SEQUENCE LISTING

<110> Mountgate Group Ltd.

<120> COMPOSITIONS AND METHODS RELATED TO THE PREVENTION AND TREATMENT OF RABIES INFECTION

<130> 090871-0113

<160> 67

<170> PatentIn version 3.5

<210> 1
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<212> DNA
<213> Artificial

<220>
<223> Synthetic Primer

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<210> 2
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<212> DNA
<213> Artificial

<220>
<223> Synthetic Primer

<400> 2
acagtcactg agctgc 16

<210> 3
<211> 21
<212> DNA
<213> Artificial

<220>
<223> Synthetic Primer

<400> 3
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<211> 420
<212> DNA
<213> Mus musculus

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tgcaaggctt ctggttattc attcactgac tacatcatgc tctgggtgaa gcagagccat 180

ggaaagagcc ttgagtggat tggagatatt tatccttact atggtagtac tagctacaat 240

ctgaagttca agggcaaggc cacattgact gtagacaaat cttccagcac agcctacatg 300

cagctcaaca gtctgacatc tgaggactct gcagtctatt actgtgcaag gcagggcggg 360

gatggtaact acgtcctctt tgactactgg ggccaaggca ccactctcac agtctcctca 420

<210> 5
<211> 140
<212> PRT
<213> Mus Musculus

<400> 5

Met Gly Gly Ile Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly
1 5 10 15

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

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

Thr Asp Tyr Ile Met Leu Trp Val Lys Gln Ser His Gly Lys Ser Leu
50 55 60

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

Leu Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Ser
85 90 95

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

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

Tyr Trp Gly Gln Gly Thr Thr Leu Thr Val Ser Ser
130 135 140

<210> 6
<211> 381
<212> DNA
<213> Mus musculus

<400> 6
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gacattgtga tgacccagtc tcaaaaattc atgtccacat cagtaggaga cagggtcagc 120

gtcacctgca aggccagtca gaatgtgggt actactgttg cctggtatca acagaaacca 180

ggacaatctc ctaaagcact gatttactcg gcatcctacc ggtacagtgg agtccctgat 240

cgcttcacag gcagtggatc tgggacagat ttcactctca ccatcagcaa tgtgcagtct 300

gaagacttgg cagaatattt ctgtcagcaa tataacagct atccattcac gttcggctcg 360

gggacaaagt tggaaataaa a 381

<210> 7
<211> 127
<212> PRT
<213> Mus musculus

<400> 7

Met Glu Ser Gln Thr Gln Val Phe Val Tyr Met Leu Leu Trp Leu Ser
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Gly Val Asp Gly Asp Ile Val Met Thr Gln Ser Gln Lys Phe Met Ser
20 25 30

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

Val Gly Thr Thr Val Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ser Pro
50 55 60

Lys Ala Leu Ile Tyr Ser Ala Ser Tyr Arg Tyr Ser Gly Val Pro Asp
65 70 75 80

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

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

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

<210> 8
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Synthetic Primer

<400> 8
gcaactagta ccaccatggg agggatctgg atc 33

<210> 9
<211> 49
<212> DNA
<213> Artificial

<220>
<223> Synthetic Primer

<400> 9
gggaagcttg ttttaaggac tcacctgagg agactgtgag agtggtgcc 49

<210> 10
<211> 454
<212> DNA
<213> Artificial

<220>
<223> Chimeric gene

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gcccactctg agatccagct gcagcagact ggacctgagc tggtgaagcc tggggcttca 120

gtgaagatat cctgcaaggc ttctggttat tcattcactg actacatcat gctctgggtg 180

aagcagagcc atggaaagag ccttgagtgg attggagata tttatcctta ctatggtagt 240

actagctaca atctgaagtt caagggcaag gccacattga ctgtagacaa atcttccagc 300

acagcctaca tgcagctcaa cagtctgaca tctgaggact ctgcagtcta ttactgtgca 360

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acagtctcct caggtgagtc cttaaaacaa gctt 454

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<211> 140
<212> PRT
<213> Artificial

<220>
<223> Chimeric protein

<400> 11

Met Gly Gly Ile Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly
1 5 10 15

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

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

Thr Asp Tyr Ile Met Leu Trp Val Lys Gln Ser His Gly Lys Ser Leu
50 55 60

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

Leu Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Ser
85 90 95

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

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

Tyr Trp Gly Gln Gly Thr Thr Leu Thr Val Ser Ser
130 135 140

<210> 12
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Synthetic primer

<400> 12
gctgctagca ccaccatgga gtcacagact cag 33

<210> 13
<211> 50
<212> DNA
<213> Artificial

<220>
<223> Synthetic primer

<400> 13
ggggaattcg caaaagtcta cttacgtttt atttccaact ttgtccccga 50

<210> 14
<211> 416
<212> DNA
<213> Artificial

<220>
<223> Chimeric gene

<400> 14
gctagcacca ccatggagtc acagactcag gtctttgtat acatgttgct gtggttgtct 60

ggtgttgatg gagacattgt gatgacccag tctcaaaaat tcatgtccac atcagtagga 120

gacagggtca gcgtcacctg caaggccagt cagaatgtgg gtactactgt tgcctggtat 180

caacagaaac caggacaatc tcctaaagca ctgatttact cggcatccta ccggtacagt 240

ggagtccctg atcgcttcac aggcagtgga tctgggacag atttcactct caccatcagc 300

aatgtgcagt ctgaagactt ggcagaatat ttctgtcagc aatataacag ctatccattc 360

acgttcggct cggggacaaa gttggaaata aaacgtaagt agacttttgc gaattc 416

<210> 15
<211> 127
<212> PRT
<213> Artificial

<220>
<223> Chimeric protein

<400> 15

Met Glu Ser Gln Thr Gln Val Phe Val Tyr Met Leu Leu Trp Leu Ser
1 5 10 15

Gly Val Asp Gly Asp Ile Val Met Thr Gln Ser Gln Lys Phe Met Ser
20 25 30

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

Val Gly Thr Thr Val Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ser Pro
50 55 60

Lys Ala Leu Ile Tyr Ser Ala Ser Tyr Arg Tyr Ser Gly Val Pro Asp
65 70 75 80

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

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

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

<210> 16
<211> 455
<212> DNA
<213> Artificial

<220>
<223> Humanized gene

<400> 16

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gcccactccc aggtccagct tgtgcagtct ggggctgaag tgaaaaagcc tggggcctca      120

gtgaaggttt cctgcaaggc ttctggatac tcattcactg actatatcat gctttgggtg      180

cgccaggccc ctggacaaag gcttgagtgg attggagata tctatcctta ctatggcagt      240

acaagctata atctgaagtt caagggcaag gccaccctca ccgtcgacac atccgcgagc      300

acagcctaca tggagctcag cagcctgaga tctgaagaca ccgctgtgta ttactgtgcc      360

aggcagggcg gcgatggaaa ctacgtcctc tttgactact ggggccaggg aaccctggtc      420

accgtctcct caggtgagtc tgctgtacta agctt                                 455
```

<210> 17
<211> 140
<212> PRT
<213> Artificial

<220>
<223> Humanized protein

<400> 17

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

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

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

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

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

```
Leu Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Thr Ser Ala Ser
                85                  90                  95

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

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

Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
    130                 135                 140
```

<210> 18
<211> 416
<212> DNA
<213> Artificial

<220>
<223> Humanized gene

<400> 18

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ggtgttgatg gagacattca gatgacccag tctccatcct ccctgtccgc atcagtcgga      120

gacagggtca ccatcacctg caaggccagt cagaatgtgg gtactactgt tgcctggtat      180

caacagaaac caggaaaagc ccctaaagtc ctgatttact ccgcatccta tcggtacagt      240

ggagtccctt cacgcttcag tggcagtgga tctgggacag atttcactct caccatcagc      300

agtctgcagc ctgaagactt tgcaacttat tactgtcagc aatataacag ctatccattc      360

acgttcggcc aggggacaaa gttggaaatc aaacgtaagt acttttttcc gaattc          416
```

<210> 19
<211> 127
<212> PRT
<213> Artificial

<220>
<223> Humanized protein

<400> 19

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Met Glu Ser Gln Thr Gln Val Phe Val Tyr Met Leu Leu Trp Leu Ser
1               5                   10                  15

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

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

Val Gly Thr Thr Val Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro
    50                  55                  60

Lys Val Leu Ile Tyr Ser Ala Ser Tyr Arg Tyr Ser Gly Val Pro Ser
65                  70                  75                  80
```

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

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

Ser Tyr Pro Phe Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
        115                 120                 125
```

<210> 20
<211> 416
<212> DNA
<213> Artificial

<220>
<223> Humanized gene

<400> 20

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gctagcacca ccatggagtc acagactcag gtctttgtgt acatgttgct gtggttgtct       60

ggtgttgatg gagacattca gatgacccag tctccatcct ccctgtccgc atcagtcgga      120

gacagggtca ccatcacctg caaggccagt cagaatgtgg gtactactgt tgcctggtat      180

caacagaaac caggaaaagc ccctaaagtc ctgatttact ccgcatccta tcggtacagt      240

ggagtccctt cacgcttcag tggcagtgga tctgggacag atttcactct caccatcagc      300

agtctgcagc ctgaagactt tgcaacttat tactgtcagc aatataacag ctatccattc      360

acgttcggcc aggggacaaa gttggaaatc aaacgtaagt acttttttcc gaattc          416
```

<210> 21
<211> 127
<212> PRT
<213> Artificial

<220>
<223> Humanized protein

<400> 21

```
Met Glu Ser Gln Thr Gln Val Phe Val Tyr Met Leu Leu Trp Leu Ser
1               5                   10                  15

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

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

Val Gly Thr Thr Val Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro
    50                  55                  60

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

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser
```

85 90 95

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

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

<210> 22
<211> 1413
<212> DNA
<213> Artificial

<220>
<223> Recombinant plasmid

<400> 22
atgggaggga tctggatctt tctcttcctc ctgtcaggaa ctgcaggtgc ccactctgag 60

atccagctgc agcagactgg acctgagctg gtgaagcctg gggcttcagt gaagatatcc 120

tgcaaggctt ctggttattc attcactgac tacatcatgc tctgggtgaa gcagagccat 180

ggaaagagcc ttgagtggat tggagatatt tatccttact atggtagtac tagctacaat 240

ctgaagttca agggcaaggc cacattgact gtagacaaat cttccagcac agcctacatg 300

cagctcaaca gtctgacatc tgaggactct gcagtctatt actgtgcaag gcagggcggg 360

gatggtaact acgtcctctt tgactactgg ggccaaggca ccactctcac agtctcctca 420

gcctccacca agggcccatc ggtcttcccc ctggcaccct cctccaagag cacctctggg 480

ggcacagcgg ccctgggctg cctggtcaag gactacttcc ccgaaccggt gacggtgtcg 540

tggaactcag gcgccctgac cagcggcgtg cacaccttcc cggctgtcct acagtcctca 600

ggactctact ccctcagcag cgtggtgacc gtgccctcca gcagcttggg cacccagacc 660

tacatctgca acgtgaatca caagcccagc aacaccaagg tggacaagaa agttgagccc 720

aaatcttgtg acaaaactca cacatgccca ccgtgcccag cacctgaact cctgggggga 780

ccgtcagtct tcctcttccc cccaaaaccc aaggacaccc tcatgatctc ccggacccct 840

gaggtcacat gcgtggtggt ggacgtgagc cacgaagacc ctgaggtcaa gttcaactgg 900

tacgtggacg gcgtggaggt gcataatgcc aagacaaagc cgcgggagga gcagtacaac 960

agcacgtacc gtgtggtcag cgtcctcacc gtcctgcacc aggactggct gaatggcaag 1020

gagtacaagt gcaaggtctc caacaaagcc ctcccagccc ccatcgagaa aaccatctcc 1080

aaagccaaag ggcagccccg agaaccacag gtgtacaccc tgccccatc ccgggatgag 1140

ctgaccaaga accaggtcag cctgacctgc ctggtcaaag gcttctatcc cagcgacatc 1200

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ctggactccg acggctcctt cttcctctac agcaagctca ccgtggacaa gagcaggtgg 1320

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cagaagagcc tctccctgtc tccgggtaaa tga 1413

<210> 23
<211> 470
<212> PRT
<213> Artificial Sequence

<220>
<223> Recombinant protein

<400> 23

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Met Gly Gly Ile Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly
1               5                  10                  15

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

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

Thr Asp Tyr Ile Met Leu Trp Val Lys Gln Ser His Gly Lys Ser Leu
    50                  55                  60

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

Leu Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Ser
                85                  90                  95

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

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

Tyr Trp Gly Gln Gly Thr Thr Leu Thr Val Ser Ser Ala Ser Thr Lys
    130                 135                 140

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

Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro
                165                 170                 175

Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr
            180                 185                 190

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

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

Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro
225                 230                 235                 240
```

```
Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu
                245                 250                 255

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

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

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

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

Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp
                325                 330                 335

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

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

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

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

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

Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys
            420                 425                 430

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

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

Ser Leu Ser Pro Gly Lys
465                 470
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<210> 24
<211> 705
<212> DNA
<213> Artificial

<220>
<223> Recombinant plasmid

<400> 24
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gacattgtga tgacccagtc tcaaaaattc atgtccacat cagtaggaga cagggtcagc 120

gtcacctgca aggccagtca gaatgtgggt actactgttg cctggtatca acagaaacca 180

ggacaatctc ctaaagcact gatttactcg gcatcctacc ggtacagtgg agtccctgat 240

cgcttcacag gcagtggatc tgggacagat ttcactctca ccatcagcaa tgtgcagtct 300

gaagacttgg cagaatattt ctgtcagcaa tataacagct atccattcac gttcggctcg 360

gggacaaagt tggaaataaa acgaactgtg gctgcaccat ctgtcttcat cttcccgcca 420

tctgatgagc agttgaaatc tggaactgcc tctgttgtgt gcctgctgaa taacttctat 480

cccagagagg ccaaagtaca gtggaaggtg gataacgccc tccaatcggg taactcccag 540

gagagtgtca cagagcagga cagcaaggac agcacctaca gcctcagcag caccctgacg 600

ctgagcaaag cagactacga gaaacacaaa gtctacgcct gcgaagtcac ccatcagggc 660

ctgagctcgc ccgtcacaaa gagcttcaac aggggagagt gttag 705

<210> 25
<211> 234
<212> PRT
<213> Artificial

<220>
<223> Recombinant protein

<400> 25

Met Glu Ser Gln Thr Gln Val Phe Val Tyr Met Leu Leu Trp Leu Ser
1 5 10 15

Gly Val Asp Gly Asp Ile Val Met Thr Gln Ser Gln Lys Phe Met Ser
20 25 30

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

Val Gly Thr Thr Val Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ser Pro
50 55 60

Lys Ala Leu Ile Tyr Ser Ala Ser Tyr Arg Tyr Ser Gly Val Pro Asp
65 70 75 80

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

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

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

Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln

```
    130                 135                 140

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

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

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

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

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

Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
225                 230
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<210> 26
<211> 1413
<212> DNA
<213> Artificial

<220>
<223> Recombinant plasmid

<400> 26

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tgcaaggctt ctggatactc attcactgac tatatcatgc tttgggtgcg ccaggcccct      180

ggacaaaggc ttgagtggat tggagatatc tatccttact atggcagtac aagctataat      240

ctgaagttca agggcaaggc caccctcacc gtcgacacat ccgcgagcac agcctacatg      300

gagctcagca gcctgagatc tgaagacacc gctgtgtatt actgtgccag gcagggcggc      360

gatggaaact acgtcctctt tgactactgg ggccagggaa ccctggtcac cgtctcctca      420

gcctccacca agggcccatc ggtcttcccc ctggcaccct cctccaagag cacctctggg      480

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tggaactcag gcgccctgac cagcggcgtg cacaccttcc cggctgtcct acagtcctca      600

ggactctact ccctcagcag cgtggtgacc gtgccctcca gcagcttggg cacccagacc      660

tacatctgca acgtgaatca caagcccagc aacaccaagg tggacaagaa agttgagccc      720

aaatcttgtg acaaaactca cacatgccca ccgtgcccag cacctgaact cctgggggga      780

ccgtcagtct tcctcttccc cccaaaaccc aaggacaccc tcatgatctc ccggacccct      840

gaggtcacat gcgtggtggt ggacgtgagc cacgaagacc ctgaggtcaa gttcaactgg      900

tacgtggacg gcgtggaggt gcataatgcc aagacaaagc cgcgggagga gcagtacaac      960

agcacgtacc gtgtggtcag cgtcctcacc gtcctgcacc aggactggct gaatggcaag     1020
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gagtacaagt gcaaggtctc caacaaagcc ctcccagccc ccatcgagaa aaccatctcc 1080

aaagccaaag ggcagccccg agaaccacag gtgtacaccc tgcccccatc ccgggatgag 1140

ctgaccaaga accaggtcag cctgacctgc ctggtcaaag gcttctatcc cagcgacatc 1200

gccgtggagt gggagagcaa tgggcagccg gagaacaact acaagaccac gcctcccgtg 1260

ctggactccg acggctcctt cttcctctac agcaagctca ccgtggacaa gagcaggtgg 1320

cagcagggga acgtcttctc atgctccgtg atgcatgagg ctctgcacaa ccactacacg 1380

cagaagagcc tctccctgtc tccgggtaaa tga 1413

<210> 27
<211> 470
<212> PRT
<213> Artificial

<220>
<223> Recombinant protein

<400> 27

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

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

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

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

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

Leu Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Thr Ser Ala Ser
85 90 95

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

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

Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys
130 135 140

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

Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro
165 170 175

```
Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr
            180                 185                 190

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

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

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

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

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

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

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

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

Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp
                325                 330                 335

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

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

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

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

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

Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys
            420                 425                 430

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

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

Ser Leu Ser Pro Gly Lys
465                 470
```

<210> 28
<211> 705
<212> DNA
<213> Artificial

<220>
<223> Recombinant plasmid

<400> 28

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atggagtcac agactcaggt ctttgtgtac atgttgctgt ggttgtctgg tgttgatgga       60

gacattcaga tgacccagtc tccatcctcc ctgtccgcat cagtcggaga cagggtcacc      120

atcacctgca aggccagtca gaatgtgggt actactgttg cctggtatca acagaaacca      180

ggaaaagccc ctaaagcact gatttactcc gcatcctatc ggtacagtgg agtcccttca      240

cgcttcagtg gcagtggatc tgggacagat ttcactctca ccatcagcag tctgcagcct      300

gaagactttg caacttatta ctgtcagcaa tataacagct atccattcac gttcggccag      360

gggacaaagt tggaaatcaa acgaactgtg gctgcaccat ctgtcttcat cttcccgcca      420

tctgatgagc agttgaaatc tggaactgcc tctgttgtgt gcctgctgaa taacttctat      480

cccagagagg ccaaagtaca gtggaaggtg gataacgccc tccaatcggg taactcccag      540

gagagtgtca cagagcagga cagcaaggac agcacctaca gcctcagcag caccctgacg      600

ctgagcaaag cagactacga gaaacacaaa gtctacgcct gcgaagtcac ccatcagggc      660

ctgagctcgc ccgtcacaaa gagcttcaac aggggagagt gttag                      705
```

<210> 29
<211> 234
<212> PRT
<213> Artificial

<220>
<223> Recombinant Protein

<400> 29

```
Met Glu Ser Gln Thr Gln Val Phe Val Tyr Met Leu Leu Trp Leu Ser
1               5                   10                  15

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

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

Val Gly Thr Thr Val Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro
    50                  55                  60

Lys Ala Leu Ile Tyr Ser Ala Ser Tyr Arg Tyr Ser Gly Val Pro Ser
```

65 70 75 80

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

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

Ser Tyr Pro Phe Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys Arg
115 120 125

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

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

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

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

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

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

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

<210> 30
<211> 705
<212> DNA
<213> Artificial

<220>
<223> Recombinant plasmid

<400> 30
atggagtcac agactcaggt ctttgtgtac atgttgctgt ggttgtctgg tgttgatgga 60

gacattcaga tgacccagtc tccatcctcc ctgtccgcat cagtcggaga cagggtcacc 120

atcacctgca aggccagtca gaatgtgggt actactgttg cctggtatca acagaaacca 180

ggaaaagccc ctaaagtcct gatttactcc gcatcctatc ggtacagtgg agtcccttca 240

cgcttcagtg gcagtggatc tgggacagat ttcactctca ccatcagcag tctgcagcct 300

gaagactttg caacttatta ctgtcagcaa tataacagct atccattcac gttcggccag 360

gggacaaagt tggaaatcaa acgaactgtg gctgcaccat ctgtcttcat cttcccgcca 420

tctgatgagc agttgaaatc tggaactgcc tctgttgtgt gcctgctgaa taacttctat 480

cccagagagg ccaaagtaca gtggaaggtg gataacgccc tccaatcggg taactcccag 540

gagagtgtca cagagcagga cagcaaggac agcacctaca gcctcagcag caccctgacg 600

ctgagcaaag cagactacga gaaacacaaa gtctacgcct gcgaagtcac ccatcagggc 660

ctgagctcgc ccgtcacaaa gagcttcaac aggggagagt gttag 705

<210> 31
<211> 234
<212> PRT
<213> Artificial

<220>
<223> Recombinant protein

<400> 31

Met Glu Ser Gln Thr Gln Val Phe Val Tyr Met Leu Leu Trp Leu Ser
1 5 10 15

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

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

Val Gly Thr Thr Val Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro
50 55 60

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

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

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

Ser Tyr Pro Phe Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys Arg
115 120 125

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

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

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

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

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

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

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

<210> 32
<211> 417
<212> DNA
<213> Mus musculus

<400> 32

```
atgaactttg tgctcagcct gattttcctt gccctcattt taagaggtgt cccgtgtgaa       60

gtgcagctgg tggagtctgg gggaggctta gtgaagcctg gagggtccct gatactctcc      120

tgtgcagcct caggattcac tttcagtggc tttgccatgt cttgggttcg ccagactccg      180

gagaagaggc tggagtgggt cgcaaccatt agtagtggtg gtacttatac ctactctcca      240

gacagtgtga tgggtcgatt caccatctcc agagacaatg ccaagaacac cctgtacctg      300

caaatgagca gtctgaggtc tgaggacacg gccatgtatt actgtgcaag acgattacgt      360

cggaattact actctatgga ctactggggt caaggaacct cagtcaccgt ctcctca         417
```

<210> 33
<211> 139
<212> PRT
<213> Mus musculus

<400> 33

```
Met Asn Phe Val Leu Ser Leu Ile Phe Leu Ala Leu Ile Leu Arg Gly
1               5                   10                  15

Val Pro Cys Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Lys
            20                  25                  30

Pro Gly Gly Ser Leu Ile Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe
        35                  40                  45

Ser Gly Phe Ala Met Ser Trp Val Arg Gln Thr Pro Glu Lys Arg Leu
    50                  55                  60

Glu Trp Val Ala Thr Ile Ser Ser Gly Gly Thr Tyr Thr Tyr Ser Pro
65                  70                  75                  80

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

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

Tyr Tyr Cys Ala Arg Arg Leu Arg Arg Asn Tyr Tyr Ser Met Asp Tyr
        115                 120                 125
```

```
Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser
    130                 135


<210>  34
<211>  396
<212>  DNA
<213>  Mus musculus

<400>  34
atgaagctgc ctgttctgct agtggtgctg ctattgttca cgagtccagc ctcaagcagt       60

gatgttgttc tgacccaagc tccactctct ctgcctgtca atattggaga tcaagcctct      120

atctcttgca agtctactaa gagtcttctg aatagtgatg gattcactta tttggactgg      180

tacctgcaga agccaggcca gtctccacag ctcctaatat atttggtttc taatcgattt      240

tctggagttc cagacaggtt cagtggcagt gggtcaggaa cagatttcac actcaagatc      300

agcagagtgg aggctgagga tttgggaatt tatttttgct tccagagtaa ctatcttcca      360

ttcacgttcg gctcggggac aaagttggaa ataaaa                                 396


<210>  35
<211>  132
<212>  PRT
<213>  Mus musculus

<400>  35

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


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


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


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


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


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


Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Leu Gly Ile Tyr Phe
            100                 105                 110


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


Leu Glu Ile Lys
    130


<210>  36
```

<211> 33
<212> DNA
<213> Artificial

<220>
<223> Synthetic priemr

<400> 36
gcaactagta ccaccatgaa ctttgtgctc agc 33

<210> 37
<211> 47
<212> DNA
<213> Artificial

<220>
<223> Synthetic primer

<400> 37
gggaagcttg agaggccatt cttacctgag gagacggtga ctgaggt 47

<210> 38
<211> 448
<212> DNA
<213> Artificial

<220>
<223> Chimeric gene

<400> 38
actagtacca ccatgaactt tgtgctcagc ctgattttcc ttgccctcat tttaagaggt 60

gtcccgtgtg aagtgcagct ggtggagtct gggggaggct tagtgaagcc tggagggtcc 120

ctgatactct cctgtgcagc ctcaggattc actttcagtg gctttgccat gtcttgggtt 180

cgccagactc cggagaagag gctggagtgg gtcgcaacca ttagtagtgg tggtacttat 240

acctactctc cagacagtgt gatgggtcga ttcaccatct ccagagacaa tgccaagaac 300

accctgtacc tgcaaatgag cagtctgagg tctgaggaca cggccatgta ttactgtgca 360

agacgattac gtcggaatta ctactctatg gactactggg gtcaaggaac ctcagtcacc 420

gtctcctcag gtgagtcctt aaaagctt 448

<210> 39
<211> 139
<212> PRT
<213> Artificial

<220>
<223> Chmeric protein

<400> 39

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

Val Pro Cys Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Lys
20 25 30

Pro Gly Gly Ser Leu Ile Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe
35 40 45

```
Ser Gly Phe Ala Met Ser Trp Val Arg Gln Thr Pro Glu Lys Arg Leu
    50                  55                  60

Glu Trp Val Ala Thr Ile Ser Ser Gly Gly Thr Tyr Thr Tyr Ser Pro
65                  70                  75                  80

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

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

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

Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser
    130                 135
```

<210> 40
<211> 431
<212> DNA
<213> Artificial

<220>
<223> Chimeric gene

<400> 40

```
gctagcacca ccatgaagct gcctgttctg ctagtggtgc tgctattgtt cacgagtcca       60

gcctcaagca gtgatgttgt tctgacccaa gctccactct ctctgcctgt caatattgga      120

gatcaagcct ctatctcttg caagtctact aagagtcttc tgaatagtga tggattcact      180

tatttggact ggtacctgca gaagccaggc cagtctccac agctcctaat atatttggtt      240

tctaatcgat tttctggagt tccagacagg ttcagtggca gtgggtcagg aacagatttc      300

acactcaaga tcagcagagt ggaggctgag gatttgggaa tttatttttg cttccagagt      360

aactatcttc cattcacgtt cggctcgggg acaaagttgg aaataaaacg taagtagact      420

tttgcgaatt c                                                           431
```

<210> 41
<211> 132
<212> PRT
<213> Artificial

<220>
<223> Chimeric protein

<400> 41

```
Met Lys Leu Pro Val Leu Leu Val Val Leu Leu Leu Phe Thr Ser Pro
1               5                   10                  15

Ala Ser Ser Ser Asp Val Val Leu Thr Gln Ala Pro Leu Ser Leu Pro
            20                  25                  30
```

```
Val Asn Ile Gly Asp Gln Ala Ser Ile Ser Cys Lys Ser Thr Lys Ser
        35                  40                  45

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

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

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

Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Leu Gly Ile Tyr Phe
            100                 105                 110

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

Leu Glu Ile Lys
    130
```

<210> 42
<211> 453
<212> DNA
<213> Artificial

<220>
<223> Humanized gene

<400> 42
actagtacca ccatggaatt ggggctgagc tgggttttcc ttgttgctat tctggaaggc 60

gtccagtgtg aagtgcagct cgtggagtct gggggaggcc tcgtccagcc tgggggctcc 120

ctgatcctct cctgtgcagc ctctggattc acctttagtg gctttgccat gagctgggtc 180

cgccaggctc agggaaggg gctcgagtgg gttgccacca ttagtagtgg cggaacttat 240

acctactctc agactctgt gatgggccga ttcaccatct ccagagacaa cgccaagaac 300

tcactgtatc tgcaaatgaa cagcctgaga gccgaggaca cagctgtgta ttactgtgcc 360

agacgactgc gtcggaatta ctactctatg gactactggg gccaagggac aatggtcacc 420

gtctcctcag gtaagatggg ctttcctaag ctt 453

<210> 43
<211> 139
<212> PRT
<213> Artificial

<220>
<223> Humanized protein

<400> 43

```
Met Glu Leu Gly Leu Ser Trp Val Phe Leu Val Ala Ile Leu Glu Gly
1               5                   10                  15
```

Val Gln Cys Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln
            20   25   30

Pro Gly Gly Ser Leu Ile Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe
        35   40   45

Ser Gly Phe Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu
    50   55   60

Glu Trp Val Ala Thr Ile Ser Ser Gly Gly Thr Tyr Thr Tyr Ser Pro
65   70   75   80

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

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

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

Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser
    130   135

<210> 44
<211> 432
<212> DNA
<213> Artificial

<220>
<223> Humanized gene

<400> 44
gctagcacca ccatgaggct ccctgctcag ctcctggggc tgctgatgct ctgggtctct 60

ggatccagtg gggatattgt gatgactcag tctccactct ccctgcccgt caccctgga 120

gagcctgcct ccatctcctg caagtctact aagagcctcc tgaatagtga tggattcact 180

tatttggatt ggtacctgca gaagccaggg cagtctccac agctcctgat ctatttggtt 240

tctaatcggt tttccggggt cccagacaga ttcagtggca gtggatcagg cacagatttt 300

acactgaaaa tcagcagagt ggaggctgag gatgttggcg tttattactg cttccaaagt 360

aactatcttc ctttcacttt cggcggcgga accaaagtcg agatcaaacg taagtgcact 420

ttcctagaat tc 432

<210> 45
<211> 132
<212> PRT
<213> Artificial

<220>
<223> Humanized protein

<400> 45

Met Arg Leu Pro Ala Gln Leu Leu Gly Leu Leu Met Leu Trp Val Ser

1 5 10 15

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

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

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

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

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

Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr
100 105 110

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

Val Glu Ile Lys
130

<210> 46
<211> 1410
<212> DNA
<213> Artificial

<220>
<223> Recombinant plasmid

<400> 46
atgaactttg tgctcagcct gattttcctt gccctcattt taagaggtgt cccgtgtgaa 60

gtgcagctgg tggagtctgg gggaggctta gtgaagcctg gagggtccct gatactctcc 120

tgtgcagcct caggattcac tttcagtggc tttgccatgt cttgggttcg ccagactccg 180

gagaagaggc tggagtgggt cgcaaccatt agtagtggtg gtacttatac ctactctcca 240

gacagtgtga tgggtcgatt caccatctcc agagacaatg ccaagaacac cctgtacctg 300

caaatgagca gtctgaggtc tgaggacacg gccatgtatt actgtgcaag acgattacgt 360

cggaattact actctatgga ctactggggt caaggaacct cagtcaccgt ctcctcagcc 420

tccaccaagg gcccatcggt cttccccctg gcaccctcct ccaagagcac ctctgggggc 480

acagcggccc tgggctgcct ggtcaaggac tacttccccg aaccggtgac ggtgtcgtgg 540

aactcaggcg ccctgaccag cggcgtgcac accttcccgg ctgtcctaca gtcctcagga 600

ctctactccc tcagcagcgt ggtgaccgtg ccctccagca gcttgggcac ccagacctac 660

atctgcaacg tgaatcacaa gcccagcaac accaaggtgg acaagaaagt tgagcccaaa 720

tcttgtgaca aaactcacac atgcccaccg tgcccagcac ctgaactcct gggggggaccg 780

tcagtcttcc tcttcccccc aaaacccaag gacaccctca tgatctcccg gacccctgag 840

gtcacatgcg tggtggtgga cgtgagccac gaagaccctg aggtcaagtt caactggtac 900

gtggacggcg tggaggtgca taatgccaag acaaagccgc gggaggagca gtacaacagc 960

acgtaccgtg tggtcagcgt cctcaccgtc ctgcaccagg actggctgaa tggcaaggag 1020

tacaagtgca aggtctccaa caaagccctc ccagccccca tcgagaaaac catctccaaa 1080

gccaaagggc agccccgaga accacaggtg tacaccctgc ccccatcccg ggatgagctg 1140

accaagaacc aggtcagcct gacctgcctg gtcaaaggct tctatcccag cgacatcgcc 1200

gtggagtggg agagcaatgg gcagccggag aacaactaca agaccacgcc tcccgtgctg 1260

gactccgacg gctccttctt cctctacagc aagctcaccg tggacaagag caggtggcag 1320

caggggaacg tcttctcatg ctccgtgatg catgaggctc tgcacaacca ctacacgcag 1380

aagagcctct ccctgtctcc gggtaaatga 1410

<210> 47
<211> 469
<212> PRT
<213> Artificial

<220>
<223> Recombinant protein

<400> 47

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

Val Pro Cys Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Lys
20 25 30

Pro Gly Gly Ser Leu Ile Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe
35 40 45

Ser Gly Phe Ala Met Ser Trp Val Arg Gln Thr Pro Glu Lys Arg Leu
50 55 60

Glu Trp Val Ala Thr Ile Ser Ser Gly Gly Thr Tyr Thr Tyr Ser Pro
65 70 75 80

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

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

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

Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser Ala Ser Thr Lys Gly
130 135 140

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

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
                165                 170                 175

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
            180                 185                 190

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

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

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

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

Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
            260                 265                 270

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

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

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
305                 310                 315                 320

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
                325                 330                 335

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

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

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

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
385                 390                 395                 400

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
                405                 410                 415
```

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
420 425 430

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

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

Leu Ser Pro Gly Lys
465

<210> 48
<211> 720
<212> DNA
<213> Artificial

<220>
<223> Recombinant plasmid

<400> 48
atgaagctgc ctgttctgct agtggtgctg ctattgttca cgagtccagc ctcaagcagt 60

gatgttgttc tgacccaagc tccactctct ctgcctgtca atattggaga tcaagcctct 120

atctcttgca agtctactaa gagtcttctg aatagtgatg gattcactta tttggactgg 180

tacctgcaga agccaggcca gtctccacag ctcctaatat atttggtttc taatcgattt 240

tctggagttc cagacaggtt cagtggcagt gggtcaggaa cagatttcac actcaagatc 300

agcagagtgg aggctgagga tttgggaatt tatttttgct tccagagtaa ctatcttcca 360

ttcacgttcg gctcggggac aaagttggaa ataaaacgaa ctgtggctgc accatctgtc 420

ttcatcttcc cgccatctga tgagcagttg aaatctggaa cctgaataac ttctatccca 480

gagaggccaa agtacagtgg aaggtggata acgccctcca atcgggtaac tcccaggaga 540

gtgtcacaga gcaggacagc aaggacagca cctacagcct cagcagcacc ctgacgctga 600

gcaaagcaga ctacgagaaa cacaaagtct acgcctgcgt cacccatcag ggcctgagct 660

cgcccgtcac aaagagcttc aacaggggag agtgttagga atgcctctgt tgtgtgcctg 720

<210> 49
<211> 239
<212> PRT
<213> Artificial

<220>
<223> Recombinant protein

<400> 49

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

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

Val Asn Ile Gly Asp Gln Ala Ser Ile Ser Cys Lys Ser Thr Lys Ser

```
        35                  40                  45

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

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

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

Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Leu Gly Ile Tyr Phe
            100                 105                 110

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

Leu Glu Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro
    130                 135                 140

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

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

Asn Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp
            180                 185                 190

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

Ala Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln
    210                 215                 220

Gly Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
225                 230                 235
```

<210> 50
<211> 1410
<212> DNA
<213> Artificial

<220>
<223> Recombinant plasmid

<400> 50
atggaattgg ggctgagctg ggttttcctt gttgctattc tggaaggcgt ccagtgtgaa 60

gtgcagctcg tggagtctgg gggaggcctc gtccagcctg ggggctccct gagactctcc 120

tgtgcagcct ctggattcac ctttagtggc tttgccatga gctgggtccg ccaggctcca 180

gggaaggggc tcgagtgggt tgccaccatt agtagtggcg gaacttatac ctactctcca 240

gactctgtga tgggccgatt caccatctcc agagacaacg ccaagaactc actgtatctg 300

caaatgaaca gcctgagagc cgaggacaca gctgtgtatt actgtgccag acgactgcgt 360

cggaattact actctatgga ctactggggc caagggacaa tggtcaccgt ctcctcagcc 420

tccaccaagg gcccatcggt cttccccctg gcaccctcct ccaagagcac ctctgggggc 480

acagcggccc tgggctgcct ggtcaaggac tacttccccg aaccggtgac ggtgtcgtgg 540

aactcaggcg ccctgaccag cggcgtgcac accttcccgg ctgtcctaca gtcctcagga 600

ctctactccc tcagcagcgt ggtgaccgtg ccctccagca gcttgggcac ccagacctac 660

atctgcaacg tgaatcacaa gcccagcaac accaaggtgg acaagaaagt tgagcccaaa 720

tcttgtgaca aaactcacac atgcccaccg tgcccagcac ctgaactcct gggggggaccg 780

tcagtcttcc tcttcccccc aaaacccaag gacaccctca tgatctcccg gacccctgag 840

gtcacatgcg tggtggtgga cgtgagccac gaagaccctg aggtcaagtt caactggtac 900

gtggacggcg tggaggtgca taatgccaag acaaagccgc gggaggagca gtacaacagc 960

acgtaccgtg tggtcagcgt cctcaccgtc ctgcaccagg actggctgaa tggcaaggag 1020

tacaagtgca aggtctccaa caaagccctc ccagccccca tcgagaaaac catctccaaa 1080

gccaaagggc agccccgaga accacaggtg tacaccctgc ccccatcccg ggatgagctg 1140

accaagaacc aggtcagcct gacctgcctg gtcaaaggct tctatcccag cgacatcgcc 1200

gtggagtggg agagcaatgg gcagccggag aacaactaca agaccacgcc tcccgtgctg 1260

gactccgacg gctccttctt cctctacagc aagctcaccg tggacaagag caggtggcag 1320

caggggaacg tcttctcatg ctccgtgatg catgaggctc tgcacaacca ctacacgcag 1380

aagagcctct ccctgtctcc gggtaaatga 1410

<210> 51
<211> 469
<212> PRT
<213> Artificial

<220>
<223> Recombinant protein

<400> 51

Met Glu Leu Gly Leu Ser Trp Val Phe Leu Val Ala Ile Leu Glu Gly
1 5 10 15

Val Gln Cys Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln
20 25 30

Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe
35 40 45

Ser Gly Phe Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu
50 55 60

Glu Trp Val Ala Thr Ile Ser Ser Gly Gly Thr Tyr Thr Tyr Ser Pro
65 70 75 80

```
Asp Ser Val Met Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn
                85                  90                  95

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

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

Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser Ala Ser Thr Lys Gly
    130                 135                 140

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

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
                165                 170                 175

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
            180                 185                 190

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

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

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

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

Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
            260                 265                 270

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

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

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
305                 310                 315                 320

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
                325                 330                 335

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
            340                 345                 350
```

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

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

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
385                 390                 395                 400

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

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
            420                 425                 430

Thr Val Asp Lys Ser Arg Trp Gln Gln Lys Ser Leu Ser Leu Ser Pro
        435                 440                 445

Gly Lys Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
    450                 455                 460

Asn His Tyr Thr Gln
465
```

<210> 52
<211> 1410
<212> DNA
<213> Artificial

<220>
<223> Recombinant plasmid

<400> 52
atggaattgg ggctgagctg ggttttcctt gttgctattc tggaaggcgt ccagtgtgaa 60

gtgcagctcg tggagtctgg gggaggcctc gtccagcctg ggggctccct gatcctctcc 120

tgtgcagcct ctggattcac ctttagtggc tttgccatga gctgggtccg ccaggctcca 180

gggaaggggc tcgagtgggt tgccaccatt agtagtggcg gaacttatac ctactctcca 240

gactctgtga tgggccgatt caccatctcc agagacaacg ccaagaactc actgtatctg 300

caaatgaaca gcctgagagc cgaggacaca gctgtgtatt actgtgccag acgactgcgt 360

cggaattact actctatgga ctactggggc caagggacaa tggtcaccgt ctcctcagcc 420

tccaccaagg gcccatcggt cttccccctg gcaccctcct ccaagagcac ctctgggggc 480

acagcggccc tgggctgcct ggtcaaggac tacttccccg aaccggtgac ggtgtcgtgg 540

aactcaggcg ccctgaccag cggcgtgcac accttcccgg ctgtcctaca gtcctcagga 600

ctctactccc tcagcagcgt ggtgaccgtg ccctccagca gcttgggcac ccagacctac 660

atctgcaacg tgaatcacaa gcccagcaac accaaggtgg acaagaaagt tgagcccaaa 720

tcttgtgaca aaactcacac atgcccaccg tgcccagcac ctgaactcct gggggggaccg 780

tcagtcttcc tcttcccccc aaaacccaag gacaccctca tgatctcccg gacccctgag 840

gtcacatgcg tggtggtgga cgtgagccac gaagaccctg aggtcaagtt caactggtac 900

gtggacggcg tggaggtgca taatgccaag acaaagccgc gggaggagca gtacaacagc 960

acgtaccgtg tggtcagcgt cctcaccgtc ctgcaccagg actggctgaa tggcaaggag 1020

tacaagtgca aggtctccaa caaagccctc ccagccccca tcgagaaaac catctccaaa 1080

gccaaagggc agccccgaga accacaggtg tacaccctgc ccccatcccg ggatgagctg 1140

accaagaacc aggtcagcct gacctgcctg gtcaaaggct tctatcccag cgacatcgcc 1200

gtggagtggg agagcaatgg gcagccggag aacaactaca agaccacgcc tcccgtgctg 1260

gactccgacg gctccttctt cctctacagc aagctcaccg tggacaagag caggtggcag 1320

caggggaacg tcttctcatg ctccgtgatg catgaggctc tgcacaacca ctacacgcag 1380

aagagcctct ccctgtctcc gggtaaatga 1410

<210> 53
<211> 469
<212> PRT
<213> Artificial

<220>
<223> Recombinant protein

<400> 53

Met Glu Leu Gly Leu Ser Trp Val Phe Leu Val Ala Ile Leu Glu Gly
1 5 10 15

Val Gln Cys Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln
20 25 30

Pro Gly Gly Ser Leu Ile Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe
35 40 45

Ser Gly Phe Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu
50 55 60

Glu Trp Val Ala Thr Ile Ser Ser Gly Gly Thr Tyr Thr Tyr Ser Pro
65 70 75 80

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

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

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

Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser Ala Ser Thr Lys Gly
130 135 140

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

```
Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
                165                 170                 175

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
            180                 185                 190

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

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

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

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

Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
            260                 265                 270

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

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

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
305                 310                 315                 320

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
                325                 330                 335

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

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

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

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
385                 390                 395                 400

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

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
            420                 425                 430
```

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

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

Leu Ser Pro Gly Lys
465
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<210> 54
<211> 720
<212> DNA
<213> Artificial

<220>
<223> Recombinant plasmid

<400> 54

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atgaggctcc ctgctcagct cctggggctg ctgatgctct gggtctctgg atccagtggg       60

gatattgtga tgactcagtc tccactctcc ctgcccgtca cccctggaga gcctgcctcc      120

atctcctgca agtctactaa gagcctcctg aatagtgatg gattcactta tttggattgg      180

tacctgcaga agccagggca gtctccacag ctcctgatct atttggtttc taatcggttt      240

tccggggtcc cagacagatt cagtggcagt ggatcaggca cagattttac actgaaaatc      300

agcagagtgg aggctgagga tgttggcgtt tattactgct tccaaagtaa ctatcttcct      360

ttcactttcg gcggcggaac caaagtcgag atcaaacgaa ctgtggctgc accatctgtc      420

ttcatcttcc cgccatctga tgagcagttg aaatctggaa ctgcctctgt tgtgtgcctg      480

ctgaataact tctatcccag agaggccaaa gtacagtgga aggtggataa cgccctccaa      540

tcgggtaact cccaggagag tgtcacagag caggacagca aggacagcac ctacagcctc      600

agcagcaccc tgacgctgag caaagcagac tacgagaaac acaaagtcta cgcctgcgaa      660

gtcacccatc agggcctgag ctcgcccgtc acaaagagct tcaacagggg agagtgttag      720
```

<210> 55
<211> 239
<212> PRT
<213> Artificial

<220>
<223> Recombinant protein

<400> 55

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

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

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

```
Leu Leu Asn Ser Asp Gly Phe Thr Tyr Leu Asp Trp Tyr Leu Gln Lys
    50                  55                  60

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

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

Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr
            100                 105                 110

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

Val Glu Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro
    130                 135                 140

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

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

Asn Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp
            180                 185                 190

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

Ala Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln
    210                 215                 220

Gly Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
225                 230                 235


<210>  56
<211>  5
<212>  PRT
<213>  Artificial

<220>
<223>  CDR peptide

<400>  56

Asp Tyr Ile Met Leu
1               5


<210>  57
<211>  17
<212>  PRT
<213>  Artificial

<220>
<223>  CDR peptide
```

<400> 57

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

Gly

<210> 58
<211> 12
<212> PRT
<213> Artificial

<220>
<223> CDR Peptide

<400> 58

Gln Gly Gly Asp Gly Asn Tyr Val Leu Phe Asp Tyr
1 5 10

<210> 59
<211> 5
<212> PRT
<213> Artificial

<220>
<223> CDR Peptide

<400> 59

Gly Phe Ala Met Ser
1 5

<210> 60
<211> 17
<212> PRT
<213> Artificial

<220>
<223> CDR Peptide

<400> 60

Thr Ile Ser Ser Gly Gly Thr Tyr Thr Tyr Ser Pro Asp Ser Val Met
1 5 10 15

Gly

<210> 61
<211> 11
<212> PRT
<213> Artificial

<220>
<223> CDR peptide

<400> 61

Arg Leu Arg Arg Asn Tyr Tyr Ser Met Asp Tyr
1 5 10

<210> 62
<211> 11
<212> PRT
<213> Artificial

<220>
<223> CDR peptide

<400> 62

Lys Ala Ser Gln Asn Val Gly Thr Thr Val Ala
1 5 10

<210> 63
<211> 7
<212> PRT
<213> Artificial

<220>
<223> CDR Peptide

<400> 63

Ser Ala Ser Tyr Arg Tyr Ser
1 5

<210> 64
<211> 9
<212> PRT
<213> Artificial

<220>
<223> CDR peptide

<400> 64

Gln Gln Tyr Asn Ser Tyr Pro Phe Thr
1 5

<210> 65
<211> 16
<212> PRT
<213> Artificial

<220>
<223> CDR peptide

<400> 65

Lys Ser Thr Lys Ser Leu Leu Asn Ser Asp Gly Phe Thr Tyr Leu Asp
1 5 10 15

<210> 66
<211> 7
<212> PRT
<213> Artificial

<220>
<223> CDR peptide

<400> 66

Leu Val Ser Asn Arg Phe Ser

1 5

<210> 67
<211> 9
<212> PRT
<213> Artificial

<220>
<223> CDR peptide

<400> 67

Phe Gln Ser Asn Tyr Leu Pro Phe Thr
1 5