SEQUENCE LISTING

<110> Firmenich SA
Pfister, Patrick
Rogers, Matthew E
Kao, Huey-Ling
Abibi, Claude Ayome

<120> Method of identifying malodor modulating compounds

<130> 10020/WO

<160> 55

<170> PatentIn version 3.5

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<213> Mus musculus

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aagtttccca tgtatttttt cctcaacttt ctgtcttttg tggacatttg ctactcctca 240

gtcacagcac ccaagatgat tattgacctg ttagtgaaga aaaagactat atcctatgtg 300

gggtgcatgt tacaactctt tgtggttcat ttctttggtt gcactgagat cttcattctt 360

actgtcatgg cctatgatag atatgtggcc atttgtaaac ctctccacta tatgactatg 420

atggaccggg aaagatgcaa taagatgttg ctcggaacat ggatcggtgg cttcttacat 480

tctattatcc aagtggctct tgtggtccag ctccccttttt gtggaccgaa tgagattgat 540

cactatttct gtgatgtaca tcctgtactg aaacttgcct gcactgacac ttacattgtt 600

ggtatttttg tgacagcaaa cagtggcacc attgcattgg gaagttttgt catcttgctg 660

atctcataca cagtcattct catgtctctg agaaagcagt catctgaagg cagacgcaaa 720

gctctctcca cttgtggatc ccacattgct gttgtcatca tttttttttgg cccctgtact 780

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<212> PRT
<213> Mus musculus

<400> 2

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Phe Val Val Phe Ser Phe Phe Tyr Met Val Ile Leu Leu Gly Asn Leu
        35                  40                  45


Leu Ile Met Leu Thr Val Cys Ser Gly Asn Leu Phe Lys Phe Pro Met
    50                  55                  60


Tyr Phe Phe Leu Asn Phe Leu Ser Phe Val Asp Ile Cys Tyr Ser Ser
65                  70                  75                  80


Val Thr Ala Pro Lys Met Ile Ile Asp Leu Leu Val Lys Lys Lys Thr
                85                  90                  95


Ile Ser Tyr Val Gly Cys Met Leu Gln Leu Phe Val Val His Phe Phe
            100                 105                 110


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


Val Ala Ile Cys Lys Pro Leu His Tyr Met Thr Met Met Asp Arg Glu
    130                 135                 140


Arg Cys Asn Lys Met Leu Leu Gly Thr Trp Ile Gly Gly Phe Leu His
145                 150                 155                 160


Ser Ile Ile Gln Val Ala Leu Val Val Gln Leu Pro Phe Cys Gly Pro
                165                 170                 175


Asn Glu Ile Asp His Tyr Phe Cys Asp Val His Pro Val Leu Lys Leu
            180                 185                 190
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Ala Cys Thr Asp Thr Tyr Ile Val Gly Ile Phe Val Thr Ala Asn Ser
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Gly Thr Ile Ala Leu Gly Ser Phe Val Ile Leu Leu Ile Ser Tyr Thr
    210                 215                 220

Val Ile Leu Met Ser Leu Arg Lys Gln Ser Ser Glu Gly Arg Arg Lys
225                 230                 235                 240

Ala Leu Ser Thr Cys Gly Ser His Ile Ala Val Val Ile Ile Phe Phe
                245                 250                 255

Gly Pro Cys Thr Phe Met Tyr Met Arg Pro Asp Thr Thr Phe Ser Glu
            260                 265                 270

Asp Lys Met Val Ala Ile Phe Tyr Thr Ile Ile Thr Pro Met Leu Asn
        275                 280                 285

Pro Leu Ile Tyr Thr Leu Arg Asn Ala Glu Val Lys Asn Ala Met Arg
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Lys Leu Trp Ala Arg Lys Phe Ser Trp Glu Thr Thr Gly Lys
305                 310                 315
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gtcattgggg attgtcggct acacaacccc atgtactatt tcctaagtgt tttgtctttc      240

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aataagtcca tttcattcct tgcatgtgca acccaaatgc ttctctttgt ttcgttggga      360

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<212> PRT
<213> Mus musculus

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Met Glu Lys Ile Thr Ser Ala Val Asp Val His Asn Ile Pro Leu Lys
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Asn Met Thr Glu Ala Thr Met Phe Ile Leu Leu Gly Phe Thr Asp Asp
20 25 30

Phe Glu Leu Gln Val Phe Leu Phe Leu Leu Phe Leu Ala Ile Tyr Leu
35 40 45

Phe Thr Leu Val Gly Asn Phe Gly Leu Val Val Leu Val Ile Gly Asp
50 55 60

Cys Arg Leu His Asn Pro Met Tyr Tyr Phe Leu Ser Val Leu Ser Phe
65 70 75 80

Leu Asp Ala Cys Tyr Ser Thr Val Val Thr Pro Lys Met Leu Val Asn
85 90 95

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

Met Leu Leu Phe Val Ser Leu Gly Thr Thr Glu Cys Phe Leu Leu Ala
115 120 125

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Ala Met Ala Tyr Asp Arg Tyr Val Ala Ile Tyr Asn Pro Leu Leu Tyr
    130                 135                 140

Thr Val Ala Met Ser Pro Arg Val Tyr Leu Pro Leu Ile Ile Ala Ser
145                 150                 155                 160

Tyr Ala Gly Gly Val Val His Gly Ala Ile His Thr Val Ala Thr Phe
                165                 170                 175

Ser Leu Ser Phe Cys Gly Ser Asn Glu Ile Lys His Val Phe Cys Asp
            180                 185                 190

Ile Pro Ala Leu Leu Ala Leu Ser Cys Ser Asp Thr His Thr Asn Glu
        195                 200                 205

Leu Leu Val Leu Tyr Leu Val Gly Leu Ile Glu Ile Val Thr Ile Leu
    210                 215                 220

Ile Val Leu Val Ser Tyr Gly Phe Ile Leu Phe Ala Ile Leu Asn Met
225                 230                 235                 240

His Ser Ala Glu Gly Arg Arg Lys Val Phe Ser Thr Cys Gly Ser His
                245                 250                 255

Leu Thr Gly Val Ser Ile Tyr His Gly Thr Ile Leu Phe Thr Tyr Met
            260                 265                 270

Arg Pro Ser Ser Ser Tyr Ala Ser Asn His Asp Met Val Val Ser Ile
        275                 280                 285

Phe Tyr Thr Ile Val Ile Pro Met Leu Asn Pro Ile Ile Tyr Ser Leu
    290                 295                 300

Arg Asn Lys Asp Val Lys Val Ala Phe Asn Lys Leu Trp Arg Lys Cys
305                 310                 315                 320

Asp Ser
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<210> 5

<211> 948
<212> DNA
<213> Mus musculus

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ggaaacatag gtatgatact gatcattcat ctagatgtcc agctccacac tccaatgtat 180

tttttcctca cccacttgtc attccttgac ctcagttact caactgtaat cacacctaaa 240

accttacaga atacgctgac ctccataaaa aatatttcct tcatgggatg cttcacccag 300

ttgtatttct ttgtcctctt ggcagcttct gaatgtttta tactttcgtc aatggcctat 360

gaccgctatg tagctatctg caaccctcta cactatccag ttattatgtc ccctaggcgc 420

tcatatactc tcatcactgt gtcctacatg attggagttt tggattcttc tgtcactgtc 480

ttttgcttaa gcacactgga tttctgcaac tccaaagtaa ttcatcactt cttttgtgac 540

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<210> 6
<211> 315
<212> PRT
<213> Mus musculus

<400> 6

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1 5 10 15

Leu Thr Asp Ser Lys Glu Ile Gln Leu Val Leu Ser Val Leu Phe Leu
20 25 30

Leu Ile Tyr Met Leu Thr Val Leu Gly Asn Ile Gly Met Ile Leu Ile
35 40 45

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Ile His Leu Asp Val Gln Leu His Thr Pro Met Tyr Phe Phe Leu Thr
    50                  55                  60

His Leu Ser Phe Leu Asp Leu Ser Tyr Ser Thr Val Ile Thr Pro Lys
65                  70                  75                  80

Thr Leu Gln Asn Thr Leu Thr Ser Ile Lys Asn Ile Ser Phe Met Gly
                85                  90                  95

Cys Phe Thr Gln Leu Tyr Phe Phe Val Leu Leu Ala Ala Ser Glu Cys
            100                 105                 110

Phe Ile Leu Ser Ser Met Ala Tyr Asp Arg Tyr Val Ala Ile Cys Asn
        115                 120                 125

Pro Leu His Tyr Pro Val Ile Met Ser Pro Arg Arg Ser Tyr Thr Leu
    130                 135                 140

Ile Thr Val Ser Tyr Met Ile Gly Val Leu Asp Ser Ser Val Thr Val
145                 150                 155                 160

Phe Cys Leu Ser Thr Leu Asp Phe Cys Asn Ser Lys Val Ile His His
                165                 170                 175

Phe Phe Cys Asp Thr Phe Pro Ile Leu Ala Leu Ser Cys Ser Asp Thr
            180                 185                 190

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

Leu Ser Leu Ile Thr Ile Ser Ser Ser Tyr Val Ser Ile Leu Ser Thr
    210                 215                 220

Ile Leu Lys Ile Asn Ser Ser Ser Gly Lys His Lys Ala Phe Ser Thr
225                 230                 235                 240

Cys Ala Ser His Leu Ile Gly Val Thr Val Phe Tyr Gly Thr Met Ile
                245                 250                 255

Phe Thr Tyr Leu Lys Pro Ser Thr Ser Tyr Ser Leu Gly Lys Asp Gln
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260 265 270

Val Ala Ser Val Phe Tyr Thr Ile Val Ile Pro Met Leu Asn Pro Leu
275 280 285

Ile Tyr Ser Leu Arg Asn Lys Glu Val Lys Ser Ala Val Val Arg Val
290 295 300

Met Lys Lys Arg Glu Cys Ile Gln Lys Leu Glu
305 310 315

<210> 7
<211> 939
<212> DNA
<213> Mus musculus

<400> 7
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aactcaggaa tgatccacct cattcgtgtg gatccaaggc tccacacccc catgtacttt 180

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gcatttaact tcctttctgg ccagaaaagc atctcttttc tgggctgtgg agtgcaatcc 300

ttcttcttcc tgactatggc atgttctgag ggcttgctct tggcttccat ggcttatgat 360

cgttttgtgg ctatctgcca tccccttcac tatcccattc gcatgagcaa aataatgtgt 420

ctgaagatga tcataggatc ctggatattg ggctcaatca actctttagc acataccgtc 480

tatgcccttc atattcctta ctgccattct aggtccatta accatttctt ctgtgatgtt 540

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tcaactcact taactgtggt gacattttac tatgcacctt ttgtctatac ctatcttcga 780

cctaggagtc ttcgctcccc aacagaagat aagattctgg ctgttttcta cactatcctt 840

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acaagagtcc ttggtacttt tccttcaact aaaccgtaa 939

<210> 8

<211> 312
<212> PRT
<213> Mus musculus

<400> 8

Met Glu Lys Trp Asn Gln Ser Ser Ser Asp Phe Thr Leu Leu Gly Leu
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Leu Pro Gln Asn Gln Thr Gly Leu Leu Leu Leu Met Leu Ile Ile Phe
20 25 30

Val Phe Ser Leu Ala Leu Cys Gly Asn Ser Gly Met Ile His Leu Ile
35 40 45

Arg Val Asp Pro Arg Leu His Thr Pro Met Tyr Phe Leu Leu Ser Gln
50 55 60

Leu Ser Leu Met Asp Leu Met Tyr Ile Ser Thr Thr Val Pro Lys Met
65 70 75 80

Ala Phe Asn Phe Leu Ser Gly Gln Lys Ser Ile Ser Phe Leu Gly Cys
85 90 95

Gly Val Gln Ser Phe Phe Phe Leu Thr Met Ala Cys Ser Glu Gly Leu
100 105 110

Leu Leu Ala Ser Met Ala Tyr Asp Arg Phe Val Ala Ile Cys His Pro
115 120 125

Leu His Tyr Pro Ile Arg Met Ser Lys Ile Met Cys Leu Lys Met Ile
130 135 140

Ile Gly Ser Trp Ile Leu Gly Ser Ile Asn Ser Leu Ala His Thr Val
145 150 155 160

Tyr Ala Leu His Ile Pro Tyr Cys His Ser Arg Ser Ile Asn His Phe
165 170 175

Phe Cys Asp Val Pro Ala Met Leu Pro Leu Ala Cys Met Asp Thr Trp
180 185 190

Val Tyr Glu Tyr Met Val Phe Val Ser Thr Ser Leu Phe Leu Leu Leu

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        195                 200                 205

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

Phe His Met Arg Ser Lys Glu Gly Lys Lys Lys Ala Phe Thr Thr Cys
225                 230                 235                 240

Ser Thr His Leu Thr Val Val Thr Phe Tyr Tyr Ala Pro Phe Val Tyr
                245                 250                 255

Thr Tyr Leu Arg Pro Arg Ser Leu Arg Ser Pro Thr Glu Asp Lys Ile
            260                 265                 270

Leu Ala Val Phe Tyr Thr Ile Leu Thr Pro Met Leu Asn Pro Ile Ile
        275                 280                 285

Tyr Ser Leu Arg Asn Lys Glu Val Leu Gly Ala Met Thr Arg Val Leu
    290                 295                 300

Gly Thr Phe Pro Ser Thr Lys Pro
305                 310
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<210> 9
<211> 942
<212> DNA
<213> Mus musculus

<400> 9

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ttcctgctta gtcatctctc cttcatggat atcttgcaca tttccaacat tgttcctaaa      240

atgattgctg acttcctctc aggcagcaga actatttcct ttgcaggctg tgccttccag      300

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gtttttgcac tccactttcc cttctgccac tcaagagcca ttgatcactt tttctgcgaa      540
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gtgagtggca ttatttttct gctgatccca ttttccatga tctctatatc ttatgtgcaa 660

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tgttccttcc acatggttgt tgtcataatg tactatgggc cattcatttt tacatatatg 780

agacctcgct cataccacac tccagggcag gataaatttt tggcaatatt ctacaccatc 840

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<211> 313
<212> PRT
<213> Mus musculus

<400> 10

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Leu Phe Ser Ser Ser Lys Thr Ser Leu Thr Phe Phe Ser Phe Ile Phe
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Phe Ile Phe Ile Met Ala Ile Thr Glu Asn Ala Leu Met Ile Leu Leu
35 40 45

Ile His Arg Asp Ser Arg Leu His Thr Pro Met Tyr Phe Leu Leu Ser
50 55 60

His Leu Ser Phe Met Asp Ile Leu His Ile Ser Asn Ile Val Pro Lys
65 70 75 80

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

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

Leu Leu Leu Ala Ala Met Ser Tyr Asp Arg Tyr Val Ala Ile Cys His
115 120 125

Pro Leu Arg Tyr Pro Val Leu Met Arg Asp Asn Ser Ser Arg Leu Leu

130 135 140

Ala Ala Gly Ser Trp Leu Val Gly Ile Leu Asn Ser Ile Val His Thr
145 150 155 160

Val Phe Ala Leu His Phe Pro Phe Cys His Ser Arg Ala Ile Asp His
165 170 175

Phe Phe Cys Glu Val Pro Ala Met Leu Lys Leu Ser Cys Ile Asp Thr
180 185 190

Thr His Tyr Glu Arg Gly Val Tyr Val Ser Gly Ile Ile Phe Leu Leu
195 200 205

Ile Pro Phe Ser Met Ile Ser Ile Ser Tyr Val Gln Ile Leu Leu Thr
210 215 220

Val Phe Gln Met Gln Ser Ser Gly Ala Arg Gln Lys Ser Phe Ser Thr
225 230 235 240

Cys Ser Phe His Met Val Val Val Ile Met Tyr Tyr Gly Pro Phe Ile
245 250 255

Phe Thr Tyr Met Arg Pro Arg Ser Tyr His Thr Pro Gly Gln Asp Lys
260 265 270

Phe Leu Ala Ile Phe Tyr Thr Ile Leu Thr Pro Thr Leu Asn Pro Ile
275 280 285

Ile Tyr Ser Phe Arg Asn Lys Asp Val Leu Met Ala Val Lys Asn Ile
290 295 300

Val Gln Ser Asn Phe Leu Asn Lys Lys
305 310

<210> 11
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<212> DNA
<213> Mus musculus

<400> 11
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<212> PRT
<213> Mus musculus

<400> 12

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Ile Leu Leu Gly Phe Pro Cys Pro Lys Glu Gly Gln Ile Leu Leu Phe
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Val Leu Phe Phe Ile Ile Tyr Ile Leu Thr Leu Met Gly Asn Ala Ser
35 40 45

Ile Ile Cys Ala Val Cys Tyr Asp Lys Lys Leu His Ser Pro Met Tyr
50 55 60

Leu Leu Leu Ala Asn Phe Ser Phe Leu Glu Ile Trp Tyr Val Thr Ser

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65                  70                  75                  80

Thr Val Pro Asn Met Leu Ala Asn Phe Leu Ser Asp Thr Lys Val Ile
                85                  90                  95

Ser Phe Ser Gly Cys Phe Leu Gln Phe Tyr Phe Phe Phe Ser Leu Gly
            100                 105                 110

Ser Thr Glu Cys Phe Phe Leu Ala Val Met Ala Phe Asp Arg Tyr Leu
        115                 120                 125

Ala Ile Cys Arg Pro Leu His Tyr Pro Ser Leu Met Thr Gly Arg Leu
    130                 135                 140

Cys Asn Ile Leu Val Ile Ser Cys Trp Val Leu Gly Phe Leu Trp Phe
145                 150                 155                 160

Pro Val Pro Ile Ile Ile Ile Ser Gln Met Ser Phe Cys Gly Ser Arg
                165                 170                 175

Ile Ile Asp His Phe Leu Cys Asp Pro Gly Pro Leu Leu Ala Leu Thr
            180                 185                 190

Cys Val Arg Asn Ser Leu Ile Glu Met Thr Ser Ser Thr Leu Ser Ser
        195                 200                 205

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

Val Met Arg Ala Val Leu Arg Val Pro Ser Ala Ala Gly Arg Arg Lys
225                 230                 235                 240

Ala Phe Ser Thr Cys Gly Ser His Leu Thr Val Val Ser Leu Phe Tyr
                245                 250                 255

Gly Ser Val Met Val Met Tyr Val Ser Pro Thr Ser Glu His Ala Ala
            260                 265                 270

Gly Val Gln Lys Leu Val Thr Leu Phe Tyr Ser Val Val Thr Pro Leu
        275                 280                 285
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Leu Asn Pro Val Ile Tyr Ser Leu Arg Asn Arg Asp Met Lys His Ala
    290                 295                 300


Met Lys Lys Leu Leu Lys Met
305                 310


<210>  13
<211>  936
<212>  DNA
<213>  Mus musculus

<400>  13
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<210>  14
<211>  311
<212>  PRT
<213>  Mus musculus

<400>  14

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

Ile Leu Leu Gly Phe Pro Cys Pro Arg Glu Gly Gln Ile Leu Leu Phe
            20                  25                  30

Val Thr Phe Phe Ile Val Tyr Ile Leu Ile Leu Met Gly Asn Ala Ser
        35                  40                  45

Ile Ile Cys Ala Val Tyr Cys Asp Gln Ser Leu His Thr Pro Met Tyr
    50                  55                  60

Phe Leu Leu Ala Asn Phe Ser Phe Leu Glu Ile Trp Tyr Val Thr Ser
65                  70                  75                  80

Thr Val Pro Asn Met Leu Ala Asn Phe Leu Ser Asp Thr Lys Val Ile
                85                  90                  95

Ser Phe Ser Gly Cys Phe Leu Gln Phe Tyr Phe Phe Phe Ser Phe Gly
            100                 105                 110

Ser Thr Glu Cys Phe Phe Leu Ala Val Met Ala Phe Asp Arg Tyr Leu
        115                 120                 125

Ala Ile Cys Arg Pro Leu His Tyr Pro Ser Leu Met Thr Gly His Leu
    130                 135                 140

Cys Asn Ile Leu Val Ile Ser Cys Trp Val Leu Gly Phe Leu Trp Phe
145                 150                 155                 160

Pro Val Pro Ile Ile Ile Ile Ser Gln Met Ser Phe Cys Gly Ser Arg
                165                 170                 175

Ile Ile Asp His Phe Leu Cys Asp Pro Gly Pro Leu Leu Ala Leu Ala
            180                 185                 190

Cys Ser Arg Ala Pro Leu Met Glu Val Phe Trp Thr Ile Ile Met Ser
        195                 200                 205

Met Leu Leu Val Ile Pro Phe Leu Phe Ile Met Gly Thr Tyr Ile Leu
    210                 215                 220
```

```
Val Leu Arg Ala Val Phe Arg Leu Pro Ser Arg Asp Gly Gln Lys Lys
225                 230                 235                 240

Ala Phe Ser Thr Cys Gly Ser His Leu Thr Val Val Ser Leu Phe Tyr
                245                 250                 255

Cys Ser Val Met Lys Met Tyr Leu Ser Pro Thr Ser Glu His Glu Ala
            260                 265                 270

Gly Met Gln Lys Leu Val Thr Leu Phe Tyr Ser Val Gly Thr Pro Leu
        275                 280                 285

Leu Asn Pro Val Ile Tyr Ser Leu Arg Asn Lys Asp Met Lys Asn Ala
    290                 295                 300

Leu Gln Lys Ile Leu Arg Thr
305                 310
```

<210> 15
<211> 918
<212> DNA
<213> Mus musculus

<400> 15

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atggaactga acaggaccca gctgactgaa tttgttctca gaggaataac agatcgttca       60

gagctgcaag tccccctgtt cctggtgttc tttctcatct atgttatcac catggtgggc      120

aaccttggct taatctttgt catctggaag gaccctcatc ttcacacacc catgtacctt      180

ttccttggaa atttggcctt tgctgatgcc tgtaattcat cctctgtgac accaaagatg      240

cttatgaaat ttttaaataa gaatgacatg atatccatgg gtgagtgttt tgctcaattt      300

tatttctttt gttcaagtgt aactgcagaa gccttcattc tggtagctat ggcctatgac      360

cgctatgtag ccatatgcaa acctctgctc tatgtagtgg tgatgtccaa cagactctgt      420

attcagttca taggtgtatc ctatctaatt ggacttctac atggcttact tcatgtagga      480

ttgttattta ggttaacgtt ttgtagttcc aatgtaatag attatttcta ctgtgacatc      540

ctgccacttt ataggatttc ttgcactgac ccatcgatca atgtactggt agctttcatt      600

atgggtattt tattacaagt gagtaccttt atgagtatta tagtctccta tgtccgtgtc      660

ctctttgcca tcctgagaac aaagtctgag aggggcagaa acaaagcctt ctctacttgc      720

agttcccacc tgtcatctgt gtctttgttc tatggcactc tcttcatcat atatgtcctc      780
```

tctggctctg acacagataa ttatcagggt aaaatgtatt cactgttcta taccattatc 840

attcctctgc taaacccctt catttacagc ctaagaaata aagaagtcat cggtgccttg 900

agaaaagtca gaaaatga 918

<210> 16
<211> 305
<212> PRT
<213> Mus musculus

<400> 16

Met Glu Leu Asn Arg Thr Gln Leu Thr Glu Phe Val Leu Arg Gly Ile
1 5 10 15

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

Ile Tyr Val Ile Thr Met Val Gly Asn Leu Gly Leu Ile Phe Val Ile
35 40 45

Trp Lys Asp Pro His Leu His Thr Pro Met Tyr Leu Phe Leu Gly Asn
50 55 60

Leu Ala Phe Ala Asp Ala Cys Asn Ser Ser Ser Val Thr Pro Lys Met
65 70 75 80

Leu Met Lys Phe Leu Asn Lys Asn Asp Met Ile Ser Met Gly Glu Cys
85 90 95

Phe Ala Gln Phe Tyr Phe Phe Cys Ser Ser Val Thr Ala Glu Ala Phe
100 105 110

Ile Leu Val Ala Met Ala Tyr Asp Arg Tyr Val Ala Ile Cys Lys Pro
115 120 125

Leu Leu Tyr Val Val Val Met Ser Asn Arg Leu Cys Ile Gln Phe Ile
130 135 140

Gly Val Ser Tyr Leu Ile Gly Leu Leu His Gly Leu Leu His Val Gly
145 150 155 160

```
Leu Leu Phe Arg Leu Thr Phe Cys Ser Ser Asn Val Ile Asp Tyr Phe
                165                 170                 175

Tyr Cys Asp Ile Leu Pro Leu Tyr Arg Ile Ser Cys Thr Asp Pro Ser
            180                 185                 190

Ile Asn Val Leu Val Ala Phe Ile Met Gly Ile Leu Leu Gln Val Ser
        195                 200                 205

Thr Phe Met Ser Ile Ile Val Ser Tyr Val Arg Val Leu Phe Ala Ile
    210                 215                 220

Leu Arg Thr Lys Ser Glu Arg Gly Arg Asn Lys Ala Phe Ser Thr Cys
225                 230                 235                 240

Ser Ser His Leu Ser Ser Val Ser Leu Phe Tyr Gly Thr Leu Phe Ile
                245                 250                 255

Ile Tyr Val Leu Ser Gly Ser Asp Thr Asp Asn Tyr Gln Gly Lys Met
            260                 265                 270

Tyr Ser Leu Phe Tyr Thr Ile Ile Ile Pro Leu Leu Asn Pro Phe Ile
        275                 280                 285

Tyr Ser Leu Arg Asn Lys Glu Val Ile Gly Ala Leu Arg Lys Val Arg
    290                 295                 300

Lys
305
```

<210>  17
<211>  951
<212>  DNA
<213>  Mus musculus

<400>  17

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atgcctgggg tcaatacctc cagcctgaca ccaagatact ttattctcaa tgggattcct       60

gggttggaag ctgcacacat ctggatctct ctgccattct tcattatgta cctcattgct      120

gtcacaggta actgtggact tatctacctc atcagtcatg aggaggctct gcaccggccc      180

atgtactact ttctagccat gttgtctgct acagatattt ctgggtgtaa tacaattgtc      240

cccagtatgt tatgcatctt ttggttcagt gtcaaggaga ttgatttcaa tgcctgcctt      300
```

gtacagatgt ttttcatcca catgttaaca ggcatggagt ctggtgtgct catgcttatg 360

gctctcgacc gctatgtggc tatatgctat ccattacgct atactaccat actcaccaac 420

actatgatta ccaagattgg attggcagca cttgttagaa gtgtgttact catggtccct 480

tttgctttcc tgatcaagcg tcttccatac tgtagaggaa acctcatcca acatacctat 540

tgtgatcaca tggctgtggc taaactatcc tgtggcaata ttaagattaa tgctatctat 600

ggtcttataa ttgctatatt tattgggggt tttgatatat tctgtatctc catgtcttat 660

gccatgatta tccatgctgt ggtgaagcta tcttcggcag atgctcgcca taaagccttc 720

agtacctgta catcacacat atgtgctatt gttattacct atgtcccagc attcttcaac 780

ttctttactc atcgctttgg gagaaccact ataccccatc atatccacat tattatagcc 840

aacctgtatc tattgctacc tcccaccttg aatccaattg tatatggagt aaagaccaag 900

cagattcgtg aaggtgtgat caaactgttt gctagacaaa aagttgtttg a 951

<210> 18
<211> 316
<212> PRT
<213> Mus musculus

<400> 18

Met Pro Gly Val Asn Thr Ser Ser Leu Thr Pro Arg Tyr Phe Ile Leu
1 5 10 15

Asn Gly Ile Pro Gly Leu Glu Ala Ala His Ile Trp Ile Ser Leu Pro
20 25 30

Phe Phe Ile Met Tyr Leu Ile Ala Val Thr Gly Asn Cys Gly Leu Ile
35 40 45

Tyr Leu Ile Ser His Glu Glu Ala Leu His Arg Pro Met Tyr Tyr Phe
50 55 60

Leu Ala Met Leu Ser Ala Thr Asp Ile Ser Gly Cys Asn Thr Ile Val
65 70 75 80

Pro Ser Met Leu Cys Ile Phe Trp Phe Ser Val Lys Glu Ile Asp Phe
85 90 95

```
Asn Ala Cys Leu Val Gln Met Phe Phe Ile His Met Leu Thr Gly Met
            100                 105                 110

Glu Ser Gly Val Leu Met Leu Met Ala Leu Asp Arg Tyr Val Ala Ile
        115                 120                 125

Cys Tyr Pro Leu Arg Tyr Thr Thr Ile Leu Thr Asn Thr Met Ile Thr
    130                 135                 140

Lys Ile Gly Leu Ala Ala Leu Val Arg Ser Val Leu Leu Met Val Pro
145                 150                 155                 160

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

Gln His Thr Tyr Cys Asp His Met Ala Val Ala Lys Leu Ser Cys Gly
            180                 185                 190

Asn Ile Lys Ile Asn Ala Ile Tyr Gly Leu Ile Ile Ala Ile Phe Ile
        195                 200                 205

Gly Gly Phe Asp Ile Phe Cys Ile Ser Met Ser Tyr Ala Met Ile Ile
    210                 215                 220

His Ala Val Val Lys Leu Ser Ser Ala Asp Ala Arg His Lys Ala Phe
225                 230                 235                 240

Ser Thr Cys Thr Ser His Ile Cys Ala Ile Val Ile Thr Tyr Val Pro
                245                 250                 255

Ala Phe Phe Asn Phe Phe Thr His Arg Phe Gly Arg Thr Thr Ile Pro
            260                 265                 270

His His Ile His Ile Ile Ile Ala Asn Leu Tyr Leu Leu Leu Pro Pro
        275                 280                 285

Thr Leu Asn Pro Ile Val Tyr Gly Val Lys Thr Lys Gln Ile Arg Glu
    290                 295                 300

Gly Val Ile Lys Leu Phe Ala Arg Gln Lys Val Val
305                 310                 315
```

<210> 19
<211> 954
<212> DNA
<213> Mus musculus

<400> 19
atgctgattt ccaacaactc atatgaagcc ccgcagtctt tcattcttaa tggaattcct 60

ggtctcgaag cagtgcatat atggatctct cttccactct gtacaatgta catcatctcc 120

ctagtaggca accttggcct tgtatatctc atttactatg aggaatcctt acatcgccca 180

atgtatttct ttctggccat gctttctctc atagacctgt ttacttgcac aaccactgtc 240

cccaatgccc tcttcatttt ctggttcaaa ctcaaggaaa ttaacttcac tgcttgccta 300

gttcagatgt tctttgtgca cggattcaca ggtgtggagt ctggggtact catgctcatg 360

gccttggacc gctatgtggc catttgctac ccactacgct atgcaaccat acttaccaac 420

cctgtcattg ccaaagctgg gcttgccacc ttcttgagag gtgtgttact gatgattcct 480

tttccattct tggttaaacg tttgcccttc tgccgaagca atgtcatctc ccatacatat 540

tgtgaccaca tgtctgtggt aaagttatcc tgtgccagca tcaaaatcaa tgtcatctat 600

ggtctcatgg ttgcacttct gattggagtg tttgacatat gttgtatatc tgtgtcctac 660

actatgatcc tccgggcagt ggtcagcctg tcctctgcag atgctcggca gaaggccttc 720

agcacctgca cagcccacat atctgccatc atcattactt atgttccagc cttcttcacc 780

ttctttactc atcgttttgg aggtcacacc atccctcctt ctcttcatat cattgtggct 840

aatctttatc ttcttctccc tccaactcta aatcccattg tttatgggat gaagaccaaa 900

cagatcagag atagtatcat taaattcttt cacggtgaaa aaggttcaag gtga 954

<210> 20
<211> 317
<212> PRT
<213> Mus musculus

<400> 20

Met Leu Ile Ser Asn Asn Ser Tyr Glu Ala Pro Gln Ser Phe Ile Leu
1 5 10 15

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

```
Leu Cys Thr Met Tyr Ile Ile Ser Leu Val Gly Asn Leu Gly Leu Val
        35                  40                  45

Tyr Leu Ile Tyr Tyr Glu Glu Ser Leu His Arg Pro Met Tyr Phe Phe
    50                  55                  60

Leu Ala Met Leu Ser Leu Ile Asp Leu Phe Thr Cys Thr Thr Thr Val
65                  70                  75                  80

Pro Asn Ala Leu Phe Ile Phe Trp Phe Lys Leu Lys Glu Ile Asn Phe
                85                  90                  95

Thr Ala Cys Leu Val Gln Met Phe Phe Val His Gly Phe Thr Gly Val
            100                 105                 110

Glu Ser Gly Val Leu Met Leu Met Ala Leu Asp Arg Tyr Val Ala Ile
        115                 120                 125

Cys Tyr Pro Leu Arg Tyr Ala Thr Ile Leu Thr Asn Pro Val Ile Ala
    130                 135                 140

Lys Ala Gly Leu Ala Thr Phe Leu Arg Gly Val Leu Leu Met Ile Pro
145                 150                 155                 160

Phe Pro Phe Leu Val Lys Arg Leu Pro Phe Cys Arg Ser Asn Val Ile
                165                 170                 175

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

Ser Ile Lys Ile Asn Val Ile Tyr Gly Leu Met Val Ala Leu Leu Ile
        195                 200                 205

Gly Val Phe Asp Ile Cys Cys Ile Ser Val Ser Tyr Thr Met Ile Leu
    210                 215                 220

Arg Ala Val Val Ser Leu Ser Ser Ala Asp Ala Arg Gln Lys Ala Phe
225                 230                 235                 240

Ser Thr Cys Thr Ala His Ile Ser Ala Ile Ile Ile Thr Tyr Val Pro
                245                 250                 255
```

```
Ala Phe Phe Thr Phe Phe Thr His Arg Phe Gly Gly His Thr Ile Pro
            260                 265                 270

Pro Ser Leu His Ile Ile Val Ala Asn Leu Tyr Leu Leu Leu Pro Pro
        275                 280                 285

Thr Leu Asn Pro Ile Val Tyr Gly Met Lys Thr Lys Gln Ile Arg Asp
    290                 295                 300

Ser Ile Ile Lys Phe Phe His Gly Glu Lys Gly Ser Arg
305                 310                 315
```

<210> 21
<211> 936
<212> DNA
<213> Mus musculus

<400> 21

```
atgcaaaacc agagttttgt aacagaattc atattccttg gactttcaca gaaccctaaa       60

gtccagaaaa tagtttttat tgtattttta tttgtctaca ttgcaactgt tgggggcaac      120

atgataattg tggtgaccat tgtctgtagc ccagcattga tagactgccc catgtacttc      180

tttttggcat tcttgtccct attggatgca tgcttctctt ctgtcatcac accaaagatg      240

gttgtggact ccctgtatga gaagaaaact atctcctttg aaggatgtat gatgcagtta      300

tttgctgagc acttccttgc agcagtagaa gtgattgtct tgacagccat ggcctatgac      360

cgctatgtag caatttgcaa gcccttgcac tactcttcca tcatgaactg gaggctctgt      420

ggcacactta tggggatagc atggacaggg ggcttcttgc attctatcat acaaattatc      480

ttcacgttgc aattgccctt ctgtggacca aatgtcatcg atcatttcat gtgtgacttg      540

ttcccattac tggaacttgc ctgcactgat actcatatct ttggcctttt agtggttgcc      600

aacagtgggt ctatctgcat cataatcttc tctattttgc tggtctccta tggtgtcatc      660

ctgttctctc tgaaagctca cagttctgaa gggcgatgga aagctctctc cacatgtgga      720

tcccacattg cagttgtggt tttgttcttt gtcccgtgta tatttattta tgcacgtcct      780

ccatctgctt tctcctttga taaaatggtg gcgatatttt atactatcct aactcccttg      840

ctcaatcctg tgatttatac ttttcggaat aaggacatga aaaatgctat gaagaaagtg      900

tggaagaggt tggcagtggt ttctgatgga aagtga                                936
```

<210> 22
<211> 311
<212> PRT
<213> Mus musculus

<400> 22

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

Gln Asn Pro Lys Val Gln Lys Ile Val Phe Ile Val Phe Leu Phe Val
20 25 30

Tyr Ile Ala Thr Val Gly Gly Asn Met Ile Ile Val Val Thr Ile Val
35 40 45

Cys Ser Pro Ala Leu Ile Asp Cys Pro Met Tyr Phe Phe Leu Ala Phe
50 55 60

Leu Ser Leu Leu Asp Ala Cys Phe Ser Ser Val Ile Thr Pro Lys Met
65 70 75 80

Val Val Asp Ser Leu Tyr Glu Lys Lys Thr Ile Ser Phe Glu Gly Cys
85 90 95

Met Met Gln Leu Phe Ala Glu His Phe Leu Ala Ala Val Glu Val Ile
100 105 110

Val Leu Thr Ala Met Ala Tyr Asp Arg Tyr Val Ala Ile Cys Lys Pro
115 120 125

Leu His Tyr Ser Ser Ile Met Asn Trp Arg Leu Cys Gly Thr Leu Met
130 135 140

Gly Ile Ala Trp Thr Gly Gly Phe Leu His Ser Ile Ile Gln Ile Ile
145 150 155 160

Phe Thr Leu Gln Leu Pro Phe Cys Gly Pro Asn Val Ile Asp His Phe
165 170 175

Met Cys Asp Leu Phe Pro Leu Leu Glu Leu Ala Cys Thr Asp Thr His
180 185 190

```
Ile Phe Gly Leu Leu Val Val Ala Asn Ser Gly Ser Ile Cys Ile Ile
        195                 200                 205

Ile Phe Ser Ile Leu Leu Val Ser Tyr Gly Val Ile Leu Phe Ser Leu
    210                 215                 220

Lys Ala His Ser Ser Glu Gly Arg Trp Lys Ala Leu Ser Thr Cys Gly
225                 230                 235                 240

Ser His Ile Ala Val Val Val Leu Phe Phe Val Pro Cys Ile Phe Ile
                245                 250                 255

Tyr Ala Arg Pro Pro Ser Ala Phe Ser Phe Asp Lys Met Val Ala Ile
            260                 265                 270

Phe Tyr Thr Ile Leu Thr Pro Leu Leu Asn Pro Val Ile Tyr Thr Phe
        275                 280                 285

Arg Asn Lys Asp Met Lys Asn Ala Met Lys Lys Val Trp Lys Arg Leu
    290                 295                 300

Ala Val Val Ser Asp Gly Lys
305                 310
```

<210> 23
<211> 975
<212> DNA
<213> Homo sapiens

<400> 23

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atgcctctat ttaattcatt atgctggttt ccaacaattc atgtgactcc tccatctttt       60

attcttaatg gaatacctgg tctggaaaga gtacatgtat ggatctccct cccactctgc      120

acaatgtaca tcatcttcct tgtggggaat cttggtcttg tgtacctcat ttattatgag      180

gagtccttac atcatccgat gtatttttt tttggccatg ctctctccct cattgacctc      240

cttacctgca ccaccactct acccaatgca ctctgcatct tctggttcag tctcaaagaa      300

attaacttca atgcttgctt ggcccagatg ttctttgttc atgggttcac aggtgtggag      360

tctggggtgc tcatgctcat ggctctagac cgctatgtag ccatttgcta ccctttgcgt      420

tatgctacca cactcaccaa ccctatcatt gccaaggctg agcttgccac cttcctgagg      480
```

ggtgtattgc tgatgattcc tttcccattc ttggttaagc gtttgccttt ctgccaaagc 540

aatattatct cccatacgta ctgcgaccac atgtctgtag taaagctatc ttgtgccagc 600

atcaaggtca atgtaatcta tggtctaatg gttgctctcc tgattggagt gtttgacatt 660

tgttgtatat ctttgtctta cactttgatc ctcaaggcag cgatcagcct ctcttcatca 720

gatgctcggc agaaggcttt cagcacctgc actgcccata tatctgccat catcatcacc 780

tatgttccag cattcttcac tttctttgcc caccgttttg ggggacacac aattcccct 840

tctcttcaca tcattgtggc taatctttat cttcttcttc ccccaactct aaaccctatt 900

gtttatggag taaagacaaa acagatacgc aagagtgtca taaagttctt ccagggtgat 960

aagggtgcag gttga 975

<210> 24
<211> 324
<212> PRT
<213> Homo sapiens

<400> 24

Met Pro Leu Phe Asn Ser Leu Cys Trp Phe Pro Thr Ile His Val Thr
1 5 10 15

Pro Pro Ser Phe Ile Leu Asn Gly Ile Pro Gly Leu Glu Arg Val His
20 25 30

Val Trp Ile Ser Leu Pro Leu Cys Thr Met Tyr Ile Ile Phe Leu Val
35 40 45

Gly Asn Leu Gly Leu Val Tyr Leu Ile Tyr Tyr Glu Glu Ser Leu His
50 55 60

His Pro Met Tyr Phe Phe Phe Gly His Ala Leu Ser Leu Ile Asp Leu
65 70 75 80

Leu Thr Cys Thr Thr Thr Leu Pro Asn Ala Leu Cys Ile Phe Trp Phe
85 90 95

Ser Leu Lys Glu Ile Asn Phe Asn Ala Cys Leu Ala Gln Met Phe Phe
100 105 110

Val His Gly Phe Thr Gly Val Glu Ser Gly Val Leu Met Leu Met Ala

```
        115                 120                 125

Leu Asp Arg Tyr Val Ala Ile Cys Tyr Pro Leu Arg Tyr Ala Thr Thr
    130                 135                 140

Leu Thr Asn Pro Ile Ile Ala Lys Ala Glu Leu Ala Thr Phe Leu Arg
145                 150                 155                 160

Gly Val Leu Leu Met Ile Pro Phe Pro Phe Leu Val Lys Arg Leu Pro
                165                 170                 175

Phe Cys Gln Ser Asn Ile Ile Ser His Thr Tyr Cys Asp His Met Ser
            180                 185                 190

Val Val Lys Leu Ser Cys Ala Ser Ile Lys Val Asn Val Ile Tyr Gly
        195                 200                 205

Leu Met Val Ala Leu Leu Ile Gly Val Phe Asp Ile Cys Cys Ile Ser
    210                 215                 220

Leu Ser Tyr Thr Leu Ile Leu Lys Ala Ala Ile Ser Leu Ser Ser Ser
225                 230                 235                 240

Asp Ala Arg Gln Lys Ala Phe Ser Thr Cys Thr Ala His Ile Ser Ala
                245                 250                 255

Ile Ile Ile Thr Tyr Val Pro Ala Phe Phe Thr Phe Phe Ala His Arg
            260                 265                 270

Phe Gly Gly His Thr Ile Pro Pro Ser Leu His Ile Ile Val Ala Asn
        275                 280                 285

Leu Tyr Leu Leu Leu Pro Pro Thr Leu Asn Pro Ile Val Tyr Gly Val
    290                 295                 300

Lys Thr Lys Gln Ile Arg Lys Ser Val Ile Lys Phe Phe Gln Gly Asp
305                 310                 315                 320

Lys Gly Ala Gly
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<210> 25
<211> 939
<212> DNA
<213> Homo sapiens

<400> 25
atggagaaat ggaatcacac ttcaaatgat ttcattttgt tgggtctgct tcccccaaat 60

caaactggaa tatttctctt gtgccttatc atcctcatat tctttctggc ctcggtgggt 120

aactcggcca tgattcacct catccacgtg gatcctcgtc tccacacacc gatgtacttt 180

cttctcagcc agctctccct tatggacctg atgtacatct ccaccaccgt ccccaagatg 240

gcgtacaact tcctgtccgg ccagaaaggc atctccttcc tgggatgtgg tgtgcaaagc 300

ttcttcttcc tgaccatggc gtgttctgaa ggcttactcc tgacctccat ggcctacgac 360

cgttatttgg ccatctgcca ctctctctat tatcctatcc gcatgagtaa aatgatgtgt 420

gtgaagatga ttggaggctc ttggacactg gggtccatca actccttggc acacacagtc 480

tttgcccttc atattcccta ctgcaggtct agggctattg accatttctt ctgcgatgtc 540

ccagccatgt tgcttcttgc ctgtacagat acttgggtct atgaatatat ggtttttgta 600

agtacaagcc tctttctcct tttccctttc attggcatca cttcttcctg tggccgagtc 660

ctatttgctg tctatcatat gcactcaaag gaggggagaa aaaaggcctt caccaccatt 720

tcaacacatt taactgtagt gatcttttac tatgcacctt ttgtctacac ctatcttcgg 780

cccaggaatc tccgctcacc agctgaagac aagatcctgg cagtcttcta caccatcctt 840

acccccatgc tcaatcccat tatctacagc ctgaggaata aggaagtcct gggggctatg 900

aggagagtgt ttgggatatt ctctttcctg aaagaataa 939

<210> 26
<211> 312
<212> PRT
<213> Homo sapiens

<400> 26

Met Glu Lys Trp Asn His Thr Ser Asn Asp Phe Ile Leu Leu Gly Leu
1 5 10 15

Leu Pro Pro Asn Gln Thr Gly Ile Phe Leu Leu Cys Leu Ile Ile Leu
20 25 30

Ile Phe Phe Leu Ala Ser Val Gly Asn Ser Ala Met Ile His Leu Ile

```
        35                  40                  45

His Val Asp Pro Arg Leu His Thr Pro Met Tyr Phe Leu Leu Ser Gln
    50                  55                  60

Leu Ser Leu Met Asp Leu Met Tyr Ile Ser Thr Thr Val Pro Lys Met
65                  70                  75                  80

Ala Tyr Asn Phe Leu Ser Gly Gln Lys Gly Ile Ser Phe Leu Gly Cys
                85                  90                  95

Gly Val Gln Ser Phe Phe Phe Leu Thr Met Ala Cys Ser Glu Gly Leu
            100                 105                 110

Leu Leu Thr Ser Met Ala Tyr Asp Arg Tyr Leu Ala Ile Cys His Ser
        115                 120                 125

Leu Tyr Tyr Pro Ile Arg Met Ser Lys Met Met Cys Val Lys Met Ile
    130                 135                 140

Gly Gly Ser Trp Thr Leu Gly Ser Ile Asn Ser Leu Ala His Thr Val
145                 150                 155                 160

Phe Ala Leu His Ile Pro Tyr Cys Arg Ser Arg Ala Ile Asp His Phe
                165                 170                 175

Phe Cys Asp Val Pro Ala Met Leu Leu Leu Ala Cys Thr Asp Thr Trp
            180                 185                 190

Val Tyr Glu Tyr Met Val Phe Val Ser Thr Ser Leu Phe Leu Leu Phe
        195                 200                 205

Pro Phe Ile Gly Ile Thr Ser Ser Cys Gly Arg Val Leu Phe Ala Val
    210                 215                 220

Tyr His Met His Ser Lys Glu Gly Arg Lys Lys Ala Phe Thr Thr Ile
225                 230                 235                 240

Ser Thr His Leu Thr Val Val Ile Phe Tyr Tyr Ala Pro Phe Val Tyr
                245                 250                 255
```

```
Thr Tyr Leu Arg Pro Arg Asn Leu Arg Ser Pro Ala Glu Asp Lys Ile
            260                 265                 270

Leu Ala Val Phe Tyr Thr Ile Leu Thr Pro Met Leu Asn Pro Ile Ile
        275                 280                 285

Tyr Ser Leu Arg Asn Lys Glu Val Leu Gly Ala Met Arg Arg Val Phe
    290                 295                 300

Gly Ile Phe Ser Phe Leu Lys Glu
305                 310
```

<210> 27
<211> 879
<212> DNA
<213> Homo sapiens

<400> 27

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atgagtgtaa cagaaaatac gctcatgatc ctcctcattc gcagtgactc ccgactccac       60

actccaatgt attttctgct cagccatctc tccttaatgg atatcttgca tgtttccaac      120

atcgttccca aaatggtcac taactttctg tcaggcagca gaactatttc atttgcaggt      180

tgtgggttcc aggtatttct gtccctcacc ctcctgggtg gtgagtgcct tctcctggct      240

gcaatgtcct gtgatcgcta tgtggctatc tgtcacccgc tgcgctatcc gattcttatg      300

aaggagtatg ccagcgctct catggctgga ggctcctggc tcattggggt tttcaactcc      360

acagtccaca cagcttatgc actgcagttt cccttctgtg gctctagggc aattgatcac      420

ttcttctgtg aagtccctgc catgttgaag ttgtcctgtg cagacacaac acgctatgaa      480

cgaggggttt gtgtaagtgc tgtgatcttc ctgctgatcc ctttctcctt gatctctgct      540

tcttatggcc aaattattct tactgtcctc cagatgaaat catcagaggc aaggaaaaag      600

tcattttcca cttgttcctt ccacatgatt gtggtcacga tgtactatgg gccatttatt      660

tttacatata tgagacctaa atcataccac actccagggc aggataagtt cctggcaata      720

ttctatacga tcctcacacc cacactcaac cctttcatct acagctttag gaataaagat      780

gttctggcgg tgatgaaaaa tatgctcaaa agtaactttc tgcacaaaaa aatgaatagg      840

aaaattcctg aatgtgtgtt ctgtctattt ctatgttaa                              879
```

<210> 28
<211> 292

<212> PRT
<213> Homo sapiens

<400> 28

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Met Ser Val Thr Glu Asn Thr Leu Met Ile Leu Leu Ile Arg Ser Asp
1               5                  10                  15

Ser Arg Leu His Thr Pro Met Tyr Phe Leu Leu Ser His Leu Ser Leu
            20                  25                  30

Met Asp Ile Leu His Val Ser Asn Ile Val Pro Lys Met Val Thr Asn
        35                  40                  45

Phe Leu Ser Gly Ser Arg Thr Ile Ser Phe Ala Gly Cys Gly Phe Gln
    50                  55                  60

Val Phe Leu Ser Leu Thr Leu Leu Gly Gly Glu Cys Leu Leu Leu Ala
65                  70                  75                  80

Ala Met Ser Cys Asp Arg Tyr Val Ala Ile Cys His Pro Leu Arg Tyr
                85                  90                  95

Pro Ile Leu Met Lys Glu Tyr Ala Ser Ala Leu Met Ala Gly Gly Ser
            100                 105                 110

Trp Leu Ile Gly Val Phe Asn Ser Thr Val His Thr Ala Tyr Ala Leu
        115                 120                 125

Gln Phe Pro Phe Cys Gly Ser Arg Ala Ile Asp His Phe Phe Cys Glu
    130                 135                 140

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

Arg Gly Val Cys Val Ser Ala Val Ile Phe Leu Leu Ile Pro Phe Ser
                165                 170                 175

Leu Ile Ser Ala Ser Tyr Gly Gln Ile Ile Leu Thr Val Leu Gln Met
            180                 185                 190

Lys Ser Ser Glu Ala Arg Lys Lys Ser Phe Ser Thr Cys Ser Phe His
        195                 200                 205
```

```
Met Ile Val Val Thr Met Tyr Tyr Gly Pro Phe Ile Phe Thr Tyr Met
    210                 215                 220

Arg Pro Lys Ser Tyr His Thr Pro Gly Gln Asp Lys Phe Leu Ala Ile
225                 230                 235                 240

Phe Tyr Thr Ile Leu Thr Pro Thr Leu Asn Pro Phe Ile Tyr Ser Phe
                245                 250                 255

Arg Asn Lys Asp Val Leu Ala Val Met Lys Asn Met Leu Lys Ser Asn
            260                 265                 270

Phe Leu His Lys Lys Met Asn Arg Lys Ile Pro Glu Cys Val Phe Cys
        275                 280                 285

Leu Phe Leu Cys
    290
```

<210> 29
<211> 1113
<212> DNA
<213> Homo sapiens

<400> 29

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atgttctcaa tgacaacaga agcactcaat aattttgcac ttggatgtac caacttgtta       60

atgactatga taccacaaat tgatctgaag caaattttcc tttgtcctaa ttgcagacta      120

tacatgatcc ctgttggagc tttcatcttt tccttgggaa acatgcaaaa ccaaagcttt      180

gtaactgagt ttgtcctcct gggactttca cagaatccaa atgttcagga aatagtattt      240

gttgtatttt tgtttgtcta cattgcaact gttgggggca acatgctaat tgtagtaacc      300

attctcagca gccctgctct tctggtgtct cctatgtact tcttcttggg cttcctgtcc      360

ttcctggatg cgtgcttctc atctgtcatc accccaaaga tgattgtaga ctccctctat      420

gtgacaaaaa ccatctcttt tgaaggctgc atgatgcagc tctttgctga acacttcttt      480

gctggggtgg aggtgattgt cctcacagcc atggcctatg atcgttatgt ggccatttgc      540

aagcccttgc attactcttc tatcatgaac aggaggctct gtggcattct gatgggggta      600

gcctggacag ggggcctctt gcattccatg atacaaattc tttttacttt ccagcttccc      660

ttttgtggcc ccaatgtcat caatcacttt atgtgtgact tgtacccgtt actggagctt      720
```

gcctgcactg atactcacat ctttggcctc atggtggtca tcaacagtgg gtttatctgc 780

atcataaact tctccttgtt gcttgtctcc tatgctgtca tcttgctctc tctgagaaca 840

cacagttctg aagggcgctg gaaagctctc tccacctgtg gatctcacat tgctgttgtg 900

attttgttct ttgtcccatg catatttgta tatacacgac ctccatctgc tttttccctt 960

gacaaaatgg cggcaatatt ttatatcatc ttaaatccct tgctcaatcc tttgatttac 1020

actttcagga ataaggaagt aaaacaggcc atgaggagaa tatggaacag actgatggtg 1080

gtttctgatg agaaagaaaa tattaaactt taa 1113

<210> 30
<211> 370
<212> PRT
<213> Homo sapiens

<400> 30

Met Phe Ser Met Thr Thr Glu Ala Leu Asn Asn Phe Ala Leu Gly Cys
1 5 10 15

Thr Asn Leu Leu Met Thr Met Ile Pro Gln Ile Asp Leu Lys Gln Ile
20 25 30

Phe Leu Cys Pro Asn Cys Arg Leu Tyr Met Ile Pro Val Gly Ala Phe
35 40 45

Ile Phe Ser Leu Gly Asn Met Gln Asn Gln Ser Phe Val Thr Glu Phe
50 55 60

Val Leu Leu Gly Leu Ser Gln Asn Pro Asn Val Gln Glu Ile Val Phe
65 70 75 80

Val Val Phe Leu Phe Val Tyr Ile Ala Thr Val Gly Gly Asn Met Leu
85 90 95

Ile Val Val Thr Ile Leu Ser Ser Pro Ala Leu Leu Val Ser Pro Met
100 105 110

Tyr Phe Phe Leu Gly Phe Leu Ser Phe Leu Asp Ala Cys Phe Ser Ser
115 120 125

```
Val Ile Thr Pro Lys Met Ile Val Asp Ser Leu Tyr Val Thr Lys Thr
    130                 135                 140

Ile Ser Phe Glu Gly Cys Met Met Gln Leu Phe Ala Glu His Phe Phe
145                 150                 155                 160

Ala Gly Val Glu Val Ile Val Leu Thr Ala Met Ala Tyr Asp Arg Tyr
                165                 170                 175

Val Ala Ile Cys Lys Pro Leu His Tyr Ser Ser Ile Met Asn Arg Arg
            180                 185                 190

Leu Cys Gly Ile Leu Met Gly Val Ala Trp Thr Gly Gly Leu Leu His
        195                 200                 205

Ser Met Ile Gln Ile Leu Phe Thr Phe Gln Leu Pro Phe Cys Gly Pro
    210                 215                 220

Asn Val Ile Asn His Phe Met Cys Asp Leu Tyr Pro Leu Leu Glu Leu
225                 230                 235                 240

Ala Cys Thr Asp Thr His Ile Phe Gly Leu Met Val Val Ile Asn Ser
                245                 250                 255

Gly Phe Ile Cys Ile Ile Asn Phe Ser Leu Leu Leu Val Ser Tyr Ala
            260                 265                 270

Val Ile Leu Leu Ser Leu Arg Thr His Ser Ser Glu Gly Arg Trp Lys
        275                 280                 285

Ala Leu Ser Thr Cys Gly Ser His Ile Ala Val Val Ile Leu Phe Phe
    290                 295                 300

Val Pro Cys Ile Phe Val Tyr Thr Arg Pro Pro Ser Ala Phe Ser Leu
305                 310                 315                 320

Asp Lys Met Ala Ala Ile Phe Tyr Ile Ile Leu Asn Pro Leu Leu Asn
                325                 330                 335

Pro Leu Ile Tyr Thr Phe Arg Asn Lys Glu Val Lys Gln Ala Met Arg
            340                 345                 350
```

```
Arg Ile Trp Asn Arg Leu Met Val Val Ser Asp Glu Lys Glu Asn Ile
        355                 360                 365


Lys Leu
    370
```

<210> 31
<211> 930
<212> DNA
<213> Homo sapiens

<400> 31

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atggatatat cagagggaaa taagactctt gtgacagagt ttgttctcac aggacttaca       60

gatcgaccat ggctgcacgt cctcttcttt gttgtgtttt tggtggtcta tctcatcacc      120

atggtgggca accttggact gatagttcta atttggaacg acccccatct tcatatgccc      180

atgtacttat tccttggtgg tttagccttt tcagatgctt gtacttcaac ctctataacc      240

cctaggatgc tggtcaattt cttagacaag actgcaatga tatccctagc tgagtgcatc      300

acccagtttt acttttttgc ttccagtgca actacagaat gcttcctcct ggtgatgatg      360

gcctatgacc gctatgtagc catatgtaat cccttgcttt atccagtgat gatgtccaac      420

aaactcagcg ctcagttgct aagtatttca tatgtaattg gtttcctgca tcctctggtt      480

catgtgagtt tactattgcg actaactttc tgcaggttta acataataca ttatttctac      540

tgtgaaattt tacaactgtt caaaatttca tgcaatggtc catctattaa cgcactaatg      600

atatttattt ttggtgcttt tatacaaata cccactttaa tgactatcat aatctcttat      660

actcgtgtgc tctttgatat tctgaaaaaa aagtctgaaa agggcagaag caaagccttc      720

tccacatgcg gcgcccatct gctttctgtc tcattgtact acggaactct gatcttcatg      780

tatgtgcgtc ctgcatctgg cttagctgaa gaccaagaca aagtgtattc tctgttttac      840

acgattataa ttcccctgct aaacccattt atttacagct tgagaaataa aaaagtcatg      900

catgcattga gaagagttat aaggaagtaa                                       930
```

<210> 32
<211> 309
<212> PRT
<213> Homo sapiens

<400> 32

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

Thr Gly Leu Thr Asp Arg Pro Trp Leu His Val Leu Phe Phe Val Val
            20                  25                  30

Phe Leu Val Val Tyr Leu Ile Thr Met Val Gly Asn Leu Gly Leu Ile
        35                  40                  45

Val Leu Ile Trp Asn Asp Pro His Leu His Met Pro Met Tyr Leu Phe
    50                  55                  60

Leu Gly Gly Leu Ala Phe Ser Asp Ala Cys Thr Ser Thr Ser Ile Thr
65                  70                  75                  80

Pro Arg Met Leu Val Asn Phe Leu Asp Lys Thr Ala Met Ile Ser Leu
                85                  90                  95

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

Glu Cys Phe Leu Leu Val Met Met Ala Tyr Asp Arg Tyr Val Ala Ile
        115                 120                 125

Cys Asn Pro Leu Leu Tyr Pro Val Met Met Ser Asn Lys Leu Ser Ala
    130                 135                 140

Gln Leu Leu Ser Ile Ser Tyr Val Ile Gly Phe Leu His Pro Leu Val
145                 150                 155                 160

His Val Ser Leu Leu Leu Arg Leu Thr Phe Cys Arg Phe Asn Ile Ile
                165                 170                 175

His Tyr Phe Tyr Cys Glu Ile Leu Gln Leu Phe Lys Ile Ser Cys Asn
            180                 185                 190

Gly Pro Ser Ile Asn Ala Leu Met Ile Phe Ile Phe Gly Ala Phe Ile
        195                 200                 205

Gln Ile Pro Thr Leu Met Thr Ile Ile Ile Ser Tyr Thr Arg Val Leu
    210                 215                 220
```

```
Phe Asp Ile Leu Lys Lys Lys Ser Glu Lys Gly Arg Ser Lys Ala Phe
225                 230                 235                 240


Ser Thr Cys Gly Ala His Leu Leu Ser Val Ser Leu Tyr Tyr Gly Thr
                245                 250                 255


Leu Ile Phe Met Tyr Val Arg Pro Ala Ser Gly Leu Ala Glu Asp Gln
            260                 265                 270


Asp Lys Val Tyr Ser Leu Phe Tyr Thr Ile Ile Ile Pro Leu Leu Asn
        275                 280                 285


Pro Phe Ile Tyr Ser Leu Arg Asn Lys Lys Val Met His Ala Leu Arg
    290                 295                 300


Arg Val Ile Arg Lys
305


<210>  33
<211>  939
<212>  DNA
<213>  Homo sapiens

<400>  33
atgatgggta gaaggaatga cacaaatgtg gctgacttca tccttacggg actgtcagac       60

tctgaagagg tccagatggc tctgtttatg ctatttctcc tcatatacct aattactatg      120

ctggggaatg tggggatgct attgataatc cgcctggacc tccagcttca cactcccatg      180

tatttttcc ttactcacct gtcatttatt gacctcagtt actcaactgt cgtcacacct      240

aaaaccttag cgaacttact gacttccaac tatatttcct tcacgggctg ctttgcccag      300

atgttctgtt ttgtcttctt gggtactgct gaatgttatc ttctctcctc aatggcctat      360

gatcgctatg cagcgatctg cagtcctcta cactacacag ttattatgcc caaaaggctc      420

tgcctcgctc tcatcactgg gccttatgtg attggcttta tggactcctt tgtcaatgtg      480

gtttccatga gcagattgca tttctgtgac tcaaacataa ttcatcactt tttctgtgac      540

acttccccaa ttttagctct gtcctgcact gacacagaca acactgaaat gctgatattc      600

attatcgctg gttccaccct gatggtgtcc cttatcacaa tatctgcatc ctatgtgtcc      660

attctctcta ccatcctgaa aattaattcc acttcaggaa agcagaaagc tttctctact      720
```

tgcgtctctc atctcttggg agtcaccatc ttctatggaa ctatgatttt tacttactta 780

aagccaagaa agtcttattc cttgggaaga gatcaagtgg ctcctgtgtt ttatactatt 840

gtgattccca tgctgaatcc actcatttat agtcttagaa acagagaagt gaaaaatgct 900

ctcattagag tcatgcagag aagacaggac tccaggtag 939

<210> 34
<211> 312
<212> PRT
<213> Homo sapiens

<400> 34

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

Gly Leu Ser Asp Ser Glu Glu Val Gln Met Ala Leu Phe Met Leu Phe
20 25 30

Leu Leu Ile Tyr Leu Ile Thr Met Leu Gly Asn Val Gly Met Leu Leu
35 40 45

Ile Ile Arg Leu Asp Leu Gln Leu His Thr Pro Met Tyr Phe Phe Leu
50 55 60

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

Lys Thr Leu Ala Asn Leu Leu Thr Ser Asn Tyr Ile Ser Phe Thr Gly
85 90 95

Cys Phe Ala Gln Met Phe Cys Phe Val Phe Leu Gly Thr Ala Glu Cys
100 105 110

Tyr Leu Leu Ser Ser Met Ala Tyr Asp Arg Tyr Ala Ala Ile Cys Ser
115 120 125

Pro Leu His Tyr Thr Val Ile Met Pro Lys Arg Leu Cys Leu Ala Leu
130 135 140

Ile Thr Gly Pro Tyr Val Ile Gly Phe Met Asp Ser Phe Val Asn Val
145 150 155 160

```
Val Ser Met Ser Arg Leu His Phe Cys Asp Ser Asn Ile Ile His His
                165                 170                 175

Phe Phe Cys Asp Thr Ser Pro Ile Leu Ala Leu Ser Cys Thr Asp Thr
            180                 185                 190

Asp Asn Thr Glu Met Leu Ile Phe Ile Ile Ala Gly Ser Thr Leu Met
        195                 200                 205

Val Ser Leu Ile Thr Ile Ser Ala Ser Tyr Val Ser Ile Leu Ser Thr
    210                 215                 220

Ile Leu Lys Ile Asn Ser Thr Ser Gly Lys Gln Lys Ala Phe Ser Thr
225                 230                 235                 240

Cys Val Ser His Leu Leu Gly Val Thr Ile Phe Tyr Gly Thr Met Ile
                245                 250                 255

Phe Thr Tyr Leu Lys Pro Arg Lys Ser Tyr Ser Leu Gly Arg Asp Gln
            260                 265                 270

Val Ala Pro Val Phe Tyr Thr Ile Val Ile Pro Met Leu Asn Pro Leu
        275                 280                 285

Ile Tyr Ser Leu Arg Asn Arg Glu Val Lys Asn Ala Leu Ile Arg Val
    290                 295                 300

Met Gln Arg Arg Gln Asp Ser Arg
305                 310
```

<210> 35
<211> 936
<212> DNA
<213> Homo sapiens

<400> 35

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atgaaaatct tcaacagccc cagcaactcc agcaccttca ctggcttcat cctcctgggc       60

ttcccttgcc ccagggaggg gcagatcctc ctctttgtgc tcttcactgt tgtttacctc      120

ctgaccctca tgggcaatgg ttccatcatc tgtgctgtgc actgggatca gagactccac      180

gcccccatgt acatcctgct cgccaacttc tccttcttgg agatatgtta tgtcacctcc      240
```

acagtcccca gcatgctggc caacttcctc tctgacacca agatcatctc gttctctggc 300

tgcttcctcc agttctactt tttcttctcc ttgggctcta cagaatgctt tttcctggca 360

gttatggcat ttgatcgata ccttgccatc tgtcggcctc tacgctatcc aaccattatg 420

accagacgtc tctgtaccaa tcttgtggtc aattgctggg tacttggttt catctggttc 480

ttgattccta tcgtcaacat ctcccaaatg tccttctgtg gatctaggat tattgaccac 540

ttcctatgtg acccagctcc tcttctaact ctcacttgca aaaaaggccc tgtgatagag 600

cttgtctttt ctgtcttaag tcctctgcct gtctttatgc tctttctctt cattgtgggg 660

tcctatgctc tggtcgtgag agctgtgttg agggtccctt cagcagctgg gagaagaaag 720

gctttctcca cctgtgggtc tcacctggct gtggtttcac tgttctacgg ctcagtactg 780

gtcatgtatg ggagcccacc atctaagaat gaagctggaa agcagaagac tgtgactctg 840

ttttattctg ttgttacccc actgcttaac cctgtgatat atagtcttag gaacaaagat 900

atgagaaaag ctctgaagaa attttgggga acataa 936

<210> 36
<211> 311
<212> PRT
<213> Homo sapiens

<400> 36

Met Lys Ile Phe Asn Ser Pro Ser Asn Ser Ser Thr Phe Thr Gly Phe
1 5 10 15

Ile Leu Leu Gly Phe Pro Cys Pro Arg Glu Gly Gln Ile Leu Leu Phe
20 25 30

Val Leu Phe Thr Val Val Tyr Leu Leu Thr Leu Met Gly Asn Gly Ser
35 40 45

Ile Ile Cys Ala Val His Trp Asp Gln Arg Leu His Ala Pro Met Tyr
50 55 60

Ile Leu Leu Ala Asn Phe Ser Phe Leu Glu Ile Cys Tyr Val Thr Ser
65 70 75 80

Thr Val Pro Ser Met Leu Ala Asn Phe Leu Ser Asp Thr Lys Ile Ile
85 90 95

```
Ser Phe Ser Gly Cys Phe Leu Gln Phe Tyr Phe Phe Phe Ser Leu Gly
            100                 105                 110

Ser Thr Glu Cys Phe Phe Leu Ala Val Met Ala Phe Asp Arg Tyr Leu
        115                 120                 125

Ala Ile Cys Arg Pro Leu Arg Tyr Pro Thr Ile Met Thr Arg Arg Leu
    130                 135                 140

Cys Thr Asn Leu Val Val Asn Cys Trp Val Leu Gly Phe Ile Trp Phe
145                 150                 155                 160

Leu Ile Pro Ile Val Asn Ile Ser Gln Met Ser Phe Cys Gly Ser Arg
                165                 170                 175

Ile Ile Asp His Phe Leu Cys Asp Pro Ala Pro Leu Leu Thr Leu Thr
            180                 185                 190

Cys Lys Lys Gly Pro Val Ile Glu Leu Val Phe Ser Val Leu Ser Pro
        195                 200                 205

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

Val Val Arg Ala Val Leu Arg Val Pro Ser Ala Ala Gly Arg Arg Lys
225                 230                 235                 240

Ala Phe Ser Thr Cys Gly Ser His Leu Ala Val Val Ser Leu Phe Tyr
                245                 250                 255

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

Gly Lys Gln Lys Thr Val Thr Leu Phe Tyr Ser Val Val Thr Pro Leu
        275                 280                 285

Leu Asn Pro Val Ile Tyr Ser Leu Arg Asn Lys Asp Met Arg Lys Ala
    290                 295                 300

Leu Lys Lys Phe Trp Gly Thr
305                 310
```

<210> 37
<211> 966
<212> DNA
<213> Homo sapiens

<400> 37
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gggctggaag ccacacacat ctggatctcc ctgccattct gctttatgta catcattgct 120

gtcgtgggga actgtgggct catctgcctc atcagccatg aggaggccct gcaccggccc 180

atgtactact tcctggccct gctctccttc actgatgtca ccttgtgcac caccatggta 240

cctaatatgc tgtgcatatt ctggttcaac ctcaaggaga ttgactttaa cgcctgcctg 300

gcccagatgt tttttgtcca tatgctgaca gggatggagt ctggggtgct catgctcatg 360

gccctggacc gctatgtggc catctgctac cccttacgct atgccaccat ccttaccaac 420

cctgtcatcg ccaaggctgg tcttgccacc ttcttgagga atgtgatgct catcatccca 480

ttcactctcc tcaccaagcg cctgccctat tgccggggga acttcatccc ccacacctac 540

tgtgaccata tgtctgtggc caaggtatcc tgtggcaatt tcaaggtcaa tgctatttat 600

ggtctgatgg ttgctctcct gattggtgtg tttgatatct gctgtatctc tgtatcttac 660

actatgattt tgcaggctgt tatgagcctg tcatcagcag atgctcgtca caaagccttc 720

agcacctgca catctcacat gtgttccatt gtgatcacct atgttgctgc ttttttcact 780

tttttcactc atcgttttgt aggacacaat atcccaaacc acatacacat catcgtggcc 840

aacctttatc tgctactgcc tcctaccatg aacccaattg tttatggagt caagaccaag 900

cagattcagg aaggtgtaat taaattttta cttggagaca aggttagttt tacctatgac 960

aaatga 966

<210> 38
<211> 321
<212> PRT
<213> Homo sapiens

<400> 38

Met Ser Gly Asp Asn Ser Ser Ser Leu Thr Pro Gly Phe Phe Ile Leu
1 5 10 15

Asn Gly Val Pro Gly Leu Glu Ala Thr His Ile Trp Ile Ser Leu Pro

```
            20                  25                  30

Phe Cys Phe Met Tyr Ile Ile Ala Val Val Gly Asn Cys Gly Leu Ile
        35                  40                  45

Cys Leu Ile Ser His Glu Glu Ala Leu His Arg Pro Met Tyr Tyr Phe
    50                  55                  60

Leu Ala Leu Leu Ser Phe Thr Asp Val Thr Leu Cys Thr Thr Met Val
65                  70                  75                  80

Pro Asn Met Leu Cys Ile Phe Trp Phe Asn Leu Lys Glu Ile Asp Phe
                85                  90                  95

Asn Ala Cys Leu Ala Gln Met Phe Phe Val His Met Leu Thr Gly Met
            100                 105                 110

Glu Ser Gly Val Leu Met Leu Met Ala Leu Asp Arg Tyr Val Ala Ile
        115                 120                 125

Cys Tyr Pro Leu Arg Tyr Ala Thr Ile Leu Thr Asn Pro Val Ile Ala
    130                 135                 140

Lys Ala Gly Leu Ala Thr Phe Leu Arg Asn Val Met Leu Ile Ile Pro
145                 150                 155                 160

Phe Thr Leu Leu Thr Lys Arg Leu Pro Tyr Cys Arg Gly Asn Phe Ile
                165                 170                 175

Pro His Thr Tyr Cys Asp His Met Ser Val Ala Lys Val Ser Cys Gly
            180                 185                 190

Asn Phe Lys Val Asn Ala Ile Tyr Gly Leu Met Val Ala Leu Leu Ile
        195                 200                 205

Gly Val Phe Asp Ile Cys Cys Ile Ser Val Ser Tyr Thr Met Ile Leu
    210                 215                 220

Gln Ala Val Met Ser Leu Ser Ser Ala Asp Ala Arg His Lys Ala Phe
225                 230                 235                 240
```

```
Ser Thr Cys Thr Ser His Met Cys Ser Ile Val Ile Thr Tyr Val Ala
                245                 250                 255

Ala Phe Phe Thr Phe Phe Thr His Arg Phe Val Gly His Asn Ile Pro
            260                 265                 270

Asn His Ile His Ile Ile Val Ala Asn Leu Tyr Leu Leu Leu Pro Pro
        275                 280                 285

Thr Met Asn Pro Ile Val Tyr Gly Val Lys Thr Lys Gln Ile Gln Glu
    290                 295                 300

Gly Val Ile Lys Phe Leu Leu Gly Asp Lys Val Ser Phe Thr Tyr Asp
305                 310                 315                 320

Lys
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<210> 39
<211> 915
<212> DNA
<213> Homo sapiens

<400> 39

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atgtttatat taataagctt cacagaagaa tttgatgtgc aagtcttcct atttttatta       60

tttttagcaa tctatctatt cactctaata ggcaatttag ggctggttgt accgatcatt      120

ggggatttct ggcttcacag cccaatgtac tattttcttg gtgttttatc attcttggat      180

gtctgctatt ctacagttgt cactccaaaa atgttggtca atttcctggc aaaaaataaa      240

tctatttcat ttcttggatg tgcaacacag atgtttcttg cttgtacttt tggaaccaca      300

gaatgctttc tcttggctgc aatggcttat gatcgctatg tagccatcta caaccctctc      360

ctgtattcag tgagcatgtc acccagagtc tatgtgccac tcatcactgc ttcctatgtt      420

gctagcattt tacatgctac tatacataca gtggctacat ttagcctgtc cttctgtgga      480

tccaatgaaa ttaggcatgt cttttgtaat atgcctcctc tccttgctat ttcttgttct      540

gacactcacg taatccagct tctattcttc tactttgtgg gctctattga gatagtcact      600

atcctgattg tcctgatctc ctatggtttt attctgttgg ccattctgaa gatgcagtct      660

gctgaaggga ggagaaaagt cttctctaca tgtggagctc acctaactgg agtgacaatt      720

tatcatggga caatcctctt catgtatgtg agaccaagtt ccagctacac ttcggacaat      780
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gacatgatag tgtcaatatt ttataccatt gtgattccca tgctgaatcc catcatctac 840

agtttgcgga acaaagatgt aaaggaggca atcaaaagat tgcttgtgag aaattggttc 900

ataaataagt tatag 915

<210> 40
<211> 304
<212> PRT
<213> Homo sapiens

<400> 40

Met Phe Ile Leu Ile Ser Phe Thr Glu Glu Phe Asp Val Gln Val Phe
1 5 10 15

Leu Phe Leu Leu Phe Leu Ala Ile Tyr Leu Phe Thr Leu Ile Gly Asn
20 25 30

Leu Gly Leu Val Val Pro Ile Ile Gly Asp Phe Trp Leu His Ser Pro
35 40 45

Met Tyr Tyr Phe Leu Gly Val Leu Ser Phe Leu Asp Val Cys Tyr Ser
50 55 60

Thr Val Val Thr Pro Lys Met Leu Val Asn Phe Leu Ala Lys Asn Lys
65 70 75 80

Ser Ile Ser Phe Leu Gly Cys Ala Thr Gln Met Phe Leu Ala Cys Thr
85 90 95

Phe Gly Thr Thr Glu Cys Phe Leu Leu Ala Ala Met Ala Tyr Asp Arg
100 105 110

Tyr Val Ala Ile Tyr Asn Pro Leu Leu Tyr Ser Val Ser Met Ser Pro
115 120 125

Arg Val Tyr Val Pro Leu Ile Thr Ala Ser Tyr Val Ala Ser Ile Leu
130 135 140

His Ala Thr Ile His Thr Val Ala Thr Phe Ser Leu Ser Phe Cys Gly
145 150 155 160

```
Ser Asn Glu Ile Arg His Val Phe Cys Asn Met Pro Pro Leu Leu Ala
                165                 170                 175

Ile Ser Cys Ser Asp Thr His Val Ile Gln Leu Leu Phe Phe Tyr Phe
            180                 185                 190

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

Gly Phe Ile Leu Leu Ala Ile Leu Lys Met Gln Ser Ala Glu Gly Arg
    210                 215                 220

Arg Lys Val Phe Ser Thr Cys Gly Ala His Leu Thr Gly Val Thr Ile
225                 230                 235                 240

Tyr His Gly Thr Ile Leu Phe Met Tyr Val Arg Pro Ser Ser Ser Tyr
                245                 250                 255

Thr Ser Asp Asn Asp Met Ile Val Ser Ile Phe Tyr Thr Ile Val Ile
            260                 265                 270

Pro Met Leu Asn Pro Ile Ile Tyr Ser Leu Arg Asn Lys Asp Val Lys
        275                 280                 285

Glu Ala Ile Lys Arg Leu Leu Val Arg Asn Trp Phe Ile Asn Lys Leu
    290                 295                 300
```

<210> 41
<211> 936
<212> DNA
<213> Homo sapiens

<400> 41
atggaaaaaa taaacaacgt aactgaattc attttctggg gtctttctca gagcccagag 60

attgagaaag tttgttttgt ggtgttttct ttcttctaca taatcattct tctgggaaat 120

ctcctcatca tgctgacagt ttgcctgagc aacctgttta agtcacccat gtatttcttt 180

ctcagcttct tgtcttttgt ggacatttgt tactcttcag tcacagctcc caagatgatt 240

gttgacctgt tagcaaagga caaaaccatc tcctatgtgg ggtgcatgtt gcaactgttt 300

ggagtacatt tctttggttg cactgagatc ttcatcctta ctgtaatggc ctatgatcgt 360

tatgtggcta tctgtaaacc cctacattat atgaccatca tgaaccggga gacatgcaat 420

aaaatgttat tagggacgtg ggtaggtggg ttcttacact ccattatcca agtggctctg 480

gtagtccaac tacccttttg tggacccaat gagatagatc actacttttg tgatgttcac 540

cctgtgttga aacttgcctg cacagaaaca tacattgttg gtgttgttgt gacagccaac 600

agtggtacca ttgctctggg gagttttgtt atcttgctaa tctcctacag catcatccta 660

gtttccctga gaaagcagtc agcagaaggc aggcgcaaag ccctctccac ctgtggctcc 720

cacattgcca tggtcgttat ctttttcggc ccctgtactt ttatgtacat gcgccctgat 780

acgacctttt cagaggataa gatggtggct gtattttaca ccattatcac tcccatgtta 840

aatcctctga tttatacact gagaaatgca gaagtaaaga atgcaatgaa gaaactgtgg 900

ggcagaaatg ttttcttgga ggctaaaggg aaatag 936

<210> 42
<211> 311
<212> PRT
<213> Homo sapiens

<400> 42

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

Gln Ser Pro Glu Ile Glu Lys Val Cys Phe Val Val Phe Ser Phe Phe
20 25 30

Tyr Ile Ile Ile Leu Leu Gly Asn Leu Leu Ile Met Leu Thr Val Cys
35 40 45

Leu Ser Asn Leu Phe Lys Ser Pro Met Tyr Phe Phe Leu Ser Phe Leu
50 55 60

Ser Phe Val Asp Ile Cys Tyr Ser Ser Val Thr Ala Pro Lys Met Ile
65 70 75 80

Val Asp Leu Leu Ala Lys Asp Lys Thr Ile Ser Tyr Val Gly Cys Met
85 90 95

Leu Gln Leu Phe Gly Val His Phe Phe Gly Cys Thr Glu Ile Phe Ile
100 105 110

```
Leu Thr Val Met Ala Tyr Asp Arg Tyr Val Ala Ile Cys Lys Pro Leu
        115                 120                 125

His Tyr Met Thr Ile Met Asn Arg Glu Thr Cys Asn Lys Met Leu Leu
    130                 135                 140

Gly Thr Trp Val Gly Gly Phe Leu His Ser Ile Ile Gln Val Ala Leu
145                 150                 155                 160

Val Val Gln Leu Pro Phe Cys Gly Pro Asn Glu Ile Asp His Tyr Phe
                165                 170                 175

Cys Asp Val His Pro Val Leu Lys Leu Ala Cys Thr Glu Thr Tyr Ile
            180                 185                 190

Val Gly Val Val Val Thr Ala Asn Ser Gly Thr Ile Ala Leu Gly Ser
        195                 200                 205

Phe Val Ile Leu Leu Ile Ser Tyr Ser Ile Ile Leu Val Ser Leu Arg
    210                 215                 220

Lys Gln Ser Ala Glu Gly Arg Arg Lys Ala Leu Ser Thr Cys Gly Ser
225                 230                 235                 240

His Ile Ala Met Val Val Ile Phe Phe Gly Pro Cys Thr Phe Met Tyr
                245                 250                 255

Met Arg Pro Asp Thr Thr Phe Ser Glu Asp Lys Met Val Ala Val Phe
            260                 265                 270

Tyr Thr Ile Ile Thr Pro Met Leu Asn Pro Leu Ile Tyr Thr Leu Arg
        275                 280                 285

Asn Ala Glu Val Lys Asn Ala Met Lys Lys Leu Trp Gly Arg Asn Val
    290                 295                 300

Phe Leu Glu Ala Lys Gly Lys
305                 310
```

<210> 43
<211> 24
<212> DNA

<213> Artificial Sequence

<220>
<223> FLAG tag

<400> 43
gattacaagg acgacgacga taag 24

<210> 44
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> FLAG tag

<400> 44

Asp Tyr Lys Asp Asp Asp Asp Lys
1 5

<210> 45
<211> 60
<212> DNA
<213> Artificial Sequence

<220>
<223> Rho tag

<400> 45
atgaacggga ccgagggccc aaacttctac gtgcctttct ccaacaagac gggcgtggtg 60

<210> 46
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Rho tag

<400> 46

Met Asn Gly Thr Glu Gly Pro Asn Phe Tyr Val Pro Phe Ser Asn Lys
1 5 10 15

Thr Gly Val Val
20

<210> 47
<211> 51

<212> DNA
<213> Artificial Sequence

<220>
<223> Lucy tag

<400> 47
atgagacccc agatcctgct gctcctggcc ctgctgaccc taggcctggc t 51

<210> 48
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Lucy tag

<400> 48

Met Arg Pro Gln Ile Leu Leu Leu Leu Ala Leu Leu Thr Leu Gly Leu
1 5 10 15

Ala

<210> 49
<211> 1376
<212> DNA
<213> Homo sapiens

<400> 49
atgggtctgt gctacagtct gcggccgctg cttttcgggg gcccagggga cgacccctgc 60

gcggcctcgg agccgccggt ggaggacgcg cagcccgccc cggccccggc cctggcccca 120

gtccgggcgg ccgcaaggga cacggcccgg accctgctcc ctcggggcgg cgaagggagc 180

ccggcatgcg ctcggcccaa agcagacaag ccgaaggaga agcggcagcg caccgagcag 240

cttagtgccg aggagcgcga ggcggccaag gagcgcgagg cggtcaagga ggcgaggaaa 300

gtgagccggg gcatcgaccg catgctgcgc gaccagaagc gcgacctgca gcagacgcac 360

cggctcctgc tgctcggggc tggtgagtct gggaaaagca ctatcgtcaa acagatgagg 420

atcctgcacg tcaatgggtt taatcccgag gaaaagaaac agaaaattct ggacatccgg 480

aaaaatgtta aagatgctat cgtgacaatt gtttcagcaa tgagtactat aatacctcca 540

gttccgctgg ccaaccctga aaaccaattt cgatcagact acatcaagag catagcccct 600

atcactgact ttgaatattc ccaggaattc tttgaccatg tgaaaaaact ttgggacgat 660

gaaggcgtga aggcatgctt tgagagatcc aacgaatacc agctgattga ctgtgcacaa 720

tacttcctgg aaagaatcga cagcgtcagc ttggttgact acacacccac agaccaggac 780

ctcctcagat gcagagttct gacatctggg atttttgaga acgattccaa gtggacaaag 840

taaacttcca catgtttgat gttggtggcc agagggatga gaggagaaaa tggatccagt 900

gctttaacga tgtcacagct atcatttacg tcgcagcctg cagtagctac aacatggtga 960

ttcgagaaga taacaacacc aacaggctga gagagtccct ggatcttttt gaaagcatct 1020

ggaacaacag gtggttacgg accatttcta tcatcttgtt cttgaacaaa caagatatgc 1080

tggcagaaaa agtcttggca gggaaatcaa aaattgaaga ctatttccca gaatatgcaa 1140

attatactgt tcctgaagac gcaacaccag atgcaggaga agatcccaaa gttacaagag 1200

ccaagttctt tatccgggac ctgtttttga ggatcagcac ggccaccggt gacggcaaac 1260

attactgcta cccgcacttc acctgcgccg tggacacaga gaacatccgc agggtgttca 1320

acgactgccg cgacatcatc cagcggatgc acctcaagca gtatgagctc ttgtga 1376

<210> 50
<211> 458
<212> PRT
<213> Homo sapiens

<400> 50

Met Gly Leu Cys Tyr Ser Leu Arg Pro Leu Leu Phe Gly Gly Pro Gly
1 5 10 15

Asp Asp Pro Cys Ala Ala Ser Glu Pro Pro Val Glu Asp Ala Gln Pro
20 25 30

Ala Pro Ala Pro Ala Leu Ala Pro Val Arg Ala Ala Ala Arg Asp Thr
35 40 45

Ala Arg Thr Leu Leu Pro Arg Gly Gly Glu Gly Ser Pro Ala Cys Ala
50 55 60

Arg Pro Lys Ala Asp Lys Pro Lys Glu Lys Arg Gln Arg Thr Glu Gln
65 70 75 80

Leu Ser Ala Glu Glu Arg Glu Ala Ala Lys Glu Arg Glu Ala Val Lys
85 90 95

```
Glu Ala Arg Lys Val Ser Arg Gly Ile Asp Arg Met Leu Arg Asp Gln
            100                 105                 110

Lys Arg Asp Leu Gln Gln Thr His Arg Leu Leu Leu Leu Gly Ala Gly
        115                 120                 125

Glu Ser Gly Lys Ser Thr Ile Val Lys Gln Met Arg Ile Leu His Val
    130                 135                 140

Asn Gly Phe Asn Pro Glu Glu Lys Lys Gln Lys Ile Leu Asp Ile Arg
145                 150                 155                 160

Lys Asn Val Lys Asp Ala Ile Val Thr Ile Val Ser Ala Met Ser Thr
                165                 170                 175

Ile Ile Pro Pro Val Pro Leu Ala Asn Pro Glu Asn Gln Phe Arg Ser
            180                 185                 190

Asp Tyr Ile Lys Ser Ile Ala Pro Ile Thr Asp Phe Glu Tyr Ser Gln
        195                 200                 205

Glu Phe Phe Asp His Val Lys Lys Leu Trp Asp Asp Glu Gly Val Lys
    210                 215                 220

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

Tyr Phe Leu Glu Arg Ile Asp Ser Val Ser Leu Val Asp Tyr Thr Pro
                245                 250                 255

Thr Asp Gln Asp Leu Leu Arg Cys Arg Val Leu Thr Ser Gly Ile Phe
            260                 265                 270

Glu Thr Arg Phe Gln Val Asp Lys Val Asn Phe His Met Phe Asp Val
        275                 280                 285

Gly Gly Gln Arg Asp Glu Arg Arg Lys Trp Ile Gln Cys Phe Asn Asp
    290                 295                 300

Val Thr Ala Ile Ile Tyr Val Ala Ala Cys Ser Ser Tyr Asn Met Val
```

305 310 315 320

Ile Arg Glu Asp Asn Asn Thr Asn Arg Leu Arg Glu Ser Leu Asp Leu
325 330 335

Phe Glu Ser Ile Trp Asn Asn Arg Trp Leu Arg Thr Ile Ser Ile Ile
340 345 350

Leu Phe Leu Asn Lys Gln Asp Met Leu Ala Glu Lys Val Leu Ala Gly
355 360 365

Lys Ser Lys Ile Glu Asp Tyr Phe Pro Glu Tyr Ala Asn Tyr Thr Val
370 375 380

Pro Glu Asp Ala Thr Pro Asp Ala Gly Glu Asp Pro Lys Val Thr Arg
385 390 395 400

Ala Lys Phe Phe Ile Arg Asp Leu Phe Leu Arg Ile Ser Thr Ala Thr
405 410 415

Gly Asp Gly Lys His Tyr Cys Tyr Pro His Phe Thr Cys Ala Val Asp
420 425 430

Thr Glu Asn Ile Arg Arg Val Phe Asn Asp Cys Arg Asp Ile Ile Gln
435 440 445

Arg Met His Leu Lys Gln Tyr Glu Leu Leu
450 455

<210> 51
<211> 1125
<212> DNA
<213> Homo sapiens

<400> 51
atggcccggt cgctgacctg gcgctgctgc ccctggtgcc tgacggagga tgagaaggcc 60

gccgcccggg tggaccagga gatcaacagg atcctcttgg agcagaagaa gcaggaccgc 120

ggggagctga agctgctgct tttgggccca ggcgagagcg ggaagagcac cttcatcaag 180

cagatgcgga tcatccacgg cgccggctac tcggaggagg agcgcaaggg cttccggccc 240

ctggtctacc agaacatctt cgtgtccatg cgggccatga tcgaggccat ggagcggctg 300

cagattccat tcagcaggcc cgagagcaag caccacgcca gcctggtcat gagccaggac 360

ccctataaag tgaccacgtt tgagaagcgc tacgctgcgg ccatgcagtg gctgtggagg 420

gatgccggca tccgggcctg ctatgagcgt cggcgggaat tccacctgct cgattcagcc 480

gtgtactacc tgtcccacct ggagcgcatc accgaggagg gctacgtccc cacagctcag 540

gacgtgctcc gcagccgcat gcccaccact ggcatcaacg agtactgctt ctccgtgcag 600

aaaaccaacc tgcggatcgt ggacgtcggg ggccagaagt cagagcgtaa gaaatggatc 660

cattgtttcg agaacgtgat cgccctcatc tacctggcct cactgagtga atacgaccag 720

tgcctggagg agaacaacca ggagaaccgc atgaaggaga gcctcgcatt gtttgggact 780

atcctggaac taccctggtt caaaagcaca tccgtcatcc tctttctcaa caaaaccgac 840

atcctggagg agaaaatccc cacctcccac ctggctacct atttccccag tttccagggc 900

cctaagcagg atgctgaggc agccaagagg ttcatcctgg acatgtacac gaggatgtac 960

accgggtgcg tggacggccc cgagggcagc aagaagggcg cacgatcccg acgcctcttc 1020

agccactaca catgtgccac agacacacag aacatccgca aggtcttcaa ggacgtgcgg 1080

gactcggtgc tcgcccgcta cctggacgag atcaacctgc tgtga 1125

<210> 52
<211> 374
<212> PRT
<213> Homo sapiens

<400> 52

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

Asp Glu Lys Ala Ala Ala Arg Val Asp Gln Glu Ile Asn Arg Ile Leu
20 25 30

Leu Glu Gln Lys Lys Gln Asp Arg Gly Glu Leu Lys Leu Leu Leu Leu
35 40 45

Gly Pro Gly Glu Ser Gly Lys Ser Thr Phe Ile Lys Gln Met Arg Ile
50 55 60

Ile His Gly Ala Gly Tyr Ser Glu Glu Glu Arg Lys Gly Phe Arg Pro
65 70 75 80

```
Leu Val Tyr Gln Asn Ile Phe Val Ser Met Arg Ala Met Ile Glu Ala
                85                  90                  95

Met Glu Arg Leu Gln Ile Pro Phe Ser Arg Pro Glu Ser Lys His His
            100                 105                 110

Ala Ser Leu Val Met Ser Gln Asp Pro Tyr Lys Val Thr Thr Phe Glu
        115                 120                 125

Lys Arg Tyr Ala Ala Ala Met Gln Trp Leu Trp Arg Asp Ala Gly Ile
    130                 135                 140

Arg Ala Cys Tyr Glu Arg Arg Arg Glu Phe His Leu Leu Asp Ser Ala
145                 150                 155                 160

Val Tyr Tyr Leu Ser His Leu Glu Arg Ile Thr Glu Glu Gly Tyr Val
                165                 170                 175

Pro Thr Ala Gln Asp Val Leu Arg Ser Arg Met Pro Thr Thr Gly Ile
            180                 185                 190

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

Val Gly Gly Gln Lys Ser Glu Arg Lys Lys Trp Ile His Cys Phe Glu
    210                 215                 220

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

Cys Leu Glu Glu Asn Asn Gln Glu Asn Arg Met Lys Glu Ser Leu Ala
                245                 250                 255

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

Ile Leu Phe Leu Asn Lys Thr Asp Ile Leu Glu Glu Lys Ile Pro Thr
        275                 280                 285

Ser His Leu Ala Thr Tyr Phe Pro Ser Phe Gln Gly Pro Lys Gln Asp
    290                 295                 300
```

```
Ala Glu Ala Ala Lys Arg Phe Ile Leu Asp Met Tyr Thr Arg Met Tyr
305                 310                 315                 320


Thr Gly Cys Val Asp Gly Pro Glu Gly Ser Lys Lys Gly Ala Arg Ser
                325                 330                 335


Arg Arg Leu Phe Ser His Tyr Thr Cys Ala Thr Asp Thr Gln Asn Ile
            340                 345                 350


Arg Lys Val Phe Lys Asp Val Arg Asp Ser Val Leu Ala Arg Tyr Leu
        355                 360                 365


Asp Glu Ile Asn Leu Leu
    370


<210>  53
<211>  10
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Protein motif

<400>  53

Met Ala Tyr Asp Arg Tyr Val Ala Ile Cys
1               5                   10


<210>  54
<211>  7
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Protein motif

<400>  54

Phe Ser Thr Cys Ser Ser His
1               5


<210>  55
<211>  8
<212>  PRT
<213>  Artificial Sequence
```

<220>
<223>  Protein motif

<400>  55

Pro Met Leu Asn Pro Phe Ile Tyr
1               5