SEQUENCE LISTING

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THE UNITED STATES OF AMERICA, Department of Health & Human Services
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<120> Yeast-MUC1 Immunotherapeutic Compositions and Uses Thereof

<130> 3923-40-PCT

<150> 61/524,407
<151> 2011-08-17

<160> 25

<170> PatentIn version 3.5

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Leu Thr Val Leu Thr Val Val Thr Gly Ser Gly His Ala Ser Ser Thr
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Pro Gly Gly Glu Lys Glu Thr Ser Ala Thr Gln Arg Ser Ser Val Pro
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agc tct act gag aag aat gct ttg tct act ggg gtc tct ttc ttt ttc 252
Ser Ser Thr Glu Lys Asn Ala Leu Ser Thr Gly Val Ser Phe Phe Phe
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65 70 75

ccc agc acc gac tac tac caa gag ctg cag aga gac att tct gaa atg 348
Pro Ser Thr Asp Tyr Tyr Gln Glu Leu Gln Arg Asp Ile Ser Glu Met
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ttt ttg cag att tat aaa caa ggg ggt ttt ctg ggc ctc tcc aat att 396
Phe Leu Gln Ile Tyr Lys Gln Gly Gly Phe Leu Gly Leu Ser Asn Ile
95 100 105 110

aag ttc agg cca gga tct gtg gtg gta caa ttg act ctg gcc ttc cga 444
Lys Phe Arg Pro Gly Ser Val Val Val Gln Leu Thr Leu Ala Phe Arg
115 120 125

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gtg agt gat gtg cca ttt cct ttc tct gcc cag tct ggg gct ggg gtg        588
Val Ser Asp Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala Gly Val
    160                 165                 170

cca ggc tgg ggc atc gcg ctg ctg gtg ctg gtc tgt gtt ctg gtt gcg        636
Pro Gly Trp Gly Ile Ala Leu Leu Val Leu Val Cys Val Leu Val Ala
175                 180                 185                 190

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Leu Ala Ile Val Tyr Leu Ile Ala Leu Ala Val Cys Gln Cys Arg Arg
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cct atg agc gag tac ccc acc tac cac acc cat ggg cgc tat gtg ccc        780
Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His Gly Arg Tyr Val Pro
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cct agc agt acc gat cgt agc ccc tat gag aag gtt tct gca ggt aat        828
Pro Ser Ser Thr Asp Arg Ser Pro Tyr Glu Lys Val Ser Ala Gly Asn
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ggt ggc agc agc ctc tct tac aca aac cca gca gtg gca gcc act tct        876
Gly Gly Ser Ser Leu Ser Tyr Thr Asn Pro Ala Val Ala Ala Thr Ser
255                 260                 265                 270

gcc aac ttg tag gggcacgtcg cccgctgagc tgagtggcca gccagtgcca            928
Ala Asn Leu


ttccactcca ctcaggttct tcagggccag agcccctgca ccctgtttgg gctggtgagc      988

tgggagttca ggtgggctgc tcacagcctc cttcagaggc cccaccaatt tctcggacac     1048

ttctcagtgt gtggaagctc atgtgggccc ctgagggctc atgcctggga agtgttgtgg     1108

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Gly Glu Lys Glu Thr Ser Ala Thr Gln Arg Ser Ser Val Pro Ser Ser
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Thr Glu Lys Asn Ala Leu Ser Thr Gly Val Ser Phe Phe Phe Leu Ser
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Phe His Ile Ser Asn Leu Gln Phe Asn Ser Ser Leu Glu Asp Pro Ser
65                  70                  75                  80

Thr Asp Tyr Tyr Gln Glu Leu Gln Arg Asp Ile Ser Glu Met Phe Leu
                85                  90                  95

Gln Ile Tyr Lys Gln Gly Gly Phe Leu Gly Leu Ser Asn Ile Lys Phe
            100                 105                 110

Arg Pro Gly Ser Val Val Val Gln Leu Thr Leu Ala Phe Arg Glu Gly
        115                 120                 125

Thr Ile Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys Thr
    130                 135                 140

Glu Ala Ala Ser Arg Tyr Asn Leu Thr Ile Ser Asp Val Ser Val Ser
145                 150                 155                 160

Asp Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala Gly Val Pro Gly
                165                 170                 175

Trp Gly Ile Ala Leu Leu Val Leu Val Cys Val Leu Val Ala Leu Ala
            180                 185                 190

Ile Val Tyr Leu Ile Ala Leu Ala Val Cys Gln Cys Arg Arg Lys Asn
        195                 200                 205

Tyr Gly Gln Leu Asp Ile Phe Pro Ala Arg Asp Thr Tyr His Pro Met
    210                 215                 220

Ser Glu Tyr Pro Thr Tyr His Thr His Gly Arg Tyr Val Pro Pro Ser
225                 230                 235                 240

Ser Thr Asp Arg Ser Pro Tyr Glu Lys Val Ser Ala Gly Asn Gly Gly
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       Met Thr Pro Gly Thr Gln Ser Pro Phe Phe Leu Leu Leu Leu
       1               5                   10

ctc aca gtg ctt aca gct acc aca gcc cct aaa ccc gca aca gtt gtt          156
Leu Thr Val Leu Thr Ala Thr Thr Ala Pro Lys Pro Ala Thr Val Val
15                  20                  25                  30

acg ggt tct ggt cat gca agc tct acc cca ggt gga gaa aag gag act          204
Thr Gly Ser Gly His Ala Ser Ser Thr Pro Gly Gly Glu Lys Glu Thr
                35                  40                  45

tcg gct acc cag aga agt tca gtg ccc agc tct act gag aag aat gct          252
Ser Ala Thr Gln Arg Ser Ser Val Pro Ser Ser Thr Glu Lys Asn Ala
            50                  55                  60

ttt aat tcc tct ctg gaa gat ccc agc acc gac tac tac caa gag ctg          300
Phe Asn Ser Ser Leu Glu Asp Pro Ser Thr Asp Tyr Tyr Gln Glu Leu
        65                  70                  75

cag aga gac att tct gaa atg ttt ttg cag att tat aaa caa ggg ggt          348
Gln Arg Asp Ile Ser Glu Met Phe Leu Gln Ile Tyr Lys Gln Gly Gly
    80                  85                  90

ttt ctg ggc ctc tcc aat att aag ttc agg cca gga tct gtg gtg gta          396
Phe Leu Gly Leu Ser Asn Ile Lys Phe Arg Pro Gly Ser Val Val Val
95                  100                 105                 110

caa ttg act ctg gcc ttc cga gaa ggt acc atc aat gtc cac gac gtg          444
Gln Leu Thr Leu Ala Phe Arg Glu Gly Thr Ile Asn Val His Asp Val
                115                 120                 125

gag aca cag ttc aat cag tat aaa acg gaa gca gcc tct cga tat aac          492
Glu Thr Gln Phe Asn Gln Tyr Lys Thr Glu Ala Ala Ser Arg Tyr Asn
            130                 135                 140

ctg acg atc tca gac gtc agc gtg agt gat gtg cca ttt cct ttc tct          540
Leu Thr Ile Ser Asp Val Ser Val Ser Asp Val Pro Phe Pro Phe Ser
        145                 150                 155

gcc cag tct ggg gct ggg gtg cca ggc tgg ggc atc gcg ctg ctg gtg          588
Ala Gln Ser Gly Ala Gly Val Pro Gly Trp Gly Ile Ala Leu Leu Val
    160                 165                 170

ctg gtc tgt gtt ctg gtt gcg ctg gcc att gtc tat ctc att gcc ttg          636
Leu Val Cys Val Leu Val Ala Leu Ala Ile Val Tyr Leu Ile Ala Leu
175                 180                 185                 190

gct gtc tgt cag tgc cgc cga aag aac tac ggg cag ctg gac atc ttt          684
Ala Val Cys Gln Cys Arg Arg Lys Asn Tyr Gly Gln Leu Asp Ile Phe
                195                 200                 205

cca gcc cgg gat acc tac cat cct atg agc gag tac ccc acc tac cac          732
Pro Ala Arg Asp Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His
            210                 215                 220

acc cat ggg cgc tat gtg ccc cct agc agt acc gat cgt agc ccc tat          780
Thr His Gly Arg Tyr Val Pro Pro Ser Ser Thr Asp Arg Ser Pro Tyr
        225                 230                 235

gag aag gtt tct gca ggt aat ggt ggc agc agc ctc tct tac aca aac          828
Glu Lys Val Ser Ala Gly Asn Gly Gly Ser Ser Leu Ser Tyr Thr Asn
    240                 245                 250
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cca gca gtg gca gcc act tct gcc aac ttg tag gggcacgtcg cccgctgagc      881
Pro Ala Val Ala Ala Thr Ser Ala Asn Leu
255                 260

tgagtggcca gccagtgcca ttccactcca ctcaggttct tcagggccag agcccctgca      941

ccctgtttgg gctggtgagc tgggagttca ggtgggctgc tcacagcctc cttcagaggc     1001

cccaccaatt tctcggacac ttctcagtgt gtggaagctc atgtgggccc ctgagggctc     1061

atgcctggga agtgttgtgg tgggggctcc caggaggact ggcccagaga gccctgagat     1121

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Ser Gly His Ala Ser Ser Thr Pro Gly Gly Glu Lys Glu Thr Ser Ala
        35                  40                  45

Thr Gln Arg Ser Ser Val Pro Ser Ser Thr Glu Lys Asn Ala Phe Asn
    50                  55                  60

Ser Ser Leu Glu Asp Pro Ser Thr Asp Tyr Tyr Gln Glu Leu Gln Arg
65                  70                  75                  80

Asp Ile Ser Glu Met Phe Leu Gln Ile Tyr Lys Gln Gly Gly Phe Leu
                85                  90                  95

Gly Leu Ser Asn Ile Lys Phe Arg Pro Gly Ser Val Val Val Gln Leu
            100                 105                 110

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

Gln Phe Asn Gln Tyr Lys Thr Glu Ala Ala Ser Arg Tyr Asn Leu Thr
    130                 135                 140

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

Ser Gly Ala Gly Val Pro Gly Trp Gly Ile Ala Leu Leu Val Leu Val
                165                 170                 175
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Cys Val Leu Val Ala Leu Ala Ile Val Tyr Leu Ile Ala Leu Ala Val
            180                 185                 190


Cys Gln Cys Arg Arg Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala
        195                 200                 205


Arg Asp Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His
    210                 215                 220


Gly Arg Tyr Val Pro Pro Ser Ser Thr Asp Arg Ser Pro Tyr Glu Lys
225                 230                 235                 240


Val Ser Ala Gly Asn Gly Gly Ser Ser Leu Ser Tyr Thr Asn Pro Ala
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Val Ala Ala Thr Ser Ala Asn Leu
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ccg ggc acc cag tct cct ttc ttc ctg ctg ctg ctc ctc aca gtg ctt        104
Pro Gly Thr Gln Ser Pro Phe Phe Leu Leu Leu Leu Leu Thr Val Leu
        5                   10                  15

aca gct acc aca gcc cct aaa ccc gca aca gtt gtt aca ggt tct ggt        152
Thr Ala Thr Thr Ala Pro Lys Pro Ala Thr Val Val Thr Gly Ser Gly
    20                  25                  30

cat gca agc tct acc cca ggt gga gaa aag gag act tcg gct acc cag        200
His Ala Ser Ser Thr Pro Gly Gly Glu Lys Glu Thr Ser Ala Thr Gln
35                  40                  45                  50

aga agt tca gtg ccc agc tct act gag aag aat gct ttt aat tcc tct        248
Arg Ser Ser Val Pro Ser Ser Thr Glu Lys Asn Ala Phe Asn Ser Ser
                55                  60                  65

ctg gaa gat ccc agc acc gac tac tac caa gag ctg cag aga gac att        296
Leu Glu Asp Pro Ser Thr Asp Tyr Tyr Gln Glu Leu Gln Arg Asp Ile
            70                  75                  80

tct gaa atg ttt ttg cag att tat aaa caa ggg ggt ttt ctg ggc ctc        344
Ser Glu Met Phe Leu Gln Ile Tyr Lys Gln Gly Gly Phe Leu Gly Leu
        85                  90                  95

tcc aat att aag ttc agg cca gga tct gtg gtg gta caa ttg act ctg        392
Ser Asn Ile Lys Phe Arg Pro Gly Ser Val Val Val Gln Leu Thr Leu
    100                 105                 110
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gcc ttc cga gaa ggt acc atc aat gtc cac gac atg gag aca cag ttc        440
Ala Phe Arg Glu Gly Thr Ile Asn Val His Asp Met Glu Thr Gln Phe
115                 120                 125                 130

aat cag tat aaa acg gaa gca gcc tct cga tat aac ctg acg atc tca        488
Asn Gln Tyr Lys Thr Glu Ala Ala Ser Arg Tyr Asn Leu Thr Ile Ser
                135                 140                 145

gac gtc agc gtg agt ggt gtg cca ttt cct ttc tct gcc cag tct ggg        536
Asp Val Ser Val Ser Gly Val Pro Phe Pro Phe Ser Ala Gln Ser Gly
            150                 155                 160

gct ggg gtg cca ggc tgg ggc atc gcg ctg ctg gtg ctg gtc tgt gtt        584
Ala Gly Val Pro Gly Trp Gly Ile Ala Leu Leu Val Leu Val Cys Val
        165                 170                 175

ctg gtt gcg ctg gcc att gtc tat ctc att gcc ttg gct gtc tgt cag        632
Leu Val Ala Leu Ala Ile Val Tyr Leu Ile Ala Leu Ala Val Cys Gln
    180                 185                 190

tgc cgc cga aag aac tac ggg cag ctg gac atc ttt cca gcc cgg gat        680
Cys Arg Arg Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala Arg Asp
195                 200                 205                 210

acc tac cat cct atg agc gag tac ccc acc tac cac acc cat ggg cgc        728
Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His Gly Arg
                215                 220                 225

tat gtg ccc cct agc agt acc gat cgt agc ccc tat gag aag gtt tct        776
Tyr Val Pro Pro Ser Ser Thr Asp Arg Ser Pro Tyr Glu Lys Val Ser
            230                 235                 240

gca ggt aat ggt ggc agc agc ctc tct tac aca aac cca gca gtg gca        824
Ala Gly Asn Gly Gly Ser Ser Leu Ser Tyr Thr Asn Pro Ala Val Ala
        245                 250                 255

gcc act tct gcc aac ttg tag gggcacgtcg cccgctgagc tgagtggcca           875
Ala Thr Ser Ala Asn Leu
    260

gccagtgcca ttccactcca ctcaggttct tcagggccag agcccctgca ccctgtttgg      935

gctggtgagc tgggagttca ggtgggctgc tcacagcctc cttcagaggc cccaccaatt      995

tctcggacac ttctcagtgt gtggaagctc atgtggg                              1032


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Val Leu Thr Ala Thr Thr Ala Pro Lys Pro Ala Thr Val Val Thr Gly
            20                  25                  30


Ser Gly His Ala Ser Ser Thr Pro Gly Gly Glu Lys Glu Thr Ser Ala
        35                  40                  45


Thr Gln Arg Ser Ser Val Pro Ser Ser Thr Glu Lys Asn Ala Phe Asn
    50                  55                  60
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Ser Ser Leu Glu Asp Pro Ser Thr Asp Tyr Tyr Gln Glu Leu Gln Arg
65                  70                  75                  80

Asp Ile Ser Glu Met Phe Leu Gln Ile Tyr Lys Gln Gly Gly Phe Leu
                85                  90                  95

Gly Leu Ser Asn Ile Lys Phe Arg Pro Gly Ser Val Val Val Gln Leu
            100                 105                 110

Thr Leu Ala Phe Arg Glu Gly Thr Ile Asn Val His Asp Met Glu Thr
        115                 120                 125

Gln Phe Asn Gln Tyr Lys Thr Glu Ala Ala Ser Arg Tyr Asn Leu Thr
    130                 135                 140

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

Ser Gly Ala Gly Val Pro Gly Trp Gly Ile Ala Leu Leu Val Leu Val
                165                 170                 175

Cys Val Leu Val Ala Leu Ala Ile Val Tyr Leu Ile Ala Leu Ala Val
            180                 185                 190

Cys Gln Cys Arg Arg Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala
        195                 200                 205

Arg Asp Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His
    210                 215                 220

Gly Arg Tyr Val Pro Pro Ser Ser Thr Asp Arg Ser Pro Tyr Glu Lys
225                 230                 235                 240

Val Ser Ala Gly Asn Gly Gly Ser Ser Leu Ser Tyr Thr Asn Pro Ala
                245                 250                 255

Val Ala Ala Thr Ser Ala Asn Leu
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                Met Thr Pro Gly Thr Gln Ser Pro Phe Phe Leu Leu Leu
                1               5                   10

ctc ctc aca gtg ctt aca gtt gtt acg ggt tct ggt cat gca agc tct       159
Leu Leu Thr Val Leu Thr Val Val Thr Gly Ser Gly His Ala Ser Ser
    15                  20                  25

acc cca ggt gga gaa aag gag act tcg gct acc cag aga agt tca gtg       207
Thr Pro Gly Gly Glu Lys Glu Thr Ser Ala Thr Gln Arg Ser Ser Val
30                  35                  40                  45

ccc agc tct act gag aag aat gct ttt aat tcc tct ctg gaa gat ccc       255
Pro Ser Ser Thr Glu Lys Asn Ala Phe Asn Ser Ser Leu Glu Asp Pro
                50                  55                  60

agc acc gac tac tac caa gag ctg cag aga gac att tct gaa atg ttt       303
Ser Thr Asp Tyr Tyr Gln Glu Leu Gln Arg Asp Ile Ser Glu Met Phe
            65                  70                  75

ttg cag att tat aaa caa ggg ggt ttt ctg ggc ctc tcc aat att aag       351
Leu Gln Ile Tyr Lys Gln Gly Gly Phe Leu Gly Leu Ser Asn Ile Lys
        80                  85                  90

ttc agg cca gga tct gtg gtg gta caa ttg act ctg gcc ttc cga gaa       399
Phe Arg Pro Gly Ser Val Val Val Gln Leu Thr Leu Ala Phe Arg Glu
    95                  100                 105

ggt acc atc aat gtc cac gac gtg gag aca cag ttc aat cag tat aaa       447
Gly Thr Ile Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys
110                 115                 120                 125

acg gaa gca gcc tct cga tat aac ctg acg atc tca gac gtc agc gtg       495
Thr Glu Ala Ala Ser Arg Tyr Asn Leu Thr Ile Ser Asp Val Ser Val
                130                 135                 140

agt gat gtg cca ttt cct ttc tct gcc cag tct ggg gct ggg gtg cca       543
Ser Asp Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala Gly Val Pro
            145                 150                 155

ggc tgg ggc atc gcg ctg ctg gtg ctg gtc tgt gtt ctg gtt gcg ctg       591
Gly Trp Gly Ile Ala Leu Leu Val Leu Val Cys Val Leu Val Ala Leu
        160                 165                 170

gcc att gtc tat ctc att gcc ttg gct gtc tgt cag tgc cgc cga aag       639
Ala Ile Val Tyr Leu Ile Ala Leu Ala Val Cys Gln Cys Arg Arg Lys
    175                 180                 185

aac tac ggg cag ctg gac atc ttt cca gcc cgg gat acc tac cat cct       687
Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala Arg Asp Thr Tyr His Pro
190                 195                 200                 205

atg agc gag tac ccc acc tac cac acc cat ggg cgc tat gtg ccc cct       735
Met Ser Glu Tyr Pro Thr Tyr His Thr His Gly Arg Tyr Val Pro Pro
                210                 215                 220

agc agt acc gat cgt agc ccc tat gag aag gtt tct gca ggt aat ggt       783
Ser Ser Thr Asp Arg Ser Pro Tyr Glu Lys Val Ser Ala Gly Asn Gly
            225                 230                 235

ggc agc agc ctc tct tac aca aac cca gca gtg gca gcc act tct gcc       831
Gly Ser Ser Leu Ser Tyr Thr Asn Pro Ala Val Ala Ala Thr Ser Ala
        240                 245                 250

aac ttg tag gggcacgtcg cccgctgagc tgagtggcca gccagtgcca               880
Asn Leu
    255

ttccactcca ctcaggttct tcagggccag agcccctgca ccctgtttgg gctggtgagc      940
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20 25 30

Gly Glu Lys Glu Thr Ser Ala Thr Gln Arg Ser Ser Val Pro Ser Ser
35 40 45

Thr Glu Lys Asn Ala Phe Asn Ser Ser Leu Glu Asp Pro Ser Thr Asp
50 55 60

Tyr Tyr Gln Glu Leu Gln Arg Asp Ile Ser Glu Met Phe Leu Gln Ile
65 70 75 80

Tyr Lys Gln Gly Gly Phe Leu Gly Leu Ser Asn Ile Lys Phe Arg Pro
85 90 95

Gly Ser Val Val Val Gln Leu Thr Leu Ala Phe Arg Glu Gly Thr Ile
100 105 110

Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys Thr Glu Ala
115 120 125

Ala Ser Arg Tyr Asn Leu Thr Ile Ser Asp Val Ser Val Ser Asp Val
130 135 140

Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala Gly Val Pro Gly Trp Gly
145 150 155 160

Ile Ala Leu Leu Val Leu Val Cys Val Leu Val Ala Leu Ala Ile Val
165 170 175

Tyr Leu Ile Ala Leu Ala Val Cys Gln Cys Arg Arg Lys Asn Tyr Gly
180 185 190

Gln Leu Asp Ile Phe Pro Ala Arg Asp Thr Tyr His Pro Met Ser Glu
195 200 205

Tyr Pro Thr Tyr His Thr His Gly Arg Tyr Val Pro Pro Ser Ser Thr
210 215 220

Asp Arg Ser Pro Tyr Glu Lys Val Ser Ala Gly Asn Gly Gly Ser Ser
225 230 235 240

Leu Ser Tyr Thr Asn Pro Ala Val Ala Ala Thr Ser Ala Asn Leu
245 250 255

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Met Thr Pro Gly Ile Arg Ala Pro Phe Phe Leu Leu Leu Leu
1 5 10

cta gca agt cta aaa ggt ttt ctt gcc ctt cca agt gag gaa aac agt 158
Leu Ala Ser Leu Lys Gly Phe Leu Ala Leu Pro Ser Glu Glu Asn Ser
15 20 25 30

gtc acc tca tct cag gac acc agc agt tcc tta gca tcg act acc act 206
Val Thr Ser Ser Gln Asp Thr Ser Ser Ser Leu Ala Ser Thr Thr Thr
35 40 45

cca gtc cac agc agc aac tca gac cca gcc acc aga cct cca ggg gac 254
Pro Val His Ser Ser Asn Ser Asp Pro Ala Thr Arg Pro Pro Gly Asp
50 55 60

tcc acc agc tct cca gtc cag agt agc acc tct tct cca gcc acc aga 302
Ser Thr Ser Ser Pro Val Gln Ser Ser Thr Ser Ser Pro Ala Thr Arg
65 70 75

gct cct gaa gac tct acc agt act gca gtc ctc agt ggc acc tcc tcc 350
Ala Pro Glu Asp Ser Thr Ser Thr Ala Val Leu Ser Gly Thr Ser Ser
80 85 90

cca gcc acc aca gct cca gtg aac tcc gcc agc tct cca gta gcc cat 398
Pro Ala Thr Thr Ala Pro Val Asn Ser Ala Ser Ser Pro Val Ala His
95 100 105 110

ggt gac acc tct tcc cca gcc act agc ctt tca aaa gac tcc aac agc 446
Gly Asp Thr Ser Ser Pro Ala Thr Ser Leu Ser Lys Asp Ser Asn Ser
115 120 125

tct cca gta gtc cac agt ggc acc tct tca gct ccg gcc acc aca gct 494
Ser Pro Val Val His Ser Gly Thr Ser Ser Ala Pro Ala Thr Thr Ala
130 135 140

cca gtg gat tcc acc agc tct cca gta gtc cac ggt ggt acc tcg tcc 542
Pro Val Asp Ser Thr Ser Ser Pro Val Val His Gly Gly Thr Ser Ser
145 150 155

cca gcc acc agc cct cca ggg gac tcc acc agc tct cca gac cat agt 590
Pro Ala Thr Ser Pro Pro Gly Asp Ser Thr Ser Ser Pro Asp His Ser

```
    160                 165                 170

agc acc tct tct cca gcc acc aga gct ccc gaa gac tct acc agt act        638
Ser Thr Ser Ser Pro Ala Thr Arg Ala Pro Glu Asp Ser Thr Ser Thr
175                 180                 185                 190

gca gtc ctc agt ggc acc tcc tcc cca gcc acc aca gct cca gtg gac        686
Ala Val Leu Ser Gly Thr Ser Ser Pro Ala Thr Thr Ala Pro Val Asp
                195                 200                 205

tcc acc agc tct cca gta gcc cat gat gac acc tct tcc cca gcc act        734
Ser Thr Ser Ser Pro Val Ala His Asp Asp Thr Ser Ser Pro Ala Thr
            210                 215                 220

agc ctt tca gaa gac tcc gcc agc tct cca gta gcc cac ggt ggc acc        782
Ser Leu Ser Glu Asp Ser Ala Ser Ser Pro Val Ala His Gly Gly Thr
        225                 230                 235

tct tct cca gcc acc agc cct cta agg gac tcc acc agt tct cca gtc        830
Ser Ser Pro Ala Thr Ser Pro Leu Arg Asp Ser Thr Ser Ser Pro Val
    240                 245                 250

cac agt agt gcc tcc atc caa aac atc aag act aca tca gac tta gct        878
His Ser Ser Ala Ser Ile Gln Asn Ile Lys Thr Thr Ser Asp Leu Ala
255                 260                 265                 270

agc act cca gac cac aat ggc acc tca gtc aca act acc agc tct gca        926
Ser Thr Pro Asp His Asn Gly Thr Ser Val Thr Thr Thr Ser Ser Ala
                275                 280                 285

ctg ggc tca gcc acc agt cca gac cac agt ggt acc tca act aca act        974
Leu Gly Ser Ala Thr Ser Pro Asp His Ser Gly Thr Ser Thr Thr Thr
            290                 295                 300

aac agc tct gaa tca gtc ttg gcc acc act cca gtt tac agt agc atg       1022
Asn Ser Ser Glu Ser Val Leu Ala Thr Thr Pro Val Tyr Ser Ser Met
        305                 310                 315

cca ttc tct act acc aaa gtg acg tca ggc tca gct atc att cca gac       1070
Pro Phe Ser Thr Thr Lys Val Thr Ser Gly Ser Ala Ile Ile Pro Asp
    320                 325                 330

cac aat ggc tcc tcg gtg cta cct acc agt tct gtg ttg ggc tca gct       1118
His Asn Gly Ser Ser Val Leu Pro Thr Ser Ser Val Leu Gly Ser Ala
335                 340                 345                 350

acc agt cta gtc tat aat acc tct gca ata gct aca act cca gtc agc       1166
Thr Ser Leu Val Tyr Asn Thr Ser Ala Ile Ala Thr Thr Pro Val Ser
                355                 360                 365

aat ggc act cag cct tca gtg cca agt caa tac cct gtt tct cct acc       1214
Asn Gly Thr Gln Pro Ser Val Pro Ser Gln Tyr Pro Val Ser Pro Thr
            370                 375                 380

atg gcc acc acc tcc agc cac agc act att gcc agc agc tct tac tat       1262
Met Ala Thr Thr Ser Ser His Ser Thr Ile Ala Ser Ser Ser Tyr Tyr
        385                 390                 395

agc aca gta cca ttt tct acc ttc tcc agt aac agt tca ccc cag ttg       1310
Ser Thr Val Pro Phe Ser Thr Phe Ser Ser Asn Ser Ser Pro Gln Leu
    400                 405                 410

tct gtt ggg gtc tcc ttc ttc ttc ttg tct ttt tac att caa aac cac       1358
Ser Val Gly Val Ser Phe Phe Phe Leu Ser Phe Tyr Ile Gln Asn His
415                 420                 425                 430

cca ttt aat tct tct ctg gaa gac ccc agc tcc aac tac tac caa gaa       1406
Pro Phe Asn Ser Ser Leu Glu Asp Pro Ser Ser Asn Tyr Tyr Gln Glu
```

```
                435                 440                 445

ctg aag agg aac att tct gga ttg ttt ctg cag att ttt aac gga gat       1454
Leu Lys Arg Asn Ile Ser Gly Leu Phe Leu Gln Ile Phe Asn Gly Asp
            450                 455                 460

ttt ctg ggg atc tct agc atc aag ttc agg tca ggc tcc gtg gtg gta       1502
Phe Leu Gly Ile Ser Ser Ile Lys Phe Arg Ser Gly Ser Val Val Val
        465                 470                 475

gaa tcg act gtg gtt ttc cgg gag ggt act ttt agt gcc tct gac gtg       1550
Glu Ser Thr Val Val Phe Arg Glu Gly Thr Phe Ser Ala Ser Asp Val
    480                 485                 490

aag tca cag ctt ata cag cat aag aag gag gca gat gac tat aat ctg       1598
Lys Ser Gln Leu Ile Gln His Lys Lys Glu Ala Asp Asp Tyr Asn Leu
495                 500                 505                 510

act att tca gaa gtc aaa gtg aat gag atg cag ttc cct ccc tct gcc       1646
Thr Ile Ser Glu Val Lys Val Asn Glu Met Gln Phe Pro Pro Ser Ala
                515                 520                 525

cag tcc cgg ccg ggg gta cca ggc tgg ggc att gcc ctg ctg gtg ctg       1694
Gln Ser Arg Pro Gly Val Pro Gly Trp Gly Ile Ala Leu Leu Val Leu
            530                 535                 540

gtc tgt att ttg gtt gct ttg gct atc gtc tat ttc ctt gcc ctg gca       1742
Val Cys Ile Leu Val Ala Leu Ala Ile Val Tyr Phe Leu Ala Leu Ala
        545                 550                 555

gtg tgc cag tgc cgc cga aag agc tat ggg cag ctg gac atc ttt cca       1790
Val Cys Gln Cys Arg Arg Lys Ser Tyr Gly Gln Leu Asp Ile Phe Pro
    560                 565                 570

acc cag gac acc tac cat cct atg agt gaa tac cct acc tac cac act       1838
Thr Gln Asp Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr
575                 580                 585                 590

cac gga cgc tac gtg ccc cct ggc agt acc aag cgt agc ccc tat gag       1886
His Gly Arg Tyr Val Pro Pro Gly Ser Thr Lys Arg Ser Pro Tyr Glu
                595                 600                 605

gag gtt tcg gca ggt aat ggc agt agc agt ctc tct tat acc aac cca       1934
Glu Val Ser Ala Gly Asn Gly Ser Ser Ser Leu Ser Tyr Thr Asn Pro
            610                 615                 620

gct gtg gtg acc act tct gcc aac ttg tag gagcaagtca ccccacccac         1984
Ala Val Val Thr Thr Ser Ala Asn Leu
        625                 630

ttggggcagc tttggcggtc tgctccctca gtggtcactg ccagacccct gcactctgat     2044

ctgggctggt gagccaggac ttctggtagg ctgttcatgc cctttgtcaa gcgcctcaac     2104

tacgtaagcc tggtgaagcc cagccctgcc ctgggggaca ctggggcagt tagtggtggc     2164

tctcagaagg actggcctgg aaaactggag acagggatgg gaacccaaac atagctgaat     2224

aaaagatggc c                                                          2235


<210>  10
<211>  631
<212>  PRT
<213>  Mus musculus

<400>  10
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Met Thr Pro Gly Ile Arg Ala Pro Phe Phe Leu Leu Leu Leu Ala
1               5                  10                  15

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

Ser Ser Gln Asp Thr Ser Ser Ser Leu Ala Ser Thr Thr Thr Pro Val
        35                  40                  45

His Ser Ser Asn Ser Asp Pro Ala Thr Arg Pro Pro Gly Asp Ser Thr
    50                  55                  60

Ser Ser Pro Val Gln Ser Ser Thr Ser Ser Pro Ala Thr Arg Ala Pro
65                  70                  75                  80

Glu Asp Ser Thr Ser Thr Ala Val Leu Ser Gly Thr Ser Ser Pro Ala
                85                  90                  95

Thr Thr Ala Pro Val Asn Ser Ala Ser Ser Pro Val Ala His Gly Asp
            100                 105                 110

Thr Ser Ser Pro Ala Thr Ser Leu Ser Lys Asp Ser Asn Ser Ser Pro
        115                 120                 125

Val Val His Ser Gly Thr Ser Ser Ala Pro Ala Thr Thr Ala Pro Val
    130                 135                 140

Asp Ser Thr Ser Ser Pro Val Val His Gly Gly Thr Ser Ser Pro Ala
145                 150                 155                 160

Thr Ser Pro Pro Gly Asp Ser Thr Ser Ser Pro Asp His Ser Ser Thr
                165                 170                 175

Ser Ser Pro Ala Thr Arg Ala Pro Glu Asp Ser Thr Ser Thr Ala Val
            180                 185                 190

Leu Ser Gly Thr Ser Ser Pro Ala Thr Thr Ala Pro Val Asp Ser Thr
        195                 200                 205

Ser Ser Pro Val Ala His Asp Asp Thr Ser Ser Pro Ala Thr Ser Leu
    210                 215                 220

Ser Glu Asp Ser Ala Ser Ser Pro Val Ala His Gly Gly Thr Ser Ser
225                 230                 235                 240

Pro Ala Thr Ser Pro Leu Arg Asp Ser Thr Ser Ser Pro Val His Ser
                245                 250                 255

Ser Ala Ser Ile Gln Asn Ile Lys Thr Thr Ser Asp Leu Ala Ser Thr
            260                 265                 270
```

```
Pro Asp His Asn Gly Thr Ser Val Thr Thr Thr Ser Ser Ala Leu Gly
        275                 280                 285

Ser Ala Thr Ser Pro Asp His Ser Gly Thr Ser Thr Thr Thr Asn Ser
    290                 295                 300

Ser Glu Ser Val Leu Ala Thr Thr Pro Val Tyr Ser Ser Met Pro Phe
305                 310                 315                 320

Ser Thr Thr Lys Val Thr Ser Gly Ser Ala Ile Ile Pro Asp His Asn
                325                 330                 335

Gly Ser Ser Val Leu Pro Thr Ser Ser Val Leu Gly Ser Ala Thr Ser
            340                 345                 350

Leu Val Tyr Asn Thr Ser Ala Ile Ala Thr Thr Pro Val Ser Asn Gly
        355                 360                 365

Thr Gln Pro Ser Val Pro Ser Gln Tyr Pro Val Ser Pro Thr Met Ala
    370                 375                 380

Thr Thr Ser Ser His Ser Thr Ile Ala Ser Ser Ser Tyr Tyr Ser Thr
385                 390                 395                 400

Val Pro Phe Ser Thr Phe Ser Ser Asn Ser Ser Pro Gln Leu Ser Val
                405                 410                 415

Gly Val Ser Phe Phe Phe Leu Ser Phe Tyr Ile Gln Asn His Pro Phe
            420                 425                 430

Asn Ser Ser Leu Glu Asp Pro Ser Ser Asn Tyr Tyr Gln Glu Leu Lys
        435                 440                 445

Arg Asn Ile Ser Gly Leu Phe Leu Gln Ile Phe Asn Gly Asp Phe Leu
    450                 455                 460

Gly Ile Ser Ser Ile Lys Phe Arg Ser Gly Ser Val Val Val Glu Ser
465                 470                 475                 480

Thr Val Val Phe Arg Glu Gly Thr Phe Ser Ala Ser Asp Val Lys Ser
                485                 490                 495

Gln Leu Ile Gln His Lys Lys Glu Ala Asp Asp Tyr Asn Leu Thr Ile
            500                 505                 510

Ser Glu Val Lys Val Asn Glu Met Gln Phe Pro Pro Ser Ala Gln Ser
        515                 520                 525

Arg Pro Gly Val Pro Gly Trp Gly Ile Ala Leu Leu Val Leu Val Cys
    530                 535                 540
```

Ile Leu Val Ala Leu Ala Ile Val Tyr Phe Leu Ala Leu Ala Val Cys
545 550 555 560

Gln Cys Arg Arg Lys Ser Tyr Gly Gln Leu Asp Ile Phe Pro Thr Gln
565 570 575

Asp Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His Gly
580 585 590

Arg Tyr Val Pro Pro Gly Ser Thr Lys Arg Ser Pro Tyr Glu Glu Val
595 600 605

Ser Ala Gly Asn Gly Ser Ser Ser Leu Ser Tyr Thr Asn Pro Ala Val
610 615 620

Val Thr Thr Ser Ala Asn Leu
625 630

<210> 11
<211> 1255
<212> PRT
<213> Homo sapiens

<400> 11

Met Thr Pro Gly Thr Gln Ser Pro Phe Phe Leu Leu Leu Leu Leu Thr
1 5 10 15

Val Leu Thr Val Val Thr Gly Ser Gly His Ala Ser Ser Thr Pro Gly
20 25 30

Gly Glu Lys Glu Thr Ser Ala Thr Gln Arg Ser Ser Val Pro Ser Ser
35 40 45

Thr Glu Lys Asn Ala Val Ser Met Thr Ser Ser Val Leu Ser Ser His
50 55 60

Ser Pro Gly Ser Gly Ser Ser Thr Thr Gln Gly Gln Asp Val Thr Leu
65 70 75 80

Ala Pro Ala Thr Glu Pro Ala Ser Gly Ser Ala Ala Thr Trp Gly Gln
85 90 95

Asp Val Thr Ser Val Pro Val Thr Arg Pro Ala Leu Gly Ser Thr Thr
100 105 110

Pro Pro Ala His Asp Val Thr Ser Ala Pro Asp Asn Lys Pro Ala Pro
115 120 125

Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
130 135 140

Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser

145 150 155 160

Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
165 170 175

Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
180 185 190

Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
195 200 205

Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
210 215 220

Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
225 230 235 240

Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
245 250 255

Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
260 265 270

Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
275 280 285

Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
290 295 300

Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
305 310 315 320

Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
325 330 335

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

Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
355 360 365

Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
370 375 380

Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
385 390 395 400

Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
405 410 415

Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala

420 425 430

Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
435 440 445

Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
450 455 460

Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
465 470 475 480

Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
485 490 495

Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
500 505 510

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

Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
530 535 540

Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
545 550 555 560

Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
565 570 575

Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
580 585 590

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

Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
610 615 620

Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
625 630 635 640

Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
645 650 655

Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
660 665 670

Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
675 680 685

Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr

690 695 700

Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
705 710 715 720

Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
725 730 735

Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
740 745 750

Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
755 760 765

Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
770 775 780

Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
785 790 795 800

Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
805 810 815

Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
820 825 830

Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
835 840 845

Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr
850 855 860

Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser
865 870 875 880

Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His
885 890 895

Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
900 905 910

Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro
915 920 925

Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Asn
930 935 940

Arg Pro Ala Leu Gly Ser Thr Ala Pro Pro Val His Asn Val Thr Ser
945 950 955 960

Ala Ser Gly Ser Ala Ser Gly Ser Ala Ser Thr Leu Val His Asn Gly

965 970 975

Thr Ser Ala Arg Ala Thr Thr Thr Pro Ala Ser Lys Ser Thr Pro Phe
980 985 990

Ser Ile Pro Ser His His Ser Asp Thr Pro Thr Thr Leu Ala Ser His
995 1000 1005

Ser Thr Lys Thr Asp Ala Ser Ser Thr His His Ser Ser Val Pro
1010 1015 1020

Pro Leu Thr Ser Ser Asn His Ser Thr Ser Pro Gln Leu Ser Thr
1025 1030 1035

Gly Val Ser Phe Phe Phe Leu Ser Phe His Ile Ser Asn Leu Gln
1040 1045 1050

Phe Asn Ser Ser Leu Glu Asp Pro Ser Thr Asp Tyr Tyr Gln Glu
1055 1060 1065

Leu Gln Arg Asp Ile Ser Glu Met Phe Leu Gln Ile Tyr Lys Gln
1070 1075 1080

Gly Gly Phe Leu Gly Leu Ser Asn Ile Lys Phe Arg Pro Gly Ser
1085 1090 1095

Val Val Val Gln Leu Thr Leu Ala Phe Arg Glu Gly Thr Ile Asn
1100 1105 1110

Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys Thr Glu Ala
1115 1120 1125

Ala Ser Arg Tyr Asn Leu Thr Ile Ser Asp Val Ser Val Ser Asp
1130 1135 1140

Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala Gly Val Pro Gly
1145 1150 1155

Trp Gly Ile Ala Leu Leu Val Leu Val Cys Val Leu Val Ala Leu
1160 1165 1170

Ala Ile Val Tyr Leu Ile Ala Leu Ala Val Cys Gln Cys Arg Arg
1175 1180 1185

Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala Arg Asp Thr Tyr
1190 1195 1200

His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His Gly Arg Tyr
1205 1210 1215

Val Pro Pro Ser Ser Thr Asp Arg Ser Pro Tyr Glu Lys Val Ser

1220 1225 1230

Ala Gly Asn Gly Gly Ser Ser Leu Ser Tyr Thr Asn Pro Ala Val
1235 1240 1245

Ala Ala Thr Ser Ala Asn Leu
1250 1255

<210> 12
<211> 20
<212> PRT
<213> Homo sapiens

<220>
<221> VARIANT
<222> (9)..(9)
<223> X= P, A, Q or T

<220>
<221> VARIANT
<222> (18)..(18)
<223> X= D or E

<220>
<221> VARIANT
<222> (19)..(19)
<223> X= T or S

<400> 12

Pro Ala Pro Gly Ser Thr Ala Pro Xaa Ala His Gly Val Thr Ser Ala
1 5 10 15

Pro Xaa Xaa Arg
20

<210> 13
<211> 711
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<220>
<221> CDS
<222> (1)..(711)

<400> 13
atg aca ccg ggc acc cag tct cct ttc ttc ctg ctg ctg ctc ctc aca 48
Met Thr Pro Gly Thr Gln Ser Pro Phe Phe Leu Leu Leu Leu Leu Thr
1 5 10 15

gtg ctt aca gct acc aca gcc cct aaa ccc gca aca gtt gtt gga tct 96
Val Leu Thr Ala Thr Thr Ala Pro Lys Pro Ala Thr Val Val Gly Ser
20 25 30

gtg gtg gta caa ttg act ctg gcc ttc cga gaa ggt acc atc aat gtc 144
Val Val Val Gln Leu Thr Leu Ala Phe Arg Glu Gly Thr Ile Asn Val
35 40 45

```
cac gac gtg gag aca cag ttc aat cag tat aaa acg gaa gca gcc tct        192
His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys Thr Glu Ala Ala Ser
    50                  55                  60

cga tat aac ctg acg atc tca gac gtc agc gtg agt gat gtg cca ttt        240
Arg Tyr Asn Leu Thr Ile Ser Asp Val Ser Val Ser Asp Val Pro Phe
65                  70                  75                  80

cct ttc tct gcc cag tct ggg gct ggg gcc cac ggt gtc acc agc gcc        288
Pro Phe Ser Ala Gln Ser Gly Ala Gly Ala His Gly Val Thr Ser Ala
                85                  90                  95

cct gac acc agg ccg gcc ccg ggc tcc acc gcg ccc cca gcc cat ggt        336
Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly
            100                 105                 110

gtc acc tcg gcc ccg gag agc agg ccc gcc cct ggg agc acc gcc ccc        384
Val Thr Ser Ala Pro Glu Ser Arg Pro Ala Pro Gly Ser Thr Ala Pro
        115                 120                 125

cct gca gtg cca ggc tgg ggc atc gcg ctg ctg gtg ctg gtc tgt gtt        432
Pro Ala Val Pro Gly Trp Gly Ile Ala Leu Leu Val Leu Val Cys Val
    130                 135                 140

ctg gtt gcg ctg gcc att gtc tat ctc att gcc ttg gct gtc tgt cag        480
Leu Val Ala Leu Ala Ile Val Tyr Leu Ile Ala Leu Ala Val Cys Gln
145                 150                 155                 160

tgc cgc cga aag aac tac ggg cag ctg gac atc ttt cca gcc cgg gat        528
Cys Arg Arg Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala Arg Asp
                165                 170                 175

acc tac cat cct atg agc gag tac ccc acc tac cac acc cat ggg cgc        576
Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His Gly Arg
            180                 185                 190

tat gtg ccc cct agc agt acc gat cgt agc ccc tat gag aag gtt tct        624
Tyr Val Pro Pro Ser Ser Thr Asp Arg Ser Pro Tyr Glu Lys Val Ser
        195                 200                 205

gca ggt aat ggt ggc agc agc ctc tct tac aca aac cca gca gtg gca        672
Ala Gly Asn Gly Gly Ser Ser Leu Ser Tyr Thr Asn Pro Ala Val Ala
    210                 215                 220

gcc act tct gcc aac ttg cat cat cac cac cat cac tag                    711
Ala Thr Ser Ala Asn Leu His His His His His His
225                 230                 235
```

<210> 14
<211> 236
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 14

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Met Thr Pro Gly Thr Gln Ser Pro Phe Phe Leu Leu Leu Leu Leu Thr
1               5                   10                  15

Val Leu Thr Ala Thr Thr Ala Pro Lys Pro Ala Thr Val Val Gly Ser
            20                  25                  30

Val Val Val Gln Leu Thr Leu Ala Phe Arg Glu Gly Thr Ile Asn Val
```

35 40 45

His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys Thr Glu Ala Ala Ser
50 55 60

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

Pro Phe Ser Ala Gln Ser Gly Ala Gly Ala His Gly Val Thr Ser Ala
85 90 95

Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly
100 105 110

Val Thr Ser Ala Pro Glu Ser Arg Pro Ala Pro Gly Ser Thr Ala Pro
115 120 125

Pro Ala Val Pro Gly Trp Gly Ile Ala Leu Leu Val Leu Val Cys Val
130 135 140

Leu Val Ala Leu Ala Ile Val Tyr Leu Ile Ala Leu Ala Val Cys Gln
145 150 155 160

Cys Arg Arg Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala Arg Asp
165 170 175

Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His Gly Arg
180 185 190

Tyr Val Pro Pro Ser Ser Thr Asp Arg Ser Pro Tyr Glu Lys Val Ser
195 200 205

Ala Gly Asn Gly Gly Ser Ser Leu Ser Tyr Thr Asn Pro Ala Val Ala
210 215 220

Ala Thr Ser Ala Asn Leu His His His His His His
225 230 235

<210> 15
<211> 200
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 15

Gly Ser Val Val Val Gln Leu Thr Leu Ala Phe Arg Glu Gly Thr Ile
1 5 10 15

Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys Thr Glu Ala
20 25 30

```
Ala Ser Arg Tyr Asn Leu Thr Ile Ser Asp Val Ser Val Ser Asp Val
        35                  40                  45

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

Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala
65                  70                  75                  80

His Gly Val Thr Ser Ala Pro Glu Ser Arg Pro Ala Pro Gly Ser Thr
                85                  90                  95

Ala Pro Pro Ala Val Pro Gly Trp Gly Ile Ala Leu Leu Val Leu Val
            100                 105                 110

Cys Val Leu Val Ala Leu Ala Ile Val Tyr Leu Ile Ala Leu Ala Val
        115                 120                 125

Cys Gln Cys Arg Arg Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala
    130                 135                 140

Arg Asp Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His
145                 150                 155                 160

Gly Arg Tyr Val Pro Pro Ser Ser Thr Asp Arg Ser Pro Tyr Glu Lys
                165                 170                 175

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

Val Ala Ala Thr Ser Ala Asn Leu
        195                 200


<210>  16
<211>  687
<212>  DNA
<213>  Artificial

<220>
<223>  Synthetic Construct


<220>
<221>  CDS
<222>  (1)..(687)

<400>  16
atg gcc gat gaa gct ccg tgt cag tgc cgc cga aag aac tac ggg cag         48
Met Ala Asp Glu Ala Pro Cys Gln Cys Arg Arg Lys Asn Tyr Gly Gln
1               5                   10                  15

ctg gac atc ttt cca gcc cgg gat acc tac cat cct atg agc gag tac         96
Leu Asp Ile Phe Pro Ala Arg Asp Thr Tyr His Pro Met Ser Glu Tyr
            20                  25                  30

ccc acc tac cac acc cat ggg cgc tat gtg ccc cct agc agt acc gat        144
```

```
Pro Thr Tyr His Thr His Gly Arg Tyr Val Pro Pro Ser Ser Thr Asp
        35                  40                  45

cgt agc ccc tat gag aag gtt tct gca ggt aat ggt ggc agc agc ctc        192
Arg Ser Pro Tyr Glu Lys Val Ser Ala Gly Asn Gly Gly Ser Ser Leu
    50                  55                  60

tct tac aca aac cca gca gtg gca gcc act tct gcc aac ttg tgc caa        240
Ser Tyr Thr Asn Pro Ala Val Ala Ala Thr Ser Ala Asn Leu Cys Gln
65                  70                  75                  80

tgc aga aga aaa aat tat ggt caa ctt gac att ttt cct gca aga gat        288
Cys Arg Arg Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala Arg Asp
                85                  90                  95

aca tat cat cca atg agt gaa tat cca act tat cac act cat ggc aga        336
Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His Gly Arg
            100                 105                 110

tat gtc cca cca tcg tct aca gat aga tcg cca tac gaa aaa gta tcg        384
Tyr Val Pro Pro Ser Ser Thr Asp Arg Ser Pro Tyr Glu Lys Val Ser
        115                 120                 125

gct gga aat gga ggt agt tca ttg tca tac act aat cct gca gtc gct        432
Ala Gly Asn Gly Gly Ser Ser Leu Ser Tyr Thr Asn Pro Ala Val Ala
    130                 135                 140

gct acg tcc gct aat cta tgt caa tgt cgt agg aaa aac tac ggt caa        480
Ala Thr Ser Ala Asn Leu Cys Gln Cys Arg Arg Lys Asn Tyr Gly Gln
145                 150                 155                 160

ttg gat ata ttc cca gcc agg gac act tat cat cct atg tcc gaa tac        528
Leu Asp Ile Phe Pro Ala Arg Asp Thr Tyr His Pro Met Ser Glu Tyr
                165                 170                 175

cca acg tac cat aca cat ggc agg tat gtt cct cct tct tca act gat        576
Pro Thr Tyr His Thr His Gly Arg Tyr Val Pro Pro Ser Ser Thr Asp
            180                 185                 190

aga tcc ccg tat gaa aag gta tca gct gga aac ggt gga agt tcc tta        624
Arg Ser Pro Tyr Glu Lys Val Ser Ala Gly Asn Gly Gly Ser Ser Leu
        195                 200                 205

tca tat aca aat ccg gct gtt gcg gcg aca tct gca aat tta cat cat        672
Ser Tyr Thr Asn Pro Ala Val Ala Ala Thr Ser Ala Asn Leu His His
    210                 215                 220

cac cac cat cac tga                                                    687
His His His His
225
```

<210> 17
<211> 228
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 17

```
Met Ala Asp Glu Ala Pro Cys Gln Cys Arg Arg Lys Asn Tyr Gly Gln
1               5                   10                  15

Leu Asp Ile Phe Pro Ala Arg Asp Thr Tyr His Pro Met Ser Glu Tyr
            20                  25                  30
```

```
Pro Thr Tyr His Thr His Gly Arg Tyr Val Pro Pro Ser Ser Thr Asp
        35                  40                  45

Arg Ser Pro Tyr Glu Lys Val Ser Ala Gly Asn Gly Gly Ser Ser Leu
    50                  55                  60

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

Cys Arg Arg Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala Arg Asp
                85                  90                  95

Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His Gly Arg
            100                 105                 110

Tyr Val Pro Pro Ser Ser Thr Asp Arg Ser Pro Tyr Glu Lys Val Ser
        115                 120                 125

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

Ala Thr Ser Ala Asn Leu Cys Gln Cys Arg Arg Lys Asn Tyr Gly Gln
145                 150                 155                 160

Leu Asp Ile Phe Pro Ala Arg Asp Thr Tyr His Pro Met Ser Glu Tyr
                165                 170                 175

Pro Thr Tyr His Thr His Gly Arg Tyr Val Pro Pro Ser Ser Thr Asp
            180                 185                 190

Arg Ser Pro Tyr Glu Lys Val Ser Ala Gly Asn Gly Gly Ser Ser Leu
        195                 200                 205

Ser Tyr Thr Asn Pro Ala Val Ala Ala Thr Ser Ala Asn Leu His His
    210                 215                 220

His His His His
225
```

<210> 18
<211> 216
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 18

```
Cys Gln Cys Arg Arg Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala
1               5                   10                  15
```

Arg Asp Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His
20 25 30

Gly Arg Tyr Val Pro Pro Ser Ser Thr Asp Arg Ser Pro Tyr Glu Lys
35 40 45

Val Ser Ala Gly Asn Gly Gly Ser Ser Leu Ser Tyr Thr Asn Pro Ala
50 55 60

Val Ala Ala Thr Ser Ala Asn Leu Cys Gln Cys Arg Arg Lys Asn Tyr
65 70 75 80

Gly Gln Leu Asp Ile Phe Pro Ala Arg Asp Thr Tyr His Pro Met Ser
85 90 95

Glu Tyr Pro Thr Tyr His Thr His Gly Arg Tyr Val Pro Pro Ser Ser
100 105 110

Thr Asp Arg Ser Pro Tyr Glu Lys Val Ser Ala Gly Asn Gly Gly Ser
115 120 125

Ser Leu Ser Tyr Thr Asn Pro Ala Val Ala Ala Thr Ser Ala Asn Leu
130 135 140

Cys Gln Cys Arg Arg Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala
145 150 155 160

Arg Asp Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His
165 170 175

Gly Arg Tyr Val Pro Pro Ser Ser Thr Asp Arg Ser Pro Tyr Glu Lys
180 185 190

Val Ser Ala Gly Asn Gly Gly Ser Ser Leu Ser Tyr Thr Asn Pro Ala
195 200 205

Val Ala Ala Thr Ser Ala Asn Leu
210 215

<210> 19
<211> 89
<212> PRT
<213> Saccharomyces cerevisiae

<400> 19

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

Ala Ser Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln
20 25 30

Ile Pro Ala Glu Ala Val Ile Gly Tyr Leu Asp Leu Glu Gly Asp Phe

35 40 45

Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
50 55 60

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

Ser Leu Asp Lys Arg Glu Ala Glu Ala
85

<210> 20
<211> 89
<212> PRT
<213> Saccharomyces cerevisiae

<400> 20

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

Ala Leu Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln
20 25 30

Ile Pro Ala Glu Ala Val Ile Gly Tyr Leu Asp Leu Glu Gly Asp Phe
35 40 45

Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
50 55 60

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

Ser Leu Asp Lys Arg Glu Ala Glu Ala
85

<210> 21
<211> 6
<212> PRT
<213> Artificial

<220>
<223> Synthetic Peptide

<400> 21

Met Ala Asp Glu Ala Pro
1 5

<210> 22
<211> 779
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<220>
<221> CDS
<222> (13)..(771)

<400> 22

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gaattcgcca cc atg aca cca ggg aca caa agc cca ttt ttc cta ttg cta       51
              Met Thr Pro Gly Thr Gln Ser Pro Phe Phe Leu Leu Leu
              1               5                   10

ctc ttg act gtc tta acc gca acc act gct cca aaa cca gca act gtg         99
Leu Leu Thr Val Leu Thr Ala Thr Thr Ala Pro Lys Pro Ala Thr Val
    15                  20                  25

gtc ggt tca gtt gtg gtt cag tta aca ctt gct ttt aga gaa gga aca        147
Val Gly Ser Val Val Val Gln Leu Thr Leu Ala Phe Arg Glu Gly Thr
30                  35                  40                  45

att aac gta cac gat gta gaa act caa ttc aat caa tac aag aca gaa        195
Ile Asn Val His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys Thr Glu
                50                  55                  60

gcg gcc agt aga tac aat ttg aca att tct gac gtt tct gtg tct gac        243
Ala Ala Ser Arg Tyr Asn Leu Thr Ile Ser Asp Val Ser Val Ser Asp
            65                  70                  75

gtg cca ttt cca ttc tcc gct caa tca ggt gcc ggt gca cat ggc gta        291
Val Pro Phe Pro Phe Ser Ala Gln Ser Gly Ala Gly Ala His Gly Val
        80                  85                  90

acg tcc tac ctg gat aca aga cct gca cca gta tac ctc gca cct cct        339
Thr Ser Tyr Leu Asp Thr Arg Pro Ala Pro Val Tyr Leu Ala Pro Pro
    95                  100                 105

gct cat gga gtt aca tct gcc cct gag tcc agg cca gct cct ggt tct        387
Ala His Gly Val Thr Ser Ala Pro Glu Ser Arg Pro Ala Pro Gly Ser
110                 115                 120                 125

acc gca cca cct gct gtt cca ggt tgg ggc atc gcc ttg ctg gtc tta        435
Thr Ala Pro Pro Ala Val Pro Gly Trp Gly Ile Ala Leu Leu Val Leu
                130                 135                 140

gtt tgt gtc ctg gtg tac ttg gct ata gtc tac tta atc gca cta gct        483
Val Cys Val Leu Val Tyr Leu Ala Ile Val Tyr Leu Ile Ala Leu Ala
            145                 150                 155

gta tgc cag gtt aga aga aag aac tac ggc caa ttg gat atc ttt cca        531
Val Cys Gln Val Arg Arg Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro
        160                 165                 170

gcg aga gat act tat cat cca atg tca gag tat cca act tat cat aca        579
Ala Arg Asp Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr
    175                 180                 185

cat gga cgt tat gtt cca cct tcc tct ctt ttt aga agt cct tac gaa        627
His Gly Arg Tyr Val Pro Pro Ser Ser Leu Phe Arg Ser Pro Tyr Glu
190                 195                 200                 205

aaa gtt tca gca ggt aat gga ggc tca tac ctt tca tac act aat cca        675
Lys Val Ser Ala Gly Asn Gly Gly Ser Tyr Leu Ser Tyr Thr Asn Pro
                210                 215                 220

gcc gtt gct gcg act tct gca aac ttg gaa cct gcc agt ggg agc gct        723
Ala Val Ala Ala Thr Ser Ala Asn Leu Glu Pro Ala Ser Gly Ser Ala
            225                 230                 235

gct tta tgg ggt caa gat gta acc tct cat cac cat cac cac cat tag        771
Ala Leu Trp Gly Gln Asp Val Thr Ser His His His His His His
```

240 245 250

gcggccgc 779

<210> 23
<211> 252
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 23

Met Thr Pro Gly Thr Gln Ser Pro Phe Phe Leu Leu Leu Leu Thr
1 5 10 15

Val Leu Thr Ala Thr Thr Ala Pro Lys Pro Ala Thr Val Val Gly Ser
20 25 30

Val Val Val Gln Leu Thr Leu Ala Phe Arg Glu Gly Thr Ile Asn Val
35 40 45

His Asp Val Glu Thr Gln Phe Asn Gln Tyr Lys Thr Glu Ala Ala Ser
50 55 60

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

Pro Phe Ser Ala Gln Ser Gly Ala Gly Ala His Gly Val Thr Ser Tyr
85 90 95

Leu Asp Thr Arg Pro Ala Pro Val Tyr Leu Ala Pro Pro Ala His Gly
100 105 110

Val Thr Ser Ala Pro Glu Ser Arg Pro Ala Pro Gly Ser Thr Ala Pro
115 120 125

Pro Ala Val Pro Gly Trp Gly Ile Ala Leu Leu Val Leu Val Cys Val
130 135 140

Leu Val Tyr Leu Ala Ile Val Tyr Leu Ile Ala Leu Ala Val Cys Gln
145 150 155 160

Val Arg Arg Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala Arg Asp
165 170 175

Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His Gly Arg
180 185 190

Tyr Val Pro Pro Ser Ser Leu Phe Arg Ser Pro Tyr Glu Lys Val Ser
195 200 205

Ala Gly Asn Gly Gly Ser Tyr Leu Ser Tyr Thr Asn Pro Ala Val Ala

210 215 220

Ala Thr Ser Ala Asn Leu Glu Pro Ala Ser Gly Ser Ala Ala Leu Trp
225 230 235 240

Gly Gln Asp Val Thr Ser His His His His His His
245 250

<210> 24
<211> 1727
<212> DNA
<213> Artificial

<220>
<223> Synthetic Construct

<220>
<221> CDS
<222> (1)..(1719)

<400> 24
atg aga ttt cct tca att ttt act gca gtt tta ttc gca gca tcc tcc 48
Met Arg Phe Pro Ser Ile Phe Thr Ala Val Leu Phe Ala Ala Ser Ser
1 5 10 15

gca tca gct gct cca gtc aac act aca aca gaa gat gaa acg gca caa 96
Ala Ser Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln
20 25 30

att ccg gct gaa gct gtc atc ggt tac tta gat tta gaa ggg gat ttc 144
Ile Pro Ala Glu Ala Val Ile Gly Tyr Leu Asp Leu Glu Gly Asp Phe
35 40 45

gat gtt gct gtt ttg cca ttt tcc aac agc aca aat aac ggg tta ttg 192
Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
50 55 60

ttt ata aat act act att gcc agc att gct gct aaa gaa gaa ggg gta 240
Phe Ile Asn Thr Thr Ile Ala Ser Ile Ala Ala Lys Glu Glu Gly Val
65 70 75 80

tct cta gat aaa aga gag gct gaa gct act agt atg act cca ggt aca 288
Ser Leu Asp Lys Arg Glu Ala Glu Ala Thr Ser Met Thr Pro Gly Thr
85 90 95

caa tca cca ttc ttt ttg ttg cta ttg tta acc gtt ctg acc gtc gtt 336
Gln Ser Pro Phe Phe Leu Leu Leu Leu Leu Thr Val Leu Thr Val Val
100 105 110

act gga tca ggt cac gcc tct agt acg cca gga ggt gaa aaa gag act 384
Thr Gly Ser Gly His Ala Ser Ser Thr Pro Gly Gly Glu Lys Glu Thr
115 120 125

tct gcc aca caa aga tcc tct gtc cca tca tct act gag aaa aat gca 432
Ser Ala Thr Gln Arg Ser Ser Val Pro Ser Ser Thr Glu Lys Asn Ala
130 135 140

gtt tct atg aca tcc tca gta ttg tcc tca cat tcc cct ggt tct ggt 480
Val Ser Met Thr Ser Ser Val Leu Ser Ser His Ser Pro Gly Ser Gly
145 150 155 160

tcc tct aca act cag gga caa gat gtg acg ttg gct cct gca acc gaa 528
Ser Ser Thr Thr Gln Gly Gln Asp Val Thr Leu Ala Pro Ala Thr Glu
165 170 175

```
cca gcc tcc ggg agt gcg gct cta tgg ggg caa gat gtc aca tca gtc        576
Pro Ala Ser Gly Ser Ala Ala Leu Trp Gly Gln Asp Val Thr Ser Val
            180                 185                 190

cca gta aca aga cct gca tta gga tca aca act cca cct gct cac gat        624
Pro Val Thr Arg Pro Ala Leu Gly Ser Thr Thr Pro Pro Ala His Asp
        195                 200                 205

gta aca agc gca cca gat aac aag cct gca cct ggc tct acc gct cca        672
Val Thr Ser Ala Pro Asp Asn Lys Pro Ala Pro Gly Ser Thr Ala Pro
    210                 215                 220

cct gcc cac ggc gta aca agt tat ttg gat aca aga cca gca cct gtt        720
Pro Ala His Gly Val Thr Ser Tyr Leu Asp Thr Arg Pro Ala Pro Val
225                 230                 235                 240

tac ttg gca cct cct gct cac ggt gtt aca tct gct cct gac aat aga        768
Tyr Leu Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Asn Arg
                245                 250                 255

cca gct tta gga tct act gct cct cca gtg cat aac gta act tca gcc        816
Pro Ala Leu Gly Ser Thr Ala Pro Pro Val His Asn Val Thr Ser Ala
            260                 265                 270

tca ggc tcc gca tcc ggt tct gct tca aca ctt gtc cac aat gga act        864
Ser Gly Ser Ala Ser Gly Ser Ala Ser Thr Leu Val His Asn Gly Thr
        275                 280                 285

tct gct aga gca aca aca aca cca gcc tct aaa agt act cct ttc tct        912
Ser Ala Arg Ala Thr Thr Thr Pro Ala Ser Lys Ser Thr Pro Phe Ser
    290                 295                 300

atc cca tct cat cat tct gat act cct aca act tta gct tca cac tca        960
Ile Pro Ser His His Ser Asp Thr Pro Thr Thr Leu Ala Ser His Ser
305                 310                 315                 320

act aaa aca gat gcc agt agt act cat cat tcc tct gta cca cct ctt       1008
Thr Lys Thr Asp Ala Ser Ser Thr His His Ser Ser Val Pro Pro Leu
                325                 330                 335

aca tct tct aat cat tca aca tca cca caa ctc tcc act ggt gtg agc       1056
Thr Ser Ser Asn His Ser Thr Ser Pro Gln Leu Ser Thr Gly Val Ser
            340                 345                 350

ttc ttc ttc ctc tct ttt cac att tca aac ctg caa ttc aac tct tcc       1104
Phe Phe Phe Leu Ser Phe His Ile Ser Asn Leu Gln Phe Asn Ser Ser
        355                 360                 365

cta gag gac cca tct acg gac tat tat caa gag ttg caa aga gat atc       1152
Leu Glu Asp Pro Ser Thr Asp Tyr Tyr Gln Glu Leu Gln Arg Asp Ile
    370                 375                 380

agc gaa atg ttt cta cag atc tac aag caa ggt gga ttt ttg gga cta       1200
Ser Glu Met Phe Leu Gln Ile Tyr Lys Gln Gly Gly Phe Leu Gly Leu
385                 390                 395                 400

tca aac ata aag ttt aga cca ggc agc gtt gtc gtc caa ctt acc tta       1248
Ser Asn Ile Lys Phe Arg Pro Gly Ser Val Val Val Gln Leu Thr Leu
                405                 410                 415

gct ttt aga gaa ggg act att aat gtt cat gat gtg gaa acc cag ttt       1296
Ala Phe Arg Glu Gly Thr Ile Asn Val His Asp Val Glu Thr Gln Phe
            420                 425                 430

aat caa tac aag aca gaa gca gct tca cga tac aat ttg aca att tcc       1344
Asn Gln Tyr Lys Thr Glu Ala Ala Ser Arg Tyr Asn Leu Thr Ile Ser
        435                 440                 445
```

```
gat gtt tct gtt tcc gac gta cct ttt cca ttc tct gcc caa agt ggt       1392
Asp Val Ser Val Ser Asp Val Pro Phe Pro Phe Ser Ala Gln Ser Gly
    450                 455                 460

gcg ggt gtt cca ggt tgg ggg att gct ctg tta gtg tta gtc tgt gtt       1440
Ala Gly Val Pro Gly Trp Gly Ile Ala Leu Leu Val Leu Val Cys Val
465                 470                 475                 480

ctc gtt tac tta gct atc gta tac tta ata gcc cta gca gtt tgc cag       1488
Leu Val Tyr Leu Ala Ile Val Tyr Leu Ile Ala Leu Ala Val Cys Gln
                485                 490                 495

gtg aga agg aaa aac tat ggc caa ttg gat atc ttt cct gct aga gac       1536
Val Arg Arg Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala Arg Asp
            500                 505                 510

act tac cat cca atg tct gaa tat cca acc tac cat aca cat ggt agg       1584
Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His Gly Arg
        515                 520                 525

tac gtg cca cca tca agt ctt ttt cgt tca cca tac gaa aaa gtt agc       1632
Tyr Val Pro Pro Ser Ser Leu Phe Arg Ser Pro Tyr Glu Lys Val Ser
    530                 535                 540

gca ggt aat ggc ggc agt tac ctg tca tac act aac cca gcg gtt gct       1680
Ala Gly Asn Gly Gly Ser Tyr Leu Ser Tyr Thr Asn Pro Ala Val Ala
545                 550                 555                 560

gcg gct agt gcc aat ctt cat cac cat cat cac cat taa gcggccgc          1727
Ala Ala Ser Ala Asn Leu His His His His His His
                565                 570
```

<210> 25
<211> 572
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 25

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

Ala Ser Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln
            20                  25                  30

Ile Pro Ala Glu Ala Val Ile Gly Tyr Leu Asp Leu Glu Gly Asp Phe
        35                  40                  45

Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
    50                  55                  60

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

Ser Leu Asp Lys Arg Glu Ala Glu Ala Thr Ser Met Thr Pro Gly Thr
                85                  90                  95
```

```
Gln Ser Pro Phe Phe Leu Leu Leu Leu Thr Val Leu Thr Val Val
            100                 105                 110

Thr Gly Ser Gly His Ala Ser Ser Thr Pro Gly Gly Glu Lys Glu Thr
        115                 120                 125

Ser Ala Thr Gln Arg Ser Ser Val Pro Ser Ser Thr Glu Lys Asn Ala
    130                 135                 140

Val Ser Met Thr Ser Ser Val Leu Ser Ser His Ser Pro Gly Ser Gly
145                 150                 155                 160

Ser Ser Thr Thr Gln Gly Gln Asp Val Thr Leu Ala Pro Ala Thr Glu
                165                 170                 175

Pro Ala Ser Gly Ser Ala Ala Leu Trp Gly Gln Asp Val Thr Ser Val
            180                 185                 190

Pro Val Thr Arg Pro Ala Leu Gly Ser Thr Thr Pro Pro Ala His Asp
        195                 200                 205

Val Thr Ser Ala Pro Asp Asn Lys Pro Ala Pro Gly Ser Thr Ala Pro
    210                 215                 220

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

Tyr Leu Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Asn Arg
                245                 250                 255

Pro Ala Leu Gly Ser Thr Ala Pro Pro Val His Asn Val Thr Ser Ala
            260                 265                 270

Ser Gly Ser Ala Ser Gly Ser Ala Ser Thr Leu Val His Asn Gly Thr
        275                 280                 285

Ser Ala Arg Ala Thr Thr Thr Pro Ala Ser Lys Ser Thr Pro Phe Ser
    290                 295                 300

Ile Pro Ser His His Ser Asp Thr Pro Thr Thr Leu Ala Ser His Ser
305                 310                 315                 320

Thr Lys Thr Asp Ala Ser Ser Thr His His Ser Ser Val Pro Pro Leu
                325                 330                 335

Thr Ser Ser Asn His Ser Thr Ser Pro Gln Leu Ser Thr Gly Val Ser
            340                 345                 350

Phe Phe Phe Leu Ser Phe His Ile Ser Asn Leu Gln Phe Asn Ser Ser
        355                 360                 365
```

```
Leu Glu Asp Pro Ser Thr Asp Tyr Tyr Gln Glu Leu Gln Arg Asp Ile
    370                 375                 380

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

Ser Asn Ile Lys Phe Arg Pro Gly Ser Val Val Val Gln Leu Thr Leu
                405                 410                 415

Ala Phe Arg Glu Gly Thr Ile Asn Val His Asp Val Glu Thr Gln Phe
            420                 425                 430

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

Asp Val Ser Val Ser Asp Val Pro Phe Pro Phe Ser Ala Gln Ser Gly
    450                 455                 460

Ala Gly Val Pro Gly Trp Gly Ile Ala Leu Leu Val Leu Val Cys Val
465                 470                 475                 480

Leu Val Tyr Leu Ala Ile Val Tyr Leu Ile Ala Leu Ala Val Cys Gln
                485                 490                 495

Val Arg Arg Lys Asn Tyr Gly Gln Leu Asp Ile Phe Pro Ala Arg Asp
            500                 505                 510

Thr Tyr His Pro Met Ser Glu Tyr Pro Thr Tyr His Thr His Gly Arg
        515                 520                 525

Tyr Val Pro Pro Ser Ser Leu Phe Arg Ser Pro Tyr Glu Lys Val Ser
    530                 535                 540

Ala Gly Asn Gly Gly Ser Tyr Leu Ser Tyr Thr Asn Pro Ala Val Ala
545                 550                 555                 560

Ala Ala Ser Ala Asn Leu His His His His His His
                565                 570
```