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<150> 61/642,844
<151> 2012-05-04

<160> 56

<170> PatentIn version 3.5

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<213> Homo sapiens

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Phe Leu Leu Gly Phe Leu Phe Gly Trp Phe Ile Lys Ser Ser Asn Glu
        35                  40                  45

Ala Thr Asn Ile Thr Pro Lys His Asn Met Lys Ala Phe Leu Asp Glu
    50                  55                  60

Leu Lys Ala Glu Asn Ile Lys Lys Phe Leu Tyr Asn Phe Thr Gln Ile
65                  70                  75                  80

Pro His Leu Ala Gly Thr Glu Gln Asn Phe Gln Leu Ala Lys Gln Ile
                85                  90                  95

Gln Ser Gln Trp Lys Glu Phe Gly Leu Asp Ser Val Glu Leu Ala His
            100                 105                 110

Tyr Asp Val Leu Leu Ser Tyr Pro Asn Lys Thr His Pro Asn Tyr Ile
        115                 120                 125

Ser Ile Ile Asn Glu Asp Gly Asn Glu Ile Phe Asn Thr Ser Leu Phe
    130                 135                 140

Glu Pro Pro Pro Pro Gly Tyr Glu Asn Val Ser Asp Ile Val Pro Pro
145                 150                 155                 160

Phe Ser Ala Phe Ser Pro Gln Gly Met Pro Glu Gly Asp Leu Val Tyr
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Val Asn Tyr Ala Arg Thr Glu Asp Phe Phe Lys Leu Glu Arg Asp Met
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Lys Ile Asn Cys Ser Gly Lys Ile Val Ile Ala Arg Tyr Gly Lys Val
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Phe Arg Gly Asn Lys Val Lys Asn Ala Gln Leu Ala Gly Ala Lys Gly
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Val Ile Leu Tyr Ser Asp Pro Ala Asp Tyr Phe Ala Pro Gly Val Lys
225                 230                 235                 240

Ser Tyr Pro Asp Gly Trp Asn Leu Pro Gly Gly Gly Val Gln Arg Gly
                245                 250                 255

Asn Ile Leu Asn Leu Asn Gly Ala Gly Asp Pro Leu Thr Pro Gly Tyr
            260                 265                 270

Pro Ala Asn Glu Tyr Ala Tyr Arg Arg Gly Ile Ala Glu Ala Val Gly
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Leu Pro Ser Ile Pro Val His Pro Ile Gly Tyr Tyr Asp Ala Gln Lys
    290                 295                 300

Leu Leu Glu Lys Met Gly Gly Ser Ala Pro Pro Asp Ser Ser Trp Arg
305                 310                 315                 320

Gly Ser Leu Lys Val Pro Tyr Asn Val Gly Pro Gly Phe Thr Gly Asn
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Phe Ser Thr Gln Lys Val Lys Met His Ile His Ser Thr Asn Glu Val
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Thr Arg Ile Tyr Asn Val Ile Gly Thr Leu Arg Gly Ala Val Glu Pro
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Asp Arg Tyr Val Ile Leu Gly Gly His Arg Asp Ser Trp Val Phe Gly
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Gly Ile Asp Pro Gln Ser Gly Ala Ala Val Val His Glu Ile Val Arg
385                 390                 395                 400

Ser Phe Gly Thr Leu Lys Lys Glu Gly Trp Arg Pro Arg Arg Thr Ile
                405                 410                 415

Leu Phe Ala Ser Trp Asp Ala Glu Glu Phe Gly Leu Leu Gly Ser Thr
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Glu Trp Ala Glu Glu Asn Ser Arg Leu Leu Gln Glu Arg Gly Val Ala
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Tyr Ile Asn Ala Asp Ser Ser Ile Glu Gly Asn Tyr Thr Leu Arg Val
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    450                 455                 460

Asp Cys Thr Pro Leu Met Tyr Ser Leu Val His Asn Leu Thr Lys Glu
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Leu Lys Ser Pro Asp Glu Gly Phe Glu Gly Lys Ser Leu Tyr Glu Ser
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Trp Thr Lys Lys Ser Pro Ser Pro Glu Phe Ser Gly Met Pro Arg Ile
            500                 505                 510

Ser Lys Leu Gly Ser Gly Asn Asp Phe Glu Val Phe Phe Gln Arg Leu
        515                 520                 525

Gly Ile Ala Ser Gly Arg Ala Arg Tyr Thr Lys Asn Trp Glu Thr Asn
    530                 535                 540

Lys Phe Ser Gly Tyr Pro Leu Tyr His Ser Val Tyr Glu Thr Tyr Glu
545                 550                 555                 560

Leu Val Glu Lys Phe Tyr Asp Pro Met Phe Lys Tyr His Leu Thr Val
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Ala Gln Val Arg Gly Gly Met Val Phe Glu Leu Ala Asn Ser Ile Val
            580                 585                 590

Leu Pro Phe Asp Cys Arg Asp Tyr Ala Val Val Leu Arg Lys Tyr Ala
        595                 600                 605

Asp Lys Ile Tyr Ser Ile Ser Met Lys His Pro Gln Glu Met Lys Thr
    610                 615                 620

Tyr Ser Val Ser Phe Asp Ser Leu Phe Ser Ala Val Lys Asn Phe Thr
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Glu Ile Ala Ser Lys Phe Ser Glu Arg Leu Gln Asp Phe Asp Lys Ser
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Asn Pro Ile Val Leu Arg Met Met Asn Asp Gln Leu Met Phe Leu Glu
            660                 665                 670

Arg Ala Phe Ile Asp Pro Leu Gly Leu Pro Asp Arg Pro Phe Tyr Arg
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His Val Ile Tyr Ala Pro Ser Ser His Asn Lys Tyr Ala Gly Glu Ser
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Phe Pro Gly Ile Tyr Asp Ala Leu Phe Asp Ile Glu Ser Lys Val Asp
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Pro Ser Lys Ala Trp Gly Glu Val Lys Arg Gln Ile Tyr Val Ala Ala
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eolf-seql

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Lys Ser Ser Ser Glu Ala Thr Asn Ile Ser Pro Gln His Asn Val Lys
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Ala Phe Leu Asp Glu Met Lys Ala Glu Asn Ile Lys Lys Phe Leu Tyr
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Leu Phe Thr Gln Ile Pro His Leu Ala Gly Thr Glu Gln Asn Phe Gln
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Leu Ala Lys Gln Ile Gln Ala Glu Trp Lys Glu Phe Gly Leu Asp Ser
85 90 95

Val Glu Leu Ala His Tyr Asp Val Leu Leu Ser Tyr Pro Asn Glu Thr
100 105 110

His Pro Asn Tyr Ile Ser Ile Ile Asp Glu Asp Gly Asn Glu Ile Phe
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Asn Thr Ser Leu Phe Glu Pro Pro Pro Pro Gly Tyr Glu Asn Ile Ser
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Leu Glu Arg Glu Leu Lys Ile Asn Cys Ser Gly Lys Ile Leu Ile Ala
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Arg Tyr Gly Lys Val Phe Arg Gly Asn Lys Val Lys Asn Ala Gln Leu
        195                 200                 205

Ala Gly Ala Lys Gly Ile Ile Leu Tyr Ser Asp Pro Ala Asp Tyr Phe
    210                 215                 220

Ala Pro Gly Val Lys Ser Tyr Pro Asp Gly Trp Asn Leu Pro Gly Gly
225                 230                 235                 240

Gly Val Gln Arg Gly Asn Val Leu Asn Leu Asn Gly Ala Gly Asp Pro
                245                 250                 255

Leu Thr Pro Gly Tyr Pro Ala Asn Glu Tyr Ala Tyr Arg Arg Glu Leu
            260                 265                 270

Ala Glu Ala Val Gly Leu Pro Ser Ile Pro Val His Pro Ile Gly Tyr
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Tyr Asp Ala Gln Lys Leu Leu Glu Lys Met Gly Gly Ser Ala Pro Pro
    290                 295                 300

Asp Ser Ser Trp Lys Gly Ser Leu Lys Val Pro Tyr Asn Val Gly Pro
305                 310                 315                 320

Gly Phe Thr Gly Asn Phe Ser Thr Gln Lys Val Lys Met His Ile His
                325                 330                 335

Ser Thr Asn Glu Val Thr Arg Ile Tyr Asn Val Ile Gly Thr Ile Arg
            340                 345                 350

Gly Ala Val Glu Pro Asp Arg Tyr Val Ile Leu Gly Gly His Arg Asp
        355                 360                 365

Ala Trp Val Phe Gly Gly Ile Asp Pro Gln Ser Gly Ala Ala Val Val
    370                 375                 380

His Glu Ile Val Arg Ser Phe Gly Thr Leu Lys Lys Lys Gly Trp Arg
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Pro Arg Arg Thr Ile Ile Phe Ala Ser Trp Asp Ala Glu Glu Phe Gly
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Leu Leu Gly Ser Thr Glu Trp Ala Glu Glu Asn Ser Arg Leu Leu Gln
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Glu Arg Gly Val Ala Tyr Ile Asn Ala Asp Ser Ser Ile Glu Gly Asn
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Tyr Thr Leu Arg Val Asp Cys Thr Pro Leu Met Tyr Ser Leu Val Tyr
    450                 455                 460

Asn Leu Thr Lys Glu Leu Gln Ser Pro Asp Glu Gly Phe Glu Gly Lys
465                 470                 475                 480

Ser Leu Tyr Glu Ser Trp Thr Lys Lys Ser Pro Ser Pro Glu Phe Ser
                485                 490                 495

Gly Val Pro Arg Ile Asn Lys Leu Gly Ser Gly Asn Asp Phe Glu Val
            500                 505                 510

Phe Phe Gln Arg Leu Gly Ile Ala Ser Gly Arg Ala Arg Tyr Thr Lys
        515                 520                 525

Asn Trp Lys Thr Asn Lys Phe Ser Gly Tyr Pro Leu Tyr His Ser Val
    530                 535                 540

Tyr Glu Thr Tyr Glu Leu Val Glu Lys Phe Tyr Asp Pro Met Phe Lys
545                 550                 555                 560

Tyr His Leu Thr Val Ala Gln Val Arg Gly Gly Leu Val Phe Glu Leu
                565                 570                 575

Ala Asp Ser Ile Val Leu Pro Phe Asp Cys Gln Asp Tyr Ala Val Val
            580                 585                 590

Leu Arg Lys Tyr Ala Asp Lys Ile Tyr Asn Leu Ala Met Lys His Pro
        595                 600                 605

Glu Glu Leu Lys Thr Tyr Ser Val Ser Phe Asp Ser Leu Phe Ser Ala
    610                 615                 620

Val Lys Asn Phe Thr Glu Ile Ala Ser Lys Phe Asn Gln Arg Leu Gln
625                 630                 635                 640

Asp Phe Asp Lys Asn Asn Pro Leu Leu Val Arg Met Leu Asn Asp Gln
                645                 650                 655

Leu Met Phe Leu Glu Arg Ala Phe Val Asp Pro Leu Gly Leu Pro Asp
            660                 665                 670

Arg Pro Phe Tyr Arg His Val Ile Tyr Ala Pro Ser Ser His Asn Lys
        675                 680                 685
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eolf-seql

Tyr Ala Gly Glu Ser Phe Pro Gly Ile Tyr Asp Ala Leu Phe Asp Ile
690 695 700

Glu Ser Lys Val Asp Pro Ser Lys Ala Trp Gly Glu Val Lys Arg Gln
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Ile Tyr Val Ala Ala Phe Thr Val Gln Ala Ala Ala Glu Thr Leu Ser
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Lys Ser Ser Ser Glu Ala Thr Asn Ile Thr Pro Gln His Asn Val Lys
35 40 45

Ala Phe Leu Asp Glu Leu Lys Ala Glu Asn Ile Lys Lys Phe Leu Tyr
50 55 60

Asn Phe Thr Gln Ile Pro His Leu Ala Gly Thr Glu Gln Asn Phe Glu
65 70 75 80

Leu Ala Lys Gln Ile Gln Ala Gln Trp Lys Glu Phe Gly Leu Asp Ser
85 90 95

Val Glu Leu Ser His Tyr Asp Val Leu Leu Ser Tyr Pro Asn Glu Thr
100 105 110

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His Pro Asn Tyr Ile Ser Ile Ile Asp Glu Asp Gly Asn Glu Ile Phe
        115                 120                 125

Asn Thr Ser Leu Phe Glu Pro Pro Pro Pro Gly Tyr Glu Asn Ile Ser
    130                 135                 140

Asp Val Val Pro Pro Tyr Ser Ala Phe Ser Pro Gln Gly Met Pro Glu
145                 150                 155                 160

Gly Asp Leu Val Tyr Val Asn Tyr Ala Arg Thr Glu Asp Phe Phe Lys
                165                 170                 175

Leu Glu Arg Asp Met Lys Ile Asn Cys Ser Gly Lys Ile Leu Ile Ala
            180                 185                 190

Arg Tyr Gly Lys Val Phe Arg Gly Asn Lys Val Lys Asn Ala Gln Leu
        195                 200                 205

Ala Gly Ala Lys Gly Ile Ile Leu Tyr Ser Asp Pro Ala Asp Tyr Phe
    210                 215                 220

Ala Pro Gly Val Lys Ser Tyr Pro Asp Gly Trp Asn Leu Pro Gly Gly
225                 230                 235                 240

Gly Val Gln Arg Gly Asn Val Leu Asn Leu Asn Gly Ala Gly Asp Pro
                245                 250                 255

Leu Thr Pro Gly Tyr Pro Ala Asn Glu Tyr Ala Tyr Arg Arg Gly Ile
            260                 265                 270

Ala Glu Ala Val Gly Leu Pro Ser Ile Pro Val His Pro Ile Gly Tyr
        275                 280                 285

Tyr Asp Ala Gln Lys Leu Leu Glu Lys Met Gly Gly Ala Ala Pro Pro
    290                 295                 300

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

Gly Phe Thr Gly Asn Phe Ser Thr Gln Lys Val Lys Met His Ile His
                325                 330                 335

Ser Thr Asn Glu Val Thr Arg Ile Tyr Asn Val Ile Gly Thr Leu Lys
            340                 345                 350

Gly Ala Val Glu Pro Asp Arg Tyr Val Ile Leu Gly Gly His Arg Asp
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Ala Trp Val Phe Gly Gly Ile Asp Pro Gln Ser Gly Ala Ala Val Val
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His Glu Ile Val Arg Ser Phe Gly Thr Leu Lys Lys Lys Gly Trp Arg
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Pro Arg Arg Thr Ile Leu Phe Ala Ser Trp Asp Ala Glu Glu Phe Gly
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Leu Leu Gly Ser Thr Glu Trp Ala Glu Glu Asn Ser Arg Leu Leu Gln
            420                 425                 430

Glu Arg Gly Val Ala Tyr Ile Asn Ala Asp Ser Ser Ile Glu Gly Asn
        435                 440                 445

Tyr Thr Leu Arg Val Asp Cys Thr Pro Leu Met Tyr Ser Leu Val Tyr
    450                 455                 460

Asn Leu Thr Lys Glu Leu Gln Ser Pro Asp Glu Gly Phe Glu Gly Lys
465                 470                 475                 480

Ser Leu Phe Asp Ser Trp Thr Glu Lys Ser Pro Ser Pro Glu Phe Ser
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Gly Leu Pro Arg Ile Ser Lys Leu Gly Ser Gly Asn Asp Phe Glu Val
            500                 505                 510

Phe Phe Gln Arg Leu Gly Ile Ala Ser Gly Arg Ala Arg Tyr Thr Lys
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Asp Trp Lys Thr Ser Lys Phe Ser Gly Tyr Pro Leu Tyr His Ser Val
    530                 535                 540

Tyr Glu Thr Tyr Glu Leu Val Glu Lys Phe Tyr Asp Pro Met Phe Lys
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Tyr His Leu Thr Val Ala Gln Val Arg Gly Gly Ile Val Phe Glu Leu
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Ala Asn Ser Val Val Leu Pro Phe Asp Cys Gln Asp Tyr Ala Val Val
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Leu Lys Lys Tyr Ala Asp Lys Ile Tyr Asn Ile Ser Met Lys His Pro
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Gln Glu Met Lys Thr Tyr Ser Val Ser Phe Asp Ser Leu Phe Ser Ala
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Val Lys Asn Phe Thr Glu Ile Ala Ser Lys Phe Asn Gln Arg Leu Gln
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Asp Phe Asp Lys Asn Asn Pro Ile Leu Leu Arg Met Met Asn Asp Gln
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690 695 700

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Ile Tyr Val Ala Ala Phe Thr Val Gln Ala Ala Ala Glu Thr Leu Ser
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Glu Val Ala

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atcagcaagc tgggcagcgg caacgacttc gaggtgttct tccagcggct gggaatcgcc 1560

agcggcagag cccggtacac caaggactgg aaaaccagca agttctccgg ctacccccctg 1620

taccacagcg tgtacgagac atacgagctg gtggaaaagt tctacgaccc catgttcaag 1680

taccacctga ccgtggccca ggtccgaggc ggcatcgtgt tcgaactggc caacagcgtg 1740

gtgctgccat tcgattgtca ggactacgcc gtggtgctga agaagtacgc cgacaaaatc 1800

tacaacatca gcatgaagca cccccaggaa atgaaaacct acagcgtgtc cttcgacagc 1860

ctgttcagcg ccgtgaagaa tttcaccgag atcgcctcca agttcaacca gagactgcag 1920

gacttcgaca agaacaaccc catcctgctg cggatgatga acgaccagct gatgttcctg 1980

gaacgggcct tcatcgaccc cctgggcctg cccgaccggc ccttttaccg gcacgtgatc 2040

tatgccccca gcagccacaa caaatacgcc ggcgagagtt tccccggcat ctacgatgcc 2100

ctgttcgata tcgagagcaa ggtggacccc agcaaggcct ggggcgaagt gaagcggcag 2160

atttacgtgg ccgcattcac agtgcaggct gctgccgaga cactgagcga ggtggcc 2217

<210> 7
<211> 739
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 7

Met Ala Ser Ala Arg Arg Pro Arg Trp Leu Cys Ala Gly Ala Leu Val
1 5 10 15

Leu Ala Gly Gly Phe Phe Leu Leu Gly Phe Leu Phe Gly Trp Phe Ile
20 25 30

Lys Ser Ser Asn Glu Ala Thr Asn Ile Thr Pro Lys His Asn Met Lys
35 40 45

Ala Phe Leu Asp Glu Leu Lys Ala Glu Asn Ile Lys Lys Phe Leu Tyr
50 55 60

```
Asn Phe Thr Gln Ile Pro His Leu Ala Gly Thr Glu Gln Asn Phe Gln
65                  70                  75                  80

Leu Ala Lys Gln Ile Gln Ser Gln Trp Lys Glu Phe Gly Leu Asp Ser
                85                  90                  95

Val Glu Leu Ala His Tyr Asp Val Leu Leu Ser Tyr Pro Asn Lys Thr
            100                 105                 110

His Pro Asn Tyr Ile Ser Ile Ile Asn Glu Asp Gly Asn Glu Ile Phe
        115                 120                 125

Asn Thr Ser Leu Phe Glu Pro Pro Pro Pro Gly Tyr Glu Asn Val Ser
    130                 135                 140

Asp Ile Val Pro Pro Phe Ser Ala Phe Ser Pro Gln Gly Met Pro Glu
145                 150                 155                 160

Gly Asp Leu Val Tyr Val Asn Tyr Ala Arg Thr Glu Asp Phe Phe Lys
                165                 170                 175

Leu Glu Arg Asp Met Lys Ile Asn Cys Ser Gly Lys Ile Val Ile Ala
            180                 185                 190

Arg Tyr Gly Lys Val Phe Arg Gly Asn Lys Val Lys Asn Ala Gln Leu
        195                 200                 205

Ala Gly Ala Lys Gly Val Ile Leu Tyr Ser Asp Pro Ala Asp Tyr Phe
    210                 215                 220

Ala Pro Gly Val Lys Ser Tyr Pro Asp Gly Trp Asn Leu Pro Gly Gly
225                 230                 235                 240

Gly Val Gln Arg Gly Asn Ile Leu Asn Leu Asn Gly Ala Gly Asp Pro
                245                 250                 255

Leu Thr Pro Gly Tyr Pro Ala Asn Glu Tyr Ala Tyr Arg Arg Gly Ile
            260                 265                 270

Ala Glu Ala Val Gly Leu Pro Ser Ile Pro Val His Pro Ile Gly Tyr
        275                 280                 285

Tyr Asp Ala Gln Lys Leu Leu Glu Lys Met Gly Gly Ser Ala Pro Pro
    290                 295                 300

Asp Ser Ser Trp Arg Gly Ser Leu Lys Val Pro Tyr Asn Val Gly Pro
305                 310                 315                 320

Gly Phe Thr Gly Asn Phe Ser Ala Gln Lys Leu Lys Leu His Ile His
                325                 330                 335
```

```
Ser Asn Thr Lys Val Thr Arg Ile Tyr Asn Val Ile Gly Thr Leu Arg
            340                 345                 350

Gly Ala Val Glu Pro Asp Arg Tyr Val Ile Leu Gly Gly His Arg Asp
        355                 360                 365

Ser Trp Val Phe Gly Gly Ile Asp Pro Gln Ser Gly Ala Ala Val Val
    370                 375                 380

His Glu Ile Val Arg Thr Phe Gly Thr Leu Lys Lys Lys Gly Trp Arg
385                 390                 395                 400

Pro Arg Arg Thr Ile Leu Phe Ala Ser Trp Asp Ala Glu Glu Phe Gly
                405                 410                 415

Leu Leu Gly Ser Thr Glu Trp Ala Glu Glu Asn Ser Arg Leu Leu Gln
            420                 425                 430

Glu Arg Gly Val Ala Tyr Ile Asn Ala Asp Ser Ser Ile Glu Gly Asn
        435                 440                 445

Tyr Thr Leu Arg Val Asp Cys Thr Pro Leu Leu His Ser Leu Val Tyr
    450                 455                 460

Asn Leu Thr Lys Glu Leu Lys Ser Pro Asp Glu Gly Phe Glu Gly Lys
465                 470                 475                 480

Ser Leu Tyr Glu Ser Trp Thr Lys Lys Ser Pro Ser Pro Glu Leu Ser
                485                 490                 495

Gly Leu Pro Arg Ile Ser Lys Leu Gly Ser Gly Asn Asp Phe Glu Val
            500                 505                 510

Phe Phe Gln Arg Leu Gly Ile Ser Ser Gly Arg Ala Arg Tyr Thr Lys
        515                 520                 525

Asp Trp Lys Thr Ser Lys Phe Ser Ser Tyr Pro Leu Tyr His Ser Ile
    530                 535                 540

Tyr Glu Thr Tyr Glu Leu Val Val Lys Phe Tyr Asp Pro Met Phe Lys
545                 550                 555                 560

Tyr His Leu Thr Val Ala Gln Val Arg Gly Gly Met Val Phe Glu Leu
                565                 570                 575

Ala Asn Ser Ile Val Leu Pro Phe Asp Cys Arg Asp Tyr Ala Val Ala
            580                 585                 590

Leu Lys Asn His Ala Glu Asn Leu Tyr Ser Ile Ser Met Lys His Pro
        595                 600                 605
```

```
Gln Glu Met Lys Thr Tyr Ser Val Ser Phe Asp Ser Leu Phe Ser Ala
    610                 615                 620

Val Lys Asn Phe Thr Glu Ile Ala Ser Lys Phe Ser Glu Arg Leu Gln
625                 630                 635                 640

Asp Phe Asp Lys Ser Asn Pro Ile Val Leu Arg Met Met Asn Asp Gln
                645                 650                 655

Leu Met Phe Leu Glu Arg Ala Phe Ile Asp Pro Leu Gly Leu Pro Asp
            660                 665                 670

Arg Pro Phe Tyr Arg His Val Ile Tyr Ala Pro Ser Ser His Asn Lys
        675                 680                 685

Tyr Ala Gly Glu Ser Phe Pro Gly Ile Tyr Asp Ala Leu Phe Asp Ile
    690                 695                 700

Glu Ser Lys Val Asp Pro Ser Lys Ala Trp Gly Glu Val Lys Arg Gln
705                 710                 715                 720

Ile Tyr Val Ala Ala Phe Thr Val Gln Ala Ala Ala Glu Thr Leu Ser
                725                 730                 735

Glu Val Ala
```

<210> 8
<211> 2217
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<400> 8

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tttttcctgc tgggcttcct gttcggctgg ttcatcaaga gcagcaacga ggccaccaac      120

atcaccccca agcacaacat gaaggccttt ctggacgagc tgaaggccga gaatatcaag      180

aagttcctgt acaacttcac ccagatcccc cacctggccg gcaccgagca gaacttccag      240

ctggccaagc agatccagag ccagtggaaa gagttcggcc tggacagcgt ggaactggcc      300

cactacgacg tgctgctgag ctaccccaac aagacccacc ccaactacat cagcatcatc      360

aacgaggacg gcaacgagat tttcaacacc agcctgttcg agccccctcc acccggctac      420

gagaacgtgt ccgacatcgt gccccattc agcgcattca gtccacaggg aatgcccgag      480

ggcgacctgg tgtacgtgaa ctacgcccgg accgaggact tcttcaagct ggaacgggac      540

atgaagatca actgcagcgg caagatcgtg atcgccagat acggcaaggt gttccggggc      600

aacaaagtga agaacgccca gctggcaggc gccaagggcg tgatcctgta tagcgacccc      660

gccgactact tcgcccctgg cgtgaagtcc taccccgacg gctggaacct gcctggcggc      720
```

ggagtgcagc ggggcaacat cctgaacctg aacggcgctg gcgaccccct gacccctggc 780

tatcccgcca acgagtacgc ctacagacgg ggaatcgccg aggccgtggg cctgcctagc 840

atccctgtgc accccatcgg ctactacgac gcccagaaac tgctggaaaa gatgggcggc 900

agcgcccctc ccgatagctc ttggagaggc agcctgaagg tgccctacaa cgtgggccct 960

ggcttcaccg gcaacttcag cgcccagaag ctgaagctgc acatccacag caacaccaaa 1020

gtgacccgga tctacaacgt gatcggcacc ctgagaggcg ccgtggaacc cgacagatac 1080

gtgatcctgg gcggccaccg ggacagctgg gtgttcggcg gcatcgaccc tcagtctggc 1140

gccgctgtgg tgcacgagat cgtgcggacc tttggcaccc tgaagaagaa gggctggcgg 1200

cccagacgga ccatcctgtt cgccagctgg gacgccgagg aattcggcct gctgggcagc 1260

accgagtggg ccgaggaaaa cagtcggctg ctgcaggaac ggggcgtcgc ctacatcaac 1320

gccgacagca gcatcgaggg caactacacc ctgcgggtgg actgcacccc cctgctgcac 1380

agcctggtgt acaacctgac caaagagctg aagtcccccg acgagggctt cgagggcaag 1440

agcctgtacg agagctggac caagaagtcc cccagccccg agctgagcgg cctgcccaga 1500

atcagcaagc tgggcagcgg caacgacttc gaggtgttct tccagcggct gggcatcagc 1560

agcggcagag cccggtacac caaggactgg aaaaccagca agttcagcag ctacccccctg 1620

taccacagca tctacgagac atacgagctg gtggtcaagt tctacgaccc catgttcaag 1680

taccacctga ccgtggccca ggtccgaggc ggcatggtgt tcgagctggc caacagcatc 1740

gtgctgccct tcgactgccg ggactacgcc gtggccctga agaaccacgc cgagaacctg 1800

tacagcatca gcatgaagca cccccaggaa atgaaaacct acagcgtgtc cttcgacagc 1860

ctgttcagcg ccgtgaagaa tttcaccgag atcgcctcca agttcagcga gcggctgcag 1920

gacttcgaca agagcaaccc catcgtgctg agaatgatga acgaccagct gatgttcctg 1980

gaacgggcct tcatcgaccc cctgggcctg cccgaccggc ccttttaccg gcacgtgatc 2040

tatgccccca gcagccacaa caaatacgcc ggcgagagtt tccccggcat ctacgatgcc 2100

ctgttcgaca tcgagagcaa ggtggacccc agcaaggcct ggggcgaagt gaagcggcag 2160

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<210> 9
<211> 739
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 9

Met Ala Ser Ala Arg Arg Pro Arg Trp Leu Cys Ala Gly Ala Leu Val
1 5 10 15

Leu Ala Gly Gly Phe Phe Leu Leu Gly Phe Leu Phe Gly Trp Phe Ile
20 25 30

```
Lys Ser Ser Asn Glu Ala Thr Asn Ile Thr Pro Lys His Asn Met Lys
        35                  40                  45

Ala Phe Leu Asp Glu Leu Lys Ala Glu Asn Ile Lys Lys Phe Leu Tyr
    50                  55                  60

Asn Phe Thr Gln Ile Pro His Leu Ala Gly Thr Glu Gln Asn Phe Gln
65                  70                  75                  80

Leu Ala Lys Gln Ile Gln Ser Gln Trp Lys Glu Phe Gly Leu Asp Ser
                85                  90                  95

Val Glu Leu Ala His Tyr Asp Val Leu Leu Ser Tyr Pro Asn Lys Thr
            100                 105                 110

His Pro Asn Tyr Ile Ser Ile Ile Asn Glu Asp Gly Asn Glu Ile Phe
        115                 120                 125

Asn Thr Ser Leu Phe Glu Pro Pro Pro Pro Gly Tyr Glu Asn Val Ser
    130                 135                 140

Asp Ile Val Pro Pro Phe Ser Ala Phe Ser Pro Gln Gly Met Pro Glu
145                 150                 155                 160

Gly Asp Leu Val Tyr Val Asn Tyr Ala Arg Thr Glu Asp Phe Phe Lys
                165                 170                 175

Leu Glu Arg Asp Met Lys Ile Asn Cys Ser Gly Lys Ile Val Ile Ala
            180                 185                 190

Arg Tyr Gly Lys Val Phe Arg Gly Asn Lys Val Lys Asn Ala Gln Leu
        195                 200                 205

Ala Gly Ala Lys Gly Val Ile Leu Tyr Ser Asp Pro Ala Asp Tyr Phe
    210                 215                 220

Ala Pro Gly Val Lys Ser Tyr Pro Asp Gly Trp Asn Leu Pro Gly Gly
225                 230                 235                 240

Gly Val Gln Arg Gly Asn Ile Leu Asn Leu Asn Gly Ala Gly Asp Pro
                245                 250                 255

Leu Thr Pro Gly Tyr Pro Ala Asn Glu Tyr Ala Tyr Arg Arg Gly Ile
            260                 265                 270

Ala Glu Ala Val Gly Leu Pro Ser Ile Pro Val His Pro Ile Gly Tyr
        275                 280                 285

Tyr Asp Ala Gln Lys Leu Leu Glu Lys Met Gly Gly Ser Ala Pro Pro
    290                 295                 300
```

```
Asp Ser Ser Trp Arg Gly Ser Leu Lys Val Pro Tyr Asn Val Gly Pro
305                 310                 315                 320

Gly Phe Thr Gly Asn Phe Ser Thr Gln Lys Val Lys Met His Ile His
                325                 330                 335

Ser Thr Asn Glu Val Thr Arg Ile Tyr Asn Val Ile Gly Thr Leu Arg
            340                 345                 350

Gly Ala Val Glu Pro Asp Arg Tyr Val Ile Leu Gly Gly His Arg Asp
        355                 360                 365

Ser Trp Val Phe Gly Gly Ile Asp Pro Gln Ser Gly Ala Ala Val Val
    370                 375                 380

His Glu Ile Val Arg Ser Phe Gly Thr Leu Lys Lys Glu Gly Trp Arg
385                 390                 395                 400

Pro Arg Arg Thr Ile Leu Phe Ala Ser Trp Asp Ala Glu Glu Phe Gly
                405                 410                 415

Leu Leu Gly Ser Thr Glu Trp Ala Glu Glu Asn Ser Arg Leu Leu Gln
            420                 425                 430

Glu Arg Gly Val Ala Tyr Ile Asn Ala Asp Ser Ser Ile Glu Gly Asn
        435                 440                 445

Tyr Thr Leu Arg Val Asp Cys Thr Pro Leu Met Tyr Ser Leu Val His
    450                 455                 460

Asn Leu Thr Lys Glu Leu Lys Ser Pro Asp Glu Gly Phe Glu Gly Lys
465                 470                 475                 480

Ser Leu Tyr Glu Ser Trp Thr Lys Lys Ser Pro Ser Pro Glu Phe Ser
                485                 490                 495

Gly Met Pro Arg Ile Ser Lys Leu Gly Ser Gly Asn Asp Phe Glu Val
            500                 505                 510

Phe Phe Gln Arg Leu Gly Ile Ala Ser Gly Arg Ala Arg Tyr Thr Lys
        515                 520                 525

Asn Trp Glu Thr Asn Lys Phe Ser Gly Tyr Pro Leu Tyr His Ser Val
    530                 535                 540

Tyr Glu Thr Tyr Glu Leu Val Glu Lys Phe Tyr Asp Pro Met Phe Lys
545                 550                 555                 560

Tyr His Leu Thr Val Ala Gln Val Arg Gly Gly Met Val Phe Glu Leu
                565                 570                 575
```

```
Ala Asn Ser Ile Val Leu Pro Phe Asp Cys Arg Asp Tyr Ala Val Val
            580                 585                 590

Leu Arg Lys Tyr Ala Asp Lys Ile Tyr Ser Ile Ser Met Lys His Pro
        595                 600                 605

Gln Glu Met Lys Thr Tyr Ser Val Ser Phe Asp Ser Leu Phe Ser Ala
    610                 615                 620

Val Lys Asn Phe Thr Glu Ile Ala Ser Lys Phe Ser Glu Arg Leu Gln
625                 630                 635                 640

Asp Phe Asp Lys Ser Asn Pro Ile Val Leu Arg Met Met Asn Asp Gln
                645                 650                 655

Leu Met Phe Leu Glu Arg Ala Phe Ile Asp Pro Leu Gly Leu Pro Asp
            660                 665                 670

Arg Pro Phe Tyr Arg His Val Ile Tyr Ala Pro Ser Ser His Asn Lys
        675                 680                 685

Tyr Ala Gly Glu Ser Phe Pro Gly Ile Tyr Asp Ala Leu Phe Asp Ile
    690                 695                 700

Glu Ser Lys Val Asp Pro Ser Lys Ala Trp Gly Glu Val Lys Arg Gln
705                 710                 715                 720

Ile Tyr Val Ala Ala Phe Thr Val Gln Ala Ala Ala Glu Thr Leu Ser
                725                 730                 735

Glu Val Ala
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<210> 10
<211> 2217
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<400> 10

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ttctttctcc tcggcttcct cttcgggtgg tttataaaat cctccaatga agctactaac      120

attactccaa agcataatat gaaagcattt ttggatgaat tgaaagctga gaacatcaag      180

aagttcttat ataattttac acagatacca catttagcag gaacagaaca aaactttcag      240

cttgcaaagc aaattcaatc ccagtggaaa gaatttggcc tggattctgt tgagctggca      300

cattatgatg tcctgttgtc ctacccaaat aagactcatc ccaactacat ctcaataatt      360

aatgaagatg gaaatgagat tttcaacaca tcattatttg aaccacctcc tccaggatat      420
```

gaaaatgttt cggatattgt accacctttc agtgctttct ctcctcaagg aatgccagag 480

ggcgatctag tgtatgttaa ctatgcacga actgaagact tctttaaatt ggaacgggac 540

atgaaaatca attgctctgg gaaaattgta attgccagat atgggaaagt tttcagagga 600

aataaggtta aaaatgccca gctggcaggg gccaaaggag tcattctcta ctccgaccct 660

gctgactact ttgctcctgg ggtgaagtcc tatccagatg gttggaatct tcctggaggt 720

ggtgtccagc gtggaaatat cctaaatctg aatggtgcag gagaccctct cacaccaggt 780

tacccagcaa atgaatatgc ttataggcgt ggaattgcag aggctgttgg tcttccaagt 840

attcctgttc atccaattgg atactatgat gcacagaagc tcctagaaaa aatgggtggc 900

tcagcaccac cagatagcag ctggagagga agtctcaaag tgccctacaa tgttggacct 960

ggctttactg gaaacttttc tacacaaaaa gtcaagatgc acatccactc taccaatgaa 1020

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gcagctgttg ttcatgaaat tgtgaggagc tttggaacac tgaaaaagga agggtggaga 1200

cctagaagaa caattttgtt tgcaagctgg gatgcagaag aatttggtct tcttggttct 1260

actgagtggg cagaggagaa ttcaagactc cttcaagagc gtggcgtggc ttatattaat 1320

gctgactcat ctatagaagg aaactacact ctgagagttg attgtacacc gctgatgtac 1380

agcttggtac acaacctaac aaaagagctg aaaagccctg atgaaggctt tgaaggcaaa 1440

tctctttatg aaagttggac taaaaaaagt ccttccccag agttcagtgg catgcccagg 1500

ataagcaaat tgggatctgg aaatgatttt gaggtgttct tccaacgact tggaattgct 1560

tcaggcagag cacggtatac taaaaattgg gaaacaaaca aattcagcgg ctatccactg 1620

tatcacagtg tctatgaaac atatgagttg gtggaaaagt tttatgatcc aatgtttaaa 1680

tatcacctca ctgtggccca ggttcgagga gggatggtgt ttgagctggc caattccata 1740

gtgctccctt ttgattgtcg agattatgct gtagttttaa gaaagtatgc tgacaaaatc 1800

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ctttttctg cagtaaagaa ttttacagaa attgcttcca agttcagtga gagactccag 1920

gactttgaca aaagcaaccc aatagtatta agaatgatga atgatcaact catgtttctg 1980

gaaagagcat ttattgatcc attagggtta ccagacaggc ctttttatag gcatgtcatc 2040

tatgctccaa gcagccacaa caagtatgca ggggagtcat tcccaggaat ttatgatgct 2100

ctgtttgata ttgaaagcaa agtggaccct tccaaggcct ggggagaagt gaagagacag 2160

atttatgttg cagccttcac agtgcaggca gctgcagaga ctttgagtga agtagcc 2217

<210> 11
<211> 710
<212> PRT
<213> Artificial

<220>

<223> Synthetic Construct

<400> 11

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Met Ala Ser Lys Ser Ser Asn Glu Ala Thr Asn Ile Thr Pro Lys His
1               5                  10                  15

Asn Met Lys Ala Phe Leu Asp Glu Leu Lys Ala Glu Asn Ile Lys Lys
            20                  25                  30

Phe Leu Tyr Asn Phe Thr Gln Ile Pro His Leu Ala Gly Thr Glu Gln
        35                  40                  45

Asn Phe Gln Leu Ala Lys Gln Ile Gln Ser Gln Trp Lys Glu Phe Gly
    50                  55                  60

Leu Asp Ser Val Glu Leu Ala His Tyr Asp Val Leu Leu Ser Tyr Pro
65                  70                  75                  80

Asn Lys Thr His Pro Asn Tyr Ile Ser Ile Ile Asn Glu Asp Gly Asn
                85                  90                  95

Glu Ile Phe Asn Thr Ser Leu Phe Glu Pro Pro Pro Pro Gly Tyr Glu
            100                 105                 110

Asn Val Ser Asp Ile Val Pro Pro Phe Ser Ala Phe Ser Pro Gln Gly
        115                 120                 125

Met Pro Glu Gly Asp Leu Val Tyr Val Asn Tyr Ala Arg Thr Glu Asp
    130                 135                 140

Phe Phe Lys Leu Glu Arg Asp Met Lys Ile Asn Cys Ser Gly Lys Ile
145                 150                 155                 160

Val Ile Ala Arg Tyr Gly Lys Val Phe Arg Gly Asn Lys Val Lys Asn
                165                 170                 175

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

Asp Tyr Phe Ala Pro Gly Val Lys Ser Tyr Pro Asp Gly Trp Asn Leu
        195                 200                 205

Pro Gly Gly Gly Val Gln Arg Gly Asn Ile Leu Asn Leu Asn Gly Ala
    210                 215                 220

Gly Asp Pro Leu Thr Pro Gly Tyr Pro Ala Asn Glu Tyr Ala Tyr Arg
225                 230                 235                 240

Arg Gly Ile Ala Glu Ala Val Gly Leu Pro Ser Ile Pro Val His Pro
                245                 250                 255
```

```
Ile Gly Tyr Tyr Asp Ala Gln Lys Leu Leu Glu Lys Met Gly Gly Ser
            260                 265                 270

Ala Pro Pro Asp Ser Ser Trp Arg Gly Ser Leu Lys Val Pro Tyr Asn
        275                 280                 285

Val Gly Pro Gly Phe Thr Gly Asn Phe Ser Thr Gln Lys Val Lys Met
    290                 295                 300

His Ile His Ser Thr Asn Glu Val Thr Arg Ile Tyr Asn Val Ile Gly
305                 310                 315                 320

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

His Arg Asp Ser Trp Val Phe Gly Gly Ile Asp Pro Gln Ser Gly Ala
            340                 345                 350

Ala Val Val His Glu Ile Val Arg Ser Phe Gly Thr Leu Lys Lys Glu
        355                 360                 365

Gly Trp Arg Pro Arg Arg Thr Ile Leu Phe Ala Ser Trp Asp Ala Glu
    370                 375                 380

Glu Phe Gly Leu Leu Gly Ser Thr Glu Trp Ala Glu Glu Asn Ser Arg
385                 390                 395                 400

Leu Leu Gln Glu Arg Gly Val Ala Tyr Ile Asn Ala Asp Ser Ser Ile
                405                 410                 415

Glu Gly Asn Tyr Thr Leu Arg Val Asp Cys Thr Pro Leu Met Tyr Ser
            420                 425                 430

Leu Val His Asn Leu Thr Lys Glu Leu Lys Ser Pro Asp Glu Gly Phe
        435                 440                 445

Glu Gly Lys Ser Leu Tyr Glu Ser Trp Thr Lys Lys Ser Pro Ser Pro
    450                 455                 460

Glu Phe Ser Gly Met Pro Arg Ile Ser Lys Leu Gly Ser Gly Asn Asp
465                 470                 475                 480

Phe Glu Val Phe Phe Gln Arg Leu Gly Ile Ala Ser Gly Arg Ala Arg
                485                 490                 495

Tyr Thr Lys Asn Trp Glu Thr Asn Lys Phe Ser Gly Tyr Pro Leu Tyr
            500                 505                 510

His Ser Val Tyr Glu Thr Tyr Glu Leu Val Glu Lys Phe Tyr Asp Pro
        515                 520                 525
```

Met Phe Lys Tyr His Leu Thr Val Ala Gln Val Arg Gly Gly Met Val
530 535 540

Phe Glu Leu Ala Asn Ser Ile Val Leu Pro Phe Asp Cys Arg Asp Tyr
545 550 555 560

Ala Val Val Leu Arg Lys Tyr Ala Asp Lys Ile Tyr Ser Ile Ser Met
565 570 575

Lys His Pro Gln Glu Met Lys Thr Tyr Ser Val Ser Phe Asp Ser Leu
580 585 590

Phe Ser Ala Val Lys Asn Phe Thr Glu Ile Ala Ser Lys Phe Ser Glu
595 600 605

Arg Leu Gln Asp Phe Asp Lys Ser Asn Pro Ile Val Leu Arg Met Met
610 615 620

Asn Asp Gln Leu Met Phe Leu Glu Arg Ala Phe Ile Asp Pro Leu Gly
625 630 635 640

Leu Pro Asp Arg Pro Phe Tyr Arg His Val Ile Tyr Ala Pro Ser Ser
645 650 655

His Asn Lys Tyr Ala Gly Glu Ser Phe Pro Gly Ile Tyr Asp Ala Leu
660 665 670

Phe Asp Ile Glu Ser Lys Val Asp Pro Ser Lys Ala Trp Gly Glu Val
675 680 685

Lys Arg Gln Ile Tyr Val Ala Ala Phe Thr Val Gln Ala Ala Ala Glu
690 695 700

Thr Leu Ser Glu Val Ala
705 710

<210> 12
<211> 2130
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<400> 12
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ccacatttag caggaacaga acaaaacttt cagcttgcaa agcaaattca atcccagtgg 180

aaagaatttg gcctggattc tgttgagctg gcacattatg atgtcctgtt gtcctaccca 240

aataagactc atcccaacta catctcaata attaatgaag atggaaatga gattttcaac 300

acatcattat ttgaaccacc tcctccagga tatgaaaatg tttcggatat tgtaccacct 360

ttcagtgctt tctctcctca aggaatgcca gagggcgatc tagtgtatgt taactatgca 420
cgaactgaag acttctttaa attggaacgg gacatgaaaa tcaattgctc tgggaaaatt 480
gtaattgcca gatatgggaa agttttcaga ggaaataagg ttaaaaatgc ccagctggca 540
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cgtggaattg cagaggctgt tggtcttcca agtattcctg ttcatccaat tggatactat 780
gatgcacaga agctcctaga aaaaatgggt ggctcagcac caccagatag cagctggaga 840
ggaagtctca aagtgcccta caatgttgga cctggcttta ctggaaactt ttctacacaa 900
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gcaggggagt cattcccagg aatttatgat gctctgtttg atattgaaag caaagtggac 2040
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<210> 13
<211> 732
<212> PRT
<213> Artificial

<220>

<223> Synthetic Construct

<400> 13

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Met Ala Ser Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp
1               5                  10                  15

Val Pro Gly Ser Thr Gly Asp Ala Ala Lys Ser Ser Asn Glu Ala Thr
            20                  25                  30

Asn Ile Thr Pro Lys His Asn Met Lys Ala Phe Leu Asp Glu Leu Lys
        35                  40                  45

Ala Glu Asn Ile Lys Lys Phe Leu Tyr Asn Phe Thr Gln Ile Pro His
    50                  55                  60

Leu Ala Gly Thr Glu Gln Asn Phe Gln Leu Ala Lys Gln Ile Gln Ser
65                  70                  75                  80

Gln Trp Lys Glu Phe Gly Leu Asp Ser Val Glu Leu Ala His Tyr Asp
                85                  90                  95

Val Leu Leu Ser Tyr Pro Asn Lys Thr His Pro Asn Tyr Ile Ser Ile
            100                 105                 110

Ile Asn Glu Asp Gly Asn Glu Ile Phe Asn Thr Ser Leu Phe Glu Pro
        115                 120                 125

Pro Pro Pro Gly Tyr Glu Asn Val Ser Asp Ile Val Pro Pro Phe Ser
    130                 135                 140

Ala Phe Ser Pro Gln Gly Met Pro Glu Gly Asp Leu Val Tyr Val Asn
145                 150                 155                 160

Tyr Ala Arg Thr Glu Asp Phe Phe Lys Leu Glu Arg Asp Met Lys Ile
                165                 170                 175

Asn Cys Ser Gly Lys Ile Val Ile Ala Arg Tyr Gly Lys Val Phe Arg
            180                 185                 190

Gly Asn Lys Val Lys Asn Ala Gln Leu Ala Gly Ala Lys Gly Val Ile
        195                 200                 205

Leu Tyr Ser Asp Pro Ala Asp Tyr Phe Ala Pro Gly Val Lys Ser Tyr
    210                 215                 220

Pro Asp Gly Trp Asn Leu Pro Gly Gly Gly Val Gln Arg Gly Asn Ile
225                 230                 235                 240

Leu Asn Leu Asn Gly Ala Gly Asp Pro Leu Thr Pro Gly Tyr Pro Ala
                245                 250                 255
```

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Asn Glu Tyr Ala Tyr Arg Arg Gly Ile Ala Glu Ala Val Gly Leu Pro
            260                 265                 270

Ser Ile Pro Val His Pro Ile Gly Tyr Tyr Asp Ala Gln Lys Leu Leu
        275                 280                 285

Glu Lys Met Gly Gly Ser Ala Pro Pro Asp Ser Ser Trp Arg Gly Ser
    290                 295                 300

Leu Lys Val Pro Tyr Asn Val Gly Pro Gly Phe Thr Gly Asn Phe Ser
305                 310                 315                 320

Thr Gln Lys Val Lys Met His Ile His Ser Thr Asn Glu Val Thr Arg
                325                 330                 335

Ile Tyr Asn Val Ile Gly Thr Leu Arg Gly Ala Val Glu Pro Asp Arg
            340                 345                 350

Tyr Val Ile Leu Gly Gly His Arg Asp Ser Trp Val Phe Gly Gly Ile
        355                 360                 365

Asp Pro Gln Ser Gly Ala Ala Val Val His Glu Ile Val Arg Ser Phe
    370                 375                 380

Gly Thr Leu Lys Lys Glu Gly Trp Arg Pro Arg Arg Thr Ile Leu Phe
385                 390                 395                 400

Ala Ser Trp Asp Ala Glu Glu Phe Gly Leu Leu Gly Ser Thr Glu Trp
                405                 410                 415

Ala Glu Glu Asn Ser Arg Leu Leu Gln Glu Arg Gly Val Ala Tyr Ile
            420                 425                 430

Asn Ala Asp Ser Ser Ile Glu Gly Asn Tyr Thr Leu Arg Val Asp Cys
        435                 440                 445

Thr Pro Leu Met Tyr Ser Leu Val His Asn Leu Thr Lys Glu Leu Lys
    450                 455                 460

Ser Pro Asp Glu Gly Phe Glu Gly Lys Ser Leu Tyr Glu Ser Trp Thr
465                 470                 475                 480

Lys Lys Ser Pro Ser Pro Glu Phe Ser Gly Met Pro Arg Ile Ser Lys
                485                 490                 495

Leu Gly Ser Gly Asn Asp Phe Glu Val Phe Phe Gln Arg Leu Gly Ile
            500                 505                 510

Ala Ser Gly Arg Ala Arg Tyr Thr Lys Asn Trp Glu Thr Asn Lys Phe
        515                 520                 525
```

Ser Gly Tyr Pro Leu Tyr His Ser Val Tyr Glu Thr Tyr Glu Leu Val
530 535 540

Glu Lys Phe Tyr Asp Pro Met Phe Lys Tyr His Leu Thr Val Ala Gln
545 550 555 560

Val Arg Gly Gly Met Val Phe Glu Leu Ala Asn Ser Ile Val Leu Pro
565 570 575

Phe Asp Cys Arg Asp Tyr Ala Val Val Leu Arg Lys Tyr Ala Asp Lys
580 585 590

Ile Tyr Ser Ile Ser Met Lys His Pro Gln Glu Met Lys Thr Tyr Ser
595 600 605

Val Ser Phe Asp Ser Leu Phe Ser Ala Val Lys Asn Phe Thr Glu Ile
610 615 620

Ala Ser Lys Phe Ser Glu Arg Leu Gln Asp Phe Asp Lys Ser Asn Pro
625 630 635 640

Ile Val Leu Arg Met Met Asn Asp Gln Leu Met Phe Leu Glu Arg Ala
645 650 655

Phe Ile Asp Pro Leu Gly Leu Pro Asp Arg Pro Phe Tyr Arg His Val
660 665 670

Ile Tyr Ala Pro Ser Ser His Asn Lys Tyr Ala Gly Glu Ser Phe Pro
675 680 685

Gly Ile Tyr Asp Ala Leu Phe Asp Ile Glu Ser Lys Val Asp Pro Ser
690 695 700

Lys Ala Trp Gly Glu Val Lys Arg Gln Ile Tyr Val Ala Ala Phe Thr
705 710 715 720

Val Gln Ala Ala Ala Glu Thr Leu Ser Glu Val Ala
725 730

<210> 14
<211> 2196
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<400> 14
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actggtgatg ctgctaaatc ctccaatgaa gctactaaca ttactccaaa gcataatatg 120

aaagcatttt tggatgaatt gaaagctgag aacatcaaga agttcttata taattttaca 180

cagataccac atttagcagg aacagaacaa aactttcagc ttgcaaagca aattcaatcc 240

cagtggaaag aatttggcct ggattctgtt gagctagcac attatgatgt cctgttgtcc 300

tacccaaata agactcatcc caactacatc tcaataatta atgaagatgg aaatgagatt 360

ttcaacacat cattatttga accacctcct ccaggatatg aaaatgtttc ggatattgta 420

ccacctttca gtgctttctc tcctcaagga atgccagagg gcgatctagt gtatgttaac 480

tatgcacgaa ctgaagactt ctttaaattg gaacgggaca tgaaaatcaa ttgctctggg 540

aaaattgtaa ttgccagata tgggaaagtt ttcagaggaa ataaggttaa aaatgcccag 600

ctggcagggg ccaaaggagt cattctctac tccgaccctg ctgactactt tgctcctggg 660

gtgaagtcct atccagatgg ttggaatctt cctggaggtg gtgtccagcg tggaaatatc 720

ctaaatctga atggtgcagg agaccctctc acaccaggtt acccagcaaa tgaatatgct 780

tataggcgtg gaattgcaga ggctgttggt cttccaagta ttcctgttca tccaattgga 840

tactatgatg cacagaagct cctagaaaaa atgggtggct cagcaccacc agatagcagc 900

tggagaggaa gtctcaaagt gccctacaat gttggacctg gctttactgg aaacttttct 960

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gactcatggg tgtttggtgg tattgaccct cagagtggag cagctgttgt tcatgaaatt 1140

gtgaggagct ttggaacact gaaaaaggaa gggtggagac ctagaagaac aattttgttt 1200

gcaagctggg atgcagaaga atttggtctt cttggttcta ctgagtgggc agaggagaat 1260

tcaagactcc ttcaagagcg tggcgtggct tatattaatg ctgactcatc tatagaagga 1320

aactacactc tgagagttga ttgtacaccg ctgatgtaca gcttggtaca caacctaaca 1380

aaagagctga aaagccctga tgaaggcttt gaaggcaaat ctctttatga aagttggact 1440

aaaaaaagtc cttccccaga gttcagtggc atgcccagga taagcaaatt gggatctgga 1500

aatgattttg aggtgttctt ccaacgactt ggaattgctt caggcagagc acggtatact 1560

aaaaattggg aaacaaacaa attcagcggc tatccactgt atcacagtgt ctatgaaaca 1620

tatgagttgg tggaaaagtt ttatgatcca atgtttaaat atcacctcac tgtggcccag 1680

gttcgaggag ggatggtgtt tgagctagcc aattccatag tgctcccttt tgattgtcga 1740

gattatgctg tagttttaag aaagtatgct gacaaaatct acagtatttc tatgaaacat 1800

ccacaggaaa tgaagacata cagtgtatca tttgattcac ttttttctgc agtaaagaat 1860

tttacagaaa ttgcttccaa gttcagtgag agactccagg actttgacaa aagcaaccca 1920

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ttagggttac cagacaggcc tttttatagg catgtcatct atgctccaag cagccacaac 2040

aagtatgcag gggagtcatt cccaggaatt tatgatgctc tgtttgatat tgaaagcaaa 2100

gtggaccctt ccaaggcctg gggagaagtg aagagacaga tttatgttgc agccttcaca 2160

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<210> 15
<211> 263
<212> PRT
<213> Homo sapiens

<400> 15

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Met Ala Ser Trp Val Pro Val Val Phe Leu Thr Leu Ser Val Thr Trp
1               5                  10                  15

Ile Gly Ala Ala Pro Leu Ile Leu Ser Arg Ile Val Gly Gly Trp Glu
            20                  25                  30

Cys Glu Lys His Ser Gln Pro Trp Gln Val Leu Val Ala Ser Arg Gly
        35                  40                  45

Arg Ala Val Cys Gly Gly Val Leu Val His Pro Gln Trp Val Leu Thr
    50                  55                  60

Ala Ala His Cys Ile Arg Asn Lys Ser Val Ile Leu Leu Gly Arg His
65                  70                  75                  80

Ser Leu Phe His Pro Glu Asp Thr Gly Gln Val Phe Gln Val Ser His
                85                  90                  95

Ser Phe Pro His Pro Leu Tyr Asp Met Ser Leu Leu Lys Asn Arg Phe
            100                 105                 110

Leu Arg Pro Gly Asp Asp Ser Ser His Asp Leu Met Leu Leu Arg Leu
        115                 120                 125

Ser Glu Pro Ala Glu Leu Thr Asp Ala Val Lys Val Met Asp Leu Pro
    130                 135                 140

Thr Gln Glu Pro Ala Leu Gly Thr Thr Cys Tyr Ala Ser Gly Trp Gly
145                 150                 155                 160

Ser Ile Glu Pro Glu Glu Phe Leu Thr Pro Lys Lys Leu Gln Cys Val
                165                 170                 175

Asp Leu His Val Ile Ser Asn Asp Val Cys Ala Gln Val His Pro Gln
            180                 185                 190

Lys Val Thr Lys Phe Met Leu Cys Ala Gly Arg Trp Thr Gly Gly Lys
        195                 200                 205

Ser Thr Cys Ser Gly Asp Ser Gly Gly Pro Leu Val Cys Asn Gly Val
    210                 215                 220

Leu Gln Gly Ile Thr Ser Trp Gly Ser Glu Pro Cys Ala Leu Pro Glu
225                 230                 235                 240

Arg Pro Ser Leu Tyr Thr Lys Val Val His Tyr Arg Lys Trp Ile Lys
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245 250 255

Asp Thr Ile Val Ala Asn Pro
260

<210> 16
<211> 789
<212> DNA
<213> Homo sapiens

<400> 16
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cccctcatcc tgtctcggat tgtgggaggc tgggagtgcg agaagcattc ccaaccctgg 120

caggtgcttg tggcctctcg tggcagggca gtctgcggcg gtgttctggt gcacccccag 180

tgggtcctca cagctgccca ctgcatcagg aacaaaagcg tgatcttgct gggtcggcac 240

agcttgtttc atcctgaaga cacaggccag gtatttcagg tcagccacag cttcccacac 300

ccgctctacg atatgagcct cctgaagaat cgattcctca ggccaggtga tgactccagc 360

cacgacctca tgctgctccg cctgtcagag cctgccgagc tcacggatgc tgtgaaggtc 420

atggacctgc ccacccagga gccagcactg gggaccacct gctacgcctc aggctggggc 480

agcattgaac cagaggagtt cttgacccca aagaaacttc agtgtgtgga cctccatgtt 540

atttccaatg acgtgtgtgc gcaagttcac cctcagaagg tgaccaagtt catgctgtgt 600

gctggacgct ggacaggggg caaaagcacc tgctcgggtg attctggggg cccacttgtc 660

tgtaatggtg tgcttcaagg tatcacgtca tggggcagtg aaccatgtgc cctgcccgaa 720

aggccttccc tgtacaccaa ggtggtgcat taccggaagt ggatcaagga caccatcgtg 780

gccaacccc 789

<210> 17
<211> 240
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 17

Met Ala Ser Ile Val Gly Gly Trp Glu Cys Glu Lys His Ser Gln Pro
1 5 10 15

Trp Gln Val Leu Val Ala Ser Arg Gly Arg Ala Val Cys Gly Gly Val
20 25 30

Leu Val His Pro Gln Trp Val Leu Thr Ala Ala His Cys Ile Arg Asn
35 40 45

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

Thr Gly Gln Val Phe Gln Val Ser His Ser Phe Pro His Pro Leu Tyr
65 70 75 80

Asp Met Ser Leu Leu Lys Asn Arg Phe Leu Arg Pro Gly Asp Asp Ser
85 90 95

Ser His Asp Leu Met Leu Leu Arg Leu Ser Glu Pro Ala Glu Leu Thr
100 105 110

Asp Ala Val Lys Val Met Asp Leu Pro Thr Gln Glu Pro Ala Leu Gly
115 120 125

Thr Thr Cys Tyr Ala Ser Gly Trp Gly Ser Ile Glu Pro Glu Glu Phe
130 135 140

Leu Thr Pro Lys Lys Leu Gln Cys Val Asp Leu His Val Ile Ser Asn
145 150 155 160

Asp Val Cys Ala Gln Val His Pro Gln Lys Val Thr Lys Phe Met Leu
165 170 175

Cys Ala Gly Arg Trp Thr Gly Gly Lys Ser Thr Cys Ser Gly Asp Ser
180 185 190

Gly Gly Pro Leu Val Cys Asn Gly Val Leu Gln Gly Ile Thr Ser Trp
195 200 205

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

Val Val His Tyr Arg Lys Trp Ile Lys Asp Thr Ile Val Ala Asn Pro
225 230 235 240

<210> 18
<211> 720
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<400> 18
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gtggcctctc gtggcagggc agtctgcggc ggtgttctgg tgcaccccca gtgggtcctc 120

acagctgccc actgcatcag gaacaaaagc gtgatcttgc tgggtcggca cagcttgttt 180

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gatatgagcc tcctgaagaa tcgattcctc aggccaggtg atgactccag ccacgacctc 300

atgctgctcc gcctgtcaga gcctgccgag ctcacggatg ctgtgaaggt catggacctg 360

cccacccagg agccagcact ggggaccacc tgctacgcct caggctgggg cagcattgaa 420

ccagaggagt tcttgacccc aaagaaactt cagtgtgtgg acctccatgt tatttccaat 480

gacgtgtgtg cgcaagttca ccctcagaag gtgaccaagt tcatgctgtg tgctggacgc 540

tggacagggg gcaaaagcac ctgctcgggt gattctgggg gcccacttgt ctgtaatggt 600

gtgcttcaag gtatcacgtc atggggcagt gaaccatgtg ccctgcccga aaggccttcc 660

ctgtacacca aggtggtgca ttaccggaag tggatcaagg acaccatcgt ggccaacccc 720

<210> 19
<211> 281
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 19

Met Ala Ser Ala Arg Arg Pro Arg Trp Leu Cys Ala Gly Ala Leu Val
1 5 10 15

Leu Ala Gly Gly Phe Phe Leu Leu Gly Phe Leu Phe Gly Trp Phe Ile
20 25 30

Lys Ser Ser Asn Glu Ala Thr Asn Ile Thr Pro Gly Ile Val Gly Gly
35 40 45

Trp Glu Cys Glu Lys His Ser Gln Pro Trp Gln Val Leu Val Ala Ser
50 55 60

Arg Gly Arg Ala Val Cys Gly Gly Val Leu Val His Pro Gln Trp Val
65 70 75 80

Leu Thr Ala Ala His Cys Ile Arg Asn Lys Ser Val Ile Leu Leu Gly
85 90 95

Arg His Ser Leu Phe His Pro Glu Asp Thr Gly Gln Val Phe Gln Val
100 105 110

Ser His Ser Phe Pro His Pro Leu Tyr Asp Met Ser Leu Leu Lys Asn
115 120 125

Arg Phe Leu Arg Pro Gly Asp Asp Ser Ser His Asp Leu Met Leu Leu
130 135 140

Arg Leu Ser Glu Pro Ala Glu Leu Thr Asp Ala Val Lys Val Met Asp
145 150 155 160

Leu Pro Thr Gln Glu Pro Ala Leu Gly Thr Thr Cys Tyr Ala Ser Gly
165 170 175

Trp Gly Ser Ile Glu Pro Glu Glu Phe Leu Thr Pro Lys Lys Leu Gln
180 185 190

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Cys Val Asp Leu His Val Ile Ser Asn Asp Val Cys Ala Gln Val His
195 200 205

Pro Gln Lys Val Thr Lys Phe Met Leu Cys Ala Gly Arg Trp Thr Gly
210 215 220

Gly Lys Ser Thr Cys Ser Gly Asp Ser Gly Gly Pro Leu Val Cys Asn
225 230 235 240

Gly Val Leu Gln Gly Ile Thr Ser Trp Gly Ser Glu Pro Cys Ala Leu
245 250 255

Pro Glu Arg Pro Ser Leu Tyr Thr Lys Val Val His Tyr Arg Lys Trp
260 265 270

Ile Lys Asp Thr Ile Val Ala Asn Pro
275 280

<210> 20
<211> 846
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<400> 20
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ttctttctcc tcggcttcct cttcgggtgg tttataaaat cctccaatga agctactaac 120

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cttgtggcct ctcgtggcag ggcagtctgc ggcggtgttc tggtgcaccc ccagtgggtc 240

ctcacagctg cccactgcat caggaacaaa agcgtgatct tgctgggtcg gcacagcttg 300

tttcatcctg aagacacagg ccaggtattt caggtcagcc acagcttccc acacccgctc 360

tacgatatga gcctcctgaa gaatcgattc ctcaggccag gtgatgactc cagccacgac 420

ctcatgctgc tccgcctgtc agagcctgcc gagctcacgg atgctgtgaa ggtcatggac 480

ctgcccaccc aggagccagc actggggacc acctgctacg cctcaggctg gggcagcatt 540

gaaccagagg agttcttgac cccaaagaaa cttcagtgtg tggacctcca tgttatttcc 600

aatgacgtgt gtgcgcaagt tcaccctcag aaggtgacca agttcatgct gtgtgctgga 660

cgctggacag ggggcaaaag cacctgctcg ggtgattctg ggggcccact tgtctgtaat 720

ggtgtgcttc aaggtatcac gtcatggggc agtgaaccat gtgccctgcc cgaaaggcct 780

tccctgtaca ccaaggtggt gcattaccgg aagtggatca aggacaccat cgtggccaac 840

ccctga 846

<210> 21
<211> 125
<212> PRT
<213> Homo sapiens

<400> 21

Met Ala Ser Lys Ala Val Leu Leu Ala Leu Leu Met Ala Gly Leu Ala
1 5 10 15

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

Ser Asn Glu Asp Cys Leu Gln Val Glu Asn Cys Thr Gln Leu Gly Glu
35 40 45

Gln Cys Trp Thr Ala Arg Ile Arg Ala Val Gly Leu Leu Thr Val Ile
50 55 60

Ser Lys Gly Cys Ser Leu Asn Cys Val Asp Asp Ser Gln Asp Tyr Tyr
65 70 75 80

Val Gly Lys Lys Asn Ile Thr Cys Cys Asp Thr Asp Leu Cys Asn Ala
85 90 95

Ser Gly Ala His Ala Leu Gln Pro Ala Ala Ala Ile Leu Ala Leu Leu
100 105 110

Pro Ala Leu Gly Leu Leu Leu Trp Gly Pro Gly Gln Leu
115 120 125

<210> 22
<211> 375
<212> DNA
<213> Homo sapiens

<400> 22
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actgccctgc tgtgctactc ctgcaaagcc caggtgagca acgaggactg cctgcaggtg 120

gagaactgca cccagctggg ggagcagtgc tggaccgcgc gcatccgcgc agttggcctc 180

ctgaccgtca tcagcaaagg ctgcagcttg aactgcgtgg atgactcaca ggactactac 240

gtgggcaaga agaacatcac gtgctgtgac accgacttgt gcaacgccag cggggcccat 300

gccctgcagc cggctgccgc catccttgcg ctgctccctg cactcggcct gctgctctgg 360

ggacccggcc agcta 375

<210> 23
<211> 5964
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<400> 23
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agcatcaaat gaaactgcaa tttattcata tcaggattat caataccata tttttgaaaa 120

agccgtttct gtaatgaagg agaaaactca ccgaggcagt tccataggat ggcaagatcc 180

tggtatcggt ctgcgattcc gactcgtcca acatcaatac aacctattaa tttcccctcg 240

tcaaaaataa ggttatcaag tgagaaatca ccatgagtga cgactgaatc cggtgagaat 300

ggcaaaagct tatgcatttc tttccagact tgttcaacag gccagccatt acgctcgtca 360

tcaaaatcac tcgcatcaac caaaccgtta ttcattcgtg attgcgcctg agcgagacga 420

aatacgcgat cgctgttaaa aggacaatta caaacaggaa tcaaatgcaa ccggcgcagg 480

aacactgcca gcgcatcaac aatattttca cctgaatcag gatattcttc taatacctgg 540

aatgctgttt tcccggggat cgcagtggtg agtaaccatg catcatcagg agtacggata 600

aaatgcttga tggtcggaag aggcataaat tccgtcagcc agtttagtct gaccatctca 660

tctgtaacat cattggcaac gctacctttg ccatgtttca gaaacaactc tggcgcatcg 720

ggcttcccat acaatcgata gattgtcgca cctgattgcc cgacattatc gcgagcccat 780

ttatacccat ataaatcagc atccatgttg gaatttaatc gcggcctcga gcaagacgtt 840

tcccgttgaa tatggctcat aacacccctt gtattactgt ttatgtaagc agacaggtcg 900

acaatattgg ctattggcca ttgcatacgt tgtatctata tcataatatg tacatttata 960

ttggctcatg tccaatatga ccgccatgtt gacattgatt attgactagt tattaatagt 1020

aatcaattac ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta 1080

cggtaaatgg cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga 1140

cgtatgttcc catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt 1200

tacggtaaac tgcccacttg gcagtacatc aagtgtatca tatgccaagt ccgcccccta 1260

ttgacgtcaa tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttacggg 1320

actttcctac ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt 1380

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<210> 38
<211> 956
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 38

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Leu Leu Pro Pro Gly Ala Ala Ser Thr Gln Val Cys Thr Gly Thr Asp
            20                  25                  30

Met Lys Leu Arg Leu Pro Ala Ser Pro Glu Thr His Leu Asp Met Leu
        35                  40                  45

Arg His Leu Tyr Gln Gly Cys Gln Val Val Gln Gly Asn Leu Glu Leu
    50                  55                  60

Thr Tyr Leu Pro Thr Asn Ala Ser Leu Ser Phe Leu Gln Asp Ile Gln
65                  70                  75                  80

Glu Val Gln Gly Tyr Val Leu Ile Ala His Asn Gln Val Arg Gln Val
                85                  90                  95

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

Asn Tyr Ala Leu Ala Val Leu Asp Asn Gly Asp Pro Leu Asp Ser Val
        115                 120                 125

Ala Pro Ala Ala Gly Ala Thr Pro Gly Gly Leu Gln Glu Leu Gln Leu
    130                 135                 140

Arg Ser Leu Thr Glu Ile Leu Lys Gly Gly Val Leu Ile Arg Arg Ser
145                 150                 155                 160

Pro Gln Leu Cys His Gln Asp Thr Val Leu Trp Glu Asp Val Phe Arg
                165                 170                 175

Lys Asn Asn Gln Leu Ala Leu Val Leu Met Asp Thr Asn Arg Ser Arg
            180                 185                 190

Ala Cys His Pro Cys Ala Pro Met Cys Lys Ala Asn His Cys Trp Gly
        195                 200                 205

Glu Ser Ser Gln Asp Cys Gln Thr Leu Thr Arg Thr Ile Cys Thr Ser
    210                 215                 220

Ala Cys Ala Arg Cys Lys Ala Pro Leu Pro Thr Asp Cys Cys His Glu
225                 230                 235                 240

Gln Cys Ala Ala Gly Cys Thr Gly Pro Lys His Ser Asp Cys Leu Ala
                245                 250                 255

Cys Leu His Phe Asn His Ser Gly Ile Cys Glu Leu His Cys Pro Ala
            260                 265                 270
```

```
Leu Val Thr Tyr Asn Thr Asp Thr Phe Glu Ser Met Pro Asn Pro Glu
        275                 280                 285

Gly Arg Tyr Thr Phe Gly Ala Ser Cys Val Thr Ala Cys Pro Tyr Asn
    290                 295                 300

Tyr Leu Ser Thr Asp Val Gly Ser Cys Thr Leu Val Cys Pro Leu His
305                 310                 315                 320

Asn Gln Glu Val Thr Ala Glu Asp Gly Thr Gln Arg Cys Glu Lys Cys
                325                 330                 335

Ser Lys Pro Cys Ala Arg Val Cys Tyr Gly Leu Gly Met Glu His Leu
            340                 345                 350

Arg Glu Ala Arg Ala Ile Thr Ser Ala Asn Val Gln Asp Phe Val Gly
        355                 360                 365

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

Gly Asp Pro Ala Ser Gly Thr Ala Pro Leu Gln Pro Glu Gln Leu Gln
385                 390                 395                 400

Val Phe Glu Thr Leu Glu Glu Ile Thr Gly Tyr Leu Tyr Ile Ser Ala
                405                 410                 415

Trp Pro Asp Ser Phe Pro Asn Leu Ser Val Phe Gln Asn Leu Arg Val
            420                 425                 430

Ile Arg Gly Arg Ile Leu His Asn Gly Ala Tyr Ser Leu Thr Leu Gln
        435                 440                 445

Gly Leu Gly Ile Ser Trp Leu Gly Leu Arg Ser Leu Gln Glu Leu Gly
    450                 455                 460

Ser Gly Leu Ala Leu Val His Arg Asn Ala Arg Leu Cys Phe Val His
465                 470                 475                 480

Thr Val Pro Trp Asp Gln Leu Phe Arg Asn Pro His Gln Ala Leu Leu
                485                 490                 495

His Ser Gly Asn Arg Pro Glu Glu Asp Cys Val Gly Glu Gly Phe Val
            500                 505                 510

Cys Tyr Ser Leu Cys Ala His Gly His Cys Trp Gly Pro Gly Pro Thr
        515                 520                 525

Gln Cys Val Asn Cys Ser His Phe Leu Arg Gly Gln Glu Cys Val Glu
    530                 535                 540
```

```
Glu Cys Arg Val Leu Gln Gly Leu Pro Arg Glu Tyr Val Asn Ala Arg
545                 550                 555                 560

His Cys Leu Pro Cys His Pro Glu Cys Gln Pro Gln Asn Gly Ser Val
                565                 570                 575

Thr Cys Phe Gly Pro Glu Ala Asp Gln Cys Val Ala Cys Ala His Tyr
            580                 585                 590

Lys Asp Pro Pro Phe Cys Val Ala Arg Cys Pro Ser Gly Val Lys Pro
        595                 600                 605

Asp Leu Ser Tyr Met Pro Ile Trp Lys Phe Pro Asp Glu Glu Gly Ala
    610                 615                 620

Cys Gln Pro Cys Pro Ile Asn Cys Thr His Ser Cys Val Asp Leu Asp
625                 630                 635                 640

Asp Lys Gly Cys Pro Ala Glu Gln Arg Ala Ser Pro Leu Thr Ser Ile
                645                 650                 655

Ile Ser Ala Val Val Gly Ile Leu Leu Val Val Val Leu Gly Val Val
            660                 665                 670

Phe Gly Ile Leu Ile Lys Arg Arg Gln Gln Lys Ile Arg Lys Tyr Thr
        675                 680                 685

Met Arg Arg Asn Glu Asp Leu Gly Pro Ser Ser Pro Met Asp Ser Thr
    690                 695                 700

Phe Tyr Arg Ser Leu Leu Glu Asp Glu Asp Met Gly Glu Leu Val Asp
705                 710                 715                 720

Ala Glu Glu Tyr Leu Val Pro Gln Gln Gly Phe Phe Cys Pro Asp Pro
                725                 730                 735

Thr Pro Gly Thr Gly Ser Thr Ala His Arg Arg His Arg Ser Ser Ser
            740                 745                 750

Ala Arg Asn Gly Gly Gly Asp Leu Thr Leu Gly Met Glu Pro Ser Gly
        755                 760                 765

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

Asp Val Phe Asp Gly Asp Leu Ala Val Gly Val Thr Lys Gly Leu Gln
785                 790                 795                 800

Ser Leu Ser Pro Gln Asp Leu Ser Pro Leu Gln Arg Tyr Ser Glu Asp
                805                 810                 815
```

Pro Thr Leu Pro Leu Pro Ser Glu Thr Asp Gly Lys Val Ala Pro Leu
820 825 830

Ser Cys Ser Pro Gln Pro Glu Phe Val Asn Gln Ser Asp Val Gln Pro
835 840 845

Lys Ser Pro Leu Thr Pro Glu Gly Pro Pro Ser Pro Ala Arg Pro Thr
850 855 860

Gly Ala Thr Leu Glu Arg Ala Lys Thr Leu Ser Pro Gly Lys Asn Gly
865 870 875 880

Val Val Lys Asp Val Phe Thr Phe Gly Gly Ala Val Glu Asn Pro Glu
885 890 895

Phe Leu Ala Pro Arg Glu Gly Thr Ala Ser Pro Pro His Pro Ser Pro
900 905 910

Ala Phe Ser Pro Ala Phe Asp Asn Leu Phe Phe Trp Asp Gln Asn Ser
915 920 925

Ser Glu Gln Gly Pro Pro Pro Ser Asn Phe Glu Gly Thr Pro Thr Ala
930 935 940

Glu Asn Pro Glu Phe Leu Gly Leu Asp Val Pro Val
945 950 955

<210> 39
<211> 2871
<212> DNA
<213> Artificial

<220>
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<400> 39
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cccgagacac acctggacat gctgcggcac ctgtaccagg gctgccaggt ggtccagggg 180

aatctggaac tgacctacct gcccaccaac gccagcctga gcttcctgca ggacatccag 240

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ctgagaatcg tgcggggcac ccagctgttc gaggacaact acgccctggc cgtgctggac 360

aacggcgacc ctctggatag cgtggccccc gctgctgggg ctacacctgg cggactgcag 420

gaactgcagc tgcggagcct gaccgagatc ctgaagggcg gcgtgctgat caggcggagc 480

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<210> 40
<211> 471
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 40

Met Asp Trp Thr Trp Arg Ile Leu Phe Leu Val Ala Ala Ala Thr Gly
1 5 10 15

Ala His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys
20 25 30

Pro Gly Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe
35 40 45

Thr Gly Tyr Tyr Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu
50 55 60

Glu Trp Met Gly Trp Ile Asn Pro Asp Ser Gly Gly Thr Asn Tyr Ala
65 70 75 80

Gln Lys Phe Gln Gly Arg Val Thr Met Thr Arg Asp Thr Ser Ile Ser
85 90 95

Thr Ala Tyr Met Glu Leu Asn Arg Leu Arg Ser Asp Asp Thr Ala Val
100 105 110

Tyr Tyr Cys Ala Arg Asp Gln Pro Leu Gly Tyr Cys Thr Asn Gly Val
115 120 125

Cys Ser Tyr Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser
130 135 140

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

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

Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr
180 185 190

Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr
195 200 205

```
Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Asn Phe Gly Thr Gln
    210                 215                 220

Thr Tyr Thr Cys Asn Val Asp His Lys Pro Ser Asn Thr Lys Val Asp
225                 230                 235                 240

Lys Thr Val Glu Arg Lys Cys Cys Val Glu Cys Pro Pro Cys Pro Ala
                245                 250                 255

Pro Pro Val Ala Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys
            260                 265                 270

Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val
        275                 280                 285

Asp Val Ser His Glu Asp Pro Glu Val Gln Phe Asn Trp Tyr Val Asp
    290                 295                 300

Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Phe
305                 310                 315                 320

Asn Ser Thr Phe Arg Val Val Ser Val Leu Thr Val Val His Gln Asp
                325                 330                 335

Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly Leu
            340                 345                 350

Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Thr Lys Gly Gln Pro Arg
        355                 360                 365

Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys
    370                 375                 380

Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp
385                 390                 395                 400

Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys
                405                 410                 415

Thr Thr Pro Pro Met Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser
            420                 425                 430

Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser
        435                 440                 445

Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser
    450                 455                 460

Leu Ser Leu Ser Pro Gly Lys
465                 470
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<210> 41
<211> 234
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 41

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Met Arg Leu Pro Ala Gln Leu Leu Gly Leu Leu Leu Leu Trp Phe Pro
1               5                  10                  15

Gly Ser Arg Cys Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Val Ser
            20                  25                  30

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

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

Asn Leu Leu Ile Tyr Thr Ala Ser Thr Leu Gln Ser Gly Val Pro Ser
65                  70                  75                  80

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

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

Ile Phe Pro Leu Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys Arg
        115                 120                 125

Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln
    130                 135                 140

Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr
145                 150                 155                 160

Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser
                165                 170                 175

Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr
            180                 185                 190

Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys
        195                 200                 205

His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro
    210                 215                 220
```

Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
225 230

<210> 42
<211> 451
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 42

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

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr
20 25 30

Gly Met His Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

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

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

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95

Ala Arg Asp Pro Arg Gly Ala Thr Leu Tyr Tyr Tyr Tyr Tyr Gly Met
100 105 110

Asp Val Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser Ala Ser Thr
115 120 125

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

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

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

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

Val Val Thr Val Pro Ser Ser Asn Phe Gly Thr Gln Thr Tyr Thr Cys
195 200 205

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

```
Arg Lys Cys Cys Val Glu Cys Pro Pro Cys Pro Ala Pro Pro Val Ala
225                 230                 235                 240

Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met
                245                 250                 255

Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His
            260                 265                 270

Glu Asp Pro Glu Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu Val
        275                 280                 285

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

Arg Val Val Ser Val Leu Thr Val Val His Gln Asp Trp Leu Asn Gly
305                 310                 315                 320

Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly Leu Pro Ala Pro Ile
                325                 330                 335

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

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

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

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

Met Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val
                405                 410                 415

Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met
            420                 425                 430

His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser
        435                 440                 445

Pro Gly Lys
    450
```

<210> 43
<211> 214
<212> PRT
<213> Artificial

<220>

<223> Synthetic Construct

<400> 43

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 Gln Ser Ile Asn Ser Tyr
20 25 30

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

Tyr Ala Ala Ser Ser Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Tyr Tyr Ser Thr Pro Phe
85 90 95

Thr Phe Gly Pro Gly Thr Lys Val Glu Ile Lys Arg Thr Val Ala Ala
100 105 110

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

Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
130 135 140

Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
145 150 155 160

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

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

Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser
195 200 205

Phe Asn Arg Gly Glu Cys
210

<210> 44
<211> 24
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<400> 44
tcgtcgtttt gtcgttttgt cgtt 24

<210> 45
<211> 21
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<400> 45
tcgtcgtttt tcggtgcttt t 21

<210> 46
<211> 21
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<400> 46
tcgtcgtttt tcggtcgttt t 21

<210> 47
<211> 239
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 47

Met Val Ser Lys Gly Glu Glu Leu Phe Thr Gly Val Val Pro Ile Leu
1 5 10 15

Val Glu Leu Asp Gly Asp Val Asn Gly His Lys Phe Ser Val Ser Gly
20 25 30

Glu Gly Glu Gly Asp Ala Thr Tyr Gly Lys Leu Thr Leu Lys Phe Ile
35 40 45

Cys Thr Thr Gly Lys Leu Pro Val Pro Trp Pro Thr Leu Val Thr Thr
50 55 60

Leu Thr Tyr Gly Val Gln Cys Phe Ser Arg Tyr Pro Asp His Met Lys
65 70 75 80

Gln His Asp Phe Phe Lys Ser Ala Met Pro Glu Gly Tyr Val Gln Glu
85 90 95

Arg Thr Ile Phe Phe Lys Asp Asp Gly Asn Tyr Lys Thr Arg Ala Glu
100 105 110

Val Lys Phe Glu Gly Asp Thr Leu Val Asn Arg Ile Glu Leu Lys Gly
115 120 125

```
Ile Asp Phe Lys Glu Asp Gly Asn Ile Leu Gly His Lys Leu Glu Tyr
    130                 135                 140

Asn Tyr Asn Ser His Asn Val Tyr Ile Met Ala Asp Lys Gln Lys Asn
145                 150                 155                 160

Gly Ile Lys Val Asn Phe Lys Ile Arg His Asn Ile Glu Asp Gly Ser
                165                 170                 175

Val Gln Leu Ala Asp His Tyr Gln Gln Asn Thr Pro Ile Gly Asp Gly
            180                 185                 190

Pro Val Leu Leu Pro Asp Asn His Tyr Leu Ser Thr Gln Ser Ala Leu
        195                 200                 205

Ser Lys Asp Pro Asn Glu Lys Arg Asp His Met Val Leu Leu Glu Phe
    210                 215                 220

Val Thr Ala Ala Gly Ile Thr Leu Gly Met Asp Glu Leu Tyr Lys
225                 230                 235
```

<210> 48
<211> 185
<212> PRT
<213> Orthohepadnavirus hepatitis B virus

<400> 48

```
Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
1               5                   10                  15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
            20                  25                  30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
        35                  40                  45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
    50                  55                  60

Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala
65                  70                  75                  80

Ser Arg Asp Leu Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys
                85                  90                  95

Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
            100                 105                 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
        115                 120                 125
```

```
Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
    130                 135                 140

Glu Thr Thr Val Val Arg Arg Arg Gly Arg Gly Arg Ser Pro Arg Arg
145                 150                 155                 160

Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg
                165                 170                 175

Arg Ser Gln Ser Arg Glu Ser Gln Cys
            180                 185
```

<210> 49
<211> 226
<212> PRT
<213> Orthohepadnavirus hepatitis B virus

<400> 49

```
Met Glu Asn Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln
1               5                   10                  15

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

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

Leu Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser
    50                  55                  60

Cys Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe
65                  70                  75                  80

Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val
                85                  90                  95

Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly
            100                 105                 110

Ser Thr Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Thr Pro Ala
        115                 120                 125

Gln Gly Asn Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Thr Asp
    130                 135                 140

Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Lys
145                 150                 155                 160

Tyr Leu Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu
                165                 170                 175
```

Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu
180 185 190

Ser Ala Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile
195 200 205

Val Ser Pro Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val
210 215 220

Tyr Ile
225

<210> 50
<211> 737
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 50

Met Ala Ser Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp
1 5 10 15

Val Pro Gly Ser Thr Gly Asp Ala Ala His His His His His His Lys
20 25 30

Ser Ser Ser Glu Ala Thr Asn Ile Thr Pro Lys His Asn Met Lys Ala
35 40 45

Phe Leu Asp Glu Leu Lys Ala Glu Asn Ile Lys Lys Phe Leu His Asn
50 55 60

Phe Thr Gln Ile Pro His Leu Ala Gly Thr Glu Gln Asn Phe Gln Leu
65 70 75 80

Ala Lys Gln Ile Gln Ser Gln Trp Lys Glu Phe Gly Leu Asp Ser Val
85 90 95

Glu Leu Thr His Tyr Asp Val Leu Leu Ser Tyr Pro Asn Lys Thr His
100 105 110

Pro Asn Tyr Ile Ser Ile Ile Asn Glu Asp Gly Asn Glu Ile Phe Asn
115 120 125

Thr Ser Leu Phe Glu Pro Pro Pro Ala Gly Tyr Glu Asn Val Ser Asp
130 135 140

Ile Val Pro Pro Phe Ser Ala Phe Ser Pro Gln Gly Met Pro Glu Gly
145 150 155 160

Asp Leu Val Tyr Val Asn Tyr Ala Arg Thr Glu Asp Phe Phe Lys Leu
165 170 175

```
Glu Arg Asp Met Lys Ile Asn Cys Ser Gly Lys Ile Val Ile Ala Arg
            180                 185                 190

Tyr Gly Lys Val Phe Arg Gly Asn Lys Val Lys Asn Ala Gln Leu Ala
        195                 200                 205

Gly Ala Thr Gly Val Ile Leu Tyr Ser Asp Pro Ala Asp Tyr Phe Ala
    210                 215                 220

Pro Gly Val Lys Ser Tyr Pro Asp Gly Trp Asn Leu Pro Gly Gly Gly
225                 230                 235                 240

Val Gln Arg Gly Asn Ile Leu Asn Leu Asn Gly Ala Gly Asp Pro Leu
                245                 250                 255

Thr Pro Gly Tyr Pro Ala Asn Glu Tyr Ala Tyr Arg Arg Gly Ile Ala
            260                 265                 270

Glu Ala Val Gly Leu Pro Ser Ile Pro Val His Pro Ile Gly Tyr Tyr
        275                 280                 285

Asp Ala Gln Lys Leu Leu Glu Lys Met Gly Gly Ser Ala Ser Pro Asp
    290                 295                 300

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

Phe Thr Gly Asn Phe Ser Thr Gln Lys Val Lys Met His Ile His Ser
                325                 330                 335

Thr Ser Glu Val Thr Arg Ile Tyr Asn Val Ile Gly Thr Leu Arg Gly
            340                 345                 350

Ala Val Glu Pro Asp Arg Tyr Val Ile Leu Gly Gly His Arg Asp Ser
        355                 360                 365

Trp Val Phe Gly Gly Ile Asp Pro Gln Ser Gly Ala Ala Val Val His
    370                 375                 380

Glu Ile Val Arg Ser Phe Gly Thr Leu Lys Lys Glu Gly Trp Arg Pro
385                 390                 395                 400

Arg Arg Thr Ile Leu Phe Ala Ser Trp Asp Ala Glu Glu Phe Gly Leu
                405                 410                 415

Leu Gly Ser Thr Glu Trp Ala Glu Glu Asn Ser Arg Leu Leu Gln Glu
            420                 425                 430

Arg Gly Val Ala Tyr Ile Asn Ala Asp Ser Ser Ile Glu Gly Asn Tyr
        435                 440                 445
```

```
Thr Leu Arg Val Asp Cys Thr Pro Leu Met Tyr Ser Leu Val Tyr Asn
    450                 455                 460

Leu Thr Lys Glu Leu Glu Ser Pro Asp Glu Gly Phe Glu Gly Lys Ser
465                 470                 475                 480

Leu Tyr Glu Ser Trp Thr Lys Ser Pro Ser Pro Glu Phe Ser Gly Met
                485                 490                 495

Pro Arg Ile Ser Lys Leu Gly Ser Gly Asn Asp Phe Glu Val Phe Phe
            500                 505                 510

Gln Arg Leu Gly Ile Ala Ser Gly Arg Ala Arg Tyr Thr Lys Asn Trp
        515                 520                 525

Glu Thr Asn Lys Phe Ser Ser Tyr Pro Leu Tyr His Ser Val Tyr Glu
    530                 535                 540

Thr Tyr Glu Leu Val Glu Lys Phe Tyr Asp Pro Met Phe Lys Tyr His
545                 550                 555                 560

Leu Thr Val Ala Gln Val Arg Gly Gly Met Val Phe Glu Leu Ala Asn
                565                 570                 575

Ser Val Val Leu Pro Phe Asp Cys Arg Asp Tyr Ala Val Val Leu Arg
            580                 585                 590

Lys Tyr Ala Asp Lys Ile Tyr Asn Ile Ser Met Lys His Pro Gln Glu
        595                 600                 605

Met Lys Thr Tyr Ser Val Ser Phe Asp Ser Leu Phe Ser Ala Val Lys
    610                 615                 620

Asn Phe Thr Glu Ile Ala Ser Lys Phe Ser Glu Arg Leu Arg Asp Phe
625                 630                 635                 640

Asp Lys Ser Asn Pro Ile Leu Leu Arg Met Met Asn Asp Gln Leu Met
                645                 650                 655

Phe Leu Glu Arg Ala Phe Ile Asp Pro Leu Gly Leu Pro Asp Arg Pro
            660                 665                 670

Phe Tyr Arg His Val Ile Tyr Ala Pro Ser Ser His Asn Lys Tyr Ala
        675                 680                 685

Gly Glu Ser Phe Pro Gly Ile Tyr Asp Ala Leu Phe Asp Ile Glu Ser
    690                 695                 700

Lys Val Asp Pro Ser Gln Ala Trp Gly Glu Val Lys Arg Gln Ile Ser
705                 710                 715                 720
```

Ile Ala Thr Phe Thr Val Gln Ala Ala Ala Glu Thr Leu Ser Glu Val
725 730 735

Ala

<210> 51
<211> 9
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 51

Thr Tyr Val Pro Ala Asn Ala Ser Leu
1 5

<210> 52
<211> 15
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 52

Asp Met Val Leu Trp Lys Asp Val Phe Arg Lys Asn Asn Gln Leu
1 5 10 15

<210> 53
<211> 9
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 53

Ser Tyr Val Asn Thr Asn Met Gly Leu
1 5

<210> 54
<211> 957
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 54

Met Ala Ser Glu Leu Ala Ala Trp Cys Arg Trp Gly Phe Leu Leu Ala
1 5 10 15

Leu Leu Pro Pro Gly Ile Ala Gly Thr Gln Val Cys Thr Gly Thr Asp
20 25 30

```
Met Lys Leu Arg Leu Pro Ala Ser Pro Glu Thr His Leu Asp Met Leu
        35                  40                  45

Arg His Leu Tyr Gln Gly Cys Gln Val Val Gln Gly Asn Leu Glu Leu
    50                  55                  60

Thr Tyr Val Pro Ala Asn Ala Ser Leu Ser Phe Leu Gln Asp Ile Gln
65                  70                  75                  80

Glu Val Gln Gly Tyr Met Leu Ile Ala His Asn Gln Val Lys Arg Val
                85                  90                  95

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

Lys Tyr Ala Leu Ala Val Leu Asp Asn Arg Asp Pro Gln Asp Asn Val
        115                 120                 125

Ala Ala Ser Thr Pro Gly Arg Thr Pro Glu Gly Leu Arg Glu Leu Gln
    130                 135                 140

Leu Arg Ser Leu Thr Glu Ile Leu Lys Gly Gly Val Leu Ile Arg Gly
145                 150                 155                 160

Asn Pro Gln Leu Cys Tyr Gln Asp Met Val Leu Trp Lys Asp Val Phe
                165                 170                 175

Arg Lys Asn Asn Gln Leu Ala Pro Val Asp Ile Asp Thr Asn Arg Ser
            180                 185                 190

Arg Ala Cys Pro Pro Cys Ala Pro Ala Cys Lys Asp Asn His Cys Trp
        195                 200                 205

Gly Glu Ser Pro Glu Asp Cys Gln Ile Leu Thr Gly Thr Ile Cys Thr
    210                 215                 220

Ser Gly Cys Ala Arg Cys Lys Gly Arg Leu Pro Thr Asp Cys Cys His
225                 230                 235                 240

Glu Gln Cys Ala Ala Gly Cys Thr Gly Pro Lys His Ser Asp Cys Leu
                245                 250                 255

Ala Cys Leu His Phe Asn His Ser Gly Ile Cys Glu Leu His Cys Pro
            260                 265                 270

Ala Leu Val Thr Tyr Asn Thr Asp Thr Phe Glu Ser Met His Asn Pro
        275                 280                 285

Glu Gly Arg Tyr Thr Phe Gly Ala Ser Cys Val Thr Thr Cys Pro Tyr
    290                 295                 300
```

```
Asn Tyr Leu Ser Thr Glu Val Gly Ser Cys Thr Leu Val Cys Pro Pro
305                 310                 315                 320

Asn Asn Gln Glu Val Thr Ala Glu Asp Gly Thr Gln Arg Cys Glu Lys
                325                 330                 335

Cys Ser Lys Pro Cys Ala Arg Val Cys Tyr Gly Leu Gly Met Glu His
            340                 345                 350

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

Gly Cys Lys Lys Ile Phe Gly Ser Leu Ala Phe Leu Pro Glu Ser Phe
    370                 375                 380

Asp Gly Asp Pro Ser Ser Gly Ile Ala Pro Leu Arg Pro Glu Gln Leu
385                 390                 395                 400

Gln Val Phe Glu Thr Leu Glu Glu Ile Thr Gly Tyr Leu Tyr Ile Ser
                405                 410                 415

Ala Trp Pro Asp Ser Leu Arg Asp Leu Ser Val Phe Gln Asn Leu Arg
            420                 425                 430

Ile Ile Arg Gly Arg Ile Leu His Asp Gly Ala Tyr Ser Leu Thr Leu
        435                 440                 445

Gln Gly Leu Gly Ile His Ser Leu Gly Leu Arg Ser Leu Arg Glu Leu
    450                 455                 460

Gly Ser Gly Leu Ala Leu Ile His Arg Asn Ala His Leu Cys Phe Val
465                 470                 475                 480

His Thr Val Pro Trp Asp Gln Leu Phe Arg Asn Pro His Gln Ala Leu
                485                 490                 495

Leu His Ser Gly Asn Arg Pro Glu Glu Asp Cys Gly Leu Glu Gly Leu
            500                 505                 510

Val Cys Asn Ser Leu Cys Ala His Gly His Cys Trp Gly Pro Gly Pro
        515                 520                 525

Thr Gln Cys Val Asn Cys Ser His Phe Leu Arg Gly Gln Glu Cys Val
    530                 535                 540

Glu Glu Cys Arg Val Trp Lys Gly Leu Pro Arg Glu Tyr Val Ser Asp
545                 550                 555                 560

Lys Arg Cys Leu Pro Cys His Pro Glu Cys Gln Pro Gln Asn Ser Ser
                565                 570                 575
```

```
Glu Thr Cys Phe Gly Ser Glu Ala Asp Gln Cys Ala Ala Cys Ala His
            580                 585                 590

Tyr Lys Asp Ser Ser Ser Cys Val Ala Arg Cys Pro Ser Gly Val Lys
        595                 600                 605

Pro Asp Leu Ser Tyr Met Pro Ile Trp Lys Tyr Pro Asp Glu Glu Gly
    610                 615                 620

Ile Cys Gln Pro Cys Pro Ile Asn Cys Thr His Ser Cys Val Asp Leu
625                 630                 635                 640

Asp Glu Arg Gly Cys Pro Ala Glu Gln Arg Ala Ser Pro Val Thr Phe
                645                 650                 655

Ile Ile Ala Thr Val Val Gly Val Leu Leu Phe Leu Ile Leu Val Val
            660                 665                 670

Val Val Gly Ile Leu Ile Lys Arg Arg Arg Gln Lys Ile Arg Lys Tyr
        675                 680                 685

Thr Met Arg Arg Asn Glu Asp Leu Gly Pro Ser Ser Pro Met Asp Ser
    690                 695                 700

Thr Phe Tyr Arg Ser Leu Leu Glu Asp Asp Asp Met Gly Asp Leu Val
705                 710                 715                 720

Asp Ala Glu Glu Tyr Leu Val Pro Gln Gln Gly Phe Phe Ser Pro Asp
                725                 730                 735

Pro Thr Pro Gly Thr Gly Ser Thr Ala His Arg Arg His Arg Ser Ser
            740                 745                 750

Ser Thr Arg Ser Gly Gly Gly Glu Leu Thr Leu Gly Leu Glu Pro Ser
        755                 760                 765

Glu Glu Gly Pro Pro Arg Ser Pro Leu Ala Pro Ser Glu Gly Ala Gly
    770                 775                 780

Ser Asp Val Phe Asp Gly Asp Leu Ala Met Gly Val Thr Lys Gly Leu
785                 790                 795                 800

Gln Ser Leu Ser Pro His Asp Leu Ser Pro Leu Gln Arg Tyr Ser Glu
                805                 810                 815

Asp Pro Thr Leu Pro Leu Pro Pro Glu Thr Asp Gly Tyr Val Ala Pro
            820                 825                 830

Leu Ala Cys Ser Pro Gln Pro Glu Phe Val Asn Gln Ser Glu Val Gln
        835                 840                 845
```

Pro Gln Pro Pro Leu Thr Pro Glu Gly Pro Leu Pro Pro Val Arg Pro
    850   855   860

Ala Gly Ala Thr Leu Glu Arg Pro Lys Thr Leu Ser Pro Gly Lys Asn
865   870   875   880

Gly Val Val Lys Asp Val Phe Ala Phe Gly Gly Ala Val Glu Asn Pro
                885   890   895

Glu Phe Leu Val Pro Arg Glu Gly Thr Ala Ser Pro Pro His Pro Ser
            900   905   910

Pro Ala Phe Ser Pro Ala Phe Asp Asn Leu Phe Phe Trp Asp Gln Asn
        915   920   925

Ser Ser Glu Gln Gly Pro Pro Pro Ser Asn Phe Glu Gly Thr Pro Thr
    930   935   940

Ala Glu Asn Pro Glu Phe Leu Gly Leu Asp Val Pro Val
945   950   955

<210> 55
<211> 739
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 55

Met Ala Ser Ala Arg Arg Pro Arg Trp Leu Cys Ala Gly Ala Leu Val
1   5   10   15

Leu Ala Gly Gly Phe Phe Leu Leu Gly Phe Leu Phe Gly Trp Phe Ile
            20   25   30

Lys Ser Ser Ser Glu Ala Thr Asn Ile Thr Pro Lys His Asn Met Lys
        35   40   45

Ala Phe Leu Asp Glu Leu Lys Ala Glu Asn Ile Lys Lys Phe Leu His
    50   55   60

Asn Phe Thr Gln Ile Pro His Leu Ala Gly Thr Glu Gln Asn Phe Gln
65   70   75   80

Leu Ala Lys Gln Ile Gln Ser Gln Trp Lys Glu Phe Gly Leu Asp Ser
                85   90   95

Val Glu Leu Thr His Tyr Asp Val Leu Leu Ser Tyr Pro Asn Lys Thr
            100   105   110

```
His Pro Asn Tyr Ile Ser Ile Ile Asn Glu Asp Gly Asn Glu Ile Phe
        115                 120                 125

Asn Thr Ser Leu Phe Glu Pro Pro Pro Ala Gly Tyr Glu Asn Val Ser
    130                 135                 140

Asp Ile Val Pro Pro Phe Ser Ala Phe Ser Pro Gln Gly Met Pro Glu
145                 150                 155                 160

Gly Asp Leu Val Tyr Val Asn Tyr Ala Arg Thr Glu Asp Phe Phe Lys
                165                 170                 175

Leu Glu Arg Asp Met Lys Ile Asn Cys Ser Gly Lys Ile Val Ile Ala
            180                 185                 190

Arg Tyr Gly Lys Val Phe Arg Gly Asn Lys Val Lys Asn Ala Gln Leu
        195                 200                 205

Ala Gly Ala Thr Gly Val Ile Leu Tyr Ser Asp Pro Ala Asp Tyr Phe
    210                 215                 220

Ala Pro Gly Val Lys Ser Tyr Pro Asp Gly Trp Asn Leu Pro Gly Gly
225                 230                 235                 240

Gly Val Gln Arg Gly Asn Ile Leu Asn Leu Asn Gly Ala Gly Asp Pro
                245                 250                 255

Leu Thr Pro Gly Tyr Pro Ala Asn Glu Tyr Ala Tyr Arg Arg Gly Ile
            260                 265                 270

Ala Glu Ala Val Gly Leu Pro Ser Ile Pro Val His Pro Ile Gly Tyr
        275                 280                 285

Tyr Asp Ala Gln Lys Leu Leu Glu Lys Met Gly Gly Ser Ala Ser Pro
    290                 295                 300

Asp Ser Ser Trp Arg Gly Ser Leu Lys Val Pro Tyr Asn Val Gly Pro
305                 310                 315                 320

Gly Phe Thr Gly Asn Phe Ser Thr Gln Lys Val Lys Met His Ile His
                325                 330                 335

Ser Thr Ser Glu Val Thr Arg Ile Tyr Asn Val Ile Gly Thr Leu Arg
            340                 345                 350

Gly Ala Val Glu Pro Asp Arg Tyr Val Ile Leu Gly Gly His Arg Asp
        355                 360                 365

Ser Trp Val Phe Gly Gly Ile Asp Pro Gln Ser Gly Ala Ala Val Val
    370                 375                 380
```

```
His Glu Ile Val Arg Ser Phe Gly Thr Leu Lys Lys Glu Gly Trp Arg
385                 390                 395                 400

Pro Arg Arg Thr Ile Leu Phe Ala Ser Trp Asp Ala Glu Glu Phe Gly
                405                 410                 415

Leu Leu Gly Ser Thr Glu Trp Ala Glu Glu Asn Ser Arg Leu Leu Gln
            420                 425                 430

Glu Arg Gly Val Ala Tyr Ile Asn Ala Asp Ser Ser Ile Glu Gly Asn
        435                 440                 445

Tyr Thr Leu Arg Val Asp Cys Thr Pro Leu Met Tyr Ser Leu Val Tyr
    450                 455                 460

Asn Leu Thr Lys Glu Leu Glu Ser Pro Asp Glu Gly Phe Glu Gly Lys
465                 470                 475                 480

Ser Leu Tyr Glu Ser Trp Thr Lys Lys Ser Pro Ser Pro Glu Phe Ser
                485                 490                 495

Gly Met Pro Arg Ile Ser Lys Leu Gly Ser Gly Asn Asp Phe Glu Val
            500                 505                 510

Phe Phe Gln Arg Leu Gly Ile Ala Ser Gly Arg Ala Arg Tyr Thr Lys
        515                 520                 525

Asn Trp Glu Thr Asn Lys Phe Ser Ser Tyr Pro Leu Tyr His Ser Val
    530                 535                 540

Tyr Glu Thr Tyr Glu Leu Val Glu Lys Phe Tyr Asp Pro Met Phe Lys
545                 550                 555                 560

Tyr His Leu Thr Val Ala Gln Val Arg Gly Gly Met Val Phe Glu Leu
                565                 570                 575

Ala Asn Ser Val Val Leu Pro Phe Asp Cys Arg Asp Tyr Ala Val Val
            580                 585                 590

Leu Arg Lys Tyr Ala Asp Lys Ile Tyr Asn Ile Ser Met Lys His Pro
        595                 600                 605

Gln Glu Met Lys Thr Tyr Ser Val Ser Phe Asp Ser Leu Phe Ser Ala
    610                 615                 620

Val Lys Asn Phe Thr Glu Ile Ala Ser Lys Phe Ser Glu Arg Leu Arg
625                 630                 635                 640

Asp Phe Asp Lys Ser Asn Pro Ile Leu Leu Arg Met Met Asn Asp Gln
                645                 650                 655
```

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Leu Met Phe Leu Glu Arg Ala Phe Ile Asp Pro Leu Gly Leu Pro Asp
660 665 670

Arg Pro Phe Tyr Arg His Val Ile Tyr Ala Pro Ser Ser His Asn Lys
675 680 685

Tyr Ala Gly Glu Ser Phe Pro Gly Ile Tyr Asp Ala Leu Phe Asp Ile
690 695 700

Glu Ser Lys Val Asp Pro Ser Gln Ala Trp Gly Glu Val Lys Arg Gln
705 710 715 720

Ile Ser Ile Ala Thr Phe Thr Val Gln Ala Ala Ala Glu Thr Leu Ser
725 730 735

Glu Val Ala

<210> 56
<211> 2217
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<400> 56
atggctagcg ctagaaggcc cagatggctg tgcgctggcg ccctggtgct ggctggcgga 60

ttcttcctgc tgggcttcct gttcggctgg ttcatcaagt cctccagcga ggccaccaac 120

atcaccccca agcacaacat gaaggccttt ctggacgagc tgaaggccga gaatatcaag 180

aagttcctgc acaacttcac ccagatcccc cacctggccg gcaccgagca gaacttccag 240

ctggccaagc agatccagtc ccagtggaaa gagttcggcc tggactccgt ggaactgacc 300

cactacgacg tgctgctgtc ctaccccaac aagacccacc ccaactacat ctccatcatc 360

aacgaggacg gcaacgaaat cttcaacacc tccctgttcg agcccccacc agccggctac 420

gagaacgtgt ccgacatcgt gcccccattc tccgcattca gtccacaagg catgcccgag 480

ggcgacctgg tgtacgtgaa ctacgccagg accgaggact tcttcaagct ggaaagggac 540

atgaagatca actgctccgg caagatcgtg atcgccagat acggcaaggt gttcaggggc 600

aacaaagtga agaacgctca gctggctggg gccaccggcg tgatcctgta ctctgacccc 660

gccgactact tcgccccagg cgtgaagtcc taccccgacg gctggaacct gccaggtggc 720

ggagtgcaga ggggcaacat cctgaacctg aacggcgctg gcgacccccc gaccccagga 780

taccccgcca acgagtacgc ctacagaaga ggaatcgccg aggccgtggg cctgccctct 840

atcccagtgc accccatcgg ctactacgac gcccagaaac tgctggaaaa gatgggcggc 900

tccgcctccc ccgactcctc ttggagaggc tccctgaagg tgccctacaa cgtgggccca 960

ggcttcaccg gcaacttctc cacccagaaa gtgaagatgc acatccactc cacctccgaa 1020

gtgaccagga tctacaacgt gatcggcacc ctgagaggcg ccgtggaacc cgacagatac 1080

gtgatcctgg gcggccacag ggacagctgg gtgttcggcg gcatcgaccc acagtctggc 1140

gccgctgtgg tgcacgagat cgtgcggtcc ttcggaaccc tgaagaaaga gggatggcgc 1200

cccagaagga caatcctgtt cgcctcctgg gacgccgagg aattcggcct gctgggatcc 1260

accgagtggg ccgaggaaaa ctccaggctg ctgcaggaaa ggggcgtcgc ctacatcaac 1320

gccgactcct ccatcgaggg caactacacc ctgagggtgg actgcacccc cctgatgtac 1380

tccctggtgt acaacctgac caaagagctg gaatcccccg acgagggctt cgagggcaag 1440

tccctgtacg agtcctggac caagaagtcc ccatcccccg agttctccgg catgcccagg 1500

atctccaagc tgggctccgg caacgacttc gaggtgttct tccagaggct gggaatcgcc 1560

tccggcaggg ccagatacac caagaactgg gagacaaaca agttctcctc ctacccccctg 1620

taccactccg tgtacgaaac ctacgagctg gtggaaaagt tctacgaccc catgttcaag 1680

taccacctga ccgtggccca ggtccgcgga ggcatggtgt tcgagctggc caactccgtg 1740

gtgctgccct tcgactgcag agactatgct gtggtgctga ggaagtacgc cgacaaaatc 1800

tacaacatct ccatgaagca cccccaggaa atgaagacct actccgtgtc cttcgactcc 1860

ctgttctccg ccgtgaagaa tttcaccgag atcgcctcca agttctccga gaggctgagg 1920

gacttcgaca agtccaaccc catcctgctg aggatgatga acgaccagct gatgttcctg 1980

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