

SEQUENCE LISTING

<110> THE UNITED STATES OF AMERICA, AS REPRESENTED BY THE
SECRETARY, DEPARTMENT OF HEALTH AND HUMAN SERVICES

<120> CHIMERIC ANTIGEN RECEPTORS AND THEIR USES

<130> 739267

<150> US 62/506,268

<151> 2017-05-15

<160> 85

<170> PatentIn version 3.5

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Met

1

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Leu Leu Leu Val Thr Ser Leu Leu Leu Cys Glu Leu Pro His Pro Ala
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Phe Leu Leu Ile Pro
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Gln	Val	Gln	Leu	Gln	Gln	Ser	Gly	Pro	Gly	Leu	Val	Lys	Pro	Ser	Gln
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Thr	Leu	Ser	Leu	Thr	Cys	Ala	Ile	Ser
			20					25

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Gly	Asp	Ser	Val	Ser	Ser	Asn	Ser	Ala	Ala
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Trp	Asn	Trp	Ile	Arg	Gln	Ser	Pro	Ser	Arg	Gly	Leu	Glu	Trp	Leu	Gly
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Arg

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Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn
1 5

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

Thr Ala Val Tyr Tyr Cys
35

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Ala Arg Glu Val Thr Gly Asp Leu Glu Asp Ala Phe Asp Ile
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Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser
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Gly Gly Gly Gly Ser
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<400> 11

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Ala Ser
20 25

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Gln Thr Ile Trp Ser Tyr
1 5

<210> 13

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Leu Asn Trp Tyr Gln Gln Arg Pro Gly Lys Ala Pro Asn Leu Leu Ile
1 5 10 15

Tyr

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Ala Ala Ser
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Ser Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly Arg Gly Ser Gly
1 5 10 15

Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Ala Glu Asp Phe Ala
20 25 30

Thr Tyr Tyr Cys
35

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Gln Gln Ser Tyr Ser Ile Pro Gln Thr
1 5

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Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
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Thr Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr
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Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala
20 25 30

Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp
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Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu
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Ser Leu Val Ile Thr Leu Tyr Cys
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Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met
1 5 10 15

Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe
20 25 30

Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
35 40

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Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
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Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
20 25 30

Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
35 40 45

Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
50 55 60

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

Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
85 90 95

Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
100 105 110

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Gly Ser Gly Glu Gly Arg Gly Ser Leu Leu Thr Cys Gly Asp Val Glu
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Glu Asn Pro Gly Pro Arg
20

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Asp Ile Gln Met Thr Gln Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly
1 5 10 15

Asp Arg Val Thr Ile Ser Cys Arg Ala Ser
20 25

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<400> 24

Gln Asp Ile Ser Lys Tyr
1 5

<210> 25
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<400> 25

Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Thr Val Lys Leu Leu Ile
1 5 10 15

Tyr

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His Thr Ser
1

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Arg Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly
1 5 10 15

Thr Asp Tyr Ser Leu Thr Ile Ser Asn Leu Glu Gln Glu Asp Ile Ala
20 25 30

Thr Tyr Phe Cys
35

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Gln Gln Gly Asn Thr Leu Pro Tyr Thr
1 5

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Phe Gly Gly Gly Thr Lys Leu Glu Ile Thr
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Gly Ser Thr Ser Gly Ser Gly Lys Pro Gly Ser Gly Glu Gly Ser Thr
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Lys Gly

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Glu Val Lys Leu Gln Glu Ser Gly Pro Gly Leu Val Ala Pro Ser Gln
1 5 10 15

Ser Leu Ser Val Thr Cys Thr Val Ser
20 25

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<400> 32

Gly Val Ser Leu Pro Asp Tyr Gly
1 5

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Val Ser Trp Ile Arg Gln Pro Pro Arg Lys Gly Leu Glu Trp Leu Gly
1 5 10 15

Val

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Ile Trp Gly Ser Glu Thr Thr
1 5

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Tyr Tyr Asn Ser Ala Leu Lys Ser Arg Leu Thr Ile Ile Lys Asp Asn
1 5 10 15

Ser Lys Ser Gln Val Phe Leu Lys Met Asn Ser Leu Gln Thr Asp Asp
20 25 30

Thr Ala Ile Tyr Tyr Cys
35

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Ala Lys His Tyr Tyr Tyr Gly Gly Ser Tyr Ala Met Asp Tyr
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Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser
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Arg Lys Arg Arg Gly Ser Gly Thr Pro Asp Pro Trp
1 5 10

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Gly Ser Gly Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly Asp Val
1 5 10 15

Glu Glu Asn Pro Gly Pro Leu Glu
20

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Thr Ser Ala Ala Ala Ile Glu Val Met Tyr Pro Pro Pro Tyr Leu Asp
1 5 10 15

Asn Glu Lys Ser Asn Gly Thr Ile Ile His Val Lys Gly Lys His Leu
20 25 30

Cys Pro Ser Pro Leu Phe Pro Gly Pro Ser Lys Pro
35 40

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Phe Trp Val Leu Val Val Val Gly Gly Val Leu Ala Cys Tyr Ser Leu
1 5 10 15

Leu Val Thr Val Ala Phe Ile Ile Phe Trp Val
20 25

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Arg Ser Lys Arg Ser Arg Leu Leu His Ser Asp Tyr Met Asn Met Thr
1 5 10 15

Pro Arg Arg Pro Gly Pro Thr Arg Lys His Tyr Gln Pro Tyr Ala Pro
20 25 30

Pro Arg Asp Phe Ala Ala Tyr Arg Ser
35 40

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Gly Ser Gly Glu Gly Arg Gly Ser Leu Leu Thr Cys Gly Asp Val Glu
1 5 10 15

Glu Asn Pro Gly Pro
20

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Gly Ser Gly Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly Asp Val
1 5 10 15

Glu Glu Asn Pro Gly Pro
20

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Gly Ser Gly Gln Cys Thr Asn Tyr Ala Leu Leu Lys Leu Ala Gly Asp
1 5 10 15

Val Glu Ser Asn Pro Gly Pro
20

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<400> 46

Gly Ser Gly Val Lys Gln Thr Leu Asn Phe Asp Leu Leu Lys Leu Ala
1 5 10 15

Gly Asp Val Glu Ser Asn Pro Gly Pro
20 25

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Arg Lys Arg Arg
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Met Leu Leu Leu Val Thr Ser Leu Leu Leu Cys Glu Leu Pro His Pro
1 5 10 15

Ala Phe Leu Leu Ile Pro Gln Val Gln Leu Gln Gln Ser Gly Pro Gly
20 25 30

Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly
35 40 45

Asp Ser Val Ser Ser Asn Ser Ala Ala Trp Asn Trp Ile Arg Gln Ser
50 55 60

Pro Ser Arg Gly Leu Glu Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys
65 70 75 80

Trp Tyr Asn Asp Tyr Ala Val Ser Val Lys Ser Arg Ile Thr Ile Asn
85 90 95

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

Pro Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg Glu Val Thr Gly Asp
115 120 125

Leu Glu Asp Ala Phe Asp Ile Trp Gly Gln Gly Thr Met Val Thr Val
130 135 140

Ser Ser Gly Gly Gly Gly Ser Asp Ile Gln Met Thr Gln Ser Pro Ser
145 150 155 160

Ser Leu Ser Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Arg Ala
165 170 175

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

Lys Ala Pro Asn Leu Leu Ile Tyr Ala Ala Ser Ser Leu Gln Ser Gly
195 200 205

Val Pro Ser Arg Phe Ser Gly Arg Gly Ser Gly Thr Asp Phe Thr Leu
210 215 220

Thr Ile Ser Ser Leu Gln Ala Glu Asp Phe Ala Thr Tyr Tyr Cys Gln
225 230 235 240

Gln Ser Tyr Ser Ile Pro Gln Thr Phe Gly Gln Gly Thr Lys Leu Glu
245 250 255

Ile Lys Thr Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala
260 265 270

Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg
275 280 285

Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys
290 295 300

Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu
305 310 315 320

Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu
325 330 335

Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln
340 345 350

Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly
355 360 365

Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr
370 375 380

Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg
385 390 395 400

Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met
405 410 415

Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu
420 425 430

Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys
435 440 445

Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu
450 455 460

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

Pro Pro Arg Gly Ser Gly Glu Gly Arg Gly Ser Leu Leu Thr Cys Gly
485 490 495

Asp Val Glu Glu Asn Pro Gly Pro Arg Met Leu Leu Leu Val Thr Ser
500 505 510

Leu Leu Leu Cys Glu Leu Pro His Pro Ala Phe Leu Leu Ile Pro Asp
515 520 525

Ile Gln Met Thr Gln Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly Asp
530 535 540

Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp Ile Ser Lys Tyr Leu
545 550 555 560

Asn Trp Tyr Gln Gln Lys Pro Asp Gly Thr Val Lys Leu Leu Ile Tyr
565 570 575

His Thr Ser Arg Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly Ser
580 585 590

Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser Asn Leu Glu Gln Glu
595 600 605

Asp Ile Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Tyr Thr
610 615 620

Phe Gly Gly Gly Thr Lys Leu Glu Ile Thr Gly Ser Thr Ser Gly Ser
625 630 635 640

Gly Lys Pro Gly Ser Gly Glu Gly Ser Thr Lys Gly Glu Val Lys Leu
645 650 655

Gln Glu Ser Gly Pro Gly Leu Val Ala Pro Ser Gln Ser Leu Ser Val
660 665 670

Thr Cys Thr Val Ser Gly Val Ser Leu Pro Asp Tyr Gly Val Ser Trp
675 680 685

Ile Arg Gln Pro Pro Arg Lys Gly Leu Glu Trp Leu Gly Val Ile Trp
690 695 700

Gly Ser Glu Thr Thr Tyr Tyr Asn Ser Ala Leu Lys Ser Arg Leu Thr
705 710 715 720

Ile Ile Lys Asp Asn Ser Lys Ser Gln Val Phe Leu Lys Met Asn Ser
725 730 735

Leu Gln Thr Asp Asp Thr Ala Ile Tyr Tyr Cys Ala Lys His Tyr Tyr
740 745 750

Tyr Gly Gly Ser Tyr Ala Met Asp Tyr Trp Gly Gln Gly Thr Ser Val
755 760 765

Thr Val Ser Ser Ser Gly Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr
770 775 780

Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala
785 790 795 800

Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe
805 810 815

Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val
820 825 830

Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys
835 840 845

Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr
850 855 860

Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu
865 870 875 880

Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro
885 890 895

Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly
900 905 910

Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro
915 920 925

Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr
930 935 940

Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly
945 950 955 960

Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln
965 970 975

Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln
980 985 990

Ala Leu Pro Pro Arg
995

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Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1 5 10 15

His Ala Ala Arg Pro Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu
20 25 30

Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp
35 40 45

Ser Val Ser Ser Asn Ser Ala Ala Trp Asn Trp Ile Arg Gln Ser Pro
50 55 60

Ser Arg Gly Leu Glu Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp
65 70 75 80

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

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

Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg Glu Val Thr Gly Asp Leu
115 120 125

Glu Asp Ala Phe Asp Ile Trp Gly Gln Gly Thr Met Val Thr Val Ser
130 135 140

Ser Gly Gly Gly Gly Ser Asp Ile Gln Met Thr Gln Ser Pro Ser Ser
145 150 155 160

Leu Ser Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Arg Ala Ser
165 170 175

Gln Thr Ile Trp Ser Tyr Leu Asn Trp Tyr Gln Gln Arg Pro Gly Lys
180 185 190

Ala Pro Asn Leu Leu Ile Tyr Ala Ala Ser Ser Leu Gln Ser Gly Val
195 200 205

Pro Ser Arg Phe Ser Gly Arg Gly Ser Gly Thr Asp Phe Thr Leu Thr
210 215 220

Ile Ser Ser Leu Gln Ala Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln
225 230 235 240

Ser Tyr Ser Ile Pro Gln Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile
245 250 255

Lys Ser Gly Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro
260 265 270

Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro
275 280 285

Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp
290 295 300

Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu
305 310 315 320

Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu
325 330 335

Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu
340 345 350

Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys
355 360 365

Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln
370 375 380

Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu
385 390 395 400

Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly
405 410 415

Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu
420 425 430

Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly
435 440 445

Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser
450 455 460

Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro
465 470 475 480

Pro Arg Arg Lys Arg Arg Gly Ser Gly Thr Pro Asp Pro Trp Gly Ser
485 490 495

Gly Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly Asp Val Glu Glu
500 505 510

Asn Pro Gly Pro Leu Glu Met Glu Phe Gly Leu Ser Trp Leu Phe Leu
515 520 525

Val Ala Ile Leu Lys Gly Val Gln Cys Ser Arg Asp Ile Gln Met Thr
530 535 540

Gln Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly Asp Arg Val Thr Ile
545 550 555 560

Ser Cys Arg Ala Ser Gln Asp Ile Ser Lys Tyr Leu Asn Trp Tyr Gln
565 570 575

Gln Lys Pro Asp Gly Thr Val Lys Leu Leu Ile Tyr His Thr Ser Arg
580 585 590

Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr
595 600 605

Asp Tyr Ser Leu Thr Ile Ser Asn Leu Glu Gln Glu Asp Ile Ala Thr
610 615 620

Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Tyr Thr Phe Gly Gly Gly
625 630 635 640

Thr Lys Leu Glu Ile Thr Gly Ser Thr Ser Gly Ser Gly Lys Pro Gly
645 650 655

Ser Gly Glu Gly Ser Thr Lys Gly Glu Val Lys Leu Gln Glu Ser Gly
660 665 670

Pro Gly Leu Val Ala Pro Ser Gln Ser Leu Ser Val Thr Cys Thr Val
675 680 685

Ser Gly Val Ser Leu Pro Asp Tyr Gly Val Ser Trp Ile Arg Gln Pro
690 695 700

Pro Arg Lys Gly Leu Glu Trp Leu Gly Val Ile Trp Gly Ser Glu Thr
705 710 715 720

Thr Tyr Tyr Asn Ser Ala Leu Lys Ser Arg Leu Thr Ile Ile Lys Asp
725 730 735

Asn Ser Lys Ser Gln Val Phe Leu Lys Met Asn Ser Leu Gln Thr Asp
740 745 750

Asp Thr Ala Ile Tyr Tyr Cys Ala Lys His Tyr Tyr Tyr Gly Gly Ser
755 760 765

Tyr Ala Met Asp Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser
770 775 780

Thr Ser Ala Ala Ala Ile Glu Val Met Tyr Pro Pro Pro Tyr Leu Asp
785 790 795 800

Asn Glu Lys Ser Asn Gly Thr Ile Ile His Val Lys Gly Lys His Leu
805 810 815

Cys Pro Ser Pro Leu Phe Pro Gly Pro Ser Lys Pro Phe Trp Val Leu
820 825 830

Val Val Val Gly Gly Val Leu Ala Cys Tyr Ser Leu Leu Val Thr Val
835 840 845

Ala Phe Ile Ile Phe Trp Val Arg Ser Lys Arg Ser Arg Leu Leu His
850 855 860

Ser Asp Tyr Met Asn Met Thr Pro Arg Arg Pro Gly Pro Thr Arg Lys
865 870 875 880

His Tyr Gln Pro Tyr Ala Pro Pro Arg Asp Phe Ala Ala Tyr Arg Ser
885 890 895

Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
900 905 910

Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
915 920 925

Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
930 935 940

Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
945 950 955 960

Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg
965 970 975

Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
980 985 990

Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
995 1000 1005

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Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
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His Ala Ala Arg Pro Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu
20 25 30

Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp
35 40 45

Ser Val Ser Ser Asn Ser Ala Ala Trp Asn Trp Ile Arg Gln Ser Pro
50 55 60

Ser Arg Gly Leu Glu Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp
65 70 75 80

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

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

Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg Glu Val Thr Gly Asp Leu
115 120 125

Glu Asp Ala Phe Asp Ile Trp Gly Gln Gly Thr Met Val Thr Val Ser
130 135 140

Ser Gly Gly Gly Gly Ser Asp Ile Gln Met Thr Gln Ser Pro Ser Ser
145 150 155 160

Leu Ser Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Arg Ala Ser
165 170 175

Gln Thr Ile Trp Ser Tyr Leu Asn Trp Tyr Gln Gln Arg Pro Gly Lys
180 185 190

Ala Pro Asn Leu Leu Ile Tyr Ala Ala Ser Ser Leu Gln Ser Gly Val
195 200 205

Pro Ser Arg Phe Ser Gly Arg Gly Ser Gly Thr Asp Phe Thr Leu Thr
210 215 220

Ile Ser Ser Leu Gln Ala Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln
225 230 235 240

Ser Tyr Ser Ile Pro Gln Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile
245 250 255

Lys Ser Gly Ala Ala Ala Ile Glu Val Met Tyr Pro Pro Pro Tyr Leu
260 265 270

Asp Asn Glu Lys Ser Asn Gly Thr Ile Ile His Val Lys Gly Lys His
275 280 285

Leu Cys Pro Ser Pro Leu Phe Pro Gly Pro Ser Lys Pro Phe Trp Val
290 295 300

Leu Val Val Val Gly Gly Val Leu Ala Cys Tyr Ser Leu Leu Val Thr
305 310 315 320

Val Ala Phe Ile Ile Phe Trp Val Arg Ser Lys Arg Ser Arg Leu Leu
325 330 335

His Ser Asp Tyr Met Asn Met Thr Pro Arg Arg Pro Gly Pro Thr Arg
340 345 350

Lys His Tyr Gln Pro Tyr Ala Pro Pro Arg Asp Phe Ala Ala Tyr Arg
355 360 365

Ser Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln
370 375 380

Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu
385 390 395 400

Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly
405 410 415

Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln
420 425 430

Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu
435 440 445

Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr
450 455 460

Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro
465 470 475 480

Arg Arg Lys Arg Arg Gly Ser Gly Thr Pro Asp Pro Trp Gly Ser Gly
485 490 495

Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly Asp Val Glu Glu Asn
500 505 510

Pro Gly Pro Leu Glu Met Glu Phe Gly Leu Ser Trp Leu Phe Leu Val
515 520 525

Ala Ile Leu Lys Gly Val Gln Cys Ser Arg Asp Ile Gln Met Thr Gln
530 535 540

Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly Asp Arg Val Thr Ile Ser
545 550 555 560

Cys Arg Ala Ser Gln Asp Ile Ser Lys Tyr Leu Asn Trp Tyr Gln Gln
565 570 575

Lys Pro Asp Gly Thr Val Lys Leu Leu Ile Tyr His Thr Ser Arg Leu
580 585 590

His Ser Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp
595 600 605

Tyr Ser Leu Thr Ile Ser Asn Leu Glu Gln Glu Asp Ile Ala Thr Tyr
610 615 620

Phe Cys Gln Gln Gly Asn Thr Leu Pro Tyr Thr Phe Gly Gly Gly Thr
625 630 635 640

Lys Leu Glu Ile Thr Gly Ser Thr Ser Gly Ser Gly Lys Pro Gly Ser
645 650 655

Gly Glu Gly Ser Thr Lys Gly Glu Val Lys Leu Gln Glu Ser Gly Pro
660 665 670

Gly Leu Val Ala Pro Ser Gln Ser Leu Ser Val Thr Cys Thr Val Ser
675 680 685

Gly Val Ser Leu Pro Asp Tyr Gly Val Ser Trp Ile Arg Gln Pro Pro
690 695 700

Arg Lys Gly Leu Glu Trp Leu Gly Val Ile Trp Gly Ser Glu Thr Thr
705 710 715 720

Tyr Tyr Asn Ser Ala Leu Lys Ser Arg Leu Thr Ile Ile Lys Asp Asn
725 730 735

Ser Lys Ser Gln Val Phe Leu Lys Met Asn Ser Leu Gln Thr Asp Asp
740 745 750

Thr Ala Ile Tyr Tyr Cys Ala Lys His Tyr Tyr Tyr Gly Gly Ser Tyr
755 760 765

Ala Met Asp Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser Thr
770 775 780

Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile
785 790 795 800

Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala
805 810 815

Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr
820 825 830

Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu
835 840 845

Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile
850 855 860

Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp
865 870 875 880

Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
885 890 895

Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
900 905 910

Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
915 920 925

Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
930 935 940

Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
945 950 955 960

Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg
965 970 975

Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
980 985 990

Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
995 1000 1005

<210> 51
<211> 1009
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic

<400> 51

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His Ala Ala Arg Pro Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu
20 25 30

Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp
35 40 45

Ser Val Ser Ser Asn Ser Ala Ala Trp Asn Trp Ile Arg Gln Ser Pro
50 55 60

Ser Arg Gly Leu Glu Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp
65 70 75 80

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

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

Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg Glu Val Thr Gly Asp Leu
115 120 125

Glu Asp Ala Phe Asp Ile Trp Gly Gln Gly Thr Met Val Thr Val Ser
130 135 140

Ser Gly Gly Gly Gly Ser Asp Ile Gln Met Thr Gln Ser Pro Ser Ser
145 150 155 160

Leu Ser Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Arg Ala Ser
165 170 175

Gln Thr Ile Trp Ser Tyr Leu Asn Trp Tyr Gln Gln Arg Pro Gly Lys
180 185 190

Ala Pro Asn Leu Leu Ile Tyr Ala Ala Ser Ser Leu Gln Ser Gly Val
195 200 205

Pro Ser Arg Phe Ser Gly Arg Gly Ser Gly Thr Asp Phe Thr Leu Thr
210 215 220

Ile Ser Ser Leu Gln Ala Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln
225 230 235 240

Ser Tyr Ser Ile Pro Gln Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile
245 250 255

Lys Ser Gly Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro
260 265 270

Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro
275 280 285

Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp
290 295 300

Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu
305 310 315 320

Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu
325 330 335

Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu
340 345 350

Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys
355 360 365

Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln
370 375 380

Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu
385 390 395 400

Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly
405 410 415

Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu
420 425 430

Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly
435 440 445

Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser
450 455 460

Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro
465 470 475 480

Pro Arg Arg Lys Arg Arg Gly Ser Gly Thr Pro Asp Pro Trp Gly Ser
485 490 495

Gly Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly Asp Val Glu Glu
500 505 510

Asn Pro Gly Pro Leu Glu Met Glu Phe Gly Leu Ser Trp Leu Phe Leu
515 520 525

Val Ala Ile Leu Lys Gly Val Gln Cys Ser Arg Asp Ile Gln Met Thr
530 535 540

Gln Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly Asp Arg Val Thr Ile
545 550 555 560

Ser Cys Arg Ala Ser Gln Asp Ile Ser Lys Tyr Leu Asn Trp Tyr Gln
565 570 575

Gln Lys Pro Asp Gly Thr Val Lys Leu Leu Ile Tyr His Thr Ser Arg
580 585 590

Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr
595 600 605

Asp Tyr Ser Leu Thr Ile Ser Asn Leu Glu Gln Glu Asp Ile Ala Thr
610 615 620

Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Tyr Thr Phe Gly Gly Gly
625 630 635 640

Thr Lys Leu Glu Ile Thr Gly Ser Thr Ser Gly Ser Gly Lys Pro Gly
645 650 655

Ser Gly Glu Gly Ser Thr Lys Gly Glu Val Lys Leu Gln Glu Ser Gly
660 665 670

Pro Gly Leu Val Ala Pro Ser Gln Ser Leu Ser Val Thr Cys Thr Val
675 680 685

Ser Gly Val Ser Leu Pro Asp Tyr Gly Val Ser Trp Ile Arg Gln Pro
690 695 700

Pro Arg Lys Gly Leu Glu Trp Leu Gly Val Ile Trp Gly Ser Glu Thr
705 710 715 720

Thr Tyr Tyr Asn Ser Ala Leu Lys Ser Arg Leu Thr Ile Ile Lys Asp
725 730 735

Asn Ser Lys Ser Gln Val Phe Leu Lys Met Asn Ser Leu Gln Thr Asp
740 745 750

Asp Thr Ala Ile Tyr Tyr Cys Ala Lys His Tyr Tyr Tyr Gly Gly Ser
755 760 765

Tyr Ala Met Asp Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser
770 775 780

Thr Ser Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr
785 790 795 800

Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala
805 810 815

Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile
820 825 830

Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser
835 840 845

Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr
850 855 860

Ile Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu
865 870 875 880

Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu
885 890 895

Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln
900 905 910

Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu
915 920 925

Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly
930 935 940

Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln
945 950 955 960

Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu
965 970 975

Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr
980 985 990

Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro
995 1000 1005

Arg

<210> 52
<211> 1007
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic

<400> 52

Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
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His Ala Ala Arg Pro Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu
20 25 30

Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp
35 40 45

Ser Val Ser Ser Asn Ser Ala Ala Trp Asn Trp Ile Arg Gln Ser Pro
50 55 60

Ser Arg Gly Leu Glu Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp
65 70 75 80

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

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

Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg Glu Val Thr Gly Asp Leu
115 120 125

Glu Asp Ala Phe Asp Ile Trp Gly Gln Gly Thr Met Val Thr Val Ser
130 135 140

Ser Gly Gly Gly Gly Ser Asp Ile Gln Met Thr Gln Ser Pro Ser Ser
145 150 155 160

Leu Ser Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Arg Ala Ser
165 170 175

Gln Thr Ile Trp Ser Tyr Leu Asn Trp Tyr Gln Gln Arg Pro Gly Lys
180 185 190

Ala Pro Asn Leu Leu Ile Tyr Ala Ala Ser Ser Leu Gln Ser Gly Val
195 200 205

Pro Ser Arg Phe Ser Gly Arg Gly Ser Gly Thr Asp Phe Thr Leu Thr
210 215 220

Ile Ser Ser Leu Gln Ala Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln
225 230 235 240

Ser Tyr Ser Ile Pro Gln Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile
245 250 255

Lys Ser Gly Ala Ala Ala Ile Glu Val Met Tyr Pro Pro Pro Tyr Leu
260 265 270

Asp Asn Glu Lys Ser Asn Gly Thr Ile Ile His Val Lys Gly Lys His
275 280 285

Leu Cys Pro Ser Pro Leu Phe Pro Gly Pro Ser Lys Pro Phe Trp Val
290 295 300

Leu Val Val Val Gly Gly Val Leu Ala Cys Tyr Ser Leu Leu Val Thr
305 310 315 320

Val Ala Phe Ile Ile Phe Trp Val Arg Ser Lys Arg Ser Arg Leu Leu
325 330 335

His Ser Asp Tyr Met Asn Met Thr Pro Arg Arg Pro Gly Pro Thr Arg
340 345 350

Lys His Tyr Gln Pro Tyr Ala Pro Pro Arg Asp Phe Ala Ala Tyr Arg
355 360 365

Ser Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln
370 375 380

Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu
385 390 395 400

Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly
405 410 415

Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln
420 425 430

Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu
435 440 445

Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr
450 455 460

Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro
465 470 475 480

Arg Arg Lys Arg Arg Gly Ser Gly Thr Pro Asp Pro Trp Gly Ser Gly
485 490 495

Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly Asp Val Glu Glu Asn
500 505 510

Pro Gly Pro Leu Glu Met Glu Phe Gly Leu Ser Trp Leu Phe Leu Val
515 520 525

Ala Ile Leu Lys Gly Val Gln Cys Ser Arg Asp Ile Gln Met Thr Gln
530 535 540

Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly Asp Arg Val Thr Ile Ser
545 550 555 560

Cys Arg Ala Ser Gln Asp Ile Ser Lys Tyr Leu Asn Trp Tyr Gln Gln
565 570 575

Lys Pro Asp Gly Thr Val Lys Leu Leu Ile Tyr His Thr Ser Arg Leu
580 585 590

His Ser Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp
595 600 605

Tyr Ser Leu Thr Ile Ser Asn Leu Glu Gln Glu Asp Ile Ala Thr Tyr
610 615 620

Phe Cys Gln Gln Gly Asn Thr Leu Pro Tyr Thr Phe Gly Gly Gly Thr
625 630 635 640

Lys Leu Glu Ile Thr Gly Ser Thr Ser Gly Ser Gly Lys Pro Gly Ser
645 650 655

Gly Glu Gly Ser Thr Lys Gly Glu Val Lys Leu Gln Glu Ser Gly Pro
660 665 670

Gly Leu Val Ala Pro Ser Gln Ser Leu Ser Val Thr Cys Thr Val Ser
675 680 685

Gly Val Ser Leu Pro Asp Tyr Gly Val Ser Trp Ile Arg Gln Pro Pro
690 695 700

Arg Lys Gly Leu Glu Trp Leu Gly Val Ile Trp Gly Ser Glu Thr Thr
705 710 715 720

Tyr Tyr Asn Ser Ala Leu Lys Ser Arg Leu Thr Ile Ile Lys Asp Asn
725 730 735

Ser Lys Ser Gln Val Phe Leu Lys Met Asn Ser Leu Gln Thr Asp Asp
740 745 750

Thr Ala Ile Tyr Tyr Cys Ala Lys His Tyr Tyr Tyr Gly Gly Ser Tyr
755 760 765

Ala Met Asp Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser Thr
770 775 780

Ser Ala Ala Ala Ile Glu Val Met Tyr Pro Pro Pro Tyr Leu Asp Asn
785 790 795 800

Glu Lys Ser Asn Gly Thr Ile Ile His Val Lys Gly Lys His Leu Cys
805 810 815

Pro Ser Pro Leu Phe Pro Gly Pro Ser Lys Pro Phe Trp Val Leu Val
820 825 830

Val Val Gly Gly Val Leu Ala Cys Tyr Ser Leu Leu Val Thr Val Ala
835 840 845

Phe Ile Ile Phe Trp Val Arg Ser Lys Arg Ser Arg Leu Leu His Ser
850 855 860

Asp Tyr Met Asn Met Thr Pro Arg Arg Pro Gly Pro Thr Arg Lys His
865 870 875 880

Tyr Gln Pro Tyr Ala Pro Pro Arg Asp Phe Ala Ala Tyr Arg Ser Arg
885 890 895

Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln
900 905 910

Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp
915 920 925

Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro
930 935 940

Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp
945 950 955 960

Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg
965 970 975

Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr
980 985 990

Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
995 1000 1005

<210> 53
<211> 2994

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 53

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 <211> 3027
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic

<400> 54	
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<210> 59
 <211> 492
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> synthetic

<400> 59

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

Leu	Ser	Ala	Ser	Leu	Gly	Asp	Arg	Val	Thr	Ile	Ser	Cys	Arg	Ala	Ser
		35					40					45			

Gln	Asp	Ile	Ser	Lys	Tyr	Leu	Asn	Trp	Tyr	Gln	Gln	Lys	Pro	Asp	Gly
	50						55				60				

Thr Val Lys Leu Leu Ile Tyr His Thr Ser Arg Leu His Ser Gly Val
65 70 75 80

Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr
85 90 95

Ile Ser Asn Leu Glu Gln Glu Asp Ile Ala Thr Tyr Phe Cys Gln Gln
100 105 110

Gly Asn Thr Leu Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile
115 120 125

Thr Gly Ser Thr Ser Gly Ser Gly Lys Pro Gly Ser Gly Glu Gly Ser
130 135 140

Thr Lys Gly Glu Val Lys Leu Gln Glu Ser Gly Pro Gly Leu Val Ala
145 150 155 160

Pro Ser Gln Ser Leu Ser Val Thr Cys Thr Val Ser Gly Val Ser Leu
165 170 175

Pro Asp Tyr Gly Val Ser Trp Ile Arg Gln Pro Pro Arg Lys Gly Leu
180 185 190

Glu Trp Leu Gly Val Ile Trp Gly Ser Glu Thr Thr Tyr Tyr Asn Ser
195 200 205

Ala Leu Lys Ser Arg Leu Thr Ile Ile Lys Asp Asn Ser Lys Ser Gln
210 215 220

Val Phe Leu Lys Met Asn Ser Leu Gln Thr Asp Asp Thr Ala Ile Tyr
225 230 235 240

Tyr Cys Ala Lys His Tyr Tyr Tyr Gly Gly Ser Tyr Ala Met Asp Tyr
245 250 255

Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser Ser Gly Thr Thr Thr
260 265 270

Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro
275 280 285

Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val
290 295 300

His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro
305 310 315 320

Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu
325 330 335

Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro
340 345 350

Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys
355 360 365

Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe
370 375 380

Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu
385 390 395 400

Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp
405 410 415

Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys
420 425 430

Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala
435 440 445

Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys
450 455 460

Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr
465 470 475 480

Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
485 490

<210> 60
<211> 485
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic

<400> 60

Met Leu Leu Leu Val Thr Ser Leu Leu Leu Cys Glu Leu Pro His Pro
1 5 10 15

Ala Phe Leu Leu Ile Pro Gln Val Gln Leu Gln Gln Ser Gly Pro Gly
20 25 30

Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly
35 40 45

Asp Ser Val Ser Ser Asn Ser Ala Ala Trp Asn Trp Ile Arg Gln Ser
50 55 60

Pro Ser Arg Gly Leu Glu Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys
65 70 75 80

Trp Tyr Asn Asp Tyr Ala Val Ser Val Lys Ser Arg Ile Thr Ile Asn
85 90 95

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

Pro Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg Glu Val Thr Gly Asp
115 120 125

Leu Glu Asp Ala Phe Asp Ile Trp Gly Gln Gly Thr Met Val Thr Val
130 135 140

Ser Ser Gly Gly Gly Gly Ser Asp Ile Gln Met Thr Gln Ser Pro Ser
145 150 155 160

Ser Leu Ser Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Arg Ala
165 170 175

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

Lys Ala Pro Asn Leu Leu Ile Tyr Ala Ala Ser Ser Leu Gln Ser Gly
195 200 205

Val Pro Ser Arg Phe Ser Gly Arg Gly Ser Gly Thr Asp Phe Thr Leu
210 215 220

Thr Ile Ser Ser Leu Gln Ala Glu Asp Phe Ala Thr Tyr Tyr Cys Gln
225 230 235 240

Gln Ser Tyr Ser Ile Pro Gln Thr Phe Gly Gln Gly Thr Lys Leu Glu
245 250 255

Ile Lys Thr Ser Ser Gly Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr
260 265 270

Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala
275 280 285

Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe
290 295 300

Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val
305 310 315 320

Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys
325 330 335

Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr
340 345 350

Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu
355 360 365

Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro
370 375 380

Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly
385 390 395 400

Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro
405 410 415

Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr
420 425 430

Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly
435 440 445

Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln
450 455 460

Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln
465 470 475 480

Ala Leu Pro Pro Arg
485

<210> 61
<211> 733
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic

<400> 61

Met Leu Leu Leu Val Thr Ser Leu Leu Leu Cys Glu Leu Pro His Pro
1 5 10 15

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

Leu Ser Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys Arg Ala Ser
35 40 45

Gln Asp Ile Ser Lys Tyr Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly
50 55 60

Thr Val Lys Leu Leu Ile Tyr His Thr Ser Arg Leu His Ser Gly Val
65 70 75 80

Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr
85 90 95

Ile Ser Asn Leu Glu Gln Glu Asp Ile Ala Thr Tyr Phe Cys Gln Gln
100 105 110

Gly Asn Thr Leu Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile
115 120 125

Thr Gly Gly Gly Gly Ser Gln Val Gln Leu Gln Gln Ser Gly Pro Gly
130 135 140

Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly
145 150 155 160

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

Pro Ser Arg Gly Leu Glu Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys
180 185 190

Trp Tyr Asn Asp Tyr Ala Val Ser Val Lys Ser Arg Ile Thr Ile Asn
195 200 205

Pro Asp Thr Ser Lys Asn Gln Phe Ser Leu Gln Leu Asn Ser Val Thr
210 215 220

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

Leu Glu Asp Ala Phe Asp Ile Trp Gly Gln Gly Thr Met Val Thr Val
245 250 255

Ser Ser Gly Ser Thr Ser Gly Ser Gly Lys Pro Gly Ser Gly Glu Gly
260 265 270

Ser Thr Lys Gly Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser
275 280 285

Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Thr
290 295 300

Ile Trp Ser Tyr Leu Asn Trp Tyr Gln Gln Arg Pro Gly Lys Ala Pro
305 310 315 320

Asn Leu Leu Ile Tyr Ala Ala Ser Ser Leu Gln Ser Gly Val Pro Ser
325 330 335

Arg Phe Ser Gly Arg Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser
340 345 350

Ser Leu Gln Ala Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Tyr
355 360 365

Ser Ile Pro Gln Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys Gly
370 375 380

Gly Gly Gly Ser Glu Val Lys Leu Gln Glu Ser Gly Pro Gly Leu Val
385 390 395 400

Ala Pro Ser Gln Ser Leu Ser Val Thr Cys Thr Val Ser Gly Val Ser
405 410 415

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

Leu Glu Trp Leu Gly Val Ile Trp Gly Ser Glu Thr Thr Tyr Tyr Asn
435 440 445

Ser Ala Leu Lys Ser Arg Leu Thr Ile Ile Lys Asp Asn Ser Lys Ser
450 455 460

Gln Val Phe Leu Lys Met Asn Ser Leu Gln Thr Asp Asp Thr Ala Ile
465 470 475 480

Tyr Tyr Cys Ala Lys His Tyr Tyr Tyr Gly Gly Ser Tyr Ala Met Asp
485 490 495

Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser Ser Gly Thr Thr
500 505 510

Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln
515 520 525

Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala
530 535 540

Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala
545 550 555 560

Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr
565 570 575

Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln
580 585 590

Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser
595 600 605

Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys
610 615 620

Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Lys Gln Gly Gln Asn Gln
625 630 635 640

Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu
645 650 655

Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg
660 665 670

Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met
675 680 685

Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly
690 695 700

Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp
705 710 715 720

Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
725 730

<210> 62
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic

<400> 62

Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu His
1 5 10 15

Ala Ala Arg Pro
20

<210> 63
<211> 751
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 63

Met Leu Leu Leu Val Thr Ser Leu Leu Leu Cys Glu Leu Pro His Pro
1 5 10 15

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

Leu Ser Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys Arg Ala Ser
35 40 45

Gln Asp Ile Ser Lys Tyr Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly
50 55 60

Thr Val Lys Leu Leu Ile Tyr His Thr Ser Arg Leu His Ser Gly Val
65 70 75 80

Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr
85 90 95

Ile Ser Asn Leu Glu Gln Glu Asp Ile Ala Thr Tyr Phe Cys Gln Gln
100 105 110

Gly Asn Thr Leu Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile
115 120 125

Thr Gly Ser Thr Ser Gly Ser Gly Lys Pro Gly Ser Gly Glu Gly Ser
130 135 140

Thr Lys Gly Glu Val Lys Leu Gln Glu Ser Gly Pro Gly Leu Val Ala
145 150 155 160

Pro Ser Gln Ser Leu Ser Val Thr Cys Thr Val Ser Gly Val Ser Leu
165 170 175

Pro Asp Tyr Gly Val Ser Trp Ile Arg Gln Pro Pro Arg Lys Gly Leu
180 185 190

Glu Trp Leu Gly Val Ile Trp Gly Ser Glu Thr Thr Tyr Tyr Asn Ser
195 200 205

Ala Leu Lys Ser Arg Leu Thr Ile Ile Lys Asp Asn Ser Lys Ser Gln
210 215 220

Val Phe Leu Lys Met Asn Ser Leu Gln Thr Asp Asp Thr Ala Ile Tyr
225 230 235 240

Tyr Cys Ala Lys His Tyr Tyr Tyr Gly Gly Ser Tyr Ala Met Asp Tyr
245 250 255

Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser Gly Gly Gly Gly Ser
260 265 270

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
275 280 285

Gly Gly Gly Ser Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu Val
290 295 300

Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Ser
305 310 315 320

Val Ser Ser Asn Ser Ala Ala Trp Asn Trp Ile Arg Gln Ser Pro Ser
325 330 335

Arg Gly Leu Glu Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr
340 345 350

Asn Asp Tyr Ala Val Ser Val Lys Ser Arg Ile Thr Ile Asn Pro Asp
355 360 365

Thr Ser Lys Asn Gln Phe Ser Leu Gln Leu Asn Ser Val Thr Pro Glu
370 375 380

Asp Thr Ala Val Tyr Tyr Cys Ala Arg Glu Val Thr Gly Asp Leu Glu
385 390 395 400

Asp Ala Phe Asp Ile Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser
405 410 415

Gly Gly Gly Gly Ser Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu
420 425 430

Ser Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln
435 440 445

Thr Ile Trp Ser Tyr Leu Asn Trp Tyr Gln Gln Arg Pro Gly Lys Ala
450 455 460

Pro Asn Leu Leu Ile Tyr Ala Ala Ser Ser Leu Gln Ser Gly Val Pro
465 470 475 480

Ser Arg Phe Ser Gly Arg Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile
485 490 495

Ser Ser Leu Gln Ala Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser
500 505 510

Tyr Ser Ile Pro Gln Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
515 520 525

Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala
530 535 540

Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly
545 550 555 560

Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile
565 570 575

Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val
580 585 590

Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe
595 600 605

Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly
610 615 620

Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg
625 630 635 640

Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Lys Gln Gly Gln
645 650 655

Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp
660 665 670

Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro
675 680 685

Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp
690 695 700

Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg
705 710 715 720

Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr
725 730 735

Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
740 745 750

<210> 64
<211> 766
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 64

Met Leu Leu Leu Val Thr Ser Leu Leu Leu Cys Glu Leu Pro His Pro
1 5 10 15

Ala Phe Leu Leu Ile Pro Gln Val Gln Leu Gln Gln Ser Gly Pro Gly
20 25 30

Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly
35 40 45

Asp Ser Val Ser Ser Asn Ser Ala Ala Trp Asn Trp Ile Arg Gln Ser
50 55 60

Pro Ser Arg Gly Leu Glu Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys
65 70 75 80

Trp Tyr Asn Asp Tyr Ala Val Ser Val Lys Ser Arg Ile Thr Ile Asn
85 90 95

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

Pro Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg Glu Val Thr Gly Asp
115 120 125

Leu Glu Asp Ala Phe Asp Ile Trp Gly Gln Gly Thr Met Val Thr Val
130 135 140

Ser Ser Gly Ser Thr Ser Gly Ser Gly Lys Pro Gly Ser Gly Glu Gly
145 150 155 160

Ser Thr Lys Gly Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser
165 170 175

Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Thr
180 185 190

Ile Trp Ser Tyr Leu Asn Trp Tyr Gln Gln Arg Pro Gly Lys Ala Pro
195 200 205

Asn Leu Leu Ile Tyr Ala Ala Ser Ser Leu Gln Ser Gly Val Pro Ser
210 215 220

Arg Phe Ser Gly Arg Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser
225 230 235 240

Ser Leu Gln Ala Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Tyr
245 250 255

Ser Ile Pro Gln Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys Gly
260 265 270

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly
275 280 285

Gly Gly Ser Gly Gly Gly Gly Ser Asp Ile Gln Met Thr Gln Thr Thr
290 295 300

Ser Ser Leu Ser Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys Arg
305 310 315 320

Ala Ser Gln Asp Ile Ser Lys Tyr Leu Asn Trp Tyr Gln Gln Lys Pro
325 330 335

Asp Gly Thr Val Lys Leu Leu Ile Tyr His Thr Ser Arg Leu His Ser
340 345 350

Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser
355 360 365

Leu Thr Ile Ser Asn Leu Glu Gln Glu Asp Ile Ala Thr Tyr Phe Cys
370 375 380

Gln Gln Gly Asn Thr Leu Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu
385 390 395 400

Glu Ile Thr Gly Ser Thr Ser Gly Ser Gly Lys Pro Gly Ser Gly Glu
405 410 415

Gly Ser Thr Lys Gly Glu Val Lys Leu Gln Glu Ser Gly Pro Gly Leu
420 425 430

Val Ala Pro Ser Gln Ser Leu Ser Val Thr Cys Thr Val Ser Gly Val
435 440 445

Ser Leu Pro Asp Tyr Gly Val Ser Trp Ile Arg Gln Pro Pro Arg Lys
450 455 460

Gly Leu Glu Trp Leu Gly Val Ile Trp Gly Ser Glu Thr Thr Tyr Tyr
465 470 475 480

Asn Ser Ala Leu Lys Ser Arg Leu Thr Ile Ile Lys Asp Asn Ser Lys
485 490 495

Ser Gln Val Phe Leu Lys Met Asn Ser Leu Gln Thr Asp Asp Thr Ala
500 505 510

Ile Tyr Tyr Cys Ala Lys His Tyr Tyr Tyr Gly Gly Ser Tyr Ala Met
515 520 525

Asp Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser Ser Gly Thr
530 535 540

Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser
545 550 555 560

Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly
565 570 575

Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp
580 585 590

Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile
595 600 605

Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys
610 615 620

Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys
625 630 635 640

Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val
645 650 655

Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn
660 665 670

Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val
675 680 685

Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg
690 695 700

Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys
705 710 715 720

Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg
725 730 735

Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys
740 745 750

Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
755 760 765

<210> 65
<211> 749
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 65

Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1 5 10 15

His Ala Ala Arg Pro Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu
20 25 30

Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp
35 40 45

Ser Val Ser Ser Asn Ser Ala Ala Trp Asn Trp Ile Arg Gln Ser Pro
50 55 60

Ser Arg Gly Leu Glu Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp
65 70 75 80

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

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

Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg Glu Val Thr Gly Asp Leu
115 120 125

Glu Asp Ala Phe Asp Ile Trp Gly Gln Gly Thr Met Val Thr Val Ser
130 135 140

Ser Gly Gly Gly Gly Ser Asp Ile Gln Met Thr Gln Ser Pro Ser Ser
145 150 155 160

Leu Ser Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Arg Ala Ser
165 170 175

Gln Thr Ile Trp Ser Tyr Leu Asn Trp Tyr Gln Gln Arg Pro Gly Lys
180 185 190

Ala Pro Asn Leu Leu Ile Tyr Ala Ala Ser Ser Leu Gln Ser Gly Val
195 200 205

Pro Ser Arg Phe Ser Gly Arg Gly Ser Gly Thr Asp Phe Thr Leu Thr
210 215 220

Ile Ser Ser Leu Gln Ala Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln
225 230 235 240

Ser Tyr Ser Ile Pro Gln Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile
245 250 255

Lys Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
260 265 270

Gly Gly Gly Gly Ser Asp Ile Gln Met Thr Gln Thr Thr Ser Ser Leu
275 280 285

Ser Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln
290 295 300

Asp Ile Ser Lys Tyr Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Thr
305 310 315 320

Val Lys Leu Leu Ile Tyr His Thr Ser Arg Leu His Ser Gly Val Pro
325 330 335

Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile
340 345 350

Ser Asn Leu Glu Gln Glu Asp Ile Ala Thr Tyr Phe Cys Gln Gln Gly
355 360 365

Asn Thr Leu Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Thr
370 375 380

Gly Ser Thr Ser Gly Ser Gly Lys Pro Gly Ser Gly Glu Gly Ser Thr
385 390 395 400

Lys Gly Glu Val Lys Leu Gln Glu Ser Gly Pro Gly Leu Val Ala Pro
405 410 415

Ser Gln Ser Leu Ser Val Thr Cys Thr Val Ser Gly Val Ser Leu Pro
420 425 430

Asp Tyr Gly Val Ser Trp Ile Arg Gln Pro Pro Arg Lys Gly Leu Glu
435 440 445

Trp Leu Gly Val Ile Trp Gly Ser Glu Thr Thr Tyr Tyr Asn Ser Ala
450 455 460

Leu Lys Ser Arg Leu Thr Ile Ile Lys Asp Asn Ser Lys Ser Gln Val
465 470 475 480

Phe Leu Lys Met Asn Ser Leu Gln Thr Asp Asp Thr Ala Ile Tyr Tyr
485 490 495

Cys Ala Lys His Tyr Tyr Tyr Gly Gly Ser Tyr Ala Met Asp Tyr Trp
500 505 510

Gly Gln Gly Thr Ser Val Thr Val Ser Ser Thr Ser Ser Gly Thr Thr
515 520 525

Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln
530 535 540

Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala
545 550 555 560

Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala
565 570 575

Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr
580 585 590

Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln
595 600 605

Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser
610 615 620

Cys Arg Phe Pro Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys
625 630 635 640

Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln
645 650 655

Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu
660 665 670

Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg
675 680 685

Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met
690 695 700

Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly
705 710 715 720

Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp
725 730 735

Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
740 745

<210> 66
<211> 742
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 66

Ala Thr Met Leu Leu Leu Val Thr Ser Leu Leu Leu Cys Glu Leu Pro
1 5 10 15

His Pro Ala Phe Leu Leu Ile Pro Asp Ile Gln Met Thr Gln Thr Thr
20 25 30

Ser Ser Leu Ser Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys Arg
35 40 45

Ala Ser Gln Asp Ile Ser Lys Tyr Leu Asn Trp Tyr Gln Gln Lys Pro
50 55 60

Asp Gly Thr Val Lys Leu Leu Ile Tyr His Thr Ser Arg Leu His Ser
65 70 75 80

Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser
85 90 95

Leu Thr Ile Ser Asn Leu Glu Gln Glu Asp Ile Ala Thr Tyr Phe Cys
100 105 110

Gln Gln Gly Asn Thr Leu Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu
115 120 125

Glu Ile Thr Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly
130 135 140

Gly Ser Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu Val Lys Pro
145 150 155 160

Ser Gln Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Ser Val Ser
165 170 175

Ser Asn Ser Ala Ala Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly
180 185 190

Leu Glu Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp
195 200 205

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

Lys Asn Gln Phe Ser Leu Gln Leu Asn Ser Val Thr Pro Glu Asp Thr
225 230 235 240

Ala Val Tyr Tyr Cys Ala Arg Glu Val Thr Gly Asp Leu Glu Asp Ala
245 250 255

Phe Asp Ile Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser Gly Gly
260 265 270

Gly Gly Ser Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala
275 280 285

Ser Val Gly Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Thr Ile
290 295 300

Trp Ser Tyr Leu Asn Trp Tyr Gln Gln Arg Pro Gly Lys Ala Pro Asn
305 310 315 320

Leu Leu Ile Tyr Ala Ala Ser Ser Leu Gln Ser Gly Val Pro Ser Arg
325 330 335

Phe Ser Gly Arg Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser
340 345 350

Leu Gln Ala Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Tyr Ser
355 360 365

Ile Pro Gln Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys Gly Gly
370 375 380

Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Lys
385 390 395 400

Leu Gln Glu Ser Gly Pro Gly Leu Val Ala Pro Ser Gln Ser Leu Ser
405 410 415

Val Thr Cys Thr Val Ser Gly Val Ser Leu Pro Asp Tyr Gly Val Ser
420 425 430

Trp Ile Arg Gln Pro Pro Arg Lys Gly Leu Glu Trp Leu Gly Val Ile
435 440 445

Trp Gly Ser Glu Thr Thr Tyr Tyr Asn Ser Ala Leu Lys Ser Arg Leu
450 455 460

Thr Ile Ile Lys Asp Asn Ser Lys Ser Gln Val Phe Leu Lys Met Asn
465 470 475 480

Ser Leu Gln Thr Asp Asp Thr Ala Ile Tyr Tyr Cys Ala Lys His Tyr
485 490 495

Tyr Tyr Gly Gly Ser Tyr Ala Met Asp Tyr Trp Gly Gln Gly Thr Ser
500 505 510

Val Thr Val Ser Ser Ser Gly Thr Thr Thr Pro Ala Pro Arg Pro Pro
515 520 525

Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu
530 535 540

Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp
545 550 555 560

Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly
565 570 575

Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg
580 585 590

Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val Gln
595 600 605

Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu
610 615 620

Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala
625 630 635 640

Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu
645 650 655

Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp
660 665 670

Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu
675 680 685

Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile
690 695 700

Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr
705 710 715 720

Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met
725 730 735

Gln Ala Leu Pro Pro Arg
740

<210> 67
<211> 755
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 67

Ala Thr Met Leu Leu Leu Val Thr Ser Leu Leu Leu Cys Glu Leu Pro
1 5 10 15

His Pro Ala Phe Leu Leu Ile Pro Asp Ile Gln Met Thr Gln Thr Thr
20 25 30

Ser Ser Leu Ser Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys Arg
35 40 45

Ala Ser Gln Asp Ile Ser Lys Tyr Leu Asn Trp Tyr Gln Gln Lys Pro
50 55 60

Asp Gly Thr Val Lys Leu Leu Ile Tyr His Thr Ser Arg Leu His Ser
65 70 75 80

Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser
85 90 95

Leu Thr Ile Ser Asn Leu Glu Gln Glu Asp Ile Ala Thr Tyr Phe Cys
100 105 110

Gln Gln Gly Asn Thr Leu Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu
115 120 125

Glu Ile Thr Gly Gly Cys Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly
130 135 140

Gly Ser Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu Val Lys Pro
145 150 155 160

Ser Gln Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Asp Ser Val Ser
165 170 175

Ser Asn Ser Ala Ala Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly
180 185 190

Leu Glu Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp
195 200 205

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

Lys Asn Gln Phe Ser Leu Gln Leu Asn Ser Val Thr Pro Glu Asp Thr
225 230 235 240

Ala Val Tyr Tyr Cys Ala Arg Glu Val Thr Gly Asp Leu Glu Asp Ala
245 250 255

Phe Asp Ile Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser Gly Ser
260 265 270

Thr Ser Gly Ser Gly Lys Pro Gly Ser Gly Glu Gly Ser Thr Lys Gly
275 280 285

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
290 295 300

Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Thr Ile Trp Ser Tyr
305 310 315 320

Leu Asn Trp Tyr Gln Gln Arg Pro Gly Lys Ala Pro Asn Leu Leu Ile
325 330 335

Tyr Ala Ala Ser Ser Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly
340 345 350

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

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Tyr Ser Ile Pro Gln
370 375 380

Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys Gly Gly Gly Gly Ser
385 390 395 400

Gly Gly Gly Gly Ser Gly Gly Cys Gly Ser Glu Val Lys Leu Gln Glu
405 410 415

Ser Gly Pro Gly Leu Val Ala Pro Ser Gln Ser Leu Ser Val Thr Cys
420 425 430

Thr Val Ser Gly Val Ser Leu Pro Asp Tyr Gly Val Ser Trp Ile Arg
435 440 445

Gln Pro Pro Arg Lys Gly Leu Glu Trp Leu Gly Val Ile Trp Gly Ser
450 455 460

Glu Thr Thr Tyr Tyr Asn Ser Ala Leu Lys Ser Arg Leu Thr Ile Ile
465 470 475 480

Lys Asp Asn Ser Lys Ser Gln Val Phe Leu Lys Met Asn Ser Leu Gln
485 490 495

Thr Asp Asp Thr Ala Ile Tyr Tyr Cys Ala Lys His Tyr Tyr Tyr Gly
500 505 510

Gly Ser Tyr Ala Met Asp Tyr Trp Gly Gln Gly Thr Ser Val Thr Val
515 520 525

Ser Ser Ser Gly Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala
530 535 540

Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg
545 550 555 560

Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys
565 570 575

Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu
580 585 590

Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu
595 600 605

Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln
610 615 620

Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly
625 630 635 640

Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr
645 650 655

Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg
660 665 670

Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met
675 680 685

Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu
690 695 700

Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys
705 710 715 720

Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu
725 730 735

Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu
740 745 750

Pro Pro Arg
755

<210> 68
<211> 744
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 68

Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1 5 10 15

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

Ser Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln
35 40 45

Asp Ile Ser Lys Tyr Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Thr
50 55 60

Val Lys Leu Leu Ile Tyr His Thr Ser Arg Leu His Ser Gly Val Pro
65 70 75 80

Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile
85 90 95

Ser Asn Leu Glu Gln Glu Asp Ile Ala Thr Tyr Phe Cys Gln Gln Gly
100 105 110

Asn Thr Leu Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Thr
115 120 125

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Val Gln Leu Gln Gln
130 135 140

Ser Gly Pro Gly Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys
145 150 155 160

Ala Ile Ser Gly Asp Ser Val Ser Ser Asn Ser Ala Ala Trp Asn Trp
165 170 175

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

Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala Val Ser Val Lys Ser Arg
195 200 205

Ile Thr Ile Asn Pro Asp Thr Ser Lys Asn Gln Phe Ser Leu Gln Leu
210 215 220

Asn Ser Val Thr Pro Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg Glu
225 230 235 240

Val Thr Gly Asp Leu Glu Asp Ala Phe Asp Ile Trp Gly Gln Gly Thr
245 250 255

Met Val Thr Val Ser Ser Gly Ser Thr Ser Gly Ser Gly Lys Pro Gly
260 265 270

Ser Gly Glu Gly Ser Thr Lys Gly Asp Ile Gln Met Thr Gln Ser Pro
275 280 285

Ser Ser Leu Ser Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Arg
290 295 300

Ala Ser Gln Thr Ile Trp Ser Tyr Leu Asn Trp Tyr Gln Gln Arg Pro
305 310 315 320

Gly Lys Ala Pro Asn Leu Leu Ile Tyr Ala Ala Ser Ser Leu Gln Ser
325 330 335

Gly Val Pro Ser Arg Phe Ser Gly Arg Gly Ser Gly Thr Asp Phe Thr
340 345 350

Leu Thr Ile Ser Ser Leu Gln Ala Glu Asp Phe Ala Thr Tyr Tyr Cys
355 360 365

Gln Gln Ser Tyr Ser Ile Pro Gln Thr Phe Gly Gln Gly Thr Lys Leu
370 375 380

Glu Ile Lys Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Lys
385 390 395 400

Leu Gln Glu Ser Gly Pro Gly Leu Val Ala Pro Ser Gln Ser Leu Ser
405 410 415

Val Thr Cys Thr Val Ser Gly Val Ser Leu Pro Asp Tyr Gly Val Ser
420 425 430

Trp Ile Arg Gln Pro Pro Arg Lys Gly Leu Glu Trp Leu Gly Val Ile
435 440 445

Trp Gly Ser Glu Thr Thr Tyr Tyr Asn Ser Ala Leu Lys Ser Arg Leu
450 455 460

Thr Ile Ile Lys Asp Asn Ser Lys Ser Gln Val Phe Leu Lys Met Asn
465 470 475 480

Ser Leu Gln Thr Asp Asp Thr Ala Ile Tyr Tyr Cys Ala Lys His Tyr
485 490 495

Tyr Tyr Gly Gly Ser Tyr Ala Met Asp Tyr Trp Gly Gln Gly Thr Ser
500 505 510

Val Thr Val Ser Ser Thr Ser Ser Gly Thr Thr Thr Pro Ala Pro Arg
515 520 525

Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg
530 535 540

Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly
545 550 555 560

Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr
565 570 575

Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys Arg
580 585 590

Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro
595 600 605

Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu
610 615 620

Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala
625 630 635 640

Asp Ala Pro Ala Tyr Lys Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu
645 650 655

Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly
660 665 670

Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu
675 680 685

Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser
690 695 700

Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly
705 710 715 720

Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu
725 730 735

His Met Gln Ala Leu Pro Pro Arg
740

<210> 69
<211> 744
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 69

Met Leu Leu Leu Val Thr Ser Leu Leu Leu Cys Glu Leu Pro His Pro
1 5 10 15

Ala Phe Leu Leu Ile Pro Gln Val Gln Leu Gln Gln Ser Gly Pro Gly
20 25 30

Leu Val Lys Pro Ser Gln Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly
35 40 45

Asp Ser Val Ser Ser Asn Ser Ala Ala Trp Asn Trp Ile Arg Gln Ser
50 55 60

Pro Ser Arg Gly Leu Glu Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys
65 70 75 80

Trp Tyr Asn Asp Tyr Ala Val Ser Val Lys Ser Arg Ile Thr Ile Asn
85 90 95

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

Pro Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg Glu Val Thr Gly Asp
115 120 125

Leu Glu Asp Ala Phe Asp Ile Trp Gly Gln Gly Thr Met Val Thr Val
130 135 140

Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Asp Ile Gln Met
145 150 155 160

Thr Gln Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly Asp Arg Val Thr
165 170 175

Ile Ser Cys Arg Ala Ser Gln Asp Ile Ser Lys Tyr Leu Asn Trp Tyr
180 185 190

Gln Gln Lys Pro Asp Gly Thr Val Lys Leu Leu Ile Tyr His Thr Ser
195 200 205

Arg Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly
210 215 220

Thr Asp Tyr Ser Leu Thr Ile Ser Asn Leu Glu Gln Glu Asp Ile Ala
225 230 235 240

Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Tyr Thr Phe Gly Gly
245 250 255

Gly Thr Lys Leu Glu Ile Thr Gly Ser Thr Ser Gly Ser Gly Lys Pro
260 265 270

Gly Ser Gly Glu Gly Ser Thr Lys Gly Glu Val Lys Leu Gln Glu Ser
275 280 285

Gly Pro Gly Leu Val Ala Pro Ser Gln Ser Leu Ser Val Thr Cys Thr
290 295 300

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

Pro Pro Arg Lys Gly Leu Glu Trp Leu Gly Val Ile Trp Gly Ser Glu
325 330 335

Thr Thr Tyr Tyr Asn Ser Ala Leu Lys Ser Arg Leu Thr Ile Ile Lys
340 345 350

Asp Asn Ser Lys Ser Gln Val Phe Leu Lys Met Asn Ser Leu Gln Thr
355 360 365

Asp Asp Thr Ala Ile Tyr Tyr Cys Ala Lys His Tyr Tyr Tyr Gly Gly
370 375 380

Ser Tyr Ala Met Asp Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser
385 390 395 400

Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Asp Ile Gln Met Thr
405 410 415

Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly Asp Arg Val Thr Ile
420 425 430

Thr Cys Arg Ala Ser Gln Thr Ile Trp Ser Tyr Leu Asn Trp Tyr Gln
435 440 445

Gln Arg Pro Gly Lys Ala Pro Asn Leu Leu Ile Tyr Ala Ala Ser Ser
450 455 460

Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly Arg Gly Ser Gly Thr
465 470 475 480

Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Ala Glu Asp Phe Ala Thr
485 490 495

Tyr Tyr Cys Gln Gln Ser Tyr Ser Ile Pro Gln Thr Phe Gly Gln Gly
500 505 510

Thr Lys Leu Glu Ile Lys Thr Ser Ser Gly Thr Thr Thr Pro Ala Pro
515 520 525

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
530 535 540

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
545 550 555 560

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
565 570 575

Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Lys
580 585 590

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
595 600 605

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Ser Cys Arg Phe Pro Glu
610 615 620

Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala
625 630 635 640

Asp Ala Pro Ala Tyr Lys Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu
645 650 655

Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly
660 665 670

Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu
675 680 685

Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser
690 695 700

Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly
705 710 715 720

Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu
725 730 735

His Met Gln Ala Leu Pro Pro Arg
740

<210> 70

<211> 747

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 70

Met Leu Leu Leu Val Thr Ser Leu Leu Leu Cys Glu Leu Pro His Pro
1 5 10 15

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

Leu Ser Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys Arg Ala Ser
35 40 45

Gln Asp Ile Ser Lys Tyr Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly
50 55 60

Thr Val Lys Leu Leu Ile Tyr His Thr Ser Arg Leu His Ser Gly Val
65 70 75 80

Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr
85 90 95

Ile Ser Asn Leu Glu Gln Glu Asp Ile Ala Thr Tyr Phe Cys Gln Gln
100 105 110

Gly Asn Thr Leu Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile
115 120 125

Thr Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Cys Gly Gly Gly Ser
130 135 140

Gln Val Gln Leu Gln Gln Ser Gly Pro Gly Leu Val Lys Pro Ser Gln
145 150 155 160

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

Ser Ala Ala Trp Asn Trp Ile Arg Gln Ser Pro Ser Arg Gly Leu Glu
180 185 190

Trp Leu Gly Arg Thr Tyr Tyr Arg Ser Lys Trp Tyr Asn Asp Tyr Ala
195 200 205

Val Ser Val Lys Ser Arg Ile Thr Ile Asn Pro Asp Thr Ser Lys Asn
210 215 220

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

Tyr Tyr Cys Ala Arg Glu Val Thr Gly Asp Leu Glu Asp Ala Phe Asp
245 250 255

Ile Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser Gly Gly Gly Gly
260 265 270

Ser Gly Gly Gly Gly Ser Asp Ile Gln Met Thr Gln Ser Pro Ser Ser
275 280 285

Leu Ser Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Arg Ala Ser
290 295 300

Gln Thr Ile Trp Ser Tyr Leu Asn Trp Tyr Gln Gln Arg Pro Gly Lys
305 310 315 320

Ala Pro Asn Leu Leu Ile Tyr Ala Ala Ser Ser Leu Gln Ser Gly Val
325 330 335

Pro Ser Arg Phe Ser Gly Arg Gly Ser Gly Thr Asp Phe Thr Leu Thr
340 345 350

Ile Ser Ser Leu Gln Ala Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln
355 360 365

Ser Tyr Ser Ile Pro Gln Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile
370 375 380

Lys Gly Gly Gly Gly Cys Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
385 390 395 400

Glu Val Lys Leu Gln Glu Ser Gly Pro Gly Leu Val Ala Pro Ser Gln
405 410 415

Ser Leu Ser Val Thr Cys Thr Val Ser Gly Val Ser Leu Pro Asp Tyr
420 425 430

Gly Val Ser Trp Ile Arg Gln Pro Pro Arg Lys Gly Leu Glu Trp Leu
435 440 445

Gly Val Ile Trp Gly Ser Glu Thr Thr Tyr Tyr Asn Ser Ala Leu Lys
450 455 460

Ser Arg Leu Thr Ile Ile Lys Asp Asn Ser Lys Ser Gln Val Phe Leu
465 470 475 480

Lys Met Asn Ser Leu Gln Thr Asp Asp Thr Ala Ile Tyr Tyr Cys Ala
485 490 495

Lys His Tyr Tyr Tyr Gly Gly Ser Tyr Ala Met Asp Tyr Trp Gly Gln
500 505 510

Gly Thr Ser Val Thr Val Ser Ser Thr Ser Ser Gly Thr Thr Thr Pro
515 520 525

Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu
530 535 540

Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His
545 550 555 560

Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu
565 570 575

Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr
580 585 590

Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe
595 600 605

Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg
610 615 620

Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser
625 630 635 640

Arg Ser Ala Asp Ala Pro Ala Tyr Lys Gln Gly Gln Asn Gln Leu Tyr
645 650 655

Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys
660 665 670

Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn
675 680 685

Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu
690 695 700

Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly
705 710 715 720

His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr
725 730 735

Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
740 745

<210> 71

<211> 2256

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 71

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ccatccagat tcagcggctc tggctccggc accgattata gcctgaccat cagcaacctg	300
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<210> 72
 <211> 2301
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 72	
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aagaaccagt tctccctgca gctgaacagc gtgacccccg aggataaccgc cgtgtactac	360
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 <211> 2250
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 73	
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<210> 74
 <211> 2247
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 74	
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<210> 75
 <211> 2274
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Synthetic

<400> 75

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 <211> 2235
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 76	
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 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 77	
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<220>
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<220>
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<400> 79

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<210> 80
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<213> Artificial Sequence

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<400> 80

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<400> 81

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<210> 82
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<212> PRT
<213> Artificial Sequence

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<400> 82

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<223> Synthetic

<400> 83

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<210> 84

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<212> PRT

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<223> Synthetic

<400> 84

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<212> PRT

<213> Artificial Sequence

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<223> Synthetic

<400> 85

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