly Leu Phe Glu Phe Tyr
420 425 430
Lys Leu Leu Cys Val Asp Gly Ile Ile Thr Ser Lys Thr Lys Ser Leu
435 440 445
Ile Glu Gly Arg Asn Lys Ala Leu Asn Asp Leu Cys Ile Lys Val Asn
450 455 460
Asn Trp Asp Leu Phe Phe Ser Pro Ser Glu Asp Asn Phe Thr Asn Asp
465 470 475 480
Leu Asn Lys Gly Glu Glu Ile Thr Ser Asp Thr Asn Ile Glu Ala Ala
485 490 495

```
Glu Glu Asn Ile Ser Leu Asp Leu Ile Gln Gln Tyr Tyr Leu Thr Phe
            500                 505                 510
Asn Phe Asp Asn Glu Pro Glu Asn Ile Ser Ile Glu Asn Leu Ser Ser
        515                 520                 525
Asp Ile Ile Gly Gln Leu Glu Leu Met Pro Asn Ile Glu Arg Phe Pro
    530                 535                 540
Asn Gly Lys Lys Tyr Glu Leu Asp Lys Tyr Thr Met Phe His Tyr Leu
545                 550                 555                 560
Arg Ala Gln Glu Phe Glu His Gly Lys Ser Arg Ile Ala Leu Thr Asn
                565                 570                 575
Ser Val Asn Glu Ala Leu Leu Asn Pro Ser Arg Val Tyr Thr Phe Phe
            580                 585                 590
Ser Ser Asp Tyr Val Lys Lys Val Asn Lys Ala Thr Glu Ala Ala Met
        595                 600                 605
Phe Leu Gly Trp Val Glu Gln Leu Val Tyr Asp Phe Thr Asp Glu Thr
    610                 615                 620
Ser Glu Val Ser Thr Thr Asp Lys Ile Ala Asp Ile Thr Ile Ile Ile
625                 630                 635                 640
Pro Tyr Ile Gly Pro Ala Leu Asn Ile Gly Asn Met Leu Tyr Lys Asp
                645                 650                 655
Asp Phe Val Gly Ala Leu Ile Phe Ser Gly Ala Val Ile Leu Leu Glu
            660                 665                 670
Phe Ile Pro Glu Ile Ala Ile Pro Val Leu Gly Thr Phe Ala Leu Val
        675                 680                 685
Ser Tyr Ile Ala Asn Lys Val Leu Thr Val Gln Thr Ile Asp Asn Ala
    690                 695                 700
Leu Ser Lys Arg Asn Glu Lys Trp Asp Glu Val Tyr Lys Tyr Ile Val
705                 710                 715                 720
Thr Asn Trp Leu Ala Lys Val Asn Thr Gln Ile Asp Leu Ile Arg Lys
                725                 730                 735
Lys Met Lys Glu Ala Leu Glu Asn Gln Ala Glu Ala Thr Lys Ala Ile
            740                 745                 750
Ile Asn Tyr Gln Tyr Asn Gln Tyr Thr Glu Glu Glu Lys Asn Asn Ile
        755                 760                 765
Asn Phe Asn Ile Asp Asp Leu Ser Ser Lys Leu Asn Glu Ser Ile Asn
    770                 775                 780
Lys Ala Met Ile Asn Ile Asn Lys Phe Leu Asn Gln Cys Ser Val Ser
785                 790                 795                 800
Tyr Leu Met Asn Ser Met Ile Pro Tyr Gly Val Lys Arg Leu Glu Asp
                805                 810                 815
Phe Asp Ala Ser Leu Lys Asp Ala Leu Leu Lys Tyr Ile Tyr Asp Asn
            820                 825                 830
Arg Gly Thr Leu Ile Gly Gln Val Asp Arg Leu Lys Asp Lys Val Asn
        835                 840                 845
Asn Thr Leu Ser Thr Asp Ile Pro Phe Gln Leu Ser Lys Tyr Val Asp
    850                 855                 860
Asn Gln Arg Leu Leu Ser Thr Leu Glu Gly Gly Gly Gly Ser Gly Gly
865                 870                 875                 880
Gly Gly Ser Gly Gly Gly Gly Ser Ala Leu Val Val Gly Arg Pro Glu
                885                 890                 895
Trp Trp Met Asp Tyr Gln Lys Arg Tyr Gly
            900                 905
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<210> 4
<211> 919
<212> PRT
<213> Artificial Sequence

<220>
<223> Retargeted endopeptidase

<400> 4

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Met Glu 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 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
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 Asp
            420                 425                 430
Gly Ile Ile Thr Ser Lys Thr Lys Ser Asp Asp Asp Asp Lys Tyr Gly
        435                 440                 445
Gly Phe Met Thr Ser Glu Lys Ser Gln Thr Pro Leu Val Thr Leu Phe
    450                 455                 460
Lys Asn Ala Ile Ile Lys Asn Ala Tyr Lys Lys Gly Glu Ala Leu Ala
465                 470                 475                 480
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ala
                485                 490                 495
Leu Val Leu Gln Cys Ile Lys Val Asn Asn Trp Asp Leu Phe Phe Ser
            500                 505                 510
Pro Ser Glu Asp Asn Phe Thr Asn Asp Leu Asn Lys Gly Glu Glu Ile
        515                 520                 525
Thr Ser Asp Thr Asn Ile Glu Ala Ala Glu Glu Asn Ile Ser Leu Asp
    530                 535                 540
Leu Ile Gln Gln Tyr Tyr Leu Thr Phe Asn Phe Asp Asn Glu Pro Glu
545                 550                 555                 560
Asn Ile Ser Ile Glu Asn Leu Ser Ser Asp Ile Ile Gly Gln Leu Glu
                565                 570                 575
Leu Met Pro Asn Ile Glu Arg Phe Pro Asn Gly Lys Lys Tyr Glu Leu
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580 585 590
Asp Lys Tyr Thr Met Phe His Tyr Leu Arg Ala Gln Glu Phe Glu His
595 600 605
Gly Lys Ser Arg Ile Ala Leu Thr Asn Ser Val Asn Glu Ala Leu Leu
610 615 620
Asn Pro Ser Arg Val Tyr Thr Phe Phe Ser Ser Asp Tyr Val Lys Lys
625 630 635 640
Val Asn Lys Ala Thr Glu Ala Ala Met Phe Leu Gly Trp Val Glu Gln
645 650 655
Leu Val Tyr Asp Phe Thr Asp Glu Thr Ser Glu Val Ser Thr Thr Asp
660 665 670
Lys Ile Ala Asp Ile Thr Ile Ile Ile Pro Tyr Ile Gly Pro Ala Leu
675 680 685
Asn Ile Gly Asn Met Leu Tyr Lys Asp Asp Phe Val Gly Ala Leu Ile
690 695 700
Phe Ser Gly Ala Val Ile Leu Leu Glu Phe Ile Pro Glu Ile Ala Ile
705 710 715 720
Pro Val Leu Gly Thr Phe Ala Leu Val Ser Tyr Ile Ala Asn Lys Val
725 730 735
Leu Thr Val Gln Thr Ile Asp Asn Ala Leu Ser Lys Arg Asn Glu Lys
740 745 750
Trp Asp Glu Val Tyr Lys Tyr Ile Val Thr Asn Trp Leu Ala Lys Val
755 760 765
Asn Thr Gln Ile Asp Leu Ile Arg Lys Lys Met Lys Glu Ala Leu Glu
770 775 780
Asn Gln Ala Glu Ala Thr Lys Ala Ile Ile Asn Tyr Gln Tyr Asn Gln
785 790 795 800
Tyr Thr Glu Glu Glu Lys Asn Asn Ile Asn Phe Asn Ile Asp Asp Leu
805 810 815
Ser Ser Lys Leu Asn Glu Ser Ile Asn Lys Ala Met Ile Asn Ile Asn
820 825 830
Lys Phe Leu Asn Gln Cys Ser Val Ser Tyr Leu Met Asn Ser Met Ile
835 840 845
Pro Tyr Gly Val Lys Arg Leu Glu Asp Phe Asp Ala Ser Leu Lys Asp
850 855 860
Ala Leu Leu Lys Tyr Ile Tyr Asp Asn Arg Gly Thr Leu Ile Gly Gln
865 870 875 880
Val Asp Arg Leu Lys Asp Lys Val Asn Asn Thr Leu Ser Thr Asp Ile
885 890 895
Pro Phe Gln Leu Ser Lys Tyr Val Asp Asn Gln Arg Leu Leu Ser Thr
900 905 910
Leu Glu Ala Leu Ala Ser Gly
915

<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> 370
<212> PRT
<213> Homo sapiens

<400> 25
Met Glu Pro Leu Phe Pro Ala Pro Phe Trp Glu Val Ile Tyr Gly Ser
 1               5                  10                  15
His Leu Gln Gly Asn Leu Ser Leu Leu Ser Pro Asn His Ser Leu Leu
            20                  25                  30
Pro Pro His Leu Leu Leu Asn Ala Ser His Gly Ala Phe Leu Pro Leu
```

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

<210> 26
<211> 365
<212> PRT
<213> Homo sapiens

<400> 26

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

<210> 27
<211> 372
<212> PRT
<213> Homo sapiens

<400> 27
Met Glu Pro Ala Pro Ser Ala Gly Ala Glu Leu Gln Pro Pro Leu Phe
1 5 10 15
Ala Asn Ala Ser Asp Ala Tyr Pro Ser Ala Cys Pro Ser Ala Gly Ala
20 25 30
Asn Ala Ser Gly Pro Pro Gly Ala Arg Ser Ala Ser Ser Leu Ala Leu
35 40 45
Ala Ile Ala Ile Thr Ala Leu Tyr Ser Ala Val Cys Ala Val Gly Leu
50 55 60
Leu Gly Asn Val Leu Val Met Phe Gly Ile Val Arg Tyr Thr Lys Met
65 70 75 80
Lys Thr Ala Thr Asn Ile Tyr Ile Phe Asn Leu Ala Leu Ala Asp Ala
85 90 95
Leu Ala Thr Ser Thr Leu Pro Phe Gln Ser Ala Lys Tyr Leu Met Glu
100 105 110
Thr Trp Pro Phe Gly Glu Leu Leu Cys Lys Ala Val Leu Ser Ile Asp
115 120 125
Tyr Tyr Asn Met Phe Thr Ser Ile Phe Thr Leu Thr Met Met Ser Val
130 135 140
Asp Arg Tyr Ile Ala Val Cys His Pro Val Lys Ala Leu Asp Phe Arg
145 150 155 160
Thr Pro Ala Lys Ala Lys Leu Ile Asn Ile Cys Ile Trp Val Leu Ala
165 170 175
Ser Gly Val Gly Val Pro Ile Met Val Met Ala Val Thr Arg Pro Arg
180 185 190
Asp Gly Ala Val Val Cys Met Leu Gln Phe Pro Ser Pro Ser Trp Tyr
195 200 205
Trp Asp Thr Val Thr Lys Ile Cys Val Phe Leu Phe Ala Phe Val Val
210 215 220
Pro Ile Leu Ile Ile Thr Val Cys Tyr Gly Leu Met Leu Leu Arg Leu
225 230 235 240
Arg Ser Val Arg Leu Leu Ser Gly Ser Lys Glu Lys Asp Arg Ser Leu

245 250 255
Arg Arg Ile Thr Arg Met Val Leu Val Val Val Gly Ala Phe Val Val
260 265 270
Cys Trp Ala Pro Ile His Ile Phe Val Ile Val Trp Thr Leu Val Asp
275 280 285
Ile Asp Arg Arg Asp Pro Leu Val Val Ala Ala Leu His Leu Cys Ile
290 295 300
Ala Leu Gly Tyr Ala Asn Ser Ser Leu Asn Pro Val Leu Tyr Ala Phe
305 310 315 320
Leu Asp Glu Asn Phe Lys Arg Cys Phe Arg Gln Leu Cys Arg Lys Pro
325 330 335
Cys Gly Arg Pro Asp Pro Ser Ser Phe Ser Arg Ala Arg Glu Ala Thr
340 345 350
Ala Arg Glu Arg Val Thr Ala Cys Thr Pro Ser Asp Gly Pro Gly Gly
355 360 365
Gly Ala Ala Ala
370

<210> 28
<211> 372
<212> PRT
<213> Homo sapiens

<400> 28
Met Glu Pro Ala Pro Ser Ala Gly Ala Glu Leu Gln Pro Pro Leu Phe
1 5 10 15
Ala Asn Ala Ser Asp Ala Tyr Pro Ser Ala Phe Pro Ser Ala Gly Ala
20 25 30
Asn Ala Ser Gly Pro Pro Gly Ala Arg Ser Ala Ser Ser Leu Ala Leu
35 40 45
Ala Ile Ala Ile Thr Ala Leu Tyr Ser Ala Val Cys Ala Val Gly Leu
50 55 60
Leu Gly Asn Val Leu Val Met Phe Gly Ile Val Arg Tyr Thr Lys Met
65 70 75 80
Lys Thr Ala Thr Asn Ile Tyr Ile Phe Asn Leu Ala Leu Ala Asp Ala
85 90 95
Leu Ala Thr Ser Thr Leu Pro Phe Gln Ser Ala Lys Tyr Leu Met Glu
100 105 110
Thr Trp Pro Phe Gly Glu Leu Leu Cys Lys Ala Val Leu Ser Ile Asp
115 120 125
Tyr Tyr Asn Met Phe Thr Ser Ile Phe Thr Leu Thr Met Met Ser Val
130 135 140
Asp Arg Tyr Ile Ala Val Cys His Pro Val Lys Ala Leu Asp Phe Arg
145 150 155 160
Thr Pro Ala Lys Ala Lys Leu Ile Asn Ile Cys Ile Trp Val Leu Ala
165 170 175
Ser Gly Val Gly Val Pro Ile Met Val Met Ala Val Thr Arg Pro Arg
180 185 190
Asp Gly Ala Val Val Cys Met Leu Gln Phe Pro Ser Pro Ser Trp Tyr
195 200 205
Trp Asp Thr Val Thr Lys Ile Cys Val Phe Leu Phe Ala Phe Val Val
210 215 220
Pro Ile Leu Ile Ile Thr Val Cys Tyr Gly Leu Met Leu Leu Arg Leu
225 230 235 240
Arg Ser Val Arg Leu Leu Ser Gly Ser Lys Glu Lys Asp Arg Ser Leu
245 250 255
Arg Arg Ile Thr Arg Met Val Leu Val Val Val Gly Ala Phe Val Val
260 265 270
Cys Trp Ala Pro Ile His Ile Phe Val Ile Val Trp Thr Leu Val Asp
275 280 285
Ile Asp Arg Arg Asp Pro Leu Val Val Ala Ala Leu His Leu Cys Ile
290 295 300
Ala Leu Gly Tyr Ala Asn Ser Ser Leu Asn Pro Val Leu Tyr Ala Phe
305 310 315 320
Leu Asp Glu Asn Phe Lys Arg Cys Phe Arg Gln Leu Cys Arg Lys Pro
325 330 335
Cys Gly Arg Pro Asp Pro Ser Ser Phe Ser Arg Ala Arg Glu Ala Thr

340 345 350
Ala Arg Glu Arg Val Thr Ala Cys Thr Pro Ser Asp Gly Pro Gly Gly
355 360 365
Gly Ala Ala Ala
370

<210> 29
<211> 380
<212> PRT
<213> Homo sapiens

<400> 29
Met Asp Ser Pro Ile Gln Ile Phe Arg Gly Glu Pro Gly Pro Thr Cys
1 5 10 15
Ala Pro Ser Ala Cys Leu Pro Pro Asn Ser Ser Ala Trp Phe Pro Gly
20 25 30
Trp Ala Glu Pro Asp Ser Asn Gly Ser Ala Gly Ser Glu Asp Ala Gln
35 40 45
Leu Glu Pro Ala His Ile Ser Pro Ala Ile Pro Val Ile Ile Thr Ala
50 55 60
Val Tyr Ser Val Val Phe Val Val Gly Leu Val Gly Asn Ser Leu Val
65 70 75 80
Met Phe Val Ile Ile Arg Tyr Thr Lys Met Lys Thr Ala Thr Asn Ile
85 90 95
Tyr Ile Phe Asn Leu Ala Leu Ala Asp Ala Leu Val Thr Thr Thr Met
100 105 110
Pro Phe Gln Ser Thr Val Tyr Leu Met Asn Ser Trp Pro Phe Gly Asp
115 120 125
Val Leu Cys Lys Ile Val Ile Ser Ile Asp Tyr Tyr Asn Met Phe Thr
130 135 140
Ser Ile Phe Thr Leu Thr Met Met Ser Val Asp Arg Tyr Ile Ala Val
145 150 155 160
Cys His Pro Val Lys Ala Leu Asp Phe Arg Thr Pro Leu Lys Ala Lys
165 170 175
Ile Ile Asn Ile Cys Ile Trp Leu Leu Ser Ser Ser Val Gly Ile Ser
180 185 190
Ala Ile Val Leu Gly Gly Thr Lys Val Arg Glu Asp Val Asp Val Ile
195 200 205
Glu Cys Ser Leu Gln Phe Pro Asp Asp Asp Tyr Ser Trp Trp Asp Leu
210 215 220
Phe Met Lys Ile Cys Val Phe Ile Phe Ala Phe Val Ile Pro Val Leu
225 230 235 240
Ile Ile Ile Val Cys Tyr Thr Leu Met Ile Leu Arg Leu Lys Ser Val
245 250 255
Arg Leu Leu Ser Gly Ser Arg Glu Lys Asp Arg Asn Leu Arg Arg Ile
260 265 270
Thr Arg Leu Val Leu Val Val Val Ala Val Phe Val Val Cys Trp Thr
275 280 285
Pro Ile His Ile Phe Ile Leu Val Glu Ala Leu Gly Ser Thr Ser His
290 295 300
Ser Thr Ala Ala Leu Ser Ser Tyr Tyr Phe Cys Ile Ala Leu Gly Tyr
305 310 315 320
Thr Asn Ser Ser Leu Asn Pro Ile Leu Tyr Ala Phe Leu Asp Glu Asn
325 330 335
Phe Lys Arg Cys Phe Arg Asp Phe Cys Phe Pro Leu Lys Met Arg Met
340 345 350
Glu Arg Gln Ser Thr Ser Arg Val Arg Asn Thr Val Gln Asp Pro Ala
355 360 365
Tyr Leu Arg Asp Ile Asp Gly Met Asn Lys Pro Val
370 375 380

<210> 30
<211> 380
<212> PRT
<213> Homo sapiens

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

<210> 31
<211> 493
<212> PRT
<213> Homo sapiens

<400> 31
Met Cys Leu His Arg Arg Val Pro Ser Glu Glu Thr Tyr Ser Leu Asp
 1   5   10   15
Arg Phe Ala Gln Asn Pro Pro Leu Phe Pro Pro Pro Ser Leu Pro Ala
            20   25   30
Ser Glu Ser Arg Met Ala His Ala Pro Leu Leu Gln Arg Cys Gly Ala
        35   40   45
Ala Arg Thr Gly Phe Cys Lys Lys Gln Gln Glu Leu Trp Gln Arg Arg
    50   55   60
Lys Glu Ala Ala Glu Ala Leu Gly Thr Arg Lys Val Ser Val Leu Leu
65   70   75   80
Ala Thr Ser His Ser Gly Ala Arg Pro Ala Val Ser Thr Met Asp Ser

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                85                  90                  95
Ser Ala Ala Pro Thr Asn Ala Ser Asn Cys Thr Asp Ala Leu Ala Tyr
            100                 105                 110
Ser Ser Cys Ser Pro Ala Pro Ser Pro Gly Ser Trp Val Asn Leu Ser
        115                 120                 125
His Leu Asp Gly Asn Leu Ser Asp Pro Cys Gly Pro Asn Arg Thr Asp
    130                 135                 140
Leu Gly Gly Arg Asp Ser Leu Cys Pro Pro Thr Gly Ser Pro Ser Met
145                 150                 155                 160
Ile Thr Ala Ile Thr Ile Met Ala Leu Tyr Ser Ile Val Cys Val Val
                165                 170                 175
Gly Leu Phe Gly Asn Phe Leu Val Met Tyr Val Ile Val Arg Tyr Thr
            180                 185                 190
Lys Met Lys Thr Ala Thr Asn Ile Tyr Ile Phe Asn Leu Ala Leu Ala
        195                 200                 205
Asp Ala Leu Ala Thr Ser Thr Leu Pro Phe Gln Ser Val Asn Tyr Leu
    210                 215                 220
Met Gly Thr Trp Pro Phe Gly Thr Ile Leu Cys Lys Ile Val Ile Ser
225                 230                 235                 240
Ile Asp Tyr Tyr Asn Met Phe Thr Ser Ile Phe Thr Leu Cys Thr Met
                245                 250                 255
Ser Val Asp Arg Tyr Ile Ala Val Cys His Pro Val Lys Ala Leu Asp
            260                 265                 270
Phe Arg Thr Pro Arg Asn Ala Lys Ile Ile Asn Val Cys Asn Trp Ile
        275                 280                 285
Leu Ser Ser Ala Ile Gly Leu Pro Val Met Phe Met Ala Thr Thr Lys
    290                 295                 300
Tyr Arg Gln Gly Ser Ile Asp Cys Thr Leu Thr Phe Ser His Pro Thr
305                 310                 315                 320
Trp Tyr Trp Glu Asn Leu Leu Lys Ile Cys Val Phe Ile Phe Ala Phe
                325                 330                 335
Ile Met Pro Val Leu Ile Ile Thr Val Cys Tyr Gly Leu Met Ile Leu
            340                 345                 350
Arg Leu Lys Ser Val Arg Met Leu Ser Gly Ser Lys Glu Lys Asp Arg
        355                 360                 365
Asn Leu Arg Arg Ile Thr Arg Met Val Leu Val Val Val Ala Val Phe
    370                 375                 380
Ile Val Cys Trp Thr Pro Ile His Ile Tyr Val Ile Ile Lys Ala Leu
385                 390                 395                 400
Val Thr Ile Pro Glu Thr Thr Phe Gln Thr Val Ser Trp His Phe Cys
                405                 410                 415
Ile Ala Leu Gly Tyr Thr Asn Ser Cys Leu Asn Pro Val Leu Tyr Ala
            420                 425                 430
Phe Leu Asp Glu Asn Phe Lys Arg Cys Phe Arg Glu Phe Cys Ile Pro
        435                 440                 445
Thr Ser Ser Asn Ile Glu Gln Gln Asn Ser Thr Arg Ile Arg Gln Asn
    450                 455                 460
Thr Arg Asp His Pro Ser Thr Ala Asn Thr Val Asp Arg Thr Asn His
465                 470                 475                 480
Gln Leu Glu Asn Leu Glu Ala Glu Thr Ala Pro Leu Pro
                485                 490
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<210> 32
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxyl-terminus at the P1

<400> 32
Asp Glu Ala Asn Gln
 1   5

<210> 33

<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

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

<210> 34
<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> 34
Arg Ile Asp Glu Ala Asn Gln
1 5

<210> 35
<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> 35
Thr Arg Ile Asp Glu Ala Asn Gln
1 5

<210> 36
<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> 36
Lys Thr Arg Ile Asp Glu Ala Asn Gln
1 5

<210> 37
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxyl-terminus at the P1

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

<210> 38
<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> 38
Ser Asn Lys Thr Arg Ile Asp Glu Ala Asn Gln
 1   5   10

<210> 39
<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> 39
Asp Ser Asn Lys Thr Arg Ile Asp Glu Ala Asn Gln
 1   5   10

<210> 40
<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> 40
Cys Asp Ser Asn Lys Thr Arg Ile Asp Glu Ala Asn Gln
 1   5   10

<210> 41
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen having a free carboxyl-terminus at the P1

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

<210> 42
<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> 42
Ala Arg Ile Asp Glu Ala Asn Lys
 1   5

<210> 43
<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> 43
Lys Ala Arg Ile Asp Glu Ala Asn Lys
 1   5

<210> 44
<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> 44
Asn Lys Ala Arg Ile Asp Glu Ala Asn Lys
 1   5   10

<210> 45
<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> 45
Met Asn Lys Ala Arg Ile Asp Glu Ala Asn Lys
 1   5   10

<210> 46
<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> 46
Asp Met Asn Lys Ala Arg Ile Asp Glu Ala Asn Lys
1 5 10

<210> 47
<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> 47
Cys Asp Met Asn Lys Ala Arg Ile Asp Glu Ala Asn Lys
1 5 10

<210> 48
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen

<400> 48
Cys Gly Gly Gly Arg Ile Asp Glu Ala Asn Gln
1 5 10

<210> 49
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> SNAP-25 antigen

<400> 49
Cys Gly Gly Gly Arg Ile Asp Glu Ala Asn Lys
1 5 10

<210> 50
<211> 88
<212> PRT
<213> Artificial Sequence

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

<400> 50
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> 51
<211> 97
<212> PRT
<213> Artificial Sequence

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

<400> 51
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> 52
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> BirA peptide

<400> 52
Gly Gly Gly Leu Asn Asp Ile Phe Glu Ala Gln Lys Ile Glu Trp His
1 5 10 15

<210> 53
<211> 7570
<212> DNA
<213> Artificial Sequence

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

<400> 53
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
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aaaatcaacg ggactttcca aaatgtcgta acaactccgc cccattgacg caaatgggcg 840

gtaggcgtgt acggtgggag gtctatataa gcagagctcg tttagtgaac cgtcagatcg 900
cctggagacg ccatccacgc tgttttgacc tccatagaag acaccgggac cgatccagcc 960
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gcccgaaggt tatgtacagg aaaggaccat cttcttcaaa gatgacggca actacaagac 1380
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tgacttcaag gaagatggca acattctggg acacaaattg gaatacaact ataactcaca 1500
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ccacaacatt gaagatggaa gcgttcaact agcagaccat tatcaacaaa atactccaat 1620
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gaaagatccc aacgaaaaga gagaccacat ggtccttctt gagtttgtaa cagctgctgg 1740
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taataaacaa tttaattata aagatcctgt aaatggtgtt gatattgctt atataaaaat 1860
tccaaatgca ggacaaatgc aaccagtaaa agcttttaaa attcataata aaatatgggt 1920
tattccagaa agagatacat ttacaaatcc tgaagaagga gatttaaatc caccaccaga 1980
agcaaaacaa gttccagttt catattatga ttcaacatat ttaagtacag ataatgaaaa 2040
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aagaatgttg ttaacatcaa tagtaagggg aataccattt tggggtggaa gtacaataga 2160
tacagaatta aaagttattg atactaattg tattaatgtg atacaaccag atggtagtta 2220
tagatcagaa gaacttaatc tagtaataat aggaccctca gctgatatta tacagtttga 2280
atgtaaaagc tttggacatg aagttttgaa tcttacgcga aatggttatg gctctactca 2340
atacattaga tttagcccag attttacatt tggttttgag gagtcacttg aagttgatac 2400
aaatcctctt ttaggtgcag gcaaatttgc tacagatcca gcagtaacat tagcacatga 2460
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<211> 245
<212> PRT
<213> Artificial Sequence

<220>
<223> GFP amino acid sequence.

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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
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Gln Leu Ala Asp His Tyr Gln Gln Asn Thr Pro Ile Gly Asp Gly Pro
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Val Leu Leu Pro Asp Asn His Tyr Leu Ser Thr Gln Ser Ala Leu Ser
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Lys Asp Pro Asn Glu Lys Arg Asp His Met Val Leu Leu Glu Phe Val
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<213> Artificial Sequence

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<223> G-spacer flexible spacer

<400> 57
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<210> 58
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<400> 58
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<223> A-spacer flexible spacer

<400> 59

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<210> 60
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<223> A-spacer flexible spacer

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<212> DNA
<213> Homo sapiens

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<212> DNA
<213> Homo sapiens

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<211> 1773
<212> DNA
<213> Homo sapiens

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<213> Homo sapiens

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<211> 2738
<212> DNA
<213> Homo sapiens

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<210> 68
<211> 2053
<212> DNA
<213> Homo sapiens

<400> 68
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gcccaggcgc ccagccactc cccaccgcta ccatggccga agacgcagac atgcgcaatg 240
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atgaatgaaa tataaactgt gagataaata tcattatagc atgtaatatt aaattcctcc 1980
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aattatagac tcc 2053

<210> 69
<211> 2053
<212> DNA
<213> Homo sapiens

<400> 69
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ggagaacaca accctcccga gaagcccagg tccagagcca aacccgtcac tgacccccca 180
gcccaggcgc ccagccactc cccaccgcta ccatggccga agacgcagac atgcgcaatg 240
agctggagga gatgcagcga agggctgacc agttggctga tgagtcgctg gaaagcaccc 300

gtcgtatgct gcaactggtt gaagagagta aagatgctgg tatcaggact ttggttatgt 360
tggatgaaca aggagaacaa ctggaacgca ttgaggaagg gatggaccaa atcaataagg 420
acatgaaaga agcagaaaag aatttgacgg acctaggaaa attctgcggg ctttgtgtgt 480
gtccctgtaa caagcttaaa tcaagtgatg cttacaaaaa agcctggggc aataatcagg 540
acggagtggt ggccagccag cctgctcgtg tagtggacga acgggagcag atggccatca 600
gtggcggctt catccgcagg gtaacaaatg atgcccgaga aaatgaaatg gatgaaaacc 660
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gagacactgt caagattaag ttataccagc aaaagtgcag tagtgtcact tttttcctgt 1560
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acaccaaatt gctgagatgt ttagtagctg ataaagaaac cttttaaaaa aataatataa 1920
atgaatgaaa tataaactgt gagataaata tcattatagc atgtaatatt aaattcctcc 1980
tgtctcctct gtcagtttgt gaagtgattg acattttgta gctagtttaa aattattaaa 2040
aattatagac tcc 2053

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

<400> 70
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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> 112
<212> PRT
<213> Mus musculus

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

<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> 112
<212> PRT
<213> Mus musculus

<400> 74
Gln Val Lys Leu Gln Glu Ser Gly Ala Glu Leu Val Lys Pro Gly Ala
1 5 10 15
Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asp His
20 25 30
Ser Ile His Trp Val Lys Gln Lys Pro Gly Gln Gly Leu Glu Trp Ile
35 40 45
Gly Tyr Leu Phe Pro Gly Asn Gly Asn Phe Glu Tyr Asn Glu Lys Phe
50 55 60
Lys Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr

65 70 75 80
Met His Leu Asn Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Phe Cys
85 90 95
Lys 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> 112
<212> PRT
<213> Mus musculus

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

<210> 77
<211> 336
<212> DNA
<213> Mus musculus

<400> 77
caggtcaagc tgcaggagtc tggcgctgag ttggtgaaac ctggggcttc agtgaagatc 60
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> 78
<211> 112
<212> PRT
<213> Mus musculus

<400> 78
Gln Val Lys Leu Gln Glu Ser Gly Ala Glu Leu Val Lys Pro Gly Ala
1 5 10 15
Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asp His
20 25 30
Ser Ile His Trp Val Lys Gln Lys Pro Gly Gln Gly Leu Glu Trp Ile
35 40 45

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

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

<400> 79
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 aagaatggac 300
tactggggcc aagggaccac ggtcaccgtc tcctca 336

<210> 80
<211> 112
<212> PRT
<213> Mus musculus

<400> 80
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 Met Asp Tyr Trp Gly Gln Gly Thr Thr Leu Thr Val Ser Ser
100 105 110

<210> 81
<211> 336
<212> DNA
<213> Mus musculus

<400> 81
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 aagaatgggg 300
tactggggcc aagggaccac ggtcaccgtc tcctca 336

<210> 82
<211> 112
<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

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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 Met Gly Tyr Trp Gly Gln Gly Thr Thr Leu Thr Val Ser Ser
            100                 105                 110
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<210> 83
<211> 342
<212> DNA
<213> Mus musculus

<400> 83
gatgttttga tgacccaaac tccactctcc ctgcctgtca gtcttggaga tcaagcctcc 60
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

<210> 84
<211> 113
<212> PRT
<213> Mus musculus

<400> 84
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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
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<210> 85
<211> 324
<212> DNA
<213> Mus musculus

<400> 85
gacatccaga tgactcagtc tccagcctcc ctatctgcat ctgtgggaga aactgtcacc 60
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> 339
<212> DNA
<213> Mus musculus

<400> 87
gatgttttg atgacccaaac tccactcact ttgtcggtta ccattggaca accagcttcc 60
atctcttgc aagtccagtca gagcctctta tatactaatg gaaaaaccta tttgacttgg 120
ttattccag aggccaggcca gtctccaaaa cgcctaatct atctggtgtc tgaattggac 180
tctggagtc cctgacaggtt cagtggcagt ggttcaggga cagatttcac actggaaatc 240
accagagtg gaggctgagga tttgggagtt tattactgct tgcagagtgc acattttcca 300
ttcacgttc ggctcgggcac caagctggaa atcaaacgg   339

<210> 88
<211> 113
<212> PRT
<213> Mus musculus

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

<210> 89
<211> 339
<212> DNA
<213> Mus musculus

<400> 89
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atctcttgca agtccagtca gagcctcttt aacactaatg gcaaaaccta tttgacttgg 120
ttaattcaga ggccaggcca gtctccacag cgcctgatct atctggtgtc caaattggac 180
tctggcgtcc cggacaggtt cagtggcagt ggctcaggga cagatttcac actgaaaatc 240
agcagagtgg aggctgagga tctgggagtt tattactgcc tgcagagtag ccattttccg 300
tttacgttcg gctcgggcac caagctggaa atcaaacgg   339

<210> 90
<211> 113
<212> PRT
<213> Mus musculus

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

<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
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

<210> 93
<211> 8
<212> PRT
<213> Mus musculus

<400> 93
Thr Phe Thr Asp His Ser Ile His
 1   5

<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> 5
<212> PRT
<213> Mus musculus

<400> 102
Ala Arg Met Asp Tyr
 1   5

<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> 16
<212> PRT
<213> Mus musculus

<400> 105
Lys Ser Ser Gln Ser Leu Leu Tyr Thr Asn Gly Lys Thr Tyr Leu Thr
 1   5   10   15

<210> 106
<211> 16
<212> PRT
<213> Mus musculus

<400> 106
Lys Ser Ser Gln Ser Leu Leu Asn Thr Asn Gly Lys Thr Tyr Leu Thr
 1   5   10   15

<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
 1   5

<210> 110
<211> 7
<212> PRT
<213> Mus musculus

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

<210> 111
<211> 7
<212> PRT
<213> Mus musculus

<400> 111
Leu Val Ser Lys Leu Asp Ser
 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
Gln His His Tyr Gly Thr Pro Tyr Thr
1 5

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

<400> 115
Leu Gln Ser Ala His Phe Pro Phe Thr
1 5

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

<400> 116
Leu Gln Ser Ser His Phe 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
1 5

<210> 118
<211> 5
<212> PRT
<213> Mus musculus

<400> 118
Asp His Ser Ile His
1 5

<210> 119
<211> 5
<212> PRT
<213> Mus musculus

<400> 119
Asn Tyr Val Ile His
1 5

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

<400> 120
Asp His Ala Leu His
 1   5

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

<400> 121
Ile Phe Pro Gly Asn Gly Asn Ile Glu
 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
 1   5

<210> 130
<211> 911
<212> PRT
<213> Artificial Sequence

<220>
<223> Retargeted endopeptidase

<400> 130
Ile Ser Glu Phe Gly Ser Met Glu Phe Val Asn Lys Gln Phe Asn Tyr
 1   5   10   15
Lys Asp Pro Val Asn Gly Val Asp Ile Ala Tyr Ile Lys Ile Pro Asn
            20   25   30
Ala Gly Gln Met Gln Pro Val Lys Ala Phe Lys Ile His Asn Lys Ile
        35   40   45
Trp Val Ile Pro Glu Arg Asp Thr Phe Thr Asn Pro Glu Glu Gly Asp
    50   55   60
Leu Asn Pro Pro Pro Glu Ala Lys Gln Val Pro Val Ser Tyr Tyr Asp
65   70   75   80
Ser Thr Tyr Leu Ser Thr Asp Asn Glu Lys Asp Asn Tyr Leu Lys Gly
                85   90   95
Val Thr Lys Leu Phe Glu Arg Ile Tyr Ser Thr Asp Leu Gly Arg Met
            100   105   110
Leu Leu Thr Ser Ile Val Arg Gly Ile Pro Phe Trp Gly Gly Ser Thr
        115   120   125
Ile Asp Thr Glu Leu Lys Val Ile Asp Thr Asn Cys Ile Asn Val Ile
    130   135   140
Gln Pro Asp Gly Ser Tyr Arg Ser Glu Glu Leu Asn Leu Val Ile Ile
145   150   155   160
Gly Pro Ser Ala Asp Ile Ile Gln Phe Glu Cys Lys Ser Phe Gly His
                165   170   175
Glu Val Leu Asn Leu Thr Arg Asn Gly Tyr Gly Ser Thr Gln Tyr Ile
            180   185   190
Arg Phe Ser Pro Asp Phe Thr Phe Gly Phe Glu Glu Ser Leu Glu Val
        195   200   205
Asp Thr Asn Pro Leu Leu Gly Ala Gly Lys Phe Ala Thr Asp Pro Ala
    210   215   220
Val Thr Leu Ala His Glu Leu Ile His Ala Gly His Arg Leu Tyr Gly
225   230   235   240
Ile Ala Ile Asn Pro Asn Arg Val Phe Lys Val Asn Thr Asn Ala Tyr

245 250 255
Tyr Glu Met Ser Gly Leu Glu Val Ser Phe Glu Glu Leu Arg Thr Phe
260 265 270
Gly Gly His Asp Ala Lys Phe Ile Asp Ser Leu Gln Glu Asn Glu Phe
275 280 285
Arg Leu Tyr Tyr Tyr Asn Lys Phe Lys Asp Ile Ala Ser Thr Leu Asn
290 295 300
Lys Ala Lys Ser Ile Val Gly Thr Thr Ala Ser Leu Gln Tyr Met Lys
305 310 315 320
Asn Val Phe Lys Glu Lys Tyr Leu Leu Ser Glu Asp Thr Ser Gly Lys
325 330 335
Phe Ser Val Asp Lys Leu Lys Phe Asp Lys Leu Tyr Lys Met Leu Thr
340 345 350
Glu Ile Tyr Thr Glu Asp Asn Phe Val Lys Phe Phe Lys Val Leu Asn
355 360 365
Arg Lys Thr Tyr Leu Asn Phe Asp Lys Ala Val Phe Lys Ile Asn Ile
370 375 380
Val Pro Lys Val Asn Tyr Thr Ile Tyr Asp Gly Phe Asn Leu Arg Asn
385 390 395 400
Thr Asn Leu Ala Ala Asn Phe Asn Gly Gln Asn Thr Glu Ile Asn Asn
405 410 415
Met Asn Phe Thr Lys Leu Lys Asn Phe Thr Gly Leu Phe Glu Phe Tyr
420 425 430
Lys Leu Leu Cys Val Asp Gly Ile Ile Thr Ser Lys Thr Lys Ser Leu
435 440 445
Ile Glu Gly Arg Phe Gly Gly Phe Thr Gly Ala Arg Lys Ser Ala Arg
450 455 460
Lys Arg Lys Asn Gln Ala Leu Ala Gly Gly Gly Gly Ser Gly Gly Gly
465 470 475 480
Gly Ser Gly Gly Gly Gly Ser Ala Leu Val Leu Gln Cys Ile Lys Val
485 490 495
Asn Asn Trp Asp Leu Phe Phe Ser Pro Ser Glu Asp Asn Phe Thr Asn
500 505 510
Asp Leu Asn Lys Gly Glu Glu Ile Thr Ser Asp Thr Asn Ile Glu Ala
515 520 525
Ala Glu Glu Asn Ile Ser Leu Asp Leu Ile Gln Gln Tyr Tyr Leu Thr
530 535 540
Phe Asn Phe Asp Asn Glu Pro Glu Asn Ile Ser Ile Glu Asn Leu Ser
545 550 555 560
Ser Asp Ile Ile Gly Gln Leu Glu Leu Met Pro Asn Ile Glu Arg Phe
565 570 575
Pro Asn Gly Lys Lys Tyr Glu Leu Asp Lys Tyr Thr Met Phe His Tyr
580 585 590
Leu Arg Ala Gln Glu Phe Glu His Gly Lys Ser Arg Ile Ala Leu Thr
595 600 605
Asn Ser Val Asn Glu Ala Leu Leu Asn Pro Ser Arg Val Tyr Thr Phe
610 615 620
Phe Ser Ser Asp Tyr Val Lys Lys Val Asn Lys Ala Thr Glu Ala Ala
625 630 635 640
Met Phe Leu Gly Trp Val Glu Gln Leu Val Tyr Asp Phe Thr Asp Glu
645 650 655
Thr Ser Glu Val Ser Thr Thr Asp Lys Ile Ala Asp Ile Thr Ile Ile
660 665 670
Ile Pro Tyr Ile Gly Pro Ala Leu Asn Ile Gly Asn Met Leu Tyr Lys
675 680 685
Asp Asp Phe Val Gly Ala Leu Ile Phe Ser Gly Ala Val Ile Leu Leu
690 695 700
Glu Phe Ile Pro Glu Ile Ala Ile Pro Val Leu Gly Thr Phe Ala Leu
705 710 715 720
Val Ser Tyr Ile Ala Asn Lys Val Leu Thr Val Gln Thr Ile Asp Asn
725 730 735
Ala Leu Ser Lys Arg Asn Glu Lys Trp Asp Glu Val Tyr Lys Tyr Ile
740 745 750
Val Thr Asn Trp Leu Ala Lys Val Asn Thr Gln Ile Asp Leu Ile Arg
755 760 765
Lys Lys Met Lys Glu Ala Leu Glu Asn Gln Ala Glu Ala Thr Lys Ala
770 775 780
Ile Ile Asn Tyr Gln Tyr Asn Gln Tyr Thr Glu Glu Glu Lys Asn Asn

785 790 795 800
Ile Asn Phe Asn Ile Asp Asp Leu Ser Ser Lys Leu Asn Glu Ser Ile
805 810 815
Asn Lys Ala Met Ile Asn Ile Asn Lys Phe Leu Asn Gln Cys Ser Val
820 825 830
Ser Tyr Leu Met Asn Ser Met Ile Pro Tyr Gly Val Lys Arg Leu Glu
835 840 845
Asp Phe Asp Ala Ser Leu Lys Asp Ala Leu Leu Lys Tyr Ile Tyr Asp
850 855 860
Asn Arg Gly Thr Leu Ile Gly Gln Val Asp Arg Leu Lys Asp Lys Val
865 870 875 880
Asn Asn Thr Leu Ser Thr Asp Ile Pro Phe Gln Leu Ser Lys Tyr Val
885 890 895
Asp Asn Gln Arg Leu Leu Ser Thr Leu Glu Ala Leu Ala Ser Gly
900 905 910

<210> 131
<211> 904
<212> PRT
<213> Artificial Sequence

<220>
<223> Retargeted endopeptidase

<400> 131
Met Gly Ser Met Glu Phe Val Asn Lys Gln Phe Asn Tyr Lys Asp Pro
1 5 10 15
Val Asn Gly Val Asp Ile Ala Tyr Ile Lys Ile Pro Asn Ala Gly Gln
20 25 30
Met Gln Pro Val Lys Ala Phe Lys Ile His Asn Lys Ile Trp Val Ile
35 40 45
Pro Glu Arg Asp Thr Phe Thr Asn Pro Glu Glu Gly Asp Leu Asn Pro
50 55 60
Pro Pro Glu Ala Lys Gln Val Pro Val Ser Tyr Tyr Asp Ser Thr Tyr
65 70 75 80
Leu Ser Thr Asp Asn Glu Lys Asp Asn Tyr Leu Lys Gly Val Thr Lys
85 90 95
Leu Phe Glu Arg Ile Tyr Ser Thr Asp Leu Gly Arg Met Leu Leu Thr
100 105 110
Ser Ile Val Arg Gly Ile Pro Phe Trp Gly Gly Ser Thr Ile Asp Thr
115 120 125
Glu Leu Lys Val Ile Asp Thr Asn Cys Ile Asn Val Ile Gln Pro Asp
130 135 140
Gly Ser Tyr Arg Ser Glu Glu Leu Asn Leu Val Ile Ile Gly Pro Ser
145 150 155 160
Ala Asp Ile Ile Gln Phe Glu Cys Lys Ser Phe Gly His Glu Val Leu
165 170 175
Asn Leu Thr Arg Asn Gly Tyr Gly Ser Thr Gln Tyr Ile Arg Phe Ser
180 185 190
Pro Asp Phe Thr Phe Gly Phe Glu Glu Ser Leu Glu Val Asp Thr Asn
195 200 205
Pro Leu Leu Gly Ala Gly Lys Phe Ala Thr Asp Pro Ala Val Thr Leu
210 215 220
Ala His Glu Leu Ile His Ala Gly His Arg Leu Tyr Gly Ile Ala Ile
225 230 235 240
Asn Pro Asn Arg Val Phe Lys Val Asn Thr Asn Ala Tyr Tyr Glu Met
245 250 255
Ser Gly Leu Glu Val Ser Phe Glu Glu Leu Arg Thr Phe Gly Gly His
260 265 270
Asp Ala Lys Phe Ile Asp Ser Leu Gln Glu Asn Glu Phe Arg Leu Tyr
275 280 285
Tyr Tyr Asn Lys Phe Lys Asp Ile Ala Ser Thr Leu Asn Lys Ala Lys
290 295 300
Ser Ile Val Gly Thr Thr Ala Ser Leu Gln Tyr Met Lys Asn Val Phe
305 310 315 320
Lys Glu Lys Tyr Leu Leu Ser Glu Asp Thr Ser Gly Lys Phe Ser Val
325 330 335

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Asp Lys Leu Lys Phe Asp Lys Leu Tyr Lys Met Leu Thr Glu Ile Tyr
            340                 345                 350
Thr Glu Asp Asn Phe Val Lys Phe Phe Lys Val Leu Asn Arg Lys Thr
        355                 360                 365
Tyr Leu Asn Phe Asp Lys Ala Val Phe Lys Ile Asn Ile Val Pro Lys
    370                 375                 380
Val Asn Tyr Thr Ile Tyr Asp Gly Phe Asn Leu Arg Asn Thr Asn Leu
385                 390                 395                 400
Ala Ala Asn Phe Asn Gly Gln Asn Thr Glu Ile Asn Asn Met Asn Phe
                405                 410                 415
Thr Lys Leu Lys Asn Phe Thr Gly Leu Phe Glu Phe Tyr Lys Leu Leu
            420                 425                 430
Cys Val Asp Gly Gly Gly Gly Ser Ala Asp Asp Asp Asp Lys Gly Trp
        435                 440                 445
Thr Leu Asn Ser Ala Gly Tyr Leu Leu Gly Pro His Ala Val Ala Leu
    450                 455                 460
Ala Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
465                 470                 475                 480
Ala Leu Val Leu Gln Cys Ile Lys Val Asn Asn Trp Asp Leu Phe Phe
                485                 490                 495
Ser Pro Ser Glu Asp Asn Phe Thr Asn Asp Leu Asn Lys Gly Glu Glu
            500                 505                 510
Ile Thr Ser Asp Thr Asn Ile Glu Ala Ala Glu Glu Asn Ile Ser Leu
        515                 520                 525
Asp Leu Ile Gln Gln Tyr Tyr Leu Thr Phe Asn Phe Asp Asn Glu Pro
    530                 535                 540
Glu Asn Ile Ser Ile Glu Asn Leu Ser Ser Asp Ile Ile Gly Gln Leu
545                 550                 555                 560
Glu Leu Met Pro Asn Ile Glu Arg Phe Pro Asn Gly Lys Lys Tyr Glu
                565                 570                 575
Leu Asp Lys Tyr Thr Met Phe His Tyr Leu Arg Ala Gln Glu Phe Glu
            580                 585                 590
His Gly Lys Ser Arg Ile Ala Leu Thr Asn Ser Val Asn Glu Ala Leu
        595                 600                 605
Leu Asn Pro Ser Arg Val Tyr Thr Phe Phe Ser Ser Asp Tyr Val Lys
    610                 615                 620
Lys Val Asn Lys Ala Thr Glu Ala Ala Met Phe Leu Gly Trp Val Glu
625                 630                 635                 640
Gln Leu Val Tyr Asp Phe Thr Asp Glu Thr Ser Glu Val Ser Thr Thr
                645                 650                 655
Asp Lys Ile Ala Asp Ile Thr Ile Ile Ile Pro Tyr Ile Gly Pro Ala
            660                 665                 670
Leu Asn Ile Gly Asn Met Leu Tyr Lys Asp Asp Phe Val Gly Ala Leu
        675                 680                 685
Ile Phe Ser Gly Ala Val Ile Leu Leu Glu Phe Ile Pro Glu Ile Ala
    690                 695                 700
Ile Pro Val Leu Gly Thr Phe Ala Leu Val Ser Tyr Ile Ala Asn Lys
705                 710                 715                 720
Val Leu Thr Val Gln Thr Ile Asp Asn Ala Leu Ser Lys Arg Asn Glu
                725                 730                 735
Lys Trp Asp Glu Val Tyr Lys Tyr Ile Val Thr Asn Trp Leu Ala Lys
            740                 745                 750
Val Asn Thr Gln Ile Asp Leu Ile Arg Lys Lys Met Lys Glu Ala Leu
        755                 760                 765
Glu Asn Gln Ala Glu Ala Thr Lys Ala Ile Ile Asn Tyr Gln Tyr Asn
    770                 775                 780
Gln Tyr Thr Glu Glu Glu Lys Asn Asn Ile Asn Phe Asn Ile Asp Asp
785                 790                 795                 800
Leu Ser Ser Lys Leu Asn Glu Ser Ile Asn Lys Ala Met Ile Asn Ile
                805                 810                 815
Asn Lys Phe Leu Asn Gln Cys Ser Val Ser Tyr Leu Met Asn Ser Met
            820                 825                 830
Ile Pro Tyr Gly Val Lys Arg Leu Glu Asp Phe Asp Ala Ser Leu Lys
        835                 840                 845
Asp Ala Leu Leu Lys Tyr Ile Tyr Asp Asn Arg Gly Thr Leu Ile Gly
    850                 855                 860
Gln Val Asp Arg Leu Lys Asp Lys Val Asn Asn Thr Leu Ser Thr Asp
865                 870                 875                 880
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Ile Pro Phe Gln Leu Ser Lys Tyr Val Asp Asn Gln Arg Leu Leu Ser
885 890 895
Thr Leu Glu Ala Leu Ala Ser Gly
900

<210> 132
<211> 360
<212> DNA
<213> Mus musculus

<400> 132
caggtgaagc 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 ggccaaggca ccactctcac agtctcctca 360

<210> 133
<211> 120
<212> PRT
<213> Mus musculus

<400> 133
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> 134
<211> 5
<212> PRT
<213> Mus musculus

<400> 134
Ala Arg Met Gly Tyr
1 5

<210> 135
<211> 13
<212> PRT
<213> Mus musculus

<400> 135
Ala Arg His Leu Ala Asn Thr Tyr Tyr Tyr Phe Asp Tyr
1 5 10

<210> 136
<211> 349
<212> PRT
<213> Homo sapiens

<400> 136
Met Glu Leu Ala Val Gly Asn Leu Ser Glu Gly Asn Ala Ser Trp Pro
 1   5   10   15
Glu Pro Pro Ala Pro Glu Pro Gly Pro Leu Phe Gly Ile Gly Val Glu
            20   25   30
Asn Phe Val Thr Leu Val Val Phe Gly Leu Ile Phe Ala Leu Gly Val
        35   40   45
Leu Gly Asn Ser Leu Val Ile Thr Val Leu Ala Arg Ser Lys Pro Gly
    50   55   60
Lys Pro Arg Ser Thr Thr Asn Leu Phe Ile Leu Asn Leu Ser Ile Ala
65   70   75   80
Asp Leu Ala Tyr Leu Leu Phe Cys Ile Pro Phe Gln Ala Thr Val Tyr
                85   90   95
Ala Leu Pro Thr Trp Val Leu Gly Ala Phe Ile Cys Lys Phe Ile His
            100   105   110
Tyr Phe Phe Thr Val Ser Met Leu Val Ser Ile Phe Thr Leu Ala Ala
        115   120   125
Met Ser Val Asp Arg Tyr Val Ala Ile Val His Ser Arg Arg Ser Ser
    130   135   140
Ser Leu Arg Val Ser Arg Asn Ala Leu Leu Gly Val Gly Cys Ile Trp
145   150   155   160
Ala Leu Ser Ile Ala Met Ala Ser Pro Val Ala Tyr His Gln Gly Leu
                165   170   175
Phe His Pro Arg Ala Ser Asn Gln Thr Phe Cys Trp Glu Gln Trp Pro
            180   185   190
Asp Pro Arg His Lys Lys Ala Tyr Val Val Cys Thr Phe Val Phe Gly
        195   200   205
Tyr Leu Leu Pro Leu Leu Leu Ile Cys Phe Cys Tyr Ala Lys Val Leu
    210   215   220
Asn His Leu His Lys Lys Leu Lys Asn Met Ser Lys Lys Ser Glu Ala
225   230   235   240
Ser Lys Lys Lys Thr Ala Gln Thr Val Leu Val Val Val Val Val Phe
                245   250   255
Gly Ile Ser Trp Leu Pro His His Ile Ile His Leu Trp Ala Glu Phe
            260   265   270
Gly Val Phe Pro Leu Thr Pro Ala Ser Phe Leu Phe Arg Ile Thr Ala
        275   280   285
His Cys Leu Ala Tyr Ser Asn Ser Ser Val Asn Pro Ile Ile Tyr Ala
    290   295   300
Phe Leu Ser Glu Asn Phe Arg Lys Ala Tyr Lys Gln Val Phe Lys Cys
305   310   315   320
His Ile Arg Lys Asp Ser His Leu Ser Asp Thr Lys Glu Asn Lys Ser
                325   330   335
Arg Ile Asp Thr Pro Pro Ser Thr Asn Cys Thr His Val
            340   345

<210> 137
<211> 349
<212> PRT
<213> Homo sapiens

<400> 137
Met Glu Leu Ala Val Gly Asn Leu Ser Glu Gly Asn Ala Ser Trp Pro
 1   5   10   15
Glu Pro Pro Ala Pro Glu Pro Gly Pro Leu Phe Gly Ile Gly Val Glu
            20   25   30
Asn Phe Val Thr Leu Val Val Phe Gly Leu Ile Phe Ala Leu Gly Val
        35   40   45
Leu Gly Asn Ser Leu Val Ile Thr Val Leu Ala Arg Ser Lys Pro Gly
    50   55   60
Lys Pro Arg Ser Thr Thr Asn Leu Phe Ile Leu Asn Leu Ser Ile Ala
65   70   75   80
Asp Leu Ala Tyr Leu Leu Phe Cys Ile Pro Phe Gln Ala Thr Val Tyr
                85   90   95
Ala Leu Pro Thr Trp Val Leu Gly Ala Phe Ile Cys Lys Phe Ile His
            100   105   110
Tyr Phe Phe Thr Val Ser Met Leu Val Ser Ile Phe Thr Leu Ala Ala

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        115                 120                 125
Met Ser Val Asp Arg Tyr Val Ala Ile Val His Ser Arg Arg Ser Ser
    130                 135                 140
Ser Leu Arg Val Ser Arg Asn Ala Leu Leu Gly Val Gly Cys Ile Trp
145                 150                 155                 160
Ala Leu Ser Ile Ala Met Ala Ser Pro Val Ala Tyr His Gln Gly Leu
                165                 170                 175
Phe His Pro Arg Ala Ser Asn Gln Thr Phe Cys Trp Glu Gln Trp Pro
            180                 185                 190
Asp Pro Arg His Lys Lys Ala Tyr Val Val Cys Thr Phe Val Phe Gly
        195                 200                 205
Tyr Leu Leu Pro Leu Leu Leu Ile Cys Phe Cys Tyr Ala Lys Val Leu
    210                 215                 220
Asn His Leu His Lys Lys Leu Lys Asn Met Ser Lys Lys Ser Glu Ala
225                 230                 235                 240
Ser Lys Lys Lys Thr Ala Gln Thr Val Leu Val Val Val Val Val Phe
                245                 250                 255
Gly Ile Ser Trp Leu Pro His His Ile Ile His Leu Trp Ala Glu Phe
            260                 265                 270
Gly Val Phe Pro Leu Thr Pro Ala Ser Phe Leu Phe Arg Ile Thr Ala
        275                 280                 285
His Cys Leu Ala Tyr Ser Asn Ser Ser Val Asn Pro Ile Ile Tyr Ala
    290                 295                 300
Phe Leu Ser Glu Asn Phe Arg Lys Ala Tyr Lys Gln Val Phe Lys Cys
305                 310                 315                 320
His Ile Arg Lys Asp Ser His Leu Ser Asp Thr Lys Glu Ser Lys Ser
                325                 330                 335
Arg Ile Asp Thr Pro Pro Ser Thr Asn Cys Thr His Val
            340                 345
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<210> 138
<211> 349
<212> PRT
<213> Homo sapiens

<400> 138

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

<210> 139
<211> 387
<212> PRT
<213> Homo sapiens

<400> 139
Met Asn Val Ser Gly Cys Pro Gly Ala Gly Asn Ala Ser Gln Ala Gly
1 5 10 15
Gly Gly Gly Gly Trp His Pro Glu Ala Val Ile Val Pro Leu Leu Phe
20 25 30
Ala Leu Ile Phe Leu Val Gly Thr Val Gly Asn Thr Leu Val Leu Ala
35 40 45
Val Leu Leu Arg Gly Gly Gln Ala Val Ser Thr Thr Asn Leu Phe Ile
50 55 60
Leu Asn Leu Gly Val Ala Asp Leu Cys Phe Ile Leu Cys Cys Val Pro
65 70 75 80
Phe Gln Ala Thr Ile Tyr Thr Leu Asp Gly Trp Val Phe Gly Ser Leu
85 90 95
Leu Cys Lys Ala Val His Phe Leu Ile Phe Leu Thr Met His Ala Ser
100 105 110
Ser Phe Thr Leu Ala Ala Val Ser Leu Asp Arg Tyr Leu Ala Ile Arg
115 120 125
Tyr Pro Leu His Ser Arg Glu Leu Arg Thr Pro Arg Asn Ala Leu Ala
130 135 140
Ala Ile Gly Leu Ile Trp Gly Leu Ser Leu Leu Phe Ser Gly Pro Tyr
145 150 155 160
Leu Ser Tyr Tyr Arg Gln Ser Gln Leu Ala Asn Leu Thr Val Cys His
165 170 175
Pro Ala Trp Ser Ala Pro Arg Arg Arg Ala Met Asp Ile Cys Thr Phe
180 185 190
Val Phe Ser Tyr Leu Leu Pro Val Leu Val Leu Gly Leu Thr Tyr Ala
195 200 205
Arg Thr Leu Arg Tyr Leu Trp Arg Ala Val Asp Pro Val Ala Ala Gly
210 215 220
Ser Gly Ala Arg Arg Ala Lys Arg Lys Val Thr Arg Met Ile Leu Ile
225 230 235 240
Val Ala Ala Leu Phe Cys Leu Cys Trp Met Pro His His Ala Leu Ile
245 250 255
Leu Cys Val Trp Phe Gly Gln Phe Pro Leu Thr Arg Ala Thr Tyr Ala
260 265 270
Leu Arg Ile Leu Ser His Leu Val Ser Tyr Ala Asn Ser Cys Val Asn
275 280 285
Pro Ile Val Tyr Ala Leu Val Ser Lys His Phe Arg Lys Gly Phe Arg
290 295 300
Thr Ile Cys Ala Gly Leu Leu Gly Arg Ala Pro Gly Arg Ala Ser Gly
305 310 315 320
Arg Val Cys Ala Ala Ala Arg Gly Thr His Ser Gly Ser Val Leu Glu
325 330 335
Arg Glu Ser Ser Asp Leu Leu His Met Ser Glu Ala Ala Gly Ala Leu
340 345 350
Arg Pro Cys Pro Gly Ala Ser Gln Pro Cys Ile Leu Glu Pro Cys Pro
355 360 365
Gly Pro Ser Trp Gln Gly Pro Lys Ala Gly Asp Ser Ile Leu Thr Val

370 375 380
Asp Val Ala
385

<210> 140
<211> 368
<212> PRT
<213> Homo sapiens

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

<210> 141
<211> 1050
<212> DNA
<213> Homo sapiens

<400> 141
atggagctgg cggtcgggaa cctcagcgag ggcaacgcga gctggccgga gccccccgcc 60
ccggagcccg ggccgctgtt cggcatcggc gtggagaact tcgtcacgct ggtggtgttc 120
ggcctgatct tcgcgctggg tgtgctgggc aacagcctag tgatcaccgt gctggcgcgc 180

agcaagccgg gcaagccgcg gagcaccacc aacctgttca tcctcaacct gagcatcgcc 240
gacctggcct acctgctctt ctgcatcccc ttccaggcca ccgtgtacgc gctgcccacc 300
tgggtgctgg gcgccttcat ctgcaagttc atccactact tcttcaccgt gtccatgctg 360
gtgagcatct tcaccctggc cgcgatgtcc gtggaccgct acgtggccat cgtgcactcg 420
cggcgctcct cctccctcag ggtgtcccgc aacgcgctgc tgggcgtggg ctgcatctgg 480
gcgctgtcca ttgccatggc ctcgcccgtg gcctaccacc agggcctctt ccacccgcgc 540
gccagcaacc agaccttctg ctgggagcag tggcccgacc ctcgccacaa gaaggcctac 600
gtggtgtgca ccttcgtctt cggctacctg ctgccgctcc tgctcatctg cttctgctat 660
gccaaggtcc ttaatcactt gcataaaaag ttgaagaaca tgtcaaagaa gtctgaagca 720
tccaagaaaa agactgcaca gacagttctg gtggtggttg tggtgtttgg aatctcctgg 780
ctgccgcacc acatcatcca tctctgggct gagtttggag ttttcccgct gacgccggct 840
tccttcctct tcagaatcac cgcccactgc ctggcgtaca gcaattcctc cgtgaatcct 900
atcatttatg catttctctc tgaaaatttc aggaaggcct ataaacaagt gttcaagtgt 960
cacattcgca aagattcaca cctgagtgat actaaagaaa ataaaagtcg aatagacacc 1020
ccaccatcaa ccaattgtac tcatgtgtga 1050

<210> 142
<211> 1050
<212> DNA
<213> Homo sapiens

<400> 142
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ccggagcccg ggccgctgtt cggcatcggc gtggagaact tcgtcacgct ggtggtgttc 120
ggcctgatct tcgcgctggg tgtgctgggc aacagcctag tgatcaccgt gctggcgcgc 180
agcaagccgg gcaagccgcg gagcaccacc aacctgttca tcctcaacct gagcatcgcc 240
gacctggcct acctgctctt ctgcatcccc ttccaggcca ccgtgtacgc gctgcccacc 300
tgggtgctgg gcgccttcat ctgcaagttc atccactact tcttcaccgt gtccatgctg 360
gtgagcatct tcaccctggc cgcgatgtcc gtggaccgct acgtggccat cgtgcactcg 420
cggcgctcct cctccctcag ggtgtcccgc aacgcgctgc tgggcgtggg ctgcatctgg 480
gcgctgtcca ttgccatggc ctcgcccgtg gcctaccacc agggcctctt ccacccgcgc 540
gccagcaacc agaccttctg ctgggagcag tggcccgacc ctcgccacaa gaaggcctac 600
gtggtgtgca ccttcgtctt cggctacctg ctgccgctcc tgctcatctg cttctgctat 660
gccaaggtcc ttaatcactt gcataaaaag ttgaagaaca tgtcaaagaa gtctgaagca 720
tccaagaaaa agactgcaca gacagttctg gtggtggttg tggtgtttgg aatctcctgg 780
ctgccgcacc acatcatcca tctctgggct gagtttggag ttttcccgct gacgccggct 840
tccttcctct tcagaatcac cgcccactgc ctggcgtaca gcaattcctc cgtgaatcct 900
atcatttatg catttctctc tgaaaatttc aggaaggcct ataaacaagt gttcaagtgt 960
cacattcgca aagattcaca cctgagtgat actaaagaaa gtaaaagtcg aatagacacc 1020
ccaccatcaa ccaattgtac tcatgtgtga 1050

<210> 143
<211> 1050
<212> DNA
<213> Homo sapiens

<400> 143
atggagctgg cggtcgggaa cctcagcgag ggcaacgcga gctgtccgga gccccccgcc 60
ccggagcccg ggccgctgtt cggcatcggc gtggagaact tcgtcacgct ggtggtgttc 120
ggcctgatct tcgcgctggg cgtgctgggc aacagcctag tgatcaccgt gctggcgcgc 180
agcaagccgg gcaagccgcg gagcaccacc aacctgttca tcctcaacct gagcatcgcc 240
gacctggcct acctgctctt ctgcatcccc ttccaggcca ccgtgtacgc gctgcccacc 300
tgggtgctgg gcgccttcat ctgcaagttc atccactact tcttcaccgt gtccatgctg 360
gtgagcatct tcaccctggc cgcgatgtcc gtggaccgct acgtggccat cgtgcactcg 420
cggcgctcct cctccctcag ggtgtcccgc aacgcgctgc tgggcgtggg ctgcatctgg 480
gcgctgtcca ttgccatggc ctcgcccgtg gcctaccacc agggcctctt ccacccgcgc 540
gccagcaacc agaccttctg ctgggagcag tggcccgacc ctcgccacaa gaaggcctac 600
gtggtgtgca ccttcgtctt cggctacctg ctgccgctcc tgctcatctg cttctgctat 660
gccaaggtcc ttaatcactt gcataaaaag ttgaagaaca tgtcaaagaa gtctgaagca 720
tccaagaaaa agactgcaca gacagttctg gtggtggttg tggtgtttgg aatctcctgg 780
ctgccgcacc acatcatcca tctctgggct gagtttggag ttttcccgct gacgccggct 840
tccttcctct tcagaatcac cgcccactgc ctggcgtaca gcaattcctc cgtgaatcct 900
atcatttatg catttctctc tgaaaatttc aggaaggcct ataaacaagt gttcaagtgt 960
cacattcgca aagattcaca cctgagtgat actaaagaaa ataaaagtcg aatagacacc 1020
ccaccatcaa ccaattgtac tcatgtgtga 1050

<210> 144
<211> 1164
<212> DNA
<213> Homo sapiens

<400> 144
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tggcaccccg aggcggtcat cgtgcccctg ctcttcgcgc tcatcttcct cgtgggcacc 120
gtgggcaaca cgctggtgct ggcggtgctg ctgcgcggcg gccaggcggt cagcactacc 180
aacctgttca tccttaacct gggcgtggcc gacctgtgtt tcatcctgtg ctgcgtgccc 240
ttccaggcca ccatctacac cctggacggc tgggtgttcg gctcgctgct gtgcaaggcg 300
gtgcacttcc tcatcttcct caccatgcac gccagcagct tcacgctggc cgccgtctcc 360
ctggacaggt atctggccat ccgctacccg ctgcactccc gcgagctgcg cacgcctcga 420
aacgcgctgg cagccatcgg gctcatctgg gggctgtcgc tgctcttctc cgggccctac 480
ctgagctact accgccagtc gcagctggcc aacctgaccg tgtgccatcc cgcgtggagc 540
gcccctcgcc gccgcgccat ggacatctgc accttcgtct tcagctacct gcttcctgtg 600
ctggttctcg gcctgaccta cgcgcgcacc ttgcgctacc tctggcgcgc cgtcgacccg 660
gtggccgcgg gctcgggtgc ccggcgcgcc aagcgcaagg tgacacgcat gatcctcatc 720
gtggccgcgc tcttctgcct ctgctggatg ccccaccacg cgctcatcct ctgcgtgtgg 780
ttcggccagt tcccgctcac gcgcgccact tatgcgcttc gcatcctctc gcacctggtc 840
tcctacgcca actcctgcgt caaccccatc gtttacgcgc tggtctccaa gcacttccgc 900
aaaggcttcc gcacgatctg cgcgggcctg ctgggccgtg ccccaggccg agcctcgggc 960
cgtgtgtgcg ctgccgcgcg gggcacccac agtggcagcg tgttggagcg cgagtccagc 1020
gacctgttgc acatgagcga ggcggcgggg gcccttcgtc cctgccccgg cgcttcccag 1080
ccatgcatcc tcgagccctg tcctggcccg tcctggcagg gcccaaaggc aggcgacagc 1140
atcctgacgg ttgatgtggc ctga 1164

<210> 145
<211> 1107
<212> DNA
<213> Homo sapiens

<400> 145
atggctgatg cccagaacat ttcactggac agcccaggga gtgtgggggc cgtggcagtg 60
cctgtggtct ttgccctaat cttcctgctg ggcacagtgg gcaatgggct ggtgctggca 120
gtgctcctgc agcctggccc gagtgcctgg caggagcctg gcagcaccac ggacctgttc 180
atcctcaacc tggcggtggc tgacctctgc ttcatcctgt gctgcgtgcc cttccaggcc 240
accatctaca cgctggatgc ctggctcttt ggggccctcg tctgcaaggc cgtgcacctg 300
ctcatctacc tcaccatgta cgccagcagc tttacgctgg ctgctgtctc cgtggacagg 360
tacctggccg tgcggcaccc gctgcgctcg cgcgccctgc gcacgccgcg taacgcccgc 420
gccgcagtgg ggctggtgtg gctgctggcg gcgctcttct cggcgcccta cctcagctac 480
tacggcaccg tgcgctacgg cgcgctggag ctctgcgtgc ccgcctggga ggacgcgcgc 540
cgccgcgccc tggacgtggc caccttcgct gccggctacc tgctgcccgt ggctgtggtg 600
agcctggcct acgggcgcac gctgcgcttc ctgtgggccg ccgtgggtcc cgcgggcgcg 660
gcggcggccg aggcgcggcg gagggcgacg ggccgcgcgg ggcgcgccat gctggcggtg 720
gccgcgctct acgcgctctg ctggggtccg caccacgcgc tcatcctgtg cttctggtac 780
ggccgcttcg ccttcagccc ggccacctac gcctgccgcc tggcctcaca ctgcctggcc 840
tacgccaact cctgcctcaa cccgctcgtc tacgcgctcg cctcgcgcca cttccgcgcg 900
cgcttccgcc gcctgtggcc gtgcggccgc cgacgccgcc accgtgcccg ccgcgccttg 960
cgtcgcgtcc gccccgcgtc ctcgggccca cccggctgcc ccggagacgc ccggcctagc 1020
gggaggctgc tggctggtgg cggccagggc ccggagccca gggagggacc cgtccacggc 1080
ggagaggctg cccgaggacc ggaataa 1107

<210> 146
<211> 889
<212> PRT
<213> Artificial Sequence

<220>
<223> LHn/A fragment

<221> VARIANT
<222> (453)...(455)
<223> Xaa is any amino acid

<400> 146

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

<210> 147
<211> 2661
<212> DNA
<213> Artificial Sequence

<220>
<223> LHn/A fragment

<400> 147
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tatatcaaaa tcccgaatgc gggtcaaatg cagcccgtga aagcatttaa aatccataac 120
aaaatttggg tgatcccgga gcgcgatacg ttcacgaacc cggaagaagg agatttaaac 180
ccaccgcctg aggctaaaca ggtcccggtg tcttactatg atagcacata cctgagtacc 240
gacaatgaaa aggacaacta cctgaaaggt gttaccaaac tgttcgagcg catttattcg 300
acagatctcg gtcgcatgtt gctgacttct attgtgcgcg gcattccgtt ttggggtggt 360
agcaccatcg atacagaact caaagtgatt gacaccaact gcatcaatgt gattcagcct 420
gatgggagct accggtccga agagcttaac ctcgtaatca ttggcccgag cgcggatatt 480
atccaattcg aatgtaaatc ttttgggcat gaagtcctga atctgacgcg gaatggctat 540
ggatcgacgc agtatattcg tttttctcca gatttcacat ttggatttga agaaagcctc 600
gaagttgata cgaaccctct tttaggcgcg ggaaaattcg cgacggaccc agcggtgacc 660
ttggcacatg aacttattca tgccgggcat cgcttgtatg gaatcgccat taacccgaac 720

cgtgttttca aggtgaatac gaacgcgtat tacgagatgt cgggcttaga agtgtccttt 780
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