SEQUENCE LISTING

<110> SANOFI
INSERM
UNIVERSITE DE MONTPELLIER 1
CENTRE VAL D'AURELLE- PAUL LAMARQUE
UNIVERSITE DE MONTPELLIER 2 SCIENCES ET TECHNIQUES

<120> Intracellular phenotypic screening

<130> B09196A

<150> EP 13305003.9
<151> 03 JANUARY 2013

<160> 46

<170> PatentIn version 3.5

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<222> (3)..(118)
<223> VH

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<222> (101)..(107)
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Met Ala Glu Val Gln Leu Val Glu Ser Gly Gly Ser Leu Val Lys Pro
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Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser
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Asn Tyr Ser Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu
35 40 45

Trp Ile Ser Ser Ile Ser Gly Ser Ser Arg Tyr Ile Tyr Tyr Ala Asp

50 55 60

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

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

Tyr Cys Val Arg Pro Ile Ala Val Ser Asp Tyr Trp Gly Arg Gly Thr
100 105 110

Leu Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
115 120 125

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

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

Asp Val Gly Gly Tyr Asn Tyr Val Ser Trp Tyr Gln Gln His Pro Gly
165 170 175

Lys Ala Pro Lys Leu Met Ile Tyr Glu Asp Ser Lys Arg Pro Ser Gly
180 185 190

Val Ser Asn Arg Phe Ser Gly Ser Lys Ser Gly Asn Thr Ala Ser Leu
195 200 205

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

Thr Tyr Asp Gly Ser Arg Ala Val Phe Gly Gly Gly Thr Lys Leu Ala
225 230 235 240

Val Leu Gly Ala Ala Ala Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu
245 250 255

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


Asn Tyr Ser Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu
        35                  40                  45


Trp Ile Ser Ser Ile Ser Gly Ser Ser Arg Tyr Ile Tyr Tyr Ala Asp
    50                  55                  60


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


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


Tyr Cys Val Arg Gly Val Arg Gly Gly Tyr Gly Leu Asp Phe Trp Gly
            100                 105                 110


Arg Gly Thr Leu Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly
        115                 120                 125


Gly Thr Lys Leu Ala Val Leu Gly Ala Ala Ala Glu Gln Lys Leu Ile
    130                 135                 140


Ser Glu Glu Asp Leu Asn Gly Ala Ala
145                 150
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<210> 3
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<220>
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<223> VH_CDR3

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

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

Asn Tyr Ser Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu
        35                  40                  45

Trp Ile Ser Ser Ile Ser Gly Ser Ser Arg Tyr Ile Tyr Tyr Ala Asp
    50                  55                  60

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

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

Tyr Cys Val Arg Asp Gly Gly Leu Arg Glu Gly Phe Asp Cys Trp Gly
            100                 105                 110

Arg Gly Thr Leu Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly
        115                 120                 125

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

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

Thr Ser Ser Asp Val Gly Gly Tyr Asn Tyr Val Ser Trp Tyr Gln Gln
                165                 170                 175

His Pro Gly Lys Ala Pro Lys Leu Met Ile Tyr Glu Asp Ser Lys Arg
            180                 185                 190

Pro Ser Gly Val Ser Asn Arg Phe Ser Gly Ser Lys Ser Gly Asn Thr
        195                 200                 205
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Ala Ser Leu Thr Ile Ser Gly Leu Gln Ala Glu Asp Glu Ala Asp Tyr
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Tyr Cys Pro Ser
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<220>
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Met Ala Glu Val Gln Leu Val Glu Ser Gly Gly Ser Leu Val Lys Pro
1 5 10 15

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

Asn Tyr Ser Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu
35 40 45

Trp Ile Ser Ser Ile Ser Gly Ser Ser Arg Tyr Ile Tyr Tyr Ala Asp
50 55 60

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

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

Tyr Cys Val Arg Asp Gly Gly Leu Arg Glu Gly Phe Asp Cys Trp Gly
100 105 110

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

Ile Ser Glu Glu Asp Leu Asn Gly Ala Ala
130 135

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<220>
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Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser
            20                  25                  30

Asn Tyr Ser Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu
        35                  40                  45

Trp Ile Ser Ser Ile Ser Gly Ser Ser Arg Tyr Ile Tyr Tyr Ala Asp
    50                  55                  60

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

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

Tyr Cys Val Arg Asp Gly Gly Leu Arg Glu Gly Phe Asp Cys Trp Gly
            100                 105                 110

Arg Gly Thr Leu Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly
        115                 120                 125

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

Ser Val Ser Gly Ser Pro Gly Gln Ser Ile Thr Ile Ser Cys Ala Gly
145                 150                 155                 160
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eolf-seql

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Thr Ser Ser Asp Val Gly Gly Tyr Asn Tyr Val Ser Trp Tyr Gln Gln
                165                 170                 175

His Pro Gly Lys Ala Pro Lys Leu Met Ile Tyr Glu Asp Ser Lys Arg
            180                 185                 190

Pro Ser Gly Val Ser Asn Arg Phe Ser Gly Ser Lys Ser Gly Asn Thr
        195                 200                 205

Ala Ser Leu Thr Ile Ser Gly Leu Gln Ala Glu Asp Glu Ala Asp Tyr
    210                 215                 220

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

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


Asn Tyr Ser Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu
        35                  40                  45
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Trp Ile Ser Ser Ile Ser Gly Ser Ser Arg Tyr Ile Tyr Tyr Ala Asp
    50                  55                  60

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

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

Tyr Cys Val Arg Ser Ser Ile Thr Ile Phe Gly Gly Gly Met Asp Val
            100                 105                 110

Trp Gly Arg Gly Thr Leu Val Thr Val Ser Ser Gly Gly Gly Gly Ser
        115                 120                 125

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

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

Ala Gly Thr Ser Ser Asp Val Gly Gly Tyr Asn Tyr Val Ser Trp Tyr
                165                 170                 175

Gln Gln His Pro Gly Lys Ala Pro Lys Leu Met Ile Tyr Glu Asp Ser
            180                 185                 190

Lys Arg Pro Ser Gly Val Ser Asn Arg Phe Ser Gly Ser Lys Ser Gly
        195                 200                 205

Asn Thr Ala Ser Leu Thr Ile Ser Gly Leu Gln Ala Glu Asp Glu Ala
    210                 215                 220

Asp Tyr Tyr Cys Ser Ser Tyr Thr Thr Arg Ser Thr Arg Val Phe Gly
225                 230                 235                 240

Gly Gly Thr Lys Leu Ala Val Leu Gly Ala Ala Ala Glu Gln Lys Leu
                245                 250                 255

Ile Ser Glu Glu Asp Leu Asn Gly Ala Ala
            260                 265
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<223> CDR3 of the VH chain of an intracellular antibody of cluster R_1

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

<210> 8
<211> 15
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Gly Lys Val Leu Lys Lys Ala Glu Tyr Ser Asp Trp Leu Asp Asn
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<210> 9
<211> 7
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<220>
<223> CDR3 of the VH chain of an intracellular antibody of cluster R_3

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Arg Ser Ala Ser Cys Glu His
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<210> 10
<211> 7
<212> PRT
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<220>
<223> CDR3 of the VH chain of an intracellular antibody of cluster R_4

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Gly Glu Val Gly Phe Asp Tyr
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<210> 11
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR3 of the VH chain of an intracellular antibody of cluster R_5

<400> 11

Thr Leu Glu Cys Ser Arg Cys Gly Asp Tyr Gly Phe Asp Leu
1   5   10

<210> 12
<211> 14
<212> PRT
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<220>
<223> CDR3 of the VH chain of an intracellular antibody of cluster R_6

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

<210> 13
<211> 17
<212> PRT
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<220>
<223> CDR3 of the VH chain of an intracellular antibody of cluster R_7

<400> 13

Glu Arg Arg Asp Asp Asp Gly Met Tyr Ala Tyr Ser Tyr Gln Phe Asp
1 5 10 15

Val

<210> 14
<211> 15
<212> PRT
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<220>
<223> CDR3 of the VH chain of an intracellular antibody of cluster R_9

<400> 14

Asn Pro Ala Ser Lys Cys Val Tyr Leu Glu His Asp Phe Glu Lys
1 5 10 15

<210> 15
<211> 8
<212> PRT
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<220>
<223> CDR3 of the VH chain of an intracellular antibody of cluster R_10

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Pro Glu Arg Ser Ala Tyr Asp Tyr
1 5

<210> 16
<211> 8

<212> PRT
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<220>
<223> CDR3 of the VH chain of an intracellular antibody of cluster D_1

<400> 16

Gly Asp Ser His Ile Ile Asp Cys
1 5

<210> 17
<211> 8
<212> PRT
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<220>
<223> CDR3 of the VH chain of an intracellular antibody of cluster D_2

<400> 17

Gly Ser Thr Ala Gly Phe Asp Tyr
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<210> 18
<211> 8
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<220>
<223> CDR3 of the VH chain of an intracellular antibody of cluster D_3

<400> 18

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<210> 19
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR3 of the VL chain of an intracellular antibody of cluster R_1

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<210> 20
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<212> PRT
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<220>
<223> CDR3 of the VL chain of an intracellular antibody of cluster R_2

<400> 20

Gln Gln Cys Ser Lys Phe Pro Leu Thr
1 5

<210> 21
<211> 10
<212> PRT
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<220>
<223> CDR3 of the VL chain of an intracellular antibody of cluster R_3

<400> 21

Glu Gln Tyr Asp Thr Ala Pro Pro Tyr Thr
1 5 10

<210> 22
<211> 9
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<220>
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<400> 22

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1 5

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

<220>
<223> CDR3 of the VL chain of an intracellular antibody of cluster R_5

<400> 23

His Gln Ser Asn Thr Tyr Pro Phe Thr
1 5

<210> 24
<211> 9
<212> PRT
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<220>
<223> CDR3 of the VL chain of an intracellular antibody of cluster R_6

<400> 24

Gln Gln Tyr Phe Ser Gln Pro Phe Thr
1 5

<210> 25
<211> 9

<212> PRT
<213> Artificial Sequence

<220>
<223> CDR3 of the VL chain of an intracellular antibody of cluster R_9

<400> 25

Gln Thr Cys Asn Cys Leu Thr Leu Val
1 5

<210> 26
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR3 of the VL chain of an intracellular antibody of cluster R_10

<400> 26

Gln Gln Tyr Ser Ser His Pro Leu Thr
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<210> 27
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<212> PRT
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<220>
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<400> 27

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1 5

<210> 28
<211> 9
<212> PRT
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<220>
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<400> 28

Gln Gln Asp Asp Ser Thr Pro Tyr Thr
1 5

<210> 29
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<212> PRT
<213> Artificial Sequence

<220>
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<210> 30
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ctagag 66

<210> 31
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<220>
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gatccgagaa ttgattggcg aaagattcaa gagatctttc gccaatcaat tcttttttgt 60

ctagag 66

<210> 32
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<212> DNA
<213> Rattus norvegicus

<220>
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<222> (1)..(1659)
<223> Protein LOC297607

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1 5 10 15

tac aaa ttc cag ata gga agt gag cgc tta gaa ctg aga gtg ccc ctc 96
Tyr Lys Phe Gln Ile Gly Ser Glu Arg Leu Glu Leu Arg Val Pro Leu
20 25 30

agg ttt ccc gtg gac gag aat gcc agt cat ctg cat gga cgt ctg atg 144
Arg Phe Pro Val Asp Glu Asn Ala Ser His Leu His Gly Arg Leu Met
35 40 45

ctg ctg cac agt ttg ccc tgc ttc ata gag aat gac tta aaa gaa gct 192
Leu Leu His Ser Leu Pro Cys Phe Ile Glu Asn Asp Leu Lys Glu Ala
50 55 60

ctg gcc cgg ttt ata gaa gaa gag tcc ctc aga gac cat gac agc gat 240
Leu Ala Arg Phe Ile Glu Glu Glu Ser Leu Arg Asp His Asp Ser Asp

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65                  70                  75                  80

gca gaa gca tgc ttg gag gcg gtt aag tct ggt gag gta gat cta cac        288
Ala Glu Ala Cys Leu Glu Ala Val Lys Ser Gly Glu Val Asp Leu His
                85                  90                  95

cag ctg gcg agt aca tgg gcc aaa gcg tat gct gag aca acc cta gag        336
Gln Leu Ala Ser Thr Trp Ala Lys Ala Tyr Ala Glu Thr Thr Leu Glu
            100                 105                 110

cat gcg aga cct gag gag cct aac tgg gat gaa gac ttt gca gat gtg        384
His Ala Arg Pro Glu Glu Pro Asn Trp Asp Glu Asp Phe Ala Asp Val
        115                 120                 125

tac cat gac cta atc cat tct ccg gcc tct gag act ctc tta aat ctg        432
Tyr His Asp Leu Ile His Ser Pro Ala Ser Glu Thr Leu Leu Asn Leu
    130                 135                 140

gaa cac aat tac ttt gtt agc atc tca gaa ttg att ggc gaa aga gat        480
Glu His Asn Tyr Phe Val Ser Ile Ser Glu Leu Ile Gly Glu Arg Asp
145                 150                 155                 160

gtg gag ctg aaa aag tta cga gag aga caa ggc att gaa atg gaa aag        528
Val Glu Leu Lys Lys Leu Arg Glu Arg Gln Gly Ile Glu Met Glu Lys
                165                 170                 175

gtg atg cag gaa ctg ggg aag tcg ctc aca gat caa gat gtg aac tca        576
Val Met Gln Glu Leu Gly Lys Ser Leu Thr Asp Gln Asp Val Asn Ser
            180                 185                 190

ctg gct gcc cag cac ttt gaa tcc cag cag gac tta gag aat aaa tgg        624
Leu Ala Ala Gln His Phe Glu Ser Gln Gln Asp Leu Glu Asn Lys Trp
        195                 200                 205

tca aac gaa ctg aaa cag tct aca gct atc cag aag caa gaa tat cag        672
Ser Asn Glu Leu Lys Gln Ser Thr Ala Ile Gln Lys Gln Glu Tyr Gln
    210                 215                 220

gaa tgg gtg ata aag ctt cat cag gac cta aaa aac ccc aac aac agc        720
Glu Trp Val Ile Lys Leu His Gln Asp Leu Lys Asn Pro Asn Asn Ser
225                 230                 235                 240

tcc ctc agt gaa gaa att aaa gtg cag ccg agt cag ttc agg gaa tct        768
Ser Leu Ser Glu Glu Ile Lys Val Gln Pro Ser Gln Phe Arg Glu Ser
                245                 250                 255

gcg gac gcc gct gga agg atc tat gag gag cag agg aag ctg gaa gaa        816
Ala Asp Ala Ala Gly Arg Ile Tyr Glu Glu Gln Arg Lys Leu Glu Glu
            260                 265                 270

agc ttc acc att cac ctg gga gcc cag ttg aag acc atg cac aat ctg        864
Ser Phe Thr Ile His Leu Gly Ala Gln Leu Lys Thr Met His Asn Leu
        275                 280                 285

cgg ttg ctg agg gca gac atg ctg gac ttc tgt aag cac aag aga acg        912
Arg Leu Leu Arg Ala Asp Met Leu Asp Phe Cys Lys His Lys Arg Thr
    290                 295                 300

cag ggg agc ggc gtg aag ctc cac cgg ctc cag acg gca ctg tcc ctt        960
Gln Gly Ser Gly Val Lys Leu His Arg Leu Gln Thr Ala Leu Ser Leu
305                 310                 315                 320

tac tcc acg tcc ctc tgt ggc ctg gtt tta cta gta gac aat cgg att       1008
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Tyr Ser Thr Ser Leu Cys Gly Leu Val Leu Leu Val Asp Asn Arg Ile
                325                 330                 335

aat tca tat agc ggc atc aaa aga gat ttt gcc aca gtt tgc caa gaa       1056
Asn Ser Tyr Ser Gly Ile Lys Arg Asp Phe Ala Thr Val Cys Gln Glu
            340                 345                 350

tgc acg gac ttc cac ttc ccg cgg att gag gag caa ctg gag gtt gtc       1104
Cys Thr Asp Phe His Phe Pro Arg Ile Glu Glu Gln Leu Glu Val Val
        355                 360                 365

cag cag gtg gcg ctg tac gca cga acc cag cgc agg agc aag tgc aag       1152
Gln Gln Val Ala Leu Tyr Ala Arg Thr Gln Arg Arg Ser Lys Cys Lys
    370                 375                 380

gag gca cgc gat tct gga aac caa aat gga gga agt gat gag aaa tct       1200
Glu Ala Arg Asp Ser Gly Asn Gln Asn Gly Gly Ser Asp Glu Lys Ser
385                 390                 395                 400

aag aat gct gag aga aac tat tta aat att tta cca gga gaa ttt tat       1248
Lys Asn Ala Glu Arg Asn Tyr Leu Asn Ile Leu Pro Gly Glu Phe Tyr
                405                 410                 415

att aca cgt cat tct aat ctc tcg gaa atc cac gtt gct ttc cat ctc       1296
Ile Thr Arg His Ser Asn Leu Ser Glu Ile His Val Ala Phe His Leu
            420                 425                 430

tgt gtg gat gac aac gtg aag tca gga aac atc act gct cgg gat ccc       1344
Cys Val Asp Asp Asn Val Lys Ser Gly Asn Ile Thr Ala Arg Asp Pro
        435                 440                 445

gct att atg gga ctc cga aat ata ctc aag gtt tgc tgt acc cac gat       1392
Ala Ile Met Gly Leu Arg Asn Ile Leu Lys Val Cys Cys Thr His Asp
    450                 455                 460

atc aca acg ata agc atc cct ctc ttg ctg gtg cat gat atg tca gag       1440
Ile Thr Thr Ile Ser Ile Pro Leu Leu Leu Val His Asp Met Ser Glu
465                 470                 475                 480

gaa atg act ata cct tgg tgc tta agg aga gct gaa ctg gtg ttt aag       1488
Glu Met Thr Ile Pro Trp Cys Leu Arg Arg Ala Glu Leu Val Phe Lys
                485                 490                 495

tgt gtc aaa ggt ttc atg atg gag atg gct tca tgg gat gga gga att       1536
Cys Val Lys Gly Phe Met Met Glu Met Ala Ser Trp Asp Gly Gly Ile
            500                 505                 510

tct cgg aca gtg caa ttt ctg gta cca cag agc att tct gaa gaa atg       1584
Ser Arg Thr Val Gln Phe Leu Val Pro Gln Ser Ile Ser Glu Glu Met
        515                 520                 525

ttt tat cag ctg agt aac atg ctc cca cag atc ttc cgg gtc tcc tca       1632
Phe Tyr Gln Leu Ser Asn Met Leu Pro Gln Ile Phe Arg Val Ser Ser
    530                 535                 540

aca ctc act ctg aca tcc aag cac taa                                  1659
Thr Leu Thr Leu Thr Ser Lys His
545                 550
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<210> 33
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<212> PRT

<213> Rattus norvegicus

<400> 33

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Met Lys Lys Asn Arg Glu Arg Phe Ser Ser Lys Glu Arg Glu Phe Val
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Tyr Lys Phe Gln Ile Gly Ser Glu Arg Leu Glu Leu Arg Val Pro Leu
            20                  25                  30

Arg Phe Pro Val Asp Glu Asn Ala Ser His Leu His Gly Arg Leu Met
        35                  40                  45

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

Leu Ala Arg Phe Ile Glu Glu Glu Ser Leu Arg Asp His Asp Ser Asp
65                  70                  75                  80

Ala Glu Ala Cys Leu Glu Ala Val Lys Ser Gly Glu Val Asp Leu His
                85                  90                  95

Gln Leu Ala Ser Thr Trp Ala Lys Ala Tyr Ala Glu Thr Thr Leu Glu
            100                 105                 110

His Ala Arg Pro Glu Glu Pro Asn Trp Asp Glu Asp Phe Ala Asp Val
        115                 120                 125

Tyr His Asp Leu Ile His Ser Pro Ala Ser Glu Thr Leu Leu Asn Leu
    130                 135                 140

Glu His Asn Tyr Phe Val Ser Ile Ser Glu Leu Ile Gly Glu Arg Asp
145                 150                 155                 160

Val Glu Leu Lys Lys Leu Arg Glu Arg Gln Gly Ile Glu Met Glu Lys
                165                 170                 175

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

Leu Ala Ala Gln His Phe Glu Ser Gln Gln Asp Leu Glu Asn Lys Trp
        195                 200                 205

Ser Asn Glu Leu Lys Gln Ser Thr Ala Ile Gln Lys Gln Glu Tyr Gln
    210                 215                 220

Glu Trp Val Ile Lys Leu His Gln Asp Leu Lys Asn Pro Asn Asn Ser
225                 230                 235                 240
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Ser Leu Ser Glu Glu Ile Lys Val Gln Pro Ser Gln Phe Arg Glu Ser
                245                 250                 255

Ala Asp Ala Ala Gly Arg Ile Tyr Glu Glu Gln Arg Lys Leu Glu Glu
            260                 265                 270

Ser Phe Thr Ile His Leu Gly Ala Gln Leu Lys Thr Met His Asn Leu
        275                 280                 285

Arg Leu Leu Arg Ala Asp Met Leu Asp Phe Cys Lys His Lys Arg Thr
    290                 295                 300

Gln Gly Ser Gly Val Lys Leu His Arg Leu Gln Thr Ala Leu Ser Leu
305                 310                 315                 320

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

Asn Ser Tyr Ser Gly Ile Lys Arg Asp Phe Ala Thr Val Cys Gln Glu
            340                 345                 350

Cys Thr Asp Phe His Phe Pro Arg Ile Glu Glu Gln Leu Glu Val Val
        355                 360                 365

Gln Gln Val Ala Leu Tyr Ala Arg Thr Gln Arg Arg Ser Lys Cys Lys
    370                 375                 380

Glu Ala Arg Asp Ser Gly Asn Gln Asn Gly Gly Ser Asp Glu Lys Ser
385                 390                 395                 400

Lys Asn Ala Glu Arg Asn Tyr Leu Asn Ile Leu Pro Gly Glu Phe Tyr
                405                 410                 415

Ile Thr Arg His Ser Asn Leu Ser Glu Ile His Val Ala Phe His Leu
            420                 425                 430

Cys Val Asp Asp Asn Val Lys Ser Gly Asn Ile Thr Ala Arg Asp Pro
        435                 440                 445

Ala Ile Met Gly Leu Arg Asn Ile Leu Lys Val Cys Cys Thr His Asp
    450                 455                 460

Ile Thr Thr Ile Ser Ile Pro Leu Leu Leu Val His Asp Met Ser Glu
465                 470                 475                 480

Glu Met Thr Ile Pro Trp Cys Leu Arg Arg Ala Glu Leu Val Phe Lys
                485                 490                 495
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Cys Val Lys Gly Phe Met Met Glu Met Ala Ser Trp Asp Gly Gly Ile
            500                 505                 510

Ser Arg Thr Val Gln Phe Leu Val Pro Gln Ser Ile Ser Glu Glu Met
        515                 520                 525

Phe Tyr Gln Leu Ser Asn Met Leu Pro Gln Ile Phe Arg Val Ser Ser
    530                 535                 540

Thr Leu Thr Leu Thr Ser Lys His
545                 550
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<210> 34
<211> 1659
<212> DNA
<213> Homo sapiens

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<221> CDS
<222> (1)..(1659)
<223> Protein C12ORF4

<400> 34

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Met Lys Lys Asn Arg Glu Arg Phe Cys Asn Arg Glu Arg Glu Phe Val
1               5                   10                  15

tat aaa ttt aaa gta gga agt cag tgc tta gaa ctg aga gtg cca ctc          96
Tyr Lys Phe Lys Val Gly Ser Gln Cys Leu Glu Leu Arg Val Pro Leu
            20                  25                  30

aaa ttt cct gtt caa gag aat gcc agt cat ttg cat gga cgt ctg atg         144
Lys Phe Pro Val Gln Glu Asn Ala Ser His Leu His Gly Arg Leu Met
        35                  40                  45

ctg ctg cac agt tta ccg tgc ttt ata gaa aaa gac tta aaa gaa gct         192
Leu Leu His Ser Leu Pro Cys Phe Ile Glu Lys Asp Leu Lys Glu Ala
    50                  55                  60

ctg act cag ttt ata gaa gaa gaa tcc ctc agc gat tat gat aga gat         240
Leu Thr Gln Phe Ile Glu Glu Glu Ser Leu Ser Asp Tyr Asp Arg Asp
65                  70                  75                  80

gct gaa gca tcc ctg gca gct gtg aaa tca ggt gaa gta gat tta cat         288
Ala Glu Ala Ser Leu Ala Ala Val Lys Ser Gly Glu Val Asp Leu His
                85                  90                  95

cag ctg gcg agt aca tgg gcc aaa gct tat gct gag acc acg tta gag         336
Gln Leu Ala Ser Thr Trp Ala Lys Ala Tyr Ala Glu Thr Thr Leu Glu
            100                 105                 110

cat gca agg cct gaa gaa ccc agc tgg gat gaa gat ttt gca gat gtg         384
His Ala Arg Pro Glu Glu Pro Ser Trp Asp Glu Asp Phe Ala Asp Val
        115                 120                 125

tac cat gac tta att cat tct cct gcc tct gaa act ctc tta aat ttg         432
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Tyr His Asp Leu Ile His Ser Pro Ala Ser Glu Thr Leu Leu Asn Leu
    130                 135                 140

gaa cat aat tac ttt gtt agt atc tca gaa ctg att ggt gaa aga gat        480
Glu His Asn Tyr Phe Val Ser Ile Ser Glu Leu Ile Gly Glu Arg Asp
145                 150                 155                 160

gtg gag ctg aaa aaa tta cga gag aga caa ggt att gaa atg gaa aaa        528
Val Glu Leu Lys Lys Leu Arg Glu Arg Gln Gly Ile Glu Met Glu Lys
                165                 170                 175

gtc atg cag gaa ttg gga aaa tca ctg aca gat caa gat gta aat tca        576
Val Met Gln Glu Leu Gly Lys Ser Leu Thr Asp Gln Asp Val Asn Ser
            180                 185                 190

ctg gct gct cag cat ttt gaa tcc cag caa gac cta gaa aat aaa tgg        624
Leu Ala Ala Gln His Phe Glu Ser Gln Gln Asp Leu Glu Asn Lys Trp
        195                 200                 205

tcg aat gaa tta aaa caa tca act gcc atc caa aaa caa gag tat caa        672
Ser Asn Glu Leu Lys Gln Ser Thr Ala Ile Gln Lys Gln Glu Tyr Gln
    210                 215                 220

gaa tgg gta ata aaa ctt cac caa gac cta aaa aac ccc aac aac agc        720
Glu Trp Val Ile Lys Leu His Gln Asp Leu Lys Asn Pro Asn Asn Ser
225                 230                 235                 240

tcc ctt agt gag gaa att aaa gtt cag cca agt cag ttc aga gaa tct        768
Ser Leu Ser Glu Glu Ile Lys Val Gln Pro Ser Gln Phe Arg Glu Ser
                245                 250                 255

gta gaa gca att gga agg att tat gag gaa cag aga aag tta gaa gaa        816
Val Glu Ala Ile Gly Arg Ile Tyr Glu Glu Gln Arg Lys Leu Glu Glu
            260                 265                 270

agt ttt acc att cac tta gga gcc cag ttg aag acc atg cat aat ttg        864
Ser Phe Thr Ile His Leu Gly Ala Gln Leu Lys Thr Met His Asn Leu
        275                 280                 285

aga ttg ctg aga gca gat atg ctg gac ttc tgt aag cat aaa aga aat        912
Arg Leu Leu Arg Ala Asp Met Leu Asp Phe Cys Lys His Lys Arg Asn
    290                 295                 300

cat cga agt ggt gtg aaa ctt cat cgg ctc caa aca gct ctg tca ctt        960
His Arg Ser Gly Val Lys Leu His Arg Leu Gln Thr Ala Leu Ser Leu
305                 310                 315                 320

tat tct aca tct ctc tgt ggc ctg gtt tta cta gta gat aat cga att       1008
Tyr Ser Thr Ser Leu Cys Gly Leu Val Leu Leu Val Asp Asn Arg Ile
                325                 330                 335

aat tca tat agt ggt att aaa aga gat ttt gcc aca gtt tgc caa gaa       1056
Asn Ser Tyr Ser Gly Ile Lys Arg Asp Phe Ala Thr Val Cys Gln Glu
            340                 345                 350

tgc act gac ttc cat ttc ccc cga att gaa gag caa tta gaa gtt gtc       1104
Cys Thr Asp Phe His Phe Pro Arg Ile Glu Glu Gln Leu Glu Val Val
        355                 360                 365

caa cag gtg gta ctt tat gct aga acc cag cgc agg agt aaa ttg aaa       1152
Gln Gln Val Val Leu Tyr Ala Arg Thr Gln Arg Arg Ser Lys Leu Lys
    370                 375                 380
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gaa tca ctt gat tct gga aac caa aat gga gga aat gat gat aag act       1200
Glu Ser Leu Asp Ser Gly Asn Gln Asn Gly Gly Asn Asp Asp Lys Thr
385                 390                 395                 400

aag aat gct gag agg aac tat tta aat gtt tta cct ggg gaa ttt tat       1248
Lys Asn Ala Glu Arg Asn Tyr Leu Asn Val Leu Pro Gly Glu Phe Tyr
                405                 410                 415

att aca cgg cat tct aat ctc tca gaa atc cat gtt gct ttc cat ctc       1296
Ile Thr Arg His Ser Asn Leu Ser Glu Ile His Val Ala Phe His Leu
            420                 425                 430

tgt gtg gat gac cat gtg aaa tcg gga aac atc act gct cgt gat cct       1344
Cys Val Asp Asp His Val Lys Ser Gly Asn Ile Thr Ala Arg Asp Pro
        435                 440                 445

gcc att atg gga ctc cga aat ata ctc aaa gtt tgc tgt acc cat gac       1392
Ala Ile Met Gly Leu Arg Asn Ile Leu Lys Val Cys Cys Thr His Asp
    450                 455                 460

atc aca aca ata agc att cct ctc ttg ctg gta cat gat atg tca gag       1440
Ile Thr Thr Ile Ser Ile Pro Leu Leu Leu Val His Asp Met Ser Glu
465                 470                 475                 480

gaa atg act ata ccc tgg tgc tta agg aga gcg gaa ctt gtg ttc aag       1488
Glu Met Thr Ile Pro Trp Cys Leu Arg Arg Ala Glu Leu Val Phe Lys
                485                 490                 495

tgt gtc aaa ggt ttc atg atg gaa atg gct tca tgg gat gga gga att       1536
Cys Val Lys Gly Phe Met Met Glu Met Ala Ser Trp Asp Gly Gly Ile
            500                 505                 510

tct agg aca gtg caa ttt cta gta cca cag agt att tct gaa gaa atg       1584
Ser Arg Thr Val Gln Phe Leu Val Pro Gln Ser Ile Ser Glu Glu Met
        515                 520                 525

ttt tat caa ctt agt aac atg ctt ccc cag atc ttc cga gta tca tca       1632
Phe Tyr Gln Leu Ser Asn Met Leu Pro Gln Ile Phe Arg Val Ser Ser
    530                 535                 540

aca ctc act ctg aca tcc aag cac taa                                  1659
Thr Leu Thr Leu Thr Ser Lys His
545                 550
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<210> 35
<211> 552
<212> PRT
<213> Homo sapiens

<400> 35

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1               5                   10                  15

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

Lys Phe Pro Val Gln Glu Asn Ala Ser His Leu His Gly Arg Leu Met
        35                  40                  45
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```
Leu Leu His Ser Leu Pro Cys Phe Ile Glu Lys Asp Leu Lys Glu Ala
    50                  55                  60

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

Ala Glu Ala Ser Leu Ala Ala Val Lys Ser Gly Glu Val Asp Leu His
                85                  90                  95

Gln Leu Ala Ser Thr Trp Ala Lys Ala Tyr Ala Glu Thr Thr Leu Glu
            100                 105                 110

His Ala Arg Pro Glu Glu Pro Ser Trp Asp Glu Asp Phe Ala Asp Val
        115                 120                 125

Tyr His Asp Leu Ile His Ser Pro Ala Ser Glu Thr Leu Leu Asn Leu
    130                 135                 140

Glu His Asn Tyr Phe Val Ser Ile Ser Glu Leu Ile Gly Glu Arg Asp
145                 150                 155                 160

Val Glu Leu Lys Lys Leu Arg Glu Arg Gln Gly Ile Glu Met Glu Lys
                165                 170                 175

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

Leu Ala Ala Gln His Phe Glu Ser Gln Gln Asp Leu Glu Asn Lys Trp
        195                 200                 205

Ser Asn Glu Leu Lys Gln Ser Thr Ala Ile Gln Lys Gln Glu Tyr Gln
    210                 215                 220

Glu Trp Val Ile Lys Leu His Gln Asp Leu Lys Asn Pro Asn Asn Ser
225                 230                 235                 240

Ser Leu Ser Glu Glu Ile Lys Val Gln Pro Ser Gln Phe Arg Glu Ser
                245                 250                 255

Val Glu Ala Ile Gly Arg Ile Tyr Glu Glu Gln Arg Lys Leu Glu Glu
            260                 265                 270

Ser Phe Thr Ile His Leu Gly Ala Gln Leu Lys Thr Met His Asn Leu
        275                 280                 285

Arg Leu Leu Arg Ala Asp Met Leu Asp Phe Cys Lys His Lys Arg Asn
    290                 295                 300
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His Arg Ser Gly Val Lys Leu His Arg Leu Gln Thr Ala Leu Ser Leu
305                 310                 315                 320

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

Asn Ser Tyr Ser Gly Ile Lys Arg Asp Phe Ala Thr Val Cys Gln Glu
            340                 345                 350

Cys Thr Asp Phe His Phe Pro Arg Ile Glu Glu Gln Leu Glu Val Val
        355                 360                 365

Gln Gln Val Val Leu Tyr Ala Arg Thr Gln Arg Arg Ser Lys Leu Lys
    370                 375                 380

Glu Ser Leu Asp Ser Gly Asn Gln Asn Gly Gly Asn Asp Asp Lys Thr
385                 390                 395                 400

Lys Asn Ala Glu Arg Asn Tyr Leu Asn Val Leu Pro Gly Glu Phe Tyr
                405                 410                 415

Ile Thr Arg His Ser Asn Leu Ser Glu Ile His Val Ala Phe His Leu
            420                 425                 430

Cys Val Asp Asp His Val Lys Ser Gly Asn Ile Thr Ala Arg Asp Pro
        435                 440                 445

Ala Ile Met Gly Leu Arg Asn Ile Leu Lys Val Cys Cys Thr His Asp
    450                 455                 460

Ile Thr Thr Ile Ser Ile Pro Leu Leu Leu Val His Asp Met Ser Glu
465                 470                 475                 480

Glu Met Thr Ile Pro Trp Cys Leu Arg Arg Ala Glu Leu Val Phe Lys
                485                 490                 495

Cys Val Lys Gly Phe Met Met Glu Met Ala Ser Trp Asp Gly Gly Ile
            500                 505                 510

Ser Arg Thr Val Gln Phe Leu Val Pro Gln Ser Ile Ser Glu Glu Met
        515                 520                 525

Phe Tyr Gln Leu Ser Asn Met Leu Pro Gln Ile Phe Arg Val Ser Ser
    530                 535                 540

Thr Leu Thr Leu Thr Ser Lys His
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545 550

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<211> 1659
<212> DNA
<213> Macaca mulatta

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<222> (1)..(1659)
<223> Protein LOC57102

<400> 36

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1               5                   10                  15

tat aaa ttt aaa gta gga agt cag tgc tta gaa ctg aga gtg cca ctc          96
Tyr Lys Phe Lys Val Gly Ser Gln Cys Leu Glu Leu Arg Val Pro Leu
            20                  25                  30

aga ttt cct gtt caa gag aat gcc agt cat tta cat gga cgt ctg atg         144
Arg Phe Pro Val Gln Glu Asn Ala Ser His Leu His Gly Arg Leu Met
        35                  40                  45

ctg ctg cac agt tta ccg tgc ttt ata gaa aaa gac tta aaa gaa gct         192
Leu Leu His Ser Leu Pro Cys Phe Ile Glu Lys Asp Leu Lys Glu Ala
    50                  55                  60

ctg act caa ttt ata gaa gaa gaa tcc ctc aga gat tat gat aga gat         240
Leu Thr Gln Phe Ile Glu Glu Glu Ser Leu Arg Asp Tyr Asp Arg Asp
65                  70                  75                  80

gct gaa gca tcc ctg gaa gct gtg aaa tca ggt gag gtg gat tta cat         288
Ala Glu Ala Ser Leu Glu Ala Val Lys Ser Gly Glu Val Asp Leu His
                85                  90                  95

cag ctg gcg agt acg tgg gcc aaa gct tat gcg gag acc aca tta gag         336
Gln Leu Ala Ser Thr Trp Ala Lys Ala Tyr Ala Glu Thr Thr Leu Glu
            100                 105                 110

cat gcg agg cct gaa gaa ccc agc tgg gat gaa gat ttt gca gat gtg         384
His Ala Arg Pro Glu Glu Pro Ser Trp Asp Glu Asp Phe Ala Asp Val
        115                 120                 125

tac cat gac cta att cat tct cct gcc tct gaa acg ctc tta aat ttg         432
Tyr His Asp Leu Ile His Ser Pro Ala Ser Glu Thr Leu Leu Asn Leu
    130                 135                 140

gaa cat aat tac ttt gtt agt atc tca gaa ctg att ggt gag aga gat         480
Glu His Asn Tyr Phe Val Ser Ile Ser Glu Leu Ile Gly Glu Arg Asp
145                 150                 155                 160

gtg gaa ctg aaa aaa tta cga gag aga caa ggt att gaa atg gaa aaa         528
Val Glu Leu Lys Lys Leu Arg Glu Arg Gln Gly Ile Glu Met Glu Lys
                165                 170                 175

gta atg cag gag ttg gga aaa tca ctg aca gat caa gat gta aat tca         576
Val Met Gln Glu Leu Gly Lys Ser Leu Thr Asp Gln Asp Val Asn Ser
            180                 185                 190
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ctg gct gct cag cat ttt gaa tcc cag caa gac cta gaa aat aaa tgg        624
Leu Ala Ala Gln His Phe Glu Ser Gln Gln Asp Leu Glu Asn Lys Trp
        195                 200                 205

tcg aat gaa tta aaa caa tca act gcc atc caa aaa caa gag tat cag        672
Ser Asn Glu Leu Lys Gln Ser Thr Ala Ile Gln Lys Gln Glu Tyr Gln
    210                 215                 220

gaa tgg gta ata aaa ctt cac caa gac cta aaa aac ccc aac aac agc        720
Glu Trp Val Ile Lys Leu His Gln Asp Leu Lys Asn Pro Asn Asn Ser
225                 230                 235                 240

tcc ctt agt gag gaa att aaa gtt cag cca agt cag ttc aga gaa tct        768
Ser Leu Ser Glu Glu Ile Lys Val Gln Pro Ser Gln Phe Arg Glu Ser
                245                 250                 255

gta gaa gca att gga agg att tat gag gaa cag aga aag tta gaa gaa        816
Val Glu Ala Ile Gly Arg Ile Tyr Glu Glu Gln Arg Lys Leu Glu Glu
            260                 265                 270

agt ttt acc att cac tta gga gcc cag tta aag acc atg cat aat ttg        864
Ser Phe Thr Ile His Leu Gly Ala Gln Leu Lys Thr Met His Asn Leu
        275                 280                 285

aga ttg ctg aga gca gat atg ctg gac ttc tgt aag cat aaa aga aat        912
Arg Leu Leu Arg Ala Asp Met Leu Asp Phe Cys Lys His Lys Arg Asn
    290                 295                 300

cat cga agt ggt gtg aaa ctt cat cgg ctc caa aca gct ctg tca ctt        960
His Arg Ser Gly Val Lys Leu His Arg Leu Gln Thr Ala Leu Ser Leu
305                 310                 315                 320

tat tct aca tct ctc tgt ggc ctg gtt tta cta gta gat aat cga att       1008
Tyr Ser Thr Ser Leu Cys Gly Leu Val Leu Leu Val Asp Asn Arg Ile
                325                 330                 335

aat tca tat agt ggt att aaa aga gat ttt gcc aca gtt tgc caa gaa       1056
Asn Ser Tyr Ser Gly Ile Lys Arg Asp Phe Ala Thr Val Cys Gln Glu
            340                 345                 350

tgc act gac ttc cat ttt ccc cga att gaa gag caa tta gaa gtt gtc       1104
Cys Thr Asp Phe His Phe Pro Arg Ile Glu Glu Gln Leu Glu Val Val
        355                 360                 365

caa cag gtg gta ctt tat gcc aga acc cag cgc agg agt aag ttg aaa       1152
Gln Gln Val Val Leu Tyr Ala Arg Thr Gln Arg Arg Ser Lys Leu Lys
    370                 375                 380

gaa tca ctt gat tct ggg aac caa aat gga gga aat gat gat aag act       1200
Glu Ser Leu Asp Ser Gly Asn Gln Asn Gly Gly Asn Asp Asp Lys Thr
385                 390                 395                 400

aag aat gct gag agg aac tat tta aat gtt tta cct ggg gaa ttt tat       1248
Lys Asn Ala Glu Arg Asn Tyr Leu Asn Val Leu Pro Gly Glu Phe Tyr
                405                 410                 415

att aca cgg cat tcg aat ctc tca gaa atc cat gtt gct ttc cat ctt       1296
Ile Thr Arg His Ser Asn Leu Ser Glu Ile His Val Ala Phe His Leu
            420                 425                 430

tgt gtg gat gac cat gtg aaa tcg gga aac atc act gct cgt gat cct       1344
Cys Val Asp Asp His Val Lys Ser Gly Asn Ile Thr Ala Arg Asp Pro
        435                 440                 445
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gcc att atg gga ctc cga aat ata ctc aaa gtt tgc tgt acc cat gac       1392
Ala Ile Met Gly Leu Arg Asn Ile Leu Lys Val Cys Cys Thr His Asp
    450                 455                 460

atc aca aca ata agc att cct ctc ttg ctg gta cat gat atg tca gag       1440
Ile Thr Thr Ile Ser Ile Pro Leu Leu Leu Val His Asp Met Ser Glu
465                 470                 475                 480

gaa atg act ata ccc tgg tgc tta agg aga gca gaa cta gtg ttc aag       1488
Glu Met Thr Ile Pro Trp Cys Leu Arg Arg Ala Glu Leu Val Phe Lys
                485                 490                 495

tgt gtc aaa ggt ttc atg atg gaa atg gct tca tgg gat gga gga att       1536
Cys Val Lys Gly Phe Met Met Glu Met Ala Ser Trp Asp Gly Gly Ile
            500                 505                 510

tct agg aca gtg cag ttt cta gta cca cag agt att tct gaa gaa atg       1584
Ser Arg Thr Val Gln Phe Leu Val Pro Gln Ser Ile Ser Glu Glu Met
        515                 520                 525

ttt tat caa ctt agt aac atg ctt ccc cag att ttc cga gta tca tca       1632
Phe Tyr Gln Leu Ser Asn Met Leu Pro Gln Ile Phe Arg Val Ser Ser
    530                 535                 540

aca ctc act ctg aca tcc aag cac taa                                  1659
Thr Leu Thr Leu Thr Ser Lys His
545                 550
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<210> 37
<211> 552
<212> PRT
<213> Macaca mulatta

<400> 37

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1               5                   10                  15

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

Arg Phe Pro Val Gln Glu Asn Ala Ser His Leu His Gly Arg Leu Met
        35                  40                  45

Leu Leu His Ser Leu Pro Cys Phe Ile Glu Lys Asp Leu Lys Glu Ala
    50                  55                  60

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

Ala Glu Ala Ser Leu Glu Ala Val Lys Ser Gly Glu Val Asp Leu His
                85                  90                  95

Gln Leu Ala Ser Thr Trp Ala Lys Ala Tyr Ala Glu Thr Thr Leu Glu
            100                 105                 110
```

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His Ala Arg Pro Glu Glu Pro Ser Trp Asp Glu Asp Phe Ala Asp Val
        115                 120                 125

Tyr His Asp Leu Ile His Ser Pro Ala Ser Glu Thr Leu Leu Asn Leu
    130                 135                 140

Glu His Asn Tyr Phe Val Ser Ile Ser Glu Leu Ile Gly Glu Arg Asp
145                 150                 155                 160

Val Glu Leu Lys Lys Leu Arg Glu Arg Gln Gly Ile Glu Met Glu Lys
                165                 170                 175

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

Leu Ala Ala Gln His Phe Glu Ser Gln Gln Asp Leu Glu Asn Lys Trp
        195                 200                 205

Ser Asn Glu Leu Lys Gln Ser Thr Ala Ile Gln Lys Gln Glu Tyr Gln
    210                 215                 220

Glu Trp Val Ile Lys Leu His Gln Asp Leu Lys Asn Pro Asn Asn Ser
225                 230                 235                 240

Ser Leu Ser Glu Glu Ile Lys Val Gln Pro Ser Gln Phe Arg Glu Ser
                245                 250                 255

Val Glu Ala Ile Gly Arg Ile Tyr Glu Glu Gln Arg Lys Leu Glu Glu
            260                 265                 270

Ser Phe Thr Ile His Leu Gly Ala Gln Leu Lys Thr Met His Asn Leu
        275                 280                 285

Arg Leu Leu Arg Ala Asp Met Leu Asp Phe Cys Lys His Lys Arg Asn
    290                 295                 300

His Arg Ser Gly Val Lys Leu His Arg Leu Gln Thr Ala Leu Ser Leu
305                 310                 315                 320

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

Asn Ser Tyr Ser Gly Ile Lys Arg Asp Phe Ala Thr Val Cys Gln Glu
            340                 345                 350

Cys Thr Asp Phe His Phe Pro Arg Ile Glu Glu Gln Leu Glu Val Val
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355 360 365

Gln Gln Val Val Leu Tyr Ala Arg Thr Gln Arg Arg Ser Lys Leu Lys
370 375 380

Glu Ser Leu Asp Ser Gly Asn Gln Asn Gly Gly Asn Asp Asp Lys Thr
385 390 395 400

Lys Asn Ala Glu Arg Asn Tyr Leu Asn Val Leu Pro Gly Glu Phe Tyr
405 410 415

Ile Thr Arg His Ser Asn Leu Ser Glu Ile His Val Ala Phe His Leu
420 425 430

Cys Val Asp Asp His Val Lys Ser Gly Asn Ile Thr Ala Arg Asp Pro
435 440 445

Ala Ile Met Gly Leu Arg Asn Ile Leu Lys Val Cys Cys Thr His Asp
450 455 460

Ile Thr Thr Ile Ser Ile Pro Leu Leu Leu Val His Asp Met Ser Glu
465 470 475 480

Glu Met Thr Ile Pro Trp Cys Leu Arg Arg Ala Glu Leu Val Phe Lys
485 490 495

Cys Val Lys Gly Phe Met Met Glu Met Ala Ser Trp Asp Gly Gly Ile
500 505 510

Ser Arg Thr Val Gln Phe Leu Val Pro Gln Ser Ile Ser Glu Glu Met
515 520 525

Phe Tyr Gln Leu Ser Asn Met Leu Pro Gln Ile Phe Arg Val Ser Ser
530 535 540

Thr Leu Thr Leu Thr Ser Lys His
545 550

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<211> 1659
<212> DNA
<213> Mus musculus

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<221> CDS
<222> (1)..(1659)
<223> Protein LOC28040

<400> 38

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Met Lys Lys Asn Arg Glu Arg Phe Cys Asn Lys Glu Arg Glu Phe Val
1               5                  10                  15

tac aag ttc cag gta gga cgt gag cgc tta gag ctg aga gtg ccc ctc          96
Tyr Lys Phe Gln Val Gly Arg Glu Arg Leu Glu Leu Arg Val Pro Leu
            20                  25                  30

agg ttt cct gtg gag gag aat gcc agt cat ctg cat gga cgt ctg atg         144
Arg Phe Pro Val Glu Glu Asn Ala Ser His Leu His Gly Arg Leu Met
        35                  40                  45

ctg ctg cac agc ttg cct tgc ttc ata gag agt gac tta aaa gat gct         192
Leu Leu His Ser Leu Pro Cys Phe Ile Glu Ser Asp Leu Lys Asp Ala
    50                  55                  60

ctg agc cgg ttt ata gaa gaa gaa tcc ctc aga gac cat gac agc gat         240
Leu Ser Arg Phe Ile Glu Glu Glu Ser Leu Arg Asp His Asp Ser Asp
65                  70                  75                  80

gca gaa gca tgc ttg gag gcc gtt aaa tcc ggt gaa gta gat ctg cac         288
Ala Glu Ala Cys Leu Glu Ala Val Lys Ser Gly Glu Val Asp Leu His
                85                  90                  95

cag ctg gca agt gcg tgg gcc aaa gct tac gct gag acc acc tta gag         336
Gln Leu Ala Ser Ala Trp Ala Lys Ala Tyr Ala Glu Thr Thr Leu Glu
            100                 105                 110

cat gcg aga cct gag gag cct gac tgg gac gaa gac ttt gca gat gtg         384
His Ala Arg Pro Glu Glu Pro Asp Trp Asp Glu Asp Phe Ala Asp Val
        115                 120                 125

tac cat gac cta atc cac tcc ccg gcc tct gaa act ctc tta aat ctg         432
Tyr His Asp Leu Ile His Ser Pro Ala Ser Glu Thr Leu Leu Asn Leu
    130                 135                 140

gaa cac aac tac ttc gtt agc atc tca gag ctg att ggt gaa aga gac         480
Glu His Asn Tyr Phe Val Ser Ile Ser Glu Leu Ile Gly Glu Arg Asp
145                 150                 155                 160

gtg gag ctg aaa aag tta cga gag aga caa ggt att gaa atg gaa aag         528
Val Glu Leu Lys Lys Leu Arg Glu Arg Gln Gly Ile Glu Met Glu Lys
                165                 170                 175

gtg atg cag gag ctg ggg aaa tcg ctc aca gat caa gat gtg aat tca         576
Val Met Gln Glu Leu Gly Lys Ser Leu Thr Asp Gln Asp Val Asn Ser
            180                 185                 190

ctg gct gcc cag cac ttt gaa tcc cag caa gac tta gag aat aaa tgg         624
Leu Ala Ala Gln His Phe Glu Ser Gln Gln Asp Leu Glu Asn Lys Trp
        195                 200                 205

tca aat gaa ctg aaa cag tct aca gct atc cag aag caa gaa tat cag         672
Ser Asn Glu Leu Lys Gln Ser Thr Ala Ile Gln Lys Gln Glu Tyr Gln
    210                 215                 220

gaa tgg gtg ata aag ctt cat cag gac cta aaa aac ccc aac aac agc         720
Glu Trp Val Ile Lys Leu His Gln Asp Leu Lys Asn Pro Asn Asn Ser
225                 230                 235                 240

tcc ctc agt gaa gag att aaa gtg cag ccg agt cag ttc aga gag tct         768
Ser Leu Ser Glu Glu Ile Lys Val Gln Pro Ser Gln Phe Arg Glu Ser
                245                 250                 255
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```
gcg gac gct gct ggg agg atc tac gag gaa cag agg aag ctg gag gag        816
Ala Asp Ala Ala Gly Arg Ile Tyr Glu Glu Gln Arg Lys Leu Glu Glu
            260                 265                 270

agc ttc acc att cac ctg gga gcc cag ttg aag acc atg cac aac ctg        864
Ser Phe Thr Ile His Leu Gly Ala Gln Leu Lys Thr Met His Asn Leu
        275                 280                 285

cgg ctg ctg agg gca gac atg ctg gac ttc tgt aag cat aag aga act        912
Arg Leu Leu Arg Ala Asp Met Leu Asp Phe Cys Lys His Lys Arg Thr
    290                 295                 300

cac ggg agc ggc gtg aag ctc cac cgt ctg cag aca gca ctg tcc ctc        960
His Gly Ser Gly Val Lys Leu His Arg Leu Gln Thr Ala Leu Ser Leu
305                 310                 315                 320

tac tcc acg tct ctc tgt ggc ctg gtt ttg cta gta gat aat cga att       1008
Tyr Ser Thr Ser Leu Cys Gly Leu Val Leu Leu Val Asp Asn Arg Ile
                325                 330                 335

aat tca tat agc ggc atc aaa aga gat ttt gcc aca gtt tgc caa gaa       1056
Asn Ser Tyr Ser Gly Ile Lys Arg Asp Phe Ala Thr Val Cys Gln Glu
            340                 345                 350

tgt acg gac ttc cac ttc cca cgg att gag gaa caa ctg gaa gtt gtc       1104
Cys Thr Asp Phe His Phe Pro Arg Ile Glu Glu Gln Leu Glu Val Val
        355                 360                 365

cag cag gtg gcg ctg tac gcg aga acc caa cgc aag agc aag tgc aaa       1152
Gln Gln Val Ala Leu Tyr Ala Arg Thr Gln Arg Lys Ser Lys Cys Lys
    370                 375                 380

gag gcc cgc gat tct gga aac caa aat gga gga agt gat gat aag tct       1200
Glu Ala Arg Asp Ser Gly Asn Gln Asn Gly Gly Ser Asp Asp Lys Ser
385                 390                 395                 400

aag aat gct gag aga aac tat tta aat att tta cct gga gaa ttt tac       1248
Lys Asn Ala Glu Arg Asn Tyr Leu Asn Ile Leu Pro Gly Glu Phe Tyr
                405                 410                 415

att aca cgt cat tct aat ctc tcg gaa atc cat gtt gct ttc cac ctc       1296
Ile Thr Arg His Ser Asn Leu Ser Glu Ile His Val Ala Phe His Leu
            420                 425                 430

tgt gtg gat gat aac gtg aag tcg gga aat atc act gct cgg gat ccc       1344
Cys Val Asp Asp Asn Val Lys Ser Gly Asn Ile Thr Ala Arg Asp Pro
        435                 440                 445

gct att atg gga ctc cga aac att ctc aaa gtc tgc tgt acc cat gat       1392
Ala Ile Met Gly Leu Arg Asn Ile Leu Lys Val Cys Cys Thr His Asp
    450                 455                 460

atc aca acg ata agc atc cct ctc ttg ctg gtg cat gat atg tca gag       1440
Ile Thr Thr Ile Ser Ile Pro Leu Leu Leu Val His Asp Met Ser Glu
465                 470                 475                 480

gaa atg act ata cct tgg tgt tta agg aga gca gaa ctg gta ttt aag       1488
Glu Met Thr Ile Pro Trp Cys Leu Arg Arg Ala Glu Leu Val Phe Lys
                485                 490                 495

tgt gtc aaa ggt ttc atg atg gag atg gct tca tgg gac gga gga att       1536
Cys Val Lys Gly Phe Met Met Glu Met Ala Ser Trp Asp Gly Gly Ile
```

```
            500                 505                 510

tct cgg aca gtg caa ttt ctg gta cca cag agc att tct gaa gaa atg       1584
Ser Arg Thr Val Gln Phe Leu Val Pro Gln Ser Ile Ser Glu Glu Met
        515                 520                 525

ttt tat cag ctg agc aac atg ctt ccc cag atc ttc cgg gtc tcc tca       1632
Phe Tyr Gln Leu Ser Asn Met Leu Pro Gln Ile Phe Arg Val Ser Ser
    530                 535                 540

aca ctc acg ctg aca tcc aag cac taa                                   1659
Thr Leu Thr Leu Thr Ser Lys His
545                 550
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<210> 39
<211> 552
<212> PRT
<213> Mus musculus

<400> 39

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Met Lys Lys Asn Arg Glu Arg Phe Cys Asn Lys Glu Arg Glu Phe Val
1               5                   10                  15

Tyr Lys Phe Gln Val Gly Arg Glu Arg Leu Glu Leu Arg Val Pro Leu
            20                  25                  30

Arg Phe Pro Val Glu Glu Asn Ala Ser His Leu His Gly Arg Leu Met
        35                  40                  45

Leu Leu His Ser Leu Pro Cys Phe Ile Glu Ser Asp Leu Lys Asp Ala
    50                  55                  60

Leu Ser Arg Phe Ile Glu Glu Glu Ser Leu Arg Asp His Asp Ser Asp
65                  70                  75                  80

Ala Glu Ala Cys Leu Glu Ala Val Lys Ser Gly Glu Val Asp Leu His
                85                  90                  95

Gln Leu Ala Ser Ala Trp Ala Lys Ala Tyr Ala Glu Thr Thr Leu Glu
            100                 105                 110

His Ala Arg Pro Glu Glu Pro Asp Trp Asp Glu Asp Phe Ala Asp Val
        115                 120                 125

Tyr His Asp Leu Ile His Ser Pro Ala Ser Glu Thr Leu Leu Asn Leu
    130                 135                 140

Glu His Asn Tyr Phe Val Ser Ile Ser Glu Leu Ile Gly Glu Arg Asp
145                 150                 155                 160

Val Glu Leu Lys Lys Leu Arg Glu Arg Gln Gly Ile Glu Met Glu Lys
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                165                 170                 175

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

Leu Ala Ala Gln His Phe Glu Ser Gln Gln Asp Leu Glu Asn Lys Trp
        195                 200                 205

Ser Asn Glu Leu Lys Gln Ser Thr Ala Ile Gln Lys Gln Glu Tyr Gln
    210                 215                 220

Glu Trp Val Ile Lys Leu His Gln Asp Leu Lys Asn Pro Asn Asn Ser
225                 230                 235                 240

Ser Leu Ser Glu Glu Ile Lys Val Gln Pro Ser Gln Phe Arg Glu Ser
                245                 250                 255

Ala Asp Ala Ala Gly Arg Ile Tyr Glu Glu Gln Arg Lys Leu Glu Glu
            260                 265                 270

Ser Phe Thr Ile His Leu Gly Ala Gln Leu Lys Thr Met His Asn Leu
        275                 280                 285

Arg Leu Leu Arg Ala Asp Met Leu Asp Phe Cys Lys His Lys Arg Thr
    290                 295                 300

His Gly Ser Gly Val Lys Leu His Arg Leu Gln Thr Ala Leu Ser Leu
305                 310                 315                 320

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

Asn Ser Tyr Ser Gly Ile Lys Arg Asp Phe Ala Thr Val Cys Gln Glu
            340                 345                 350

Cys Thr Asp Phe His Phe Pro Arg Ile Glu Glu Gln Leu Glu Val Val
        355                 360                 365

Gln Gln Val Ala Leu Tyr Ala Arg Thr Gln Arg Lys Ser Lys Cys Lys
    370                 375                 380

Glu Ala Arg Asp Ser Gly Asn Gln Asn Gly Gly Ser Asp Asp Lys Ser
385                 390                 395                 400

Lys Asn Ala Glu Arg Asn Tyr Leu Asn Ile Leu Pro Gly Glu Phe Tyr
                405                 410                 415
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```
Ile Thr Arg His Ser Asn Leu Ser Glu Ile His Val Ala Phe His Leu
            420                 425                 430

Cys Val Asp Asp Asn Val Lys Ser Gly Asn Ile Thr Ala Arg Asp Pro
        435                 440                 445

Ala Ile Met Gly Leu Arg Asn Ile Leu Lys Val Cys Cys Thr His Asp
    450                 455                 460

Ile Thr Thr Ile Ser Ile Pro Leu Leu Leu Val His Asp Met Ser Glu
465                 470                 475                 480

Glu Met Thr Ile Pro Trp Cys Leu Arg Arg Ala Glu Leu Val Phe Lys
                485                 490                 495

Cys Val Lys Gly Phe Met Met Glu Met Ala Ser Trp Asp Gly Gly Ile
            500                 505                 510

Ser Arg Thr Val Gln Phe Leu Val Pro Gln Ser Ile Ser Glu Glu Met
        515                 520                 525

Phe Tyr Gln Leu Ser Asn Met Leu Pro Gln Ile Phe Arg Val Ser Ser
    530                 535                 540

Thr Leu Thr Leu Thr Ser Lys His
545                 550
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<210> 40
<211> 2538
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(2538)
<223> ABCF1 Protein

<400> 40

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atg ccg aag gcg ccc aag cag cag ccg ccg gag ccc gag tgg atc ggg          48
Met Pro Lys Ala Pro Lys Gln Gln Pro Pro Glu Pro Glu Trp Ile Gly
1               5                   10                  15

gac gga gag agc acg agc cca tca gac aaa gtg gtg aag aaa ggg aag          96
Asp Gly Glu Ser Thr Ser Pro Ser Asp Lys Val Val Lys Lys Gly Lys
            20                  25                  30

aag gac aag aag atc aaa aaa acg ttc ttt gaa gag ctg gca gta gaa         144
Lys Asp Lys Lys Ile Lys Lys Thr Phe Phe Glu Glu Leu Ala Val Glu
        35                  40                  45

gat aaa cag gct ggg gaa gaa gag aaa gtg ctc aag gag aag gag cag         192
Asp Lys Gln Ala Gly Glu Glu Glu Lys Val Leu Lys Glu Lys Glu Gln
    50                  55                  60
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cag cag cag caa cag caa cag cag caa aaa aaa aag cga gat acc cga        240
Gln Gln Gln Gln Gln Gln Gln Gln Gln Lys Lys Lys Arg Asp Thr Arg
65                  70                  75                  80

aaa ggc agg cgg aag aag gat gtg gat gat gat gga gaa gag aaa gag        288
Lys Gly Arg Arg Lys Lys Asp Val Asp Asp Asp Gly Glu Glu Lys Glu
                85                  90                  95

ctc atg gag cgt ctt aag aag ctc tca gtg cca acc agt gat gag gag        336
Leu Met Glu Arg Leu Lys Lys Leu Ser Val Pro Thr Ser Asp Glu Glu
            100                 105                 110

gat gaa gta ccc gcc cca aaa ccc cgc gga ggg aag aaa acc aag ggt        384
Asp Glu Val Pro Ala Pro Lys Pro Arg Gly Gly Lys Lys Thr Lys Gly
        115                 120                 125

ggt aat gtt ttt gca gcc ctg att cag gat cag agt gag gaa gag gag        432
Gly Asn Val Phe Ala Ala Leu Ile Gln Asp Gln Ser Glu Glu Glu Glu
    130                 135                 140

gag gaa gaa aaa cat cct cct aag cct gcc aag ccg gag aag aat cgg        480
Glu Glu Glu Lys His Pro Pro Lys Pro Ala Lys Pro Glu Lys Asn Arg
145                 150                 155                 160

atc aat aag gcc gta tct gag gaa cag cag cct gca ctc aag ggc aaa        528
Ile Asn Lys Ala Val Ser Glu Glu Gln Gln Pro Ala Leu Lys Gly Lys
                165                 170                 175

aag gga aag gaa gag aag tca aaa ggg aag gct aag cct caa aat aaa        576
Lys Gly Lys Glu Glu Lys Ser Lys Gly Lys Ala Lys Pro Gln Asn Lys
            180                 185                 190

ttc gct gct ctg gac aat gaa gag gag gat aaa gaa gaa gaa att ata        624
Phe Ala Ala Leu Asp Asn Glu Glu Glu Asp Lys Glu Glu Glu Ile Ile
        195                 200                 205

aag gaa aag gag cct ccc aaa caa ggg aag gag aag gcc aag aag gca        672
Lys Glu Lys Glu Pro Pro Lys Gln Gly Lys Glu Lys Ala Lys Lys Ala
    210                 215                 220

gag cag ggt tca gag gaa gaa gga gaa ggg gaa gaa gag gag gag gaa        720
Glu Gln Gly Ser Glu Glu Glu Gly Glu Gly Glu Glu Glu Glu Glu Glu
225                 230                 235                 240

gga gga gag tct aag gca gat gat ccc tat gct cat ctt agc aaa aag        768
Gly Gly Glu Ser Lys Ala Asp Asp Pro Tyr Ala His Leu Ser Lys Lys
                245                 250                 255

gag aag aaa aag ctg aaa aaa cag atg gag tat gag cgc caa gtg gct        816
Glu Lys Lys Lys Leu Lys Lys Gln Met Glu Tyr Glu Arg Gln Val Ala
            260                 265                 270

tca tta aaa gca gcc aat gca gct gaa aat gac ttc tcc gtg tcc cag        864
Ser Leu Lys Ala Ala Asn Ala Ala Glu Asn Asp Phe Ser Val Ser Gln
        275                 280                 285

gcg gag atg tcc tcc cgc caa gcc atg tta gaa aat gca tct gac atc        912
Ala Glu Met Ser Ser Arg Gln Ala Met Leu Glu Asn Ala Ser Asp Ile
    290                 295                 300

aag ctg gag aag ttc agc atc tcc gct cat ggc aag gag ctg ttc gtc        960
Lys Leu Glu Lys Phe Ser Ile Ser Ala His Gly Lys Glu Leu Phe Val
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305                 310                 315                 320

aat gca gac ctg tac att gta gcc ggc cgc cgc tac ggg ctg gta gga       1008
Asn Ala Asp Leu Tyr Ile Val Ala Gly Arg Arg Tyr Gly Leu Val Gly
                325                 330                 335

ccc aat ggc aag ggc aag acc aca ctc ctc aag cac att gcc aac cga       1056
Pro Asn Gly Lys Gly Lys Thr Thr Leu Leu Lys His Ile Ala Asn Arg
            340                 345                 350

gcc ctg agc atc cct ccc aac att gat gtg ttg ctg tgt gag cag gag       1104
Ala Leu Ser Ile Pro Pro Asn Ile Asp Val Leu Leu Cys Glu Gln Glu
        355                 360                 365

gtg gta gca gat gag aca cca gca gtc cag gct gtt ctt cga gct gac       1152
Val Val Ala Asp Glu Thr Pro Ala Val Gln Ala Val Leu Arg Ala Asp
    370                 375                 380

acc aag cga ttg aag ctg ctg gaa gag gag cgg cgg ctt cag gga cag       1200
Thr Lys Arg Leu Lys Leu Leu Glu Glu Glu Arg Arg Leu Gln Gly Gln
385                 390                 395                 400

ctg gaa caa ggg gat gac aca gct gct gag agg cta gag aag gtg tat       1248
Leu Glu Gln Gly Asp Asp Thr Ala Ala Glu Arg Leu Glu Lys Val Tyr
                405                 410                 415

gag gaa ttg cgg gcc act ggg gcg gca gct gca gag gcc aaa gca cgg       1296
Glu Glu Leu Arg Ala Thr Gly Ala Ala Ala Ala Glu Ala Lys Ala Arg
            420                 425                 430

cgg atc ctg gct ggc ctg ggc ttt gac cct gaa atg cag aat cga ccc       1344
Arg Ile Leu Ala Gly Leu Gly Phe Asp Pro Glu Met Gln Asn Arg Pro
        435                 440                 445

aca cag aag ttc tca ggg ggc tgg cgc atg cgt gtc tcc ctg gcc agg       1392
Thr Gln Lys Phe Ser Gly Gly Trp Arg Met Arg Val Ser Leu Ala Arg
    450                 455                 460

gca ctg ttc atg gag ccc aca ctg ctg atg ctg gat gag ccc acc aac       1440
Ala Leu Phe Met Glu Pro Thr Leu Leu Met Leu Asp Glu Pro Thr Asn
465                 470                 475                 480

cac ctg gac ctc aac gct gtc atc tgg ctt aat aac tac ctc cag ggc       1488
His Leu Asp Leu Asn Ala Val Ile Trp Leu Asn Asn Tyr Leu Gln Gly
                485                 490                 495

tgg cgg aag acc ttg ctg atc gtc tcc cat gac cag ggc ttc ttg gat       1536
Trp Arg Lys Thr Leu Leu Ile Val Ser His Asp Gln Gly Phe Leu Asp
            500                 505                 510

gat gtc tgc act gat atc atc cac ctc gat gcc cag cgg ctc cac tac       1584
Asp Val Cys Thr Asp Ile Ile His Leu Asp Ala Gln Arg Leu His Tyr
        515                 520                 525

tat agg ggc aat tac atg acc ttc aaa aag atg tac cag cag aag cag       1632
Tyr Arg Gly Asn Tyr Met Thr Phe Lys Lys Met Tyr Gln Gln Lys Gln
    530                 535                 540

aaa gaa ctg ctg aaa cag tat gag aag caa gag aaa aag ctg aag gag       1680
Lys Glu Leu Leu Lys Gln Tyr Glu Lys Gln Glu Lys Lys Leu Lys Glu
545                 550                 555                 560

ctg aag gca ggc ggg aag tcc acc aag cag gcg gaa aaa caa acg aag       1728
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Leu Lys Ala Gly Gly Lys Ser Thr Lys Gln Ala Glu Lys Gln Thr Lys
                565                 570                 575

gaa gcc ctg act cgg aag cag cag aaa tgc cga cgg aaa aac caa gat       1776
Glu Ala Leu Thr Arg Lys Gln Gln Lys Cys Arg Arg Lys Asn Gln Asp
            580                 585                 590

gag gaa tcc cag gag gcc cct gag ctc ctg aag cgc cct aag gag tac       1824
Glu Glu Ser Gln Glu Ala Pro Glu Leu Leu Lys Arg Pro Lys Glu Tyr
        595                 600                 605

act gtg cgc ttc act ttt cca gac ccc cca cca ctc agc cct cca gtg       1872
Thr Val Arg Phe Thr Phe Pro Asp Pro Pro Pro Leu Ser Pro Pro Val
    610                 615                 620

ctg ggt ctg cat ggt gtg aca ttc ggc tac cag gga cag aaa cca ctc       1920
Leu Gly Leu His Gly Val Thr Phe Gly Tyr Gln Gly Gln Lys Pro Leu
625                 630                 635                 640

ttt aag aac ttg gat ttt ggc atc gac atg gat tca agg att tgc att       1968
Phe Lys Asn Leu Asp Phe Gly Ile Asp Met Asp Ser Arg Ile Cys Ile
                645                 650                 655

gtg ggc cct aat ggt gtg ggg aag agt acg cta ctc ctg ctg ctg act       2016
Val Gly Pro Asn Gly Val Gly Lys Ser Thr Leu Leu Leu Leu Leu Thr
            660                 665                 670

ggc aag ctg aca ccg acc cat ggg gaa atg aga aag aac cac cgg ctg       2064
Gly Lys Leu Thr Pro Thr His Gly Glu Met Arg Lys Asn His Arg Leu
        675                 680                 685

aaa att ggc ttc ttc aac cag cag tat gca gag cag ctg cgc atg gag       2112
Lys Ile Gly Phe Phe Asn Gln Gln Tyr Ala Glu Gln Leu Arg Met Glu
    690                 695                 700

gag acg ccc act gag tac ctg cag cgg ggc ttc aac ctg ccc tac cag       2160
Glu Thr Pro Thr Glu Tyr Leu Gln Arg Gly Phe Asn Leu Pro Tyr Gln
705                 710                 715                 720

gat gcc cgc aag tgc ctg ggc cgc ttc ggc ctg gag agt cac gcc cac       2208
Asp Ala Arg Lys Cys Leu Gly Arg Phe Gly Leu Glu Ser His Ala His
                725                 730                 735

acc atc cag atc tgc aaa ctc tct ggt ggt cag aag gcg cga gtt gtg       2256
Thr Ile Gln Ile Cys Lys Leu Ser Gly Gly Gln Lys Ala Arg Val Val
            740                 745                 750

ttt gct gag ctg gcc tgt cgg gaa cct gat gtc ctc atc ttg gac gag       2304
Phe Ala Glu Leu Ala Cys Arg Glu Pro Asp Val Leu Ile Leu Asp Glu
        755                 760                 765

cca acc aat aac ctg gac ata gag tct att gat gct cta ggg gag gcc       2352
Pro Thr Asn Asn Leu Asp Ile Glu Ser Ile Asp Ala Leu Gly Glu Ala
    770                 775                 780

atc aat gaa tac aag ggt gct gtg atc gtt gtc agc cat gat gcc cga       2400
Ile Asn Glu Tyr Lys Gly Ala Val Ile Val Val Ser His Asp Ala Arg
785                 790                 795                 800

ctc atc aca gaa acc aat tgc cag ctg tgg gtg gtg gag gag cag agt       2448
Leu Ile Thr Glu Thr Asn Cys Gln Leu Trp Val Val Glu Glu Gln Ser
                805                 810                 815
```

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gtt agc caa atc gat ggt gac ttt gaa gac tac aag cgg gag gtg ttg       2496
Val Ser Gln Ile Asp Gly Asp Phe Glu Asp Tyr Lys Arg Glu Val Leu
            820                 825                 830

gag gcc ctg ggt gaa gtc atg gtc agc cgg ccc cga gag tga               2538
Glu Ala Leu Gly Glu Val Met Val Ser Arg Pro Arg Glu
        835                 840                 845
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<210> 41
<211> 845
<212> PRT
<213> Homo sapiens

<400> 41

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Met Pro Lys Ala Pro Lys Gln Gln Pro Pro Glu Pro Glu Trp Ile Gly
1               5                   10                  15

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

Lys Asp Lys Lys Ile Lys Lys Thr Phe Phe Glu Glu Leu Ala Val Glu
        35                  40                  45

Asp Lys Gln Ala Gly Glu Glu Glu Lys Val Leu Lys Glu Lys Glu Gln
    50                  55                  60

Gln Gln Gln Gln Gln Gln Gln Gln Gln Lys Lys Lys Arg Asp Thr Arg
65                  70                  75                  80

Lys Gly Arg Arg Lys Lys Asp Val Asp Asp Asp Gly Glu Glu Lys Glu
                85                  90                  95

Leu Met Glu Arg Leu Lys Lys Leu Ser Val Pro Thr Ser Asp Glu Glu
            100                 105                 110

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

Gly Asn Val Phe Ala Ala Leu Ile Gln Asp Gln Ser Glu Glu Glu Glu
    130                 135                 140

Glu Glu Glu Lys His Pro Pro Lys Pro Ala Lys Pro Glu Lys Asn Arg
145                 150                 155                 160

Ile Asn Lys Ala Val Ser Glu Glu Gln Gln Pro Ala Leu Lys Gly Lys
                165                 170                 175

Lys Gly Lys Glu Glu Lys Ser Lys Gly Lys Ala Lys Pro Gln Asn Lys
            180                 185                 190
```

```
Phe Ala Ala Leu Asp Asn Glu Glu Glu Asp Lys Glu Glu Glu Ile Ile
        195                 200                 205

Lys Glu Lys Glu Pro Pro Lys Gln Gly Lys Glu Lys Ala Lys Lys Ala
    210                 215                 220

Glu Gln Gly Ser Glu Glu Glu Gly Glu Gly Glu Glu Glu Glu Glu Glu
225                 230                 235                 240

Gly Gly Glu Ser Lys Ala Asp Asp Pro Tyr Ala His Leu Ser Lys Lys
                245                 250                 255

Glu Lys Lys Lys Leu Lys Lys Gln Met Glu Tyr Glu Arg Gln Val Ala
            260                 265                 270

Ser Leu Lys Ala Ala Asn Ala Ala Glu Asn Asp Phe Ser Val Ser Gln
        275                 280                 285

Ala Glu Met Ser Ser Arg Gln Ala Met Leu Glu Asn Ala Ser Asp Ile
    290                 295                 300

Lys Leu Glu Lys Phe Ser Ile Ser Ala His Gly Lys Glu Leu Phe Val
305                 310                 315                 320

Asn Ala Asp Leu Tyr Ile Val Ala Gly Arg Arg Tyr Gly Leu Val Gly
                325                 330                 335

Pro Asn Gly Lys Gly Lys Thr Thr Leu Leu Lys His Ile Ala Asn Arg
            340                 345                 350

Ala Leu Ser Ile Pro Pro Asn Ile Asp Val Leu Leu Cys Glu Gln Glu
        355                 360                 365

Val Val Ala Asp Glu Thr Pro Ala Val Gln Ala Val Leu Arg Ala Asp
    370                 375                 380

Thr Lys Arg Leu Lys Leu Leu Glu Glu Glu Arg Arg Leu Gln Gly Gln
385                 390                 395                 400

Leu Glu Gln Gly Asp Asp Thr Ala Ala Glu Arg Leu Glu Lys Val Tyr
                405                 410                 415

Glu Glu Leu Arg Ala Thr Gly Ala Ala Ala Ala Glu Ala Lys Ala Arg
            420                 425                 430

Arg Ile Leu Ala Gly Leu Gly Phe Asp Pro Glu Met Gln Asn Arg Pro
        435                 440                 445
```

```
Thr Gln Lys Phe Ser Gly Gly Trp Arg Met Arg Val Ser Leu Ala Arg
    450                 455                 460

Ala Leu Phe Met Glu Pro Thr Leu Leu Met Leu Asp Glu Pro Thr Asn
465                 470                 475                 480

His Leu Asp Leu Asn Ala Val Ile Trp Leu Asn Asn Tyr Leu Gln Gly
                485                 490                 495

Trp Arg Lys Thr Leu Leu Ile Val Ser His Asp Gln Gly Phe Leu Asp
            500                 505                 510

Asp Val Cys Thr Asp Ile Ile His Leu Asp Ala Gln Arg Leu His Tyr
        515                 520                 525

Tyr Arg Gly Asn Tyr Met Thr Phe Lys Lys Met Tyr Gln Gln Lys Gln
    530                 535                 540

Lys Glu Leu Leu Lys Gln Tyr Glu Lys Gln Glu Lys Lys Leu Lys Glu
545                 550                 555                 560

Leu Lys Ala Gly Gly Lys Ser Thr Lys Gln Ala Glu Lys Gln Thr Lys
                565                 570                 575

Glu Ala Leu Thr Arg Lys Gln Gln Lys Cys Arg Arg Lys Asn Gln Asp
            580                 585                 590

Glu Glu Ser Gln Glu Ala Pro Glu Leu Leu Lys Arg Pro Lys Glu Tyr
        595                 600                 605

Thr Val Arg Phe Thr Phe Pro Asp Pro Pro Pro Leu Ser Pro Pro Val
    610                 615                 620

Leu Gly Leu His Gly Val Thr Phe Gly Tyr Gln Gly Gln Lys Pro Leu
625                 630                 635                 640

Phe Lys Asn Leu Asp Phe Gly Ile Asp Met Asp Ser Arg Ile Cys Ile
                645                 650                 655

Val Gly Pro Asn Gly Val Gly Lys Ser Thr Leu Leu Leu Leu Leu Thr
            660                 665                 670

Gly Lys Leu Thr Pro Thr His Gly Glu Met Arg Lys Asn His Arg Leu
        675                 680                 685

Lys Ile Gly Phe Phe Asn Gln Gln Tyr Ala Glu Gln Leu Arg Met Glu
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eolf-seql

690 695 700

Glu Thr Pro Thr Glu Tyr Leu Gln Arg Gly Phe Asn Leu Pro Tyr Gln
705 710 715 720

Asp Ala Arg Lys Cys Leu Gly Arg Phe Gly Leu Glu Ser His Ala His
725 730 735

Thr Ile Gln Ile Cys Lys Leu Ser Gly Gly Gln Lys Ala Arg Val Val
740 745 750

Phe Ala Glu Leu Ala Cys Arg Glu Pro Asp Val Leu Ile Leu Asp Glu
755 760 765

Pro Thr Asn Asn Leu Asp Ile Glu Ser Ile Asp Ala Leu Gly Glu Ala
770 775 780

Ile Asn Glu Tyr Lys Gly Ala Val Ile Val Val Ser His Asp Ala Arg
785 790 795 800

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