

## SEQUENCE LISTING

<110> Ajinomoto Co., Inc.

<120> A method of screening a modifier of salty taste substances

<130> D223-10163

<150> JP2009-224942

<151> 2009-09-29

<160> 53

<170> PatentIn version 3.5

<210> 1

<211> 1842

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (1)..(1842)

<400> 1

|                                                                 |     |
|-----------------------------------------------------------------|-----|
| atg ggc aag atc gag aac aac gag agg gtg atc ctc aat gtc ggg ggc | 48  |
| Met Gly Lys Ile Glu Asn Asn Glu Arg Val Ile Leu Asn Val Gly Gly |     |
| 1 5 10 15                                                       |     |
| acc cgg cac gaa acc tac cgc agc acc ctc aag acc ctg cct gga aca | 96  |
| Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr |     |
| 20 25 30                                                        |     |
| cgc ctg gcc ctt ctt gcc tcc tcc gag ccc cca ggc gac tgc ttg acc | 144 |
| Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Pro Gly Asp Cys Leu Thr |     |
| 35 40 45                                                        |     |
| acg gcg ggc gac aag ctg cag ccg tcg ccg cct cca ctg tcg ccg ccg | 192 |
| Thr Ala Gly Asp Lys Leu Gln Pro Ser Pro Pro Pro Leu Ser Pro Pro |     |
| 50 55 60                                                        |     |
| ccg aga gcg ccc ccg ctg tcc ccc ggg cca ggc ggc tgc ttc gag ggc | 240 |
| Pro Arg Ala Pro Pro Leu Ser Pro Gly Pro Gly Gly Cys Phe Glu Gly |     |
| 65 70 75 80                                                     |     |
| ggc gcg ggc aac tgc agt tcc cgc ggc ggc agg gcc agc gac cat ccc | 288 |
| Gly Ala Gly Asn Cys Ser Ser Arg Gly Gly Arg Ala Ser Asp His Pro |     |
| 85 90 95                                                        |     |
| ggt ggc ggc cgc gag ttc ttc ttc gac cgg cac ccg ggc gtc ttc gcc | 336 |
| Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro Gly Val Phe Ala |     |
| 100 105 110                                                     |     |
| tat gtg ctc aat tac tac cgc acc ggc aag ctg cac tgc ccc gca gac | 384 |
| Tyr Val Leu Asn Tyr Tyr Arg Thr Gly Lys Leu His Cys Pro Ala Asp |     |

|                                                                 |     |     |      |
|-----------------------------------------------------------------|-----|-----|------|
| 115                                                             | 120 | 125 |      |
| gtg tgc ggg ccg ctc ttc gag gag gag ctg gcc ttc tgg ggc atc gac |     |     | 432  |
| Val Cys Gly Pro Leu Phe Glu Glu Glu Leu Ala Phe Trp Gly Ile Asp |     |     |      |
| 130                                                             | 135 | 140 |      |
| gag acc gac gtg gag ccc tgc tgc tgg atg acc tac cgg cag cac cgc |     |     | 480  |
| Glu Thr Asp Val Glu Pro Cys Cys Trp Met Thr Tyr Arg Gln His Arg |     |     |      |
| 145                                                             | 150 | 155 | 160  |
| gac gcc gag gag gcg ctg gac atc ttc gag acc ccc gac ctc att ggc |     |     | 528  |
| Asp Ala Glu Glu Ala Leu Asp Ile Phe Glu Thr Pro Asp Leu Ile Gly |     |     |      |
| 165                                                             | 170 | 175 |      |
| ggc gac ccc ggc gac gac gag gac ctg gcg gcc aag agg ctg ggc atc |     |     | 576  |
| Gly Asp Pro Gly Asp Asp Glu Asp Leu Ala Ala Lys Arg Leu Gly Ile |     |     |      |
| 180                                                             | 185 | 190 |      |
| gag gac gcg gcg ggg ctc ggg ggc ccc gac ggc aaa tct ggc cgc tgg |     |     | 624  |
| Glu Asp Ala Ala Gly Leu Gly Gly Pro Asp Gly Lys Ser Gly Arg Trp |     |     |      |
| 195                                                             | 200 | 205 |      |
| agg agg ctg cag ccc cgc atg tgg gcc ctc ttc gaa gac ccc tac tcg |     |     | 672  |
| Arg Arg Leu Gln Pro Arg Met Trp Ala Leu Phe Glu Asp Pro Tyr Ser |     |     |      |
| 210                                                             | 215 | 220 |      |
| tcc aga gcc gcc agg ttt att gct ttt gct tct tta ttc ttc atc ctg |     |     | 720  |
| Ser Arg Ala Ala Arg Phe Ile Ala Phe Ala Ser Leu Phe Phe Ile Leu |     |     |      |
| 225                                                             | 230 | 235 | 240  |
| gtt tca att aca act ttt tgc ctg gaa aca cat gaa gct ttc aat att |     |     | 768  |
| Val Ser Ile Thr Thr Phe Cys Leu Glu Thr His Glu Ala Phe Asn Ile |     |     |      |
| 245                                                             | 250 | 255 |      |
| gtt aaa aac aag aca gaa cca gtc atc aat ggc aca agt gtt gtt cta |     |     | 816  |
| Val Lys Asn Lys Thr Glu Pro Val Ile Asn Gly Thr Ser Val Val Leu |     |     |      |
| 260                                                             | 265 | 270 |      |
| cag tat gaa att gaa acg gat cct gcc ttg acg tat gta gaa gga gtg |     |     | 864  |
| Gln Tyr Glu Ile Glu Thr Asp Pro Ala Leu Thr Tyr Val Glu Gly Val |     |     |      |
| 275                                                             | 280 | 285 |      |
| tgt gtg gtg tgg ttt act ttt gaa ttt tta gtc cgt att gtt ttt tca |     |     | 912  |
| Cys Val Val Trp Phe Thr Phe Glu Phe Leu Val Arg Ile Val Phe Ser |     |     |      |
| 290                                                             | 295 | 300 |      |
| ccc aat aaa ctt gaa ttc atc aaa aat ctc ttg aat atc att gac ttt |     |     | 960  |
| Pro Asn Lys Leu Glu Phe Ile Lys Asn Leu Leu Asn Ile Ile Asp Phe |     |     |      |
| 305                                                             | 310 | 315 | 320  |
| gtg gcc atc cta cct ttc tac tta gag gtg gga ctc agt ggg ctg tca |     |     | 1008 |
| Val Ala Ile Leu Pro Phe Tyr Leu Glu Val Gly Leu Ser Gly Leu Ser |     |     |      |
| 325                                                             | 330 | 335 |      |
| tcc aaa gct gct aaa gat gtg ctt ggc ttc ctc agg gtg gta agg ttt |     |     | 1056 |
| Ser Lys Ala Ala Lys Asp Val Leu Gly Phe Leu Arg Val Val Arg Phe |     |     |      |
| 340                                                             | 345 | 350 |      |
| gtg agg atc ctg aga att ttc aag ctc acc cgc cat ttt gta ggt ctg |     |     | 1104 |
| Val Arg Ile Leu Arg Ile Phe Lys Leu Thr Arg His Phe Val Gly Leu |     |     |      |
| 355                                                             | 360 | 365 |      |
| agg gtg ctt gga cat act ctt cga gct agt act aat gaa ttt ttg ctg |     |     | 1152 |
| Arg Val Leu Gly His Thr Leu Arg Ala Ser Thr Asn Glu Phe Leu Leu |     |     |      |
| 370                                                             | 375 | 380 |      |

|                       |     |
|-----------------------|-----|
| $\langle 210 \rangle$ | 2   |
| $\langle 211 \rangle$ | 613 |

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 2

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Met Gly Lys Ile Glu Asn Asn Glu Arg Val Ile Leu Asn Val Gly Gly
 1          5          10          15
Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr
      20          25          30
Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Pro Gly Asp Cys Leu Thr
      35          40          45
Thr Ala Gly Asp Lys Leu Gln Pro Ser Pro Pro Pro Leu Ser Pro Pro
      50          55          60
Pro Arg Ala Pro Pro Leu Ser Pro Gly Pro Gly Gly Cys Phe Glu Gly
65          70          75          80
Gly Ala Gly Asn Cys Ser Ser Arg Gly Gly Arg Ala Ser Asp His Pro
      85          90          95
Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro Gly Val Phe Ala
      100          105          110
Tyr Val Leu Asn Tyr Tyr Arg Thr Gly Lys Leu His Cys Pro Ala Asp
      115          120          125
Val Cys Gly Pro Leu Phe Glu Glu Glu Leu Ala Phe Trp Gly Ile Asp
      130          135          140
Glu Thr Asp Val Glu Pro Cys Cys Trp Met Thr Tyr Arg Gln His Arg
145          150          155          160
Asp Ala Glu Glu Ala Leu Asp Ile Phe Glu Thr Pro Asp Leu Ile Gly
      165          170          175
Gly Asp Pro Gly Asp Asp Glu Asp Leu Ala Ala Lys Arg Leu Gly Ile
      180          185          190
Glu Asp Ala Ala Gly Leu Gly Gly Pro Asp Gly Lys Ser Gly Arg Trp
      195          200          205
Arg Arg Leu Gln Pro Arg Met Trp Ala Leu Phe Glu Asp Pro Tyr Ser
      210          215          220
Ser Arg Ala Ala Arg Phe Ile Ala Phe Ala Ser Leu Phe Phe Ile Leu
225          230          235          240
Val Ser Ile Thr Thr Phe Cys Leu Glu Thr His Glu Ala Phe Asn Ile
      245          250          255
Val Lys Asn Lys Thr Glu Pro Val Ile Asn Gly Thr Ser Val Val Leu
      260          265          270
Gln Tyr Glu Ile Glu Thr Asp Pro Ala Leu Thr Tyr Val Glu Gly Val
      275          280          285
Cys Val Val Trp Phe Thr Phe Glu Phe Leu Val Arg Ile Val Phe Ser
      290          295          300
Pro Asn Lys Leu Glu Phe Ile Lys Asn Leu Leu Asn Ile Ile Asp Phe
305          310          315          320
Val Ala Ile Leu Pro Phe Tyr Leu Glu Val Gly Leu Ser Gly Leu Ser
      325          330          335
Ser Lys Ala Ala Lys Asp Val Leu Gly Phe Leu Arg Val Val Arg Phe
      340          345          350
Val Arg Ile Leu Arg Ile Phe Lys Leu Thr Arg His Phe Val Gly Leu

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          355              360              365
Arg Val Leu Gly His Thr Leu Arg Ala Ser Thr Asn Glu Phe Leu Leu
  370              375              380
Leu Ile Ile Phe Leu Ala Leu Gly Val Leu Ile Phe Ala Thr Met Ile
385              390              395              400
Tyr Tyr Ala Glu Arg Val Gly Ala Gln Pro Asn Asp Pro Ser Ala Ser
          405              410              415
Glu His Thr Gln Phe Lys Asn Ile Pro Ile Gly Phe Trp Trp Ala Val
          420              425              430
Val Thr Met Thr Thr Leu Gly Tyr Gly Asp Met Tyr Pro Gln Thr Trp
          435              440              445
Ser Gly Met Leu Val Gly Ala Leu Cys Ala Leu Ala Gly Val Leu Thr
          450              455              460
Ile Ala Met Pro Val Pro Val Ile Val Asn Asn Phe Gly Met Tyr Tyr
465              470              475              480
Ser Leu Ala Met Ala Lys Gln Lys Leu Pro Arg Lys Arg Lys Lys His
          485              490              495
Ile Pro Pro Ala Pro Gln Ala Ser Ser Pro Thr Phe Cys Lys Thr Glu
          500              505              510
Leu Asn Met Ala Cys Asn Ser Thr Gln Ser Asp Thr Cys Leu Gly Lys
          515              520              525
Asp Asn Arg Leu Leu Glu His Asn Arg Ser Val Leu Ser Gly Asp Asp
          530              535              540
Ser Thr Gly Ser Glu Pro Pro Leu Ser Pro Pro Glu Arg Leu Pro Ile
545              550              555              560
Arg Arg Ser Ser Thr Arg Asp Lys Asn Arg Arg Gly Glu Thr Cys Phe
          565              570              575
Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp Gly Gly Ile Arg
          580              585              590
Lys Asp Asn Cys Lys Glu Val Val Ile Thr Gly Tyr Thr Gln Ala Glu
          595              600              605
Ala Arg Ser Leu Thr
          610

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<210> 3
<211> 1917
<212> DNA
<213> Homo sapiens

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<220>
<221> CDS
<222> (1)..(1917)

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<400> 3
atg ggc aag atc gag aac aac gag agg gtg atc ctc aat gtc ggg ggc      48
Met Gly Lys Ile Glu Asn Asn Glu Arg Val Ile Leu Asn Val Gly Gly
1              5              10              15
acc cgg cac gaa acc tac cgc agc acc ctc aag acc ctg cct gga aca      96

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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Arg | His | Glu | Thr | Tyr | Arg | Ser | Thr | Leu | Lys | Thr | Leu | Pro | Gly | Thr |     |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |     |
| cgc | ctg | gcc | ctt | ctt | gcc | tcc | tcc | gag | ccc | cca | ggc | gac | tgc | ttg | acc | 144 |
| Arg | Leu | Ala | Leu | Leu | Ala | Ser | Ser | Glu | Pro | Pro | Gly | Asp | Cys | Leu | Thr |     |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |     |
| acg | gcg | ggc | gac | aag | ctg | cag | ccg | tcg | ccg | cct | cca | ctg | tcg | ccg | ccg | 192 |
| Thr | Ala | Gly | Asp | Lys | Leu | Gln | Pro | Ser | Pro | Pro | Pro | Leu | Ser | Pro | Pro |     |
|     |     | 50  |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |     |
| ccg | aga | gcg | ccc | ccg | ctg | tcc | ccc | ggg | cca | ggc | ggc | tgc | ttc | gag | ggc | 240 |
| Pro | Arg | Ala | Pro | Pro | Leu | Ser | Pro | Gly | Pro | Gly | Gly | Cys | Phe | Glu | Gly |     |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     | 80  |     |     |     |
| ggc | gcg | ggc | aac | tgc | agt | tcc | cgc | ggc | ggc | agg | gcc | agc | gac | cat | ccc | 288 |
| Gly | Ala | Gly | Asn | Cys | Ser | Ser | Arg | Gly | Gly | Arg | Ala | Ser | Asp | His | Pro |     |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |     |     |
| ggt | ggc | ggc | cgc | gag | ttc | ttc | ttc | gac | cgg | cac | ccg | ggc | gtc | ttc | gcc | 336 |
| Gly | Gly | Gly | Arg | Glu | Phe | Phe | Phe | Asp | Arg | His | Pro | Gly | Val | Phe | Ala |     |
|     |     | 100 |     |     |     |     |     | 105 |     |     |     | 110 |     |     |     |     |
| tat | gtg | ctc | aat | tac | tac | cgc | acc | ggc | aag | ctg | cac | tgc | ccc | gca | gac | 384 |
| Tyr | Val | Leu | Asn | Tyr | Tyr | Arg | Thr | Gly | Lys | Leu | His | Cys | Pro | Ala | Asp |     |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |     |
| gtg | tgc | ggg | ccg | ctc | ttc | gag | gag | gag | ctg | gcc | ttc | tgg | ggc | atc | gac | 432 |
| Val | Cys | Gly | Pro | Leu | Phe | Glu | Glu | Glu | Leu | Ala | Phe | Trp | Gly | Ile | Asp |     |
|     |     | 130 |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |     |
| gag | acc | gac | gtg | gag | ccc | tgc | tgc | tgg | atg | acc | tac | cgg | cag | cac | cgc | 480 |
| Glu | Thr | Asp | Val | Glu | Pro | Cys | Cys | Trp | Met | Thr | Tyr | Arg | Gln | His | Arg |     |
| 145 |     |     |     |     | 150 |     |     |     | 155 |     |     |     | 160 |     |     |     |
| gac | gcc | gag | gag | gcg | ctg | gac | atc | ttc | gag | acc | ccc | gac | ctc | att | ggc | 528 |
| Asp | Ala | Glu | Glu | Ala | Leu | Asp | Ile | Phe | Glu | Thr | Pro | Asp | Leu | Ile | Gly |     |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     | 175 |     |     |     |     |
| ggc | gac | ccc | ggc | gac | gac | gag | gac | ctg | gcg | gcc | aag | agg | ctg | ggc | atc | 576 |
| Gly | Asp | Pro | Gly | Asp | Asp | Glu | Asp | Leu | Ala | Ala | Lys | Arg | Leu | Gly | Ile |     |
|     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     |
| gag | gac | gcg | gcg | ggg | ctc | ggg | ggc | ccc | gac | ggc | aaa | tct | ggc | cgc | tgg | 624 |
| Glu | Asp | Ala | Ala | Gly | Leu | Gly | Gly | Pro | Asp | Gly | Lys | Ser | Gly | Arg | Trp |     |
|     |     | 195 |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     |     |
| agg | agg | ctg | cag | ccc | cgc | atg | tgg | gcc | ctc | ttc | gaa | gac | ccc | tac | tcg | 672 |
| Arg | Arg | Leu | Gln | Pro | Arg | Met | Trp | Ala | Leu | Phe | Glu | Asp | Pro | Tyr | Ser |     |
|     |     | 210 |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |     |
| tcc | aga | gcc | gcc | agg | ttt | att | gct | ttt | gct | tct | tta | ttc | ttc | atc | ctg | 720 |
| Ser | Arg | Ala | Ala | Arg | Phe | Ile | Ala | Phe | Ala | Ser | Leu | Phe | Phe | Ile | Leu |     |
| 225 |     |     |     |     | 230 |     |     |     | 235 |     |     |     | 240 |     |     |     |
| gtt | tca | att | aca | act | ttt | tgc | ctg | gaa | aca | cat | gaa | gct | ttc | aat | att | 768 |
| Val | Ser | Ile | Thr | Thr | Phe | Cys | Leu | Glu | Thr | His | Glu | Ala | Phe | Asn | Ile |     |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     | 255 |     |     |     |     |
| gtt | aaa | aac | aag | aca | gaa | cca | gtc | atc | aat | ggc | aca | agt | gtt | gtt | cta | 816 |
| Val | Lys | Asn | Lys | Thr | Glu | Pro | Val | Ile | Asn | Gly | Thr | Ser | Val | Val | Leu |     |
|     |     | 260 |     |     |     |     | 265 |     |     |     | 270 |     |     |     |     |     |
| cag | tat | gaa | att | gaa | acg | gat | cct | gcc | ttg | acg | tat | gta | gaa | gga | gtg | 864 |
| Gln | Tyr | Glu | Ile | Glu | Thr | Asp | Pro | Ala | Leu | Thr | Tyr | Val | Glu | Gly | Val |     |

|                                                                 |     |     |      |
|-----------------------------------------------------------------|-----|-----|------|
| 275                                                             | 280 | 285 |      |
| tgt gtg gtg tgg ttt act ttt gaa ttt tta gtc cgt att gtt ttt tca |     |     | 912  |
| Cys Val Val Trp Phe Thr Phe Glu Phe Leu Val Arg Ile Val Phe Ser |     |     |      |
| 290                                                             | 295 | 300 |      |
| ccc aat aaa ctt gaa ttc atc aaa aat ctc ttg aat atc att gac ttt |     |     | 960  |
| Pro Asn Lys Leu Glu Phe Ile Lys Asn Leu Leu Asn Ile Ile Asp Phe |     |     |      |
| 305                                                             | 310 | 315 | 320  |
| gtg gcc atc cta cct ttc tac tta gag gtg gga ctc agt ggg ctg tca |     |     | 1008 |
| Val Ala Ile Leu Pro Phe Tyr Leu Glu Val Gly Leu Ser Gly Leu Ser |     |     |      |
|                                                                 | 325 | 330 | 335  |
| tcc aaa gct gct aaa gat gtg ctt ggc ttc ctc agg gtg gta agg ttt |     |     | 1056 |
| Ser Lys Ala Ala Lys Asp Val Leu Gly Phe Leu Arg Val Val Arg Phe |     |     |      |
|                                                                 | 340 | 345 | 350  |
| gtg agg atc ctg aga att ttc aag ctc acc cgc cat ttt gta ggt ctg |     |     | 1104 |
| Val Arg Ile Leu Arg Ile Phe Lys Leu Thr Arg His Phe Val Gly Leu |     |     |      |
|                                                                 | 355 | 360 | 365  |
| agg gtg ctt gga cat act ctt cga gct agt act aat gaa ttt ttg ctg |     |     | 1152 |
| Arg Val Leu Gly His Thr Leu Arg Ala Ser Thr Asn Glu Phe Leu Leu |     |     |      |
|                                                                 | 370 | 375 | 380  |
| ctg ata att ttc ctg gct cta gga gtt ttg ata ttt gct acc atg atc |     |     | 1200 |
| Leu Ile Ile Phe Leu Ala Leu Gly Val Leu Ile Phe Ala Thr Met Ile |     |     |      |
| 385                                                             | 390 | 395 | 400  |
| tac tat gcc gag aga gtg gga gct caa cct aac gac cct tca gct agt |     |     | 1248 |
| Tyr Tyr Ala Glu Arg Val Gly Ala Gln Pro Asn Asp Pro Ser Ala Ser |     |     |      |
|                                                                 | 405 | 410 | 415  |
| gag cac aca cag ttc aaa aac att ccc att ggg ttc tgg tgg gct gta |     |     | 1296 |
| Glu His Thr Gln Phe Lys Asn Ile Pro Ile Gly Phe Trp Trp Ala Val |     |     |      |
|                                                                 | 420 | 425 | 430  |
| gtg acc atg act acc ctg ggt tat ggg gat atg tac ccc caa aca tgg |     |     | 1344 |
| Val Thr Met Thr Thr Leu Gly Tyr Gly Asp Met Tyr Pro Gln Thr Trp |     |     |      |
|                                                                 | 435 | 440 | 445  |
| tca ggc atg ctg gtg gga gcc ctg tgt gct ctg gct gga gtg ctg aca |     |     | 1392 |
| Ser Gly Met Leu Val Gly Ala Leu Cys Ala Leu Ala Gly Val Leu Thr |     |     |      |
|                                                                 | 450 | 455 | 460  |
| ata gcc atg cca gtg cct gtc att gtc aat aat ttt gga atg tac tac |     |     | 1440 |
| Ile Ala Met Pro Val Pro Val Ile Val Asn Asn Phe Gly Met Tyr Tyr |     |     |      |
| 465                                                             | 470 | 475 | 480  |
| tcc ttg gca atg gca aag cag aaa ctt cca agg aaa aga aag aag cac |     |     | 1488 |
| Ser Leu Ala Met Ala Lys Gln Lys Leu Pro Arg Lys Arg Lys Lys His |     |     |      |
|                                                                 | 485 | 490 | 495  |
| atc cct cct gct cct cag gca agc tca cct act ttt tgc aag aca gaa |     |     | 1536 |
| Ile Pro Pro Ala Pro Gln Ala Ser Ser Pro Thr Phe Cys Lys Thr Glu |     |     |      |
|                                                                 | 500 | 505 | 510  |
| tta aat atg gcc tgc aat agt aca cag agt gac aca tgt ctg ggc aaa |     |     | 1584 |
| Leu Asn Met Ala Cys Asn Ser Thr Gln Ser Asp Thr Cys Leu Gly Lys |     |     |      |
|                                                                 | 515 | 520 | 525  |
| gac aat cga ctt ctg gaa cat aac aga tca gtg tta tca ggt gac gac |     |     | 1632 |
| Asp Asn Arg Leu Leu Glu His Asn Arg Ser Val Leu Ser Gly Asp Asp |     |     |      |
| 530                                                             | 535 | 540 |      |

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agt aca gga agt gag ccg cca cta tca ccc cca gaa agg ctc ccc atc      1680
Ser Thr Gly Ser Glu Pro Pro Leu Ser Pro Pro Glu Arg Leu Pro Ile
545                      550                      555                      560
aga cgc tct agt acc aga gac aaa aac aga aga ggg gaa aca tgt ttc      1728
Arg Arg Ser Ser Thr Arg Asp Lys Asn Arg Arg Gly Glu Thr Cys Phe
                      565                      570                      575
cta ctg acg aca ggt gat tac acg tgt gct tct gat gga ggg atc agg      1776
Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp Gly Gly Ile Arg
                      580                      585                      590
aaa gga tat gaa aaa tcc cga agc tta aac aac ata gcg ggc ttg gca      1824
Lys Gly Tyr Glu Lys Ser Arg Ser Leu Asn Asn Ile Ala Gly Leu Ala
                      595                      600                      605
ggc aat gct ctg agg ctc tct cca gta aca tca ccc tac aac tct cct      1872
Gly Asn Ala Leu Arg Leu Ser Pro Val Thr Ser Pro Tyr Asn Ser Pro
                      610                      615                      620
tgt cct ctg agg cgc tct cga tct ccc atc cca tct atc ttg taa      1917
Cys Pro Leu Arg Arg Ser Arg Ser Pro Ile Pro Ser Ile Leu
625                      630                      635

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<210> 4
<211> 638
<212> PRT
<213> Homo sapiens

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<400> 4
Met Gly Lys Ile Glu Asn Asn Glu Arg Val Ile Leu Asn Val Gly Gly
1                      5                      10                      15
Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr
                      20                      25                      30
Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Pro Gly Asp Cys Leu Thr
                      35                      40                      45
Thr Ala Gly Asp Lys Leu Gln Pro Ser Pro Pro Pro Leu Ser Pro Pro
50                      55                      60
Pro Arg Ala Pro Pro Leu Ser Pro Gly Pro Gly Gly Cys Phe Glu Gly
65                      70                      75                      80
Gly Ala Gly Asn Cys Ser Ser Arg Gly Gly Arg Ala Ser Asp His Pro
                      85                      90                      95
Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro Gly Val Phe Ala
100                      105                      110
Tyr Val Leu Asn Tyr Tyr Arg Thr Gly Lys Leu His Cys Pro Ala Asp
115                      120                      125
Val Cys Gly Pro Leu Phe Glu Glu Glu Leu Ala Phe Trp Gly Ile Asp
130                      135                      140
Glu Thr Asp Val Glu Pro Cys Cys Trp Met Thr Tyr Arg Gln His Arg
145                      150                      155                      160
Asp Ala Glu Glu Ala Leu Asp Ile Phe Glu Thr Pro Asp Leu Ile Gly
165                      170                      175
Gly Asp Pro Gly Asp Asp Glu Asp Leu Ala Ala Lys Arg Leu Gly Ile

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|             |                                     |                         |             |     |     |
|-------------|-------------------------------------|-------------------------|-------------|-----|-----|
|             | 180                                 |                         | 185         |     | 190 |
| Glu Asp Ala | Ala Gly Leu Gly Gly                 | Pro Asp Gly Lys Ser     | Gly Arg Trp |     |     |
| 195         |                                     | 200                     |             | 205 |     |
| Arg Arg Leu | Gln Pro Arg Met Trp Ala Leu Phe     | Glu Asp Pro Tyr Ser     |             |     |     |
| 210         |                                     | 215                     |             | 220 |     |
| Ser Arg Ala | Ala Arg Phe Ile Ala Phe Ala         | Ser Leu Phe Phe Ile Leu |             |     |     |
| 225         |                                     | 230                     |             | 235 | 240 |
| Val Ser Ile | Thr Thr Phe Cys Leu Glu Thr His     | Glu Ala Phe Asn Ile     |             |     |     |
|             | 245                                 |                         | 250         |     | 255 |
| Val Lys Asn | Lys Thr Glu Pro Val Ile Asn Gly Thr | Ser Val Val Leu         |             |     |     |
|             | 260                                 |                         | 265         |     | 270 |
| Gln Tyr Glu | Ile Glu Thr Asp Pro Ala Leu Thr Tyr | Val Glu Gly Val         |             |     |     |
| 275         |                                     | 280                     |             | 285 |     |
| Cys Val Val | Trp Phe Thr Phe Glu Phe Leu Val Arg | Ile Val Phe Ser         |             |     |     |
| 290         |                                     | 295                     |             | 300 |     |
| Pro Asn Lys | Leu Glu Phe Ile Lys Asn Leu Leu Asn | Ile Ile Asp Phe         |             |     |     |
| 305         |                                     | 310                     |             | 315 | 320 |
| Val Ala Ile | Leu Pro Phe Tyr Leu Glu Val Gly Leu | Ser Gly Leu Ser         |             |     |     |
|             | 325                                 |                         | 330         |     | 335 |
| Ser Lys Ala | Ala Lys Asp Val Leu Gly Phe Leu Arg | Val Val Arg Phe         |             |     |     |
|             | 340                                 |                         | 345         |     | 350 |
| Val Arg Ile | Leu Arg Ile Phe Lys Leu Thr Arg His | Phe Val Gly Leu         |             |     |     |
| 355         |                                     | 360                     |             | 365 |     |
| Arg Val Leu | Gly His Thr Leu Arg Ala Ser Thr Asn | Glu Phe Leu Leu         |             |     |     |
| 370         |                                     | 375                     |             | 380 |     |
| Leu Ile Ile | Phe Leu Ala Leu Gly Val Leu Ile Phe | Ala Thr Met Ile         |             |     |     |
| 385         |                                     | 390                     |             | 395 | 400 |
| Tyr Tyr Ala | Glu Arg Val Gly Ala Gln Pro Asn Asp | Pro Ser Ala Ser         |             |     |     |
|             | 405                                 |                         | 410         |     | 415 |
| Glu His Thr | Gln Phe Lys Asn Ile Pro Ile Gly Phe | Trp Trp Ala Val         |             |     |     |
|             | 420                                 |                         | 425         |     | 430 |
| Val Thr Met | Thr Thr Leu Gly Tyr Gly Asp Met Tyr | Pro Gln Thr Trp         |             |     |     |
| 435         |                                     | 440                     |             | 445 |     |
| Ser Gly Met | Leu Val Gly Ala Leu Cys Ala Leu Ala | Gly Val Leu Thr         |             |     |     |
| 450         |                                     | 455                     |             | 460 |     |
| Ile Ala Met | Pro Val Pro Val Ile Val Asn Asn Phe | Gly Met Tyr Tyr         |             |     |     |
| 465         |                                     | 470                     |             | 475 | 480 |
| Ser Leu Ala | Met Ala Lys Gln Lys Leu Pro Arg Lys | Arg Lys Lys His         |             |     |     |
|             | 485                                 |                         | 490         |     | 495 |
| Ile Pro Pro | Ala Pro Gln Ala Ser Ser Pro Thr Phe | Cys Lys Thr Glu         |             |     |     |
|             | 500                                 |                         | 505         |     | 510 |
| Leu Asn Met | Ala Cys Asn Ser Thr Gln Ser Asp Thr | Cys Leu Gly Lys         |             |     |     |
|             | 515                                 |                         | 520         |     | 525 |
| Asp Asn Arg | Leu Leu Glu His Asn Arg Ser Val Leu | Ser Gly Asp Asp         |             |     |     |
| 530         |                                     | 535                     |             | 540 |     |
| Ser Thr Gly | Ser Glu Pro Pro Leu Ser Pro Pro Glu | Arg Leu Pro Ile         |             |     |     |
| 545         |                                     | 550                     |             | 555 | 560 |
| Arg Arg Ser | Ser Thr Arg Asp Lys Asn Arg Arg Gly | Glu Thr Cys Phe         |             |     |     |
|             | 565                                 |                         | 570         |     | 575 |

Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp Gly Gly Ile Arg  
                   580                                  585                                  590  
 Lys Gly Tyr Glu Lys Ser Arg Ser Leu Asn Asn Ile Ala Gly Leu Ala  
                   595                                  600                                  605  
 Gly Asn Ala Leu Arg Leu Ser Pro Val Thr Ser Pro Tyr Asn Ser Pro  
                   610                                  615                                  620  
 Cys Pro Leu Arg Arg Ser Arg Ser Pro Ile Pro Ser Ile Leu  
                   625                                  630                                  635

<210> 5  
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 <212> DNA  
 <213> Homo sapiens

<220>  
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 <222> (1)..(1677)

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 Met Gly Lys Ile Glu Asn Asn Glu Arg Val Ile Leu Asn Val Gly Gly  
 1                  5                                  10                                  15  
 acc cgg cac gaa acc tac cgc agc acc ctc aag acc ctg cct gga aca 96  
 Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr  
                   20                                  25                                  30  
 cgc ctg gcc ctt ctt gcc tcc tcc gag ccc cca ggc gac tgc ttg acc 144  
 Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Pro Gly Asp Cys Leu Thr  
                   35                                  40                                  45  
 acg gcg ggc gac aag ctg cag ccg tcg ccg cct cca ctg tcg ccg ccg 192  
 Thr Ala Gly Asp Lys Leu Gln Pro Ser Pro Pro Pro Leu Ser Pro Pro  
                   50                                  55                                  60  
 ccg aga gcg ccc ccg ctg tcc ccc ggg cca ggc ggc tgc ttc gag ggc 240  
 Pro Arg Ala Pro Pro Leu Ser Pro Gly Pro Gly Gly Cys Phe Glu Gly  
 65                  70                                  75                                  80  
 ggc gcg ggc aac tgc agt tcc cgc ggc ggc agg gcc agc gac cat ccc 288  
 Gly Ala Gly Asn Cys Ser Ser Arg Gly Gly Arg Ala Ser Asp His Pro  
                   85                                  90                                  95  
 ggt ggc ggc cgc gag ttc ttc ttc gac cgg cac ccg ggc gtc ttc gcc 336  
 Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro Gly Val Phe Ala  
                   100                                  105                                  110  
 tat gtg ctc aat tac tac cgc acc ggc aag ctg cac tgc ccc gca gac 384  
 Tyr Val Leu Asn Tyr Tyr Arg Thr Gly Lys Leu His Cys Pro Ala Asp  
                   115                                  120                                  125  
 gtg tgc ggg ccg ctc ttc gag gag gag ctg gcc ttc tgg ggc atc gac 432  
 Val Cys Gly Pro Leu Phe Glu Glu Glu Leu Ala Phe Trp Gly Ile Asp  
                   130                                  135                                  140  
 gag acc gac gtg gag ccc tgc tgc tgg atg acc tac ccg cag cac cgc 480  
 Glu Thr Asp Val Glu Pro Cys Cys Trp Met Thr Tyr Arg Gln His Arg

|                                                                 |     |     |     |      |
|-----------------------------------------------------------------|-----|-----|-----|------|
| 145                                                             | 150 | 155 | 160 |      |
| gac gcc gag gag gcg ctg gac atc ttc gag acc ccc gac ctc att ggc |     |     |     | 528  |
| Asp Ala Glu Glu Ala Leu Asp Ile Phe Glu Thr Pro Asp Leu Ile Gly |     |     |     |      |
|                                                                 | 165 | 170 | 175 |      |
| ggc gac ccc ggc gac gac gag gac ctg gcg gcc aag agg ctg ggc atc |     |     |     | 576  |
| Gly Asp Pro Gly Asp Asp Glu Asp Leu Ala Ala Lys Arg Leu Gly Ile |     |     |     |      |
|                                                                 | 180 | 185 | 190 |      |
| gag gac gcg gcg ggg ctc ggg ggc ccc gac ggc aaa tct ggc cgc tgg |     |     |     | 624  |
| Glu Asp Ala Ala Gly Leu Gly Gly Pro Asp Gly Lys Ser Gly Arg Trp |     |     |     |      |
|                                                                 | 195 | 200 | 205 |      |
| agg agg ctg cag ccc cgc atg tgg gcc ctc ttc gaa gac ccc tac tcg |     |     |     | 672  |
| Arg Arg Leu Gln Pro Arg Met Trp Ala Leu Phe Glu Asp Pro Tyr Ser |     |     |     |      |
|                                                                 | 210 | 215 | 220 |      |
| tcc aga gcc gcc agg ttt att gct ttt gct tct tta ttc ttc atc ctg |     |     |     | 720  |
| Ser Arg Ala Ala Arg Phe Ile Ala Phe Ala Ser Leu Phe Phe Ile Leu |     |     |     |      |
|                                                                 | 225 | 230 | 235 | 240  |
| gtt tca att aca act ttt tgc ctg gaa aca cat gaa gct ttc aat att |     |     |     | 768  |
| Val Ser Ile Thr Thr Phe Cys Leu Glu Thr His Glu Ala Phe Asn Ile |     |     |     |      |
|                                                                 | 245 | 250 | 255 |      |
| gtt aaa aac aag aca gaa cca gtc atc aat ggc aca agt gtt gtt cta |     |     |     | 816  |
| Val Lys Asn Lys Thr Glu Pro Val Ile Asn Gly Thr Ser Val Val Leu |     |     |     |      |
|                                                                 | 260 | 265 | 270 |      |
| cag tat gaa att gaa acg gat cct gcc ttg acg tat gta gaa gga gtg |     |     |     | 864  |
| Gln Tyr Glu Ile Glu Thr Asp Pro Ala Leu Thr Tyr Val Glu Gly Val |     |     |     |      |
|                                                                 | 275 | 280 | 285 |      |
| tgt gtg gtg tgg ttt act ttt gaa ttt tta gtc cgt att gtt ttt tca |     |     |     | 912  |
| Cys Val Val Trp Phe Thr Phe Glu Phe Leu Val Arg Ile Val Phe Ser |     |     |     |      |
|                                                                 | 290 | 295 | 300 |      |
| ccc aat aaa ctt gaa ttc atc aaa aat ctc ttg aat atc att gac ttt |     |     |     | 960  |
| Pro Asn Lys Leu Glu Phe Ile Lys Asn Leu Leu Asn Ile Ile Asp Phe |     |     |     |      |
|                                                                 | 305 | 310 | 315 | 320  |
| gtg gcc atc cta cct ttc tac tta gag gtg gga ctc agt ggg ctg tca |     |     |     | 1008 |
| Val Ala Ile Leu Pro Phe Tyr Leu Glu Val Gly Leu Ser Gly Leu Ser |     |     |     |      |
|                                                                 | 325 | 330 | 335 |      |
| tcc aaa gct gct aaa gat gtg ctt ggc ttc ctc agg gtg gta agg ttt |     |     |     | 1056 |
| Ser Lys Ala Ala Lys Asp Val Leu Gly Phe Leu Arg Val Val Arg Phe |     |     |     |      |
|                                                                 | 340 | 345 | 350 |      |
| gtg agg atc ctg aga att ttc aag ctc acc cgc cat ttt gta ggt ctg |     |     |     | 1104 |
| Val Arg Ile Leu Arg Ile Phe Lys Leu Thr Arg His Phe Val Gly Leu |     |     |     |      |
|                                                                 | 355 | 360 | 365 |      |
| agg gtg ctt gga cat act ctt cga gct agt act aat gaa ttt ttg ctg |     |     |     | 1152 |
| Arg Val Leu Gly His Thr Leu Arg Ala Ser Thr Asn Glu Phe Leu Leu |     |     |     |      |
|                                                                 | 370 | 375 | 380 |      |
| ctg ata att ttc ctg gct cta gga gtt ttg ata ttt gct acc atg atc |     |     |     | 1200 |
| Leu Ile Ile Phe Leu Ala Leu Gly Val Leu Ile Phe Ala Thr Met Ile |     |     |     |      |
|                                                                 | 385 | 390 | 395 | 400  |
| tac tat gcc gag aga gtg gga gct caa cct aac gac cct tca gct agt |     |     |     | 1248 |
| Tyr Tyr Ala Glu Arg Val Gly Ala Gln Pro Asn Asp Pro Ser Ala Ser |     |     |     |      |
|                                                                 | 405 | 410 | 415 |      |

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gag cac aca cag ttc aaa aac att ccc att ggg ttc tgg tgg gct gta      1296
Glu His Thr Gln Phe Lys Asn Ile Pro Ile Gly Phe Trp Trp Ala Val
      420      425      430

gtg acc atg act acc ctg ggt tat ggg gat atg tac ccc caa aca tgg      1344
Val Thr Met Thr Thr Leu Gly Tyr Gly Asp Met Tyr Pro Gln Thr Trp
      435      440      445

tca ggc atg ctg gtg gga gcc ctg tgt gct ctg gct gga gtg ctg aca      1392
Ser Gly Met Leu Val Gly Ala Leu Cys Ala Leu Ala Gly Val Leu Thr
      450      455      460

ata gcc atg cca gtg cct gtc att gtc aat aat ttt gga atg tac tac      1440
Ile Ala Met Pro Val Pro Val Ile Val Asn Asn Phe Gly Met Tyr Tyr
      465      470      475      480

tcc ttg gca atg gca aag cag aaa ctt cca agg aaa aga aag aag cac      1488
Ser Leu Ala Met Ala Lys Gln Lys Leu Pro Arg Lys Arg Lys Lys His
      485      490      495

atc cct cct gct cct cag gca agc tca cct act ttt tgc aag aca gaa      1536
Ile Pro Pro Ala Pro Gln Ala Ser Ser Pro Thr Phe Cys Lys Thr Glu
      500      505      510

tta aat atg gcc tgc aat agt aca cag agt gac aca tgt ctg ggc aaa      1584
Leu Asn Met Ala Cys Asn Ser Thr Gln Ser Asp Thr Cys Leu Gly Lys
      515      520      525

gac aat cga ctt ctg gaa cat aac aga tca gat aac tgc aaa gag gtt      1632
Asp Asn Arg Leu Leu Glu His Asn Arg Ser Asp Asn Cys Lys Glu Val
      530      535      540

gtc att act ggt tac acg caa gcc gag gcc aga tct ctt act taa      1677
Val Ile Thr Gly Tyr Thr Gln Ala Glu Ala Arg Ser Leu Thr
      545      550      555

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<211> 558
<212> PRT
<213> Homo sapiens

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Met Gly Lys Ile Glu Asn Asn Glu Arg Val Ile Leu Asn Val Gly Gly
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Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr
      20      25      30
Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Pro Gly Asp Cys Leu Thr
      35      40      45
Thr Ala Gly Asp Lys Leu Gln Pro Ser Pro Pro Pro Leu Ser Pro Pro
      50      55      60
Pro Arg Ala Pro Pro Leu Ser Pro Gly Pro Gly Gly Cys Phe Glu Gly
      65      70      75      80
Gly Ala Gly Asn Cys Ser Ser Arg Gly Gly Arg Ala Ser Asp His Pro
      85      90      95
Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro Gly Val Phe Ala
      100      105      110

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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Tyr | Val | Leu | Asn | Tyr | Tyr | Arg | Thr | Gly | Lys | Leu | His | Cys | Pro | Ala | Asp | 115 | 120 | 125 |
| Val | Cys | Gly | Pro | Leu | Phe | Glu | Glu | Glu | Leu | Ala | Phe | Trp | Gly | Ile | Asp | 130 | 135 | 140 |
| Glu | Thr | Asp | Val | Glu | Pro | Cys | Cys | Trp | Met | Thr | Tyr | Arg | Gln | His | Arg | 145 | 150 | 155 |
| Asp | Ala | Glu | Glu | Ala | Leu | Asp | Ile | Phe | Glu | Thr | Pro | Asp | Leu | Ile | Gly | 165 | 170 | 175 |
| Gly | Asp | Pro | Gly | Asp | Asp | Glu | Asp | Leu | Ala | Ala | Lys | Arg | Leu | Gly | Ile | 180 | 185 | 190 |
| Glu | Asp | Ala | Ala | Gly | Leu | Gly | Gly | Pro | Asp | Gly | Lys | Ser | Gly | Arg | Trp | 195 | 200 | 205 |
| Arg | Arg | Leu | Gln | Pro | Arg | Met | Trp | Ala | Leu | Phe | Glu | Asp | Pro | Tyr | Ser | 210 | 215 | 220 |
| Ser | Arg | Ala | Ala | Arg | Phe | Ile | Ala | Phe | Ala | Ser | Leu | Phe | Phe | Ile | Leu | 225 | 230 | 235 |
| Val | Ser | Ile | Thr | Thr | Phe | Cys | Leu | Glu | Thr | His | Glu | Ala | Phe | Asn | Ile | 245 | 250 | 255 |
| Val | Lys | Asn | Lys | Thr | Glu | Pro | Val | Ile | Asn | Gly | Thr | Ser | Val | Val | Leu | 260 | 265 | 270 |
| Gln | Tyr | Glu | Ile | Glu | Thr | Asp | Pro | Ala | Leu | Thr | Tyr | Val | Glu | Gly | Val | 275 | 280 | 285 |
| Cys | Val | Val | Trp | Phe | Thr | Phe | Glu | Phe | Leu | Val | Arg | Ile | Val | Phe | Ser | 290 | 295 | 300 |
| Pro | Asn | Lys | Leu | Glu | Phe | Ile | Lys | Asn | Leu | Leu | Asn | Ile | Ile | Asp | Phe | 305 | 310 | 315 |
| Val | Ala | Ile | Leu | Pro | Phe | Tyr | Leu | Glu | Val | Gly | Leu | Ser | Gly | Leu | Ser | 325 | 330 | 335 |
| Ser | Lys | Ala | Ala | Lys | Asp | Val | Leu | Gly | Phe | Leu | Arg | Val | Val | Arg | Phe | 340 | 345 | 350 |
| Val | Arg | Ile | Leu | Arg | Ile | Phe | Lys | Leu | Thr | Arg | His | Phe | Val | Gly | Leu | 355 | 360 | 365 |
| Arg | Val | Leu | Gly | His | Thr | Leu | Arg | Ala | Ser | Thr | Asn | Glu | Phe | Leu | Leu | 370 | 375 | 380 |
| Leu | Ile | Ile | Phe | Leu | Ala | Leu | Gly | Val | Leu | Ile | Phe | Ala | Thr | Met | Ile | 385 | 390 | 395 |
| Tyr | Tyr | Ala | Glu | Arg | Val | Gly | Ala | Gln | Pro | Asn | Asp | Pro | Ser | Ala | Ser | 405 | 410 | 415 |
| Glu | His | Thr | Gln | Phe | Lys | Asn | Ile | Pro | Ile | Gly | Phe | Trp | Trp | Ala | Val | 420 | 425 | 430 |
| Val | Thr | Met | Thr | Thr | Leu | Gly | Tyr | Gly | Asp | Met | Tyr | Pro | Gln | Thr | Trp | 435 | 440 | 445 |
| Ser | Gly | Met | Leu | Val | Gly | Ala | Leu | Cys | Ala | Leu | Ala | Gly | Val | Leu | Thr | 450 | 455 | 460 |
| Ile | Ala | Met | Pro | Val | Pro | Val | Ile | Val | Asn | Asn | Phe | Gly | Met | Tyr | Tyr | 465 | 470 | 475 |
| Ser | Leu | Ala | Met | Ala | Lys | Gln | Lys | Leu | Pro | Arg | Lys | Arg | Lys | Lys | His | 485 | 490 | 495 |
| Ile | Pro | Pro | Ala | Pro | Gln | Ala | Ser | Ser | Pro | Thr | Phe | Cys | Lys | Thr | Glu |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | 500 |     | 505 |     | 510 |     |     |     |     |     |     |     |     |     |     |
| Leu | Asn | Met | Ala | Cys | Asn | Ser | Thr | Gln | Ser | Asp | Thr | Cys | Leu | Gly | Lys |
|     | 515 |     |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |
| Asp | Asn | Arg | Leu | Leu | Glu | His | Asn | Arg | Ser | Asp | Asn | Cys | Lys | Glu | Val |
|     | 530 |     |     |     |     |     | 535 |     |     |     |     | 540 |     |     |     |
| Val | Ile | Thr | Gly | Tyr | Thr | Gln | Ala | Glu | Ala | Arg | Ser | Leu | Thr |     |     |
| 545 |     |     |     |     |     | 550 |     |     |     |     | 555 |     |     |     |     |

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 <212> DNA  
 <213> Homo sapiens

<220>  
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 <222> (1)..(1890)

<400> 7

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| Met Gly Lys Ile Glu Asn Asn Glu Arg Val Ile Leu Asn Val Gly Gly |     |
| 1 5 10 15                                                       |     |
| acc cgg cac gaa acc tac cgc agc acc ctc aag acc ctg cct gga aca | 96  |
| Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr |     |
| 20 25 30                                                        |     |
| cgc ctg gcc ctt ctt gcc tcc tcc gag ccc cca ggc gac tgc ttg acc | 144 |
| Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Pro Gly Asp Cys Leu Thr |     |
| 35 40 45                                                        |     |
| acg gcg ggc gac aag ctg cag ccg tcg ccg cct cca ctg tcg ccg ccg | 192 |
| Thr Ala Gly Asp Lys Leu Gln Pro Ser Pro Pro Pro Leu Ser Pro Pro |     |
| 50 55 60                                                        |     |
| ccg aga gcg ccc ccg ctg tcc ccc ggg cca ggc ggc tgc ttc gag ggc | 240 |
| Pro Arg Ala Pro Pro Leu Ser Pro Gly Pro Gly Gly Cys Phe Glu Gly |     |
| 65 70 75 80                                                     |     |
| ggc gcg ggc aac tgc agt tcc cgc ggc ggc agg gcc agc gac cat ccc | 288 |
| Gly Ala Gly Asn Cys Ser Ser Arg Gly Gly Arg Ala Ser Asp His Pro |     |
| 85 90 95                                                        |     |
| ggt ggc ggc cgc gag ttc ttc ttc gac cgg cac ccg ggc gtc ttc gcc | 336 |
| Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro Gly Val Phe Ala |     |
| 100 105 110                                                     |     |
| tat gtg ctc aat tac tac cgc acc ggc aag ctg cac tgc ccc gca gac | 384 |
| Tyr Val Leu Asn Tyr Tyr Arg Thr Gly Lys Leu His Cys Pro Ala Asp |     |
| 115 120 125                                                     |     |
| gtg tgc ggg ccg ctc ttc gag gag gag ctg gcc ttc tgg ggc atc gac | 432 |
| Val Cys Gly Pro Leu Phe Glu Glu Glu Leu Ala Phe Trp Gly Ile Asp |     |
| 130 135 140                                                     |     |
| gag acc gac gtg gag ccc tgc tgc tgg atg acc tac ccg cag cac cgc | 480 |
| Glu Thr Asp Val Glu Pro Cys Cys Trp Met Thr Tyr Arg Gln His Arg |     |
| 145 150 155 160                                                 |     |

|                                                                 |      |
|-----------------------------------------------------------------|------|
| gac gcc gag gag gcg ctg gac atc ttc gag acc ccc gac ctc att ggc | 528  |
| Asp Ala Glu Glu Ala Leu Asp Ile Phe Glu Thr Pro Asp Leu Ile Gly |      |
| 165 170 175                                                     |      |
| ggc gac ccc ggc gac gac gag gac ctg gcg gcc aag agg ctg ggc atc | 576  |
| Gly Asp Pro Gly Asp Asp Glu Asp Leu Ala Ala Lys Arg Leu Gly Ile |      |
| 180 185 190                                                     |      |
| gag gac gcg gcg ggg ctc ggg ggc ccc gac ggc aaa tct ggc cgc tgg | 624  |
| Glu Asp Ala Ala Gly Leu Gly Gly Pro Asp Gly Lys Ser Gly Arg Trp |      |
| 195 200 205                                                     |      |
| agg agg ctg cag ccc cgc atg tgg gcc ctc ttc gaa gac ccc tac tcg | 672  |
| Arg Arg Leu Gln Pro Arg Met Trp Ala Leu Phe Glu Asp Pro Tyr Ser |      |
| 210 215 220                                                     |      |
| tcc aga gcc gcc agg ttt att gct ttt gct tct tta ttc ttc atc ctg | 720  |
| Ser Arg Ala Ala Arg Phe Ile Ala Phe Ala Ser Leu Phe Phe Ile Leu |      |
| 225 230 235 240                                                 |      |
| gtt tca att aca act ttt tgc ctg gaa aca cat gaa gct ttc aat att | 768  |
| Val Ser Ile Thr Thr Phe Cys Leu Glu Thr His Glu Ala Phe Asn Ile |      |
| 245 250 255                                                     |      |
| gtt aaa aac aag aca gaa cca gtc atc aat ggc aca agt gtt gtt cta | 816  |
| Val Lys Asn Lys Thr Glu Pro Val Ile Asn Gly Thr Ser Val Val Leu |      |
| 260 265 270                                                     |      |
| cag tat gaa att gaa acg gat cct gcc ttg acg tat gta gaa gga gtg | 864  |
| Gln Tyr Glu Ile Glu Thr Asp Pro Ala Leu Thr Tyr Val Glu Gly Val |      |
| 275 280 285                                                     |      |
| tgt gtg gtg tgg ttt act ttt gaa ttt tta gtc cgt att gtt ttt tca | 912  |
| Cys Val Val Trp Phe Thr Phe Glu Phe Leu Val Arg Ile Val Phe Ser |      |
| 290 295 300                                                     |      |
| ccc aat aaa ctt gaa ttc atc aaa aat ctc ttg aat atc att gac ttt | 960  |
| Pro Asn Lys Leu Glu Phe Ile Lys Asn Leu Leu Asn Ile Ile Asp Phe |      |
| 305 310 315 320                                                 |      |
| gtg gcc atc cta cct ttc tac tta gag gtg gga ctc agt ggg ctg tca | 1008 |
| Val Ala Ile Leu Pro Phe Tyr Leu Glu Val Gly Leu Ser Gly Leu Ser |      |
| 325 330 335                                                     |      |
| tcc aaa gct gct aaa gat gtg ctt ggc ttc ctc agg gtg gta agg ttt | 1056 |
| Ser Lys Ala Ala Lys Asp Val Leu Gly Phe Leu Arg Val Val Arg Phe |      |
| 340 345 350                                                     |      |
| gtg agg atc ctg aga att ttc aag ctc acc cgc cat ttt gta ggt ctg | 1104 |
| Val Arg Ile Leu Arg Ile Phe Lys Leu Thr Arg His Phe Val Gly Leu |      |
| 355 360 365                                                     |      |
| agg gtg ctt gga cat act ctt cga gct agt act aat gaa ttt ttg ctg | 1152 |
| Arg Val Leu Gly His Thr Leu Arg Ala Ser Thr Asn Glu Phe Leu Leu |      |
| 370 375 380                                                     |      |
| ctg ata att ttc ctg gct cta gga gtt ttg ata ttt gct acc atg atc | 1200 |
| Leu Ile Ile Phe Leu Ala Leu Gly Val Leu Ile Phe Ala Thr Met Ile |      |
| 385 390 395 400                                                 |      |
| tac tat gcc gag aga gtg gga gct caa cct aac gac cct tca gct agt | 1248 |
| Tyr Tyr Ala Glu Arg Val Gly Ala Gln Pro Asn Asp Pro Ser Ala Ser |      |
| 405 410 415                                                     |      |
| gag cac aca cag ttc aaa aac att ccc att ggg ttc tgg tgg gct gta | 1296 |

|                                                                 |      |
|-----------------------------------------------------------------|------|
| Glu His Thr Gln Phe Lys Asn Ile Pro Ile Gly Phe Trp Trp Ala Val |      |
| 420 425 430                                                     |      |
| gtg acc atg act acc ctg ggt tat ggg gat atg tac ccc caa aca tgg | 1344 |
| Val Thr Met Thr Thr Leu Gly Tyr Gly Asp Met Tyr Pro Gln Thr Trp |      |
| 435 440 445                                                     |      |
| tca ggc atg ctg gtg gga gcc ctg tgt gct ctg gct gga gtg ctg aca | 1392 |
| Ser Gly Met Leu Val Gly Ala Leu Cys Ala Leu Ala Gly Val Leu Thr |      |
| 450 455 460                                                     |      |
| ata gcc atg cca gtg cct gtc att gtc aat aat ttt gga atg tac tac | 1440 |
| Ile Ala Met Pro Val Pro Val Ile Val Asn Asn Phe Gly Met Tyr Tyr |      |
| 465 470 475 480                                                 |      |
| tcc ttg gca atg gca aag cag aaa ctt cca agg aaa aga aag aag cac | 1488 |
| Ser Leu Ala Met Ala Lys Gln Lys Leu Pro Arg Lys Arg Lys Lys His |      |
| 485 490 495                                                     |      |
| atc cct cct gct cct cag gca agc tca cct act ttt tgc aag aca gaa | 1536 |
| Ile Pro Pro Ala Pro Gln Ala Ser Ser Pro Thr Phe Cys Lys Thr Glu |      |
| 500 505 510                                                     |      |
| tta aat atg gcc tgc aat agt aca cag agt gac aca tgt ctg ggc aaa | 1584 |
| Leu Asn Met Ala Cys Asn Ser Thr Gln Ser Asp Thr Cys Leu Gly Lys |      |
| 515 520 525                                                     |      |
| gac aat cga ctt ctg gaa cat aac aga tca gtg tta tca ggt gac gac | 1632 |
| Asp Asn Arg Leu Leu Glu His Asn Arg Ser Val Leu Ser Gly Asp Asp |      |
| 530 535 540                                                     |      |
| agt aca gga agt gag ccg cca cta tca ccc cca gaa agg ctc ccc atc | 1680 |
| Ser Thr Gly Ser Glu Pro Pro Leu Ser Pro Pro Glu Arg Leu Pro Ile |      |
| 545 550 555 560                                                 |      |
| aga cgc tct agt acc aga gac aaa aac aga aga ggg gaa aca tgt ttc | 1728 |
| Arg Arg Ser Ser Thr Arg Asp Lys Asn Arg Arg Gly Glu Thr Cys Phe |      |
| 565 570 575                                                     |      |
| cta ctg acg aca ggt gat tac acg tgt gct tct gat gga ggg atc agg | 1776 |
| Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp Gly Gly Ile Arg |      |
| 580 585 590                                                     |      |
| aaa gtg ttg tac aga att tat cat gga tta ttg act gct gag aaa ggg | 1824 |
| Lys Val Leu Tyr Arg Ile Tyr His Gly Leu Leu Thr Ala Glu Lys Gly |      |
| 595 600 605                                                     |      |
| aca gtg gaa ttt agc cat acc aag gac tat act gga aac aga ctt ctg | 1872 |
| Thr Val Glu Phe Ser His Thr Lys Asp Tyr Thr Gly Asn Arg Leu Leu |      |
| 610 615 620                                                     |      |
| ctg ctg aat gtg ccc tga                                         | 1890 |
| Leu Leu Asn Val Pro                                             |      |
| 625                                                             |      |

&lt;210&gt; 8

&lt;211&gt; 629

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 8

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Gly | Lys | Ile | Glu | Asn | Asn | Glu | Arg | Val | Ile | Leu | Asn | Val | Gly | Gly |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Thr | Arg | His | Glu | Thr | Tyr | Arg | Ser | Thr | Leu | Lys | Thr | Leu | Pro | Gly | Thr |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Arg | Leu | Ala | Leu | Leu | Ala | Ser | Ser | Glu | Pro | Pro | Gly | Asp | Cys | Leu | Thr |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Thr | Ala | Gly | Asp | Lys | Leu | Gln | Pro | Ser | Pro | Pro | Pro | Leu | Ser | Pro | Pro |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Pro | Arg | Ala | Pro | Pro | Leu | Ser | Pro | Gly | Pro | Gly | Gly | Cys | Phe | Glu | Gly |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |
| Gly | Ala | Gly | Asn | Cys | Ser | Ser | Arg | Gly | Gly | Arg | Ala | Ser | Asp | His | Pro |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Gly | Gly | Gly | Arg | Glu | Phe | Phe | Phe | Asp | Arg | His | Pro | Gly | Val | Phe | Ala |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Tyr | Val | Leu | Asn | Tyr | Tyr | Arg | Thr | Gly | Lys | Leu | His | Cys | Pro | Ala | Asp |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Val | Cys | Gly | Pro | Leu | Phe | Glu | Glu | Glu | Leu | Ala | Phe | Trp | Gly | Ile | Asp |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Glu | Thr | Asp | Val | Glu | Pro | Cys | Cys | Trp | Met | Thr | Tyr | Arg | Gln | His | Arg |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Asp | Ala | Glu | Glu | Ala | Leu | Asp | Ile | Phe | Glu | Thr | Pro | Asp | Leu | Ile | Gly |
|     |     |     | 165 |     |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Gly | Asp | Pro | Gly | Asp | Asp | Glu | Asp | Leu | Ala | Ala | Lys | Arg | Leu | Gly | Ile |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Glu | Asp | Ala | Ala | Gly | Leu | Gly | Gly | Pro | Asp | Gly | Lys | Ser | Gly | Arg | Trp |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Arg | Arg | Leu | Gln | Pro | Arg | Met | Trp | Ala | Leu | Phe | Glu | Asp | Pro | Tyr | Ser |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Ser | Arg | Ala | Ala | Arg | Phe | Ile | Ala | Phe | Ala | Ser | Leu | Phe | Phe | Ile | Leu |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Val | Ser | Ile | Thr | Thr | Phe | Cys | Leu | Glu | Thr | His | Glu | Ala | Phe | Asn | Ile |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Val | Lys | Asn | Lys | Thr | Glu | Pro | Val | Ile | Asn | Gly | Thr | Ser | Val | Val | Leu |
|     |     | 260 |     |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Gln | Tyr | Glu | Ile | Glu | Thr | Asp | Pro | Ala | Leu | Thr | Tyr | Val | Glu | Gly | Val |
|     | 275 |     |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Cys | Val | Val | Trp | Phe | Thr | Phe | Glu | Phe | Leu | Val | Arg | Ile | Val | Phe | Ser |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Pro | Asn | Lys | Leu | Glu | Phe | Ile | Lys | Asn | Leu | Leu | Asn | Ile | Ile | Asp | Phe |
| 305 |     |     |     |     | 310 |     |     |     |     |     | 315 |     |     |     | 320 |
| Val | Ala | Ile | Leu | Pro | Phe | Tyr | Leu | Glu | Val | Gly | Leu | Ser | Gly | Leu | Ser |
|     |     |     | 325 |     |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Ser | Lys | Ala | Ala | Lys | Asp | Val | Leu | Gly | Phe | Leu | Arg | Val | Val | Arg | Phe |
|     |     | 340 |     |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Val | Arg | Ile | Leu | Arg | Ile |     |     |     |     |     |     |     |     |     |     |

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385              390              395              400
Tyr Tyr Ala Glu Arg Val Gly Ala Gln Pro Asn Asp Pro Ser Ala Ser
              405              410              415
Glu His Thr Gln Phe Lys Asn Ile Pro Ile Gly Phe Trp Trp Ala Val
              420              425              430
Val Thr Met Thr Thr Leu Gly Tyr Gly Asp Met Tyr Pro Gln Thr Trp
              435              440              445
Ser Gly Met Leu Val Gly Ala Leu Cys Ala Leu Ala Gly Val Leu Thr
              450              455              460
Ile Ala Met Pro Val Pro Val Ile Val Asn Asn Phe Gly Met Tyr Tyr
465              470              475              480
Ser Leu Ala Met Ala Lys Gln Lys Leu Pro Arg Lys Arg Lys Lys His
              485              490              495
Ile Pro Pro Ala Pro Gln Ala Ser Ser Pro Thr Phe Cys Lys Thr Glu
              500              505              510
Leu Asn Met Ala Cys Asn Ser Thr Gln Ser Asp Thr Cys Leu Gly Lys
              515              520              525
Asp Asn Arg Leu Leu Glu His Asn Arg Ser Val Leu Ser Gly Asp Asp
              530              535              540
Ser Thr Gly Ser Glu Pro Pro Leu Ser Pro Pro Glu Arg Leu Pro Ile
545              550              555              560
Arg Arg Ser Ser Thr Arg Asp Lys Asn Arg Arg Gly Glu Thr Cys Phe
              565              570              575
Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp Gly Gly Ile Arg
              580              585              590
Lys Val Leu Tyr Arg Ile Tyr His Gly Leu Leu Thr Ala Glu Lys Gly
              595              600              605
Thr Val Glu Phe Ser His Thr Lys Asp Tyr Thr Gly Asn Arg Leu Leu
              610              615              620
Leu Leu Asn Val Pro
625

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<210> 9
<211> 1920
<212> DNA
<213> Mus musculus

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<220>
<221> CDS
<222> (1)..(1920)

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<400> 9
atg ggc aag atc gag agc aac gag agg gtg atc ctc aat gtc ggg ggt      48
Met Gly Lys Ile Glu Ser Asn Glu Arg Val Ile Leu Asn Val Gly Gly
1              5              10              15
acc agg cac gaa acc tac cgc agc acc ctc aag acc ctg cct gga act      96
Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr
              20              25              30

```

|                                                                 |     |
|-----------------------------------------------------------------|-----|
| cgc ctg gcc ctt ctt gcc tcc tct gaa cct cag ggc gac tgc ctg act | 144 |
| Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Gln Gly Asp Cys Leu Thr |     |
| 35 40 45                                                        |     |
| gcg gcc ggg gac aag ctg caa ccg ctg ccc cct cgg ctg tct ccg ccg | 192 |
| Ala Ala Gly Asp Lys Leu Gln Pro Leu Pro Pro Pro Leu Ser Pro Pro |     |
| 50 55 60                                                        |     |
| cca cga ccg cct ccc ttg tcc cct gtc ccc agc ggc tgc ttc gag ggc | 240 |
| Pro Arg Pro Pro Pro Leu Ser Pro Val Pro Ser Gly Cys Phe Glu Gly |     |
| 65 70 75 80                                                     |     |
| ggc gca ggc aac tgc agt tgc cac ggt ggc aac ggc ggc aac ggc ggc | 288 |
| Gly Ala Gly Asn Cys Ser Ser His Gly Gly Asn Gly Gly Asn Gly Gly |     |
| 85 90 95                                                        |     |
| agc gac cac cct ggg gga ggc cgc gaa ttc ttc ttc gat cgc cac cca | 336 |
| Ser Asp His Pro Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro |     |
| 100 105 110                                                     |     |
| gga gta ttc gcc tat gtg ctc aat tac tac cgc acg ggc aag ctg cac | 384 |
| Gly Val Phe Ala Tyr Val Leu Asn Tyr Tyr Arg Thr Gly Lys Leu His |     |
| 115 120 125                                                     |     |
| tgc ccc gcc gac gtg tgc ggg ccg ctc ttc gag gaa gag ctg gct ttc | 432 |
| Cys Pro Ala Asp Val Cys Gly Pro Leu Phe Glu Glu Glu Leu Ala Phe |     |
| 130 135 140                                                     |     |
| tgg ggc atc gat gag acc gac gtg gag ccc tgc tgc tgg atg acc tac | 480 |
| Trp Gly Ile Asp Glu Thr Asp Val Glu Pro Cys Cys Trp Met Thr Tyr |     |
| 145 150 155 160                                                 |     |
| agg cag cac cgg gac gcg gag gag gcc ctg gac atc ttt gag aca ccc | 528 |
| Arg Gln His Arg Asp Ala Glu Glu Ala Leu Asp Ile Phe Glu Thr Pro |     |
| 165 170 175                                                     |     |
| gac ctc atc ggg ggc gac cct ggt gat gat gag gac cta gcg gcc aag | 576 |
| Asp Leu Ile Gly Gly Asp Pro Gly Asp Asp Glu Asp Leu Ala Lys     |     |
| 180 185 190                                                     |     |
| aga ttg ggc att gag gat gct gcg ggg ctg gga gga ccc gat ggc aag | 624 |
| Arg Leu Gly Ile Glu Asp Ala Ala Gly Leu Gly Gly Pro Asp Gly Lys |     |
| 195 200 205                                                     |     |
| tca ggc cgc tgg agg aag ctg cag cct cgc atg tgg gct ctt ttt gag | 672 |
| Ser Gly Arg Trp Arg Lys Leu Gln Pro Arg Met Trp Ala Leu Phe Glu |     |
| 210 215 220                                                     |     |
| gac ccc tac tca tct aga gcc gct agg ttt att gct ttt gct tct ttg | 720 |
| Asp Pro Tyr Ser Ser Arg Ala Ala Arg Phe Ile Ala Phe Ala Ser Leu |     |
| 225 230 235 240                                                 |     |
| ttc ttc att ttg gtt tcc atc aca acc ttt tgc ctg gag aca cat gaa | 768 |
| Phe Phe Ile Leu Val Ser Ile Thr Thr Phe Cys Leu Glu Thr His Glu |     |
| 245 250 255                                                     |     |
| gct ttc aat att gtt aaa aac aag acg gag ccc gtc atc aat ggc acc | 816 |
| Ala Phe Asn Ile Val Lys Asn Lys Thr Glu Pro Val Ile Asn Gly Thr |     |
| 260 265 270                                                     |     |
| agc ccg gtc ctc cag tac gaa atc gaa acg gat ccc gcc ctg acg tac | 864 |
| Ser Pro Val Leu Gln Tyr Glu Ile Glu Thr Asp Pro Ala Leu Thr Tyr |     |
| 275 280 285                                                     |     |
| gtg gaa gga gta tgt gtg gtg tgg ttt acg ttt gaa ttt tta gtc cga | 912 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|--|
| Val | Glu | Gly | Val | Cys | Val | Val | Trp | Phe | Thr | Phe | Glu | Phe | Leu | Val | Arg |      |  |
| 290 |     |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |      |  |
| att | gtt | ttc | tca | ccc | aat | aaa | ctt | gaa | ttc | atc | aaa | aat | ctc | ttg | aac | 960  |  |
| Ile | Val | Phe | Ser | Pro | Asn | Lys | Leu | Glu | Phe | Ile | Lys | Asn | Leu | Leu | Asn |      |  |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     | 320 |     |      |  |
| atc | att | gac | ttt | gtg | gcc | atc | ctc | ccc | ttc | tac | cta | gag | gtg | gga | ctc | 1008 |  |
| Ile | Ile | Asp | Phe | Val | Ala | Ile | Leu | Pro | Phe | Tyr | Leu | Glu | Val | Gly | Leu |      |  |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |      |  |
| agc | ggg | ctg | tcc | tcc | aaa | gcg | gcc | aaa | gat | gtg | ctc | ggc | ttt | ctc | agg | 1056 |  |
| Ser | Gly | Leu | Ser | Ser | Lys | Ala | Ala | Lys | Asp | Val | Leu | Gly | Phe | Leu | Arg |      |  |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |      |  |
| gtg | gtt | agg | ttt | gtg | agg | atc | ctg | aga | atc | ttc | aag | ctc | acc | cgc | cat | 1104 |  |
| Val | Val | Arg | Phe | Val | Arg | Ile | Leu | Arg | Ile | Phe | Lys | Leu | Thr | Arg | His |      |  |
|     |     | 355 |     |     |     | 360 |     |     |     |     |     | 365 |     |     |     |      |  |
| ttc | gta | ggc | ctg | agg | gtg | ctc | gga | cat | act | ctt | cgg | gcg | agc | acc | aac | 1152 |  |
| Phe | Val | Gly | Leu | Arg | Val | Leu | Gly | His | Thr | Leu | Arg | Ala | Ser | Thr | Asn |      |  |
|     |     | 370 |     |     | 375 |     |     |     |     | 380 |     |     |     |     |     |      |  |
| gaa | ttt | ttg | ttg | ctg | atc | atc | ttc | ctg | gcg | ctg | gga | gtt | ttg | ata | ttc | 1200 |  |
| Glu | Phe | Leu | Leu | Leu | Ile | Ile | Phe | Leu | Ala | Leu | Gly | Val | Leu | Ile | Phe |      |  |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     | 400 |     |      |  |
| gct | acg | atg | atc | tac | tac | gct | gag | aga | gta | ggg | gct | cag | ccc | aat | gac | 1248 |  |
| Ala | Thr | Met | Ile | Tyr | Tyr | Ala | Glu | Arg | Val | Gly | Ala | Gln | Pro | Asn | Asp |      |  |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     | 415 |     |     |      |  |
| cct | tca | gct | agt | gag | cac | acg | cag | ttc | aaa | aac | atc | ccc | att | ggt | ttc | 1296 |  |
| Pro | Ser | Ala | Ser | Glu | His | Thr | Gln | Phe | Lys | Asn | Ile | Pro | Ile | Gly | Phe |      |  |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |      |  |
| tgg | tgg | gcc | gta | gtg | acc | atg | act | acc | tta | ggt | tac | ggg | gat | atg | tac | 1344 |  |
| Trp | Trp | Ala | Val | Val | Thr | Met | Thr | Thr | Leu | Gly | Tyr | Gly | Asp | Met | Tyr |      |  |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |      |  |
| ccc | caa | aca | tgg | tca | ggg | atg | ttg | gtg | ggg | gcc | ttg | tgt | gcc | ctg | gcc | 1392 |  |
| Pro | Gln | Thr | Trp | Ser | Gly | Met | Leu | Val | Gly | Ala | Leu | Cys | Ala | Leu | Ala |      |  |
|     |     | 450 |     |     |     | 455 |     |     |     | 460 |     |     |     |     |     |      |  |
| gga | gtg | ctg | aca | ata | gcc | atg | cct | gtg | cct | gtc | att | gtc | aac | aat | ttt | 1440 |  |
| Gly | Val | Leu | Thr | Ile | Ala | Met | Pro | Val | Pro | Val | Ile | Val | Asn | Asn | Phe |      |  |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     | 480 |     |      |  |
| gga | atg | tac | tac | tcc | ttg | gca | atg | gcg | aag | cag | aaa | ctt | cca | aga | aag | 1488 |  |
| Gly | Met | Tyr | Tyr | Ser | Leu | Ala | Met | Ala | Lys | Gln | Lys | Leu | Pro | Arg | Lys |      |  |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     | 495 |     |     |      |  |
| aga | aag | aag | cat | att | cct | cct | gcc | cct | ctg | gca | agc | tcg | cct | aca | ttt | 1536 |  |
| Arg | Lys | Lys | His | Ile | Pro | Pro | Ala | Pro | Leu | Ala | Ser | Ser | Pro | Thr | Phe |      |  |
|     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |     |     |      |  |
| tgc | aag | aca | gaa | ttg | aac | atg | gct | tgc | aac | agt | acc | cag | agt | gac | aca | 1584 |  |
| Cys | Lys | Thr | Glu | Leu | Asn | Met | Ala | Cys | Asn | Ser | Thr | Gln | Ser | Asp | Thr |      |  |
|     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |      |  |
| tgt | ctg | ggc | aaa | gaa | aac | cgg | ctt | ctg | gaa | cat | aac | aga | tca | gtg | tta | 1632 |  |
| Cys | Leu | Gly | Lys | Glu | Asn | Arg | Leu | Leu | Glu | His | Asn | Arg | Ser | Val | Leu |      |  |
|     |     | 530 |     |     |     | 535 |     |     |     |     | 540 |     |     |     |     |      |  |
| tca | ggt | gac | gac | agt | aca | gga | agt | gag | cgg | cca | tta | tca | cct | cca | gaa | 1680 |  |
| Ser | Gly | Asp | Asp | Ser | Thr | Gly | Ser | Glu | Pro | Pro | Leu | Ser | Pro | Pro | Glu |      |  |

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545          550          555          560
agg ctc cct atc aga cgc tct agt acc aga gac aaa aac aga aga ggg      1728
Arg Leu Pro Ile Arg Arg Ser Ser Thr Arg Asp Lys Asn Arg Arg Gly

          565          570          575
gaa acg tgt ttc ctg ttg acg aca ggt gat tac acg tgc gct tct gat      1776
Glu Thr Cys Phe Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp

          580          585          590
gga gga atc agg aaa gca agc aca cta gag ccc atg gag agt act gca      1824
Gly Gly Ile Arg Lys Ala Ser Thr Leu Glu Pro Met Glu Ser Thr Ala

          595          600          605
cag act aaa gga gac aca aga cca gaa gct cat tgg aat tgt gcg cac      1872
Gln Thr Lys Gly Asp Thr Arg Pro Glu Ala His Trp Asn Cys Ala His

          610          615          620
tta ctc aat ttt ggg tgt cct aca gga agt tca ttt ccc acc ctc taa      1920
Leu Leu Asn Phe Gly Cys Pro Thr Gly Ser Ser Phe Pro Thr Leu

625          630          635

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<210> 10
<211> 639
<212> PRT
<213> Mus musculus

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<400> 10
Met Gly Lys Ile Glu Ser Asn Glu Arg Val Ile Leu Asn Val Gly Gly
1          5          10          15
Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr
          20          25          30
Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Gln Gly Asp Cys Leu Thr
          35          40          45
Ala Ala Gly Asp Lys Leu Gln Pro Leu Pro Pro Pro Leu Ser Pro Pro
          50          55          60
Pro Arg Pro Pro Pro Leu Ser Pro Val Pro Ser Gly Cys Phe Glu Gly
65          70          75          80
Gly Ala Gly Asn Cys Ser Ser His Gly Gly Asn Gly Gly Asn Gly Gly
          85          90          95
Ser Asp His Pro Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro
          100          105          110
Gly Val Phe Ala Tyr Val Leu Asn Tyr Tyr Arg Thr Gly Lys Leu His
          115          120          125
Cys Pro Ala Asp Val Cys Gly Pro Leu Phe Glu Glu Glu Leu Ala Phe
          130          135          140
Trp Gly Ile Asp Glu Thr Asp Val Glu Pro Cys Cys Trp Met Thr Tyr
145          150          155          160
Arg Gln His Arg Asp Ala Glu Glu Ala Leu Asp Ile Phe Glu Thr Pro
          165          170          175
Asp Leu Ile Gly Gly Asp Pro Gly Asp Asp Glu Asp Leu Ala Ala Lys
          180          185          190
Arg Leu Gly Ile Glu Asp Ala Ala Gly Leu Gly Gly Pro Asp Gly Lys

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|                                                                 |     |     |
|-----------------------------------------------------------------|-----|-----|
| 195                                                             | 200 | 205 |
| Ser Gly Arg Trp Arg Lys Leu Gln Pro Arg Met Trp Ala Leu Phe Glu |     |     |
| 210                                                             | 215 | 220 |
| Asp Pro Tyr Ser Ser Arg Ala Ala Arg Phe Ile Ala Phe Ala Ser Leu |     |     |
| 225                                                             | 230 | 235 |
| Phe Phe Ile Leu Val Ser Ile Thr Thr Phe Cys Leu Glu Thr His Glu |     |     |
|                                                                 | 245 | 250 |
| Ala Phe Asn Ile Val Lys Asn Lys Thr Glu Pro Val Ile Asn Gly Thr |     |     |
|                                                                 | 260 | 265 |
| Ser Pro Val Leu Gln Tyr Glu Ile Glu Thr Asp Pro Ala Leu Thr Tyr |     |     |
|                                                                 | 275 | 280 |
| Val Glu Gly Val Cys Val Val Trp Phe Thr Phe Glu Phe Leu Val Arg |     |     |
|                                                                 | 290 | 295 |
| Ile Val Phe Ser Pro Asn Lys Leu Glu Phe Ile Lys Asn Leu Leu Asn |     |     |
| 305                                                             | 310 | 315 |
| Ile Ile Asp Phe Val Ala Ile Leu Pro Phe Tyr Leu Glu Val Gly Leu |     |     |
|                                                                 | 325 | 330 |
| Ser Gly Leu Ser Ser Lys Ala Ala Lys Asp Val Leu Gly Phe Leu Arg |     |     |
|                                                                 | 340 | 345 |
| Val Val Arg Phe Val Arg Ile Leu Arg Ile Phe Lys Leu Thr Arg His |     |     |
|                                                                 | 355 | 360 |
| Phe Val Gly Leu Arg Val Leu Gly His Thr Leu Arg Ala Ser Thr Asn |     |     |
|                                                                 | 370 | 375 |
| Glu Phe Leu Leu Leu Ile Ile Phe Leu Ala Leu Gly Val Leu Ile Phe |     |     |
| 385                                                             | 390 | 395 |
| Ala Thr Met Ile Tyr Tyr Ala Glu Arg Val Gly Ala Gln Pro Asn Asp |     |     |
|                                                                 | 405 | 410 |
| Pro Ser Ala Ser Glu His Thr Gln Phe Lys Asn Ile Pro Ile Gly Phe |     |     |
|                                                                 | 420 | 425 |
| Trp Trp Ala Val Val Thr Met Thr Thr Leu Gly Tyr Gly Asp Met Tyr |     |     |
|                                                                 | 435 | 440 |
| Pro Gln Thr Trp Ser Gly Met Leu Val Gly Ala Leu Cys Ala Leu Ala |     |     |
|                                                                 | 450 | 455 |
| Gly Val Leu Thr Ile Ala Met Pro Val Pro Val Ile Val Asn Asn Phe |     |     |
| 465                                                             | 470 | 475 |
| Gly Met Tyr Tyr Ser Leu Ala Met Ala Lys Gln Lys Leu Pro Arg Lys |     |     |
|                                                                 | 485 | 490 |
| Arg Lys Lys His Ile Pro Pro Ala Pro Leu Ala Ser Ser Pro Thr Phe |     |     |
|                                                                 | 500 | 505 |
| Cys Lys Thr Glu Leu Asn Met Ala Cys Asn Ser Thr Gln Ser Asp Thr |     |     |
|                                                                 | 515 | 520 |
| Cys Leu Gly Lys Glu Asn Arg Leu Leu Glu His Asn Arg Ser Val Leu |     |     |
|                                                                 | 530 | 535 |
| Ser Gly Asp Asp Ser Thr Gly Ser Glu Pro Pro Leu Ser Pro Pro Glu |     |     |
| 545                                                             | 550 | 555 |
| Arg Leu Pro Ile Arg Arg Ser Ser Thr Arg Asp Lys Asn Arg Arg Gly |     |     |
|                                                                 | 565 | 570 |
| Glu Thr Cys Phe Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp |     |     |
|                                                                 | 580 | 585 |
|                                                                 |     | 590 |

Gly Gly Ile Arg Lys Ala Ser Thr Leu Glu Pro Met Glu Ser Thr Ala  
           595                                600                                605  
 Gln Thr Lys Gly Asp Thr Arg Pro Glu Ala His Trp Asn Cys Ala His  
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 acc agg cac gaa acc tac cgc agc act ctc aag acc ctt cct gga act 96  
 Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr  
                                 20                                25                                30  
 cgc ctg gcc ctt ctc gcc tcc tct gaa cct cag ggc gac tgc ctg act 144  
 Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Gln Gly Asp Cys Leu Thr  
                                 35                                40                                45  
 gct gcg ggt gac aag ctg cag ccg ctg ccc cct ccg ctg tct cca ccg 192  
 Ala Ala Gly Asp Lys Leu Gln Pro Leu Pro Pro Pro Leu Ser Pro Pro  
                                 50                                55                                60  
 ccg cga ccg cct ccc ttg tcc cct gtc ccc agc ggc tgc ttc gag ggc 240  
 Pro Arg Pro Pro Pro Leu Ser Pro Val Pro Ser Gly Cys Phe Glu Gly  
   65                                70                                75                                80  
 ggc gca ggc aac tgc agt tgc cac ggt ggc aat ggc agc gac cac cct 288  
 Gly Ala Gly Asn Cys Ser Ser His Gly Gly Asn Gly Ser Asp His Pro  
                                 85                                90                                95  
 ggg gga ggc cgc gaa ttc ttc ttc gat cgc cac cca gga gtc ttc gcc 336  
 Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro Gly Val Phe Ala  
                                 100                                105                                110  
 tat gtg ctc aac tac tac cgc acg ggc aag ctg cac tgc ccc gcc gac 384  
 Tyr Val Leu Asn Tyr Tyr Arg Thr Gly Lys Leu His Cys Pro Ala Asp  
                                 115                                120                                125  
 gtg tgt gga ccg ctc ttc gag gaa gag ctg gca ttc tgg ggc atc gat 432  
 Val Cys Gly Pro Leu Phe Glu Glu Glu Leu Ala Phe Trp Gly Ile Asp  
                                 130                                135                                140  
 gag acc gac gtg gag ccc tgc tgc tgg atg acc tac agg cag cac ccg 480  
 Glu Thr Asp Val Glu Pro Cys Cys Trp Met Thr Tyr Arg Gln His Arg  
   145                                150                                155                                160  
 gac gcg gag gag gcc ctg gat atc ttc gag aca ccc gac ctc atc gga 528

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|--|
| Asp | Ala | Glu | Glu | Ala | Leu | Asp | Ile | Phe | Glu | Thr | Pro | Asp | Leu | Ile | Gly |      |  |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |      |  |
| ggc | gac | cct | ggt | gat | gat | gag | gac | cta | ggg | ggc | aag | aga | ctg | ggc | att | 576  |  |
| Gly | Asp | Pro | Gly | Asp | Asp | Glu | Asp | Leu | Gly | Gly | Lys | Arg | Leu | Gly | Ile |      |  |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |      |  |
| gag | gat | gct | gcg | ggg | ctg | gga | gga | ccc | gat | ggc | aag | tct | ggc | cgc | tgg | 624  |  |
| Glu | Asp | Ala | Ala | Gly | Leu | Gly | Gly | Pro | Asp | Gly | Lys | Ser | Gly | Arg | Trp |      |  |
|     |     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |      |  |
| agg | aag | ctg | cag | cct | cgc | atg | tgg | gct | ctc | ttt | gag | gac | ccc | tat | tca | 672  |  |
| Arg | Lys | Leu | Gln | Pro | Arg | Met | Trp | Ala | Leu | Phe | Glu | Asp | Pro | Tyr | Ser |      |  |
|     |     |     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |      |  |
| tcc | aga | gcc | gct | agg | ttt | att | gct | ttt | gct | tct | ctg | ttc | ttc | att | ttg | 720  |  |
| Ser | Arg | Ala | Ala | Arg | Phe | Ile | Ala | Phe | Ala | Ser | Leu | Phe | Phe | Ile | Leu |      |  |
|     |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |      |  |
| gtt | tcc | atc | aca | acc | ttt | tgc | ctg | gag | aca | cac | gaa | gct | ttc | aat | att | 768  |  |
| Val | Ser | Ile | Thr | Thr | Phe | Cys | Leu | Glu | Thr | His | Glu | Ala | Phe | Asn | Ile |      |  |
|     |     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |      |  |
| gtt | aaa | aac | aag | aca | gag | cca | gtc | atc | aac | ggc | acc | agc | gct | gtt | ctc | 816  |  |
| Val | Lys | Asn | Lys | Thr | Glu | Pro | Val | Ile | Asn | Gly | Thr | Ser | Ala | Val | Leu |      |  |
|     |     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |      |  |
| cag | tat | gaa | atc | gaa | acg | gat | cct | gcc | ttg | aca | tat | gtg | gaa | gga | gtg | 864  |  |
| Gln | Tyr | Glu | Ile | Glu | Thr | Asp | Pro | Ala | Leu | Thr | Tyr | Val | Glu | Gly | Val |      |  |
|     |     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |      |  |
| tgt | gtg | gtg | tgg | ttt | act | ttt | gaa | ttt | tta | gtc | cgt | att | gtt | ttc | tcg | 912  |  |
| Cys | Val | Val | Trp | Phe | Thr | Phe | Glu | Phe | Leu | Val | Arg | Ile | Val | Phe | Ser |      |  |
|     |     |     |     |     |     |     | 295 |     |     |     | 300 |     |     |     |     |      |  |
| ccc | aat | aaa | ctt | gag | ttc | atc | aaa | aat | cta | ttg | aac | atc | att | gac | ttt | 960  |  |
| Pro | Asn | Lys | Leu | Glu | Phe | Ile | Lys | Asn | Leu | Leu | Asn | Ile | Ile | Asp | Phe |      |  |
|     |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |      |  |
| gtg | gcc | atc | ctc | ccc | ttc | tac | tta | gag | gtg | gga | ctc | agc | ggg | ctg | tct | 1008 |  |
| Val | Ala | Ile | Leu | Pro | Phe | Tyr | Leu | Glu | Val | Gly | Leu | Ser | Gly | Leu | Ser |      |  |
|     |     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |      |  |
| tcc | aaa | gcg | gct | aaa | gat | gtg | ctc | ggc | ttt | ctc | agg | gtg | ggt | agg | ttt | 1056 |  |
| Ser | Lys | Ala | Ala | Lys | Asp | Val | Leu | Gly | Phe | Leu | Arg | Val | Val | Arg | Phe |      |  |
|     |     |     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |      |  |
| gtg | agg | atc | ctg | aga | atc | ttc | aag | ctt | acc | cgc | cat | ttc | gta | ggt | ctg | 1104 |  |
| Val | Arg | Ile | Leu | Arg | Ile | Phe | Lys | Leu | Thr | Arg | His | Phe | Val | Gly | Leu |      |  |
|     |     |     |     |     |     |     | 355 |     |     | 360 |     |     |     |     | 365 |      |  |
| aga | gtg | ctc | gga | cac | act | ctt | cgt | gcg | agc | acc | aat | gaa | ttt | ttg | ttg | 1152 |  |
| Arg | Val | Leu | Gly | His | Thr | Leu | Arg | Ala | Ser | Thr | Asn | Glu | Phe | Leu | Leu |      |  |
|     |     |     |     |     |     |     | 370 |     |     |     |     |     |     |     | 380 |      |  |
| ctg | atc | atc | ttt | ctg | gct | ctg | gga | ggt | ttg | ata | ttc | gct | acg | atg | atc | 1200 |  |
| Leu | Ile | Ile | Phe | Leu | Ala | Leu | Gly | Val | Leu | Ile | Phe | Ala | Thr | Met | Ile |      |  |
|     |     |     |     |     | 385 |     |     |     |     | 390 |     |     |     |     | 400 |      |  |
| tac | tac | gct | gag | cga | gta | ggg | gct | caa | cct | aat | gat | ccc | tca | gcg | agt | 1248 |  |
| Tyr | Tyr | Ala | Glu | Arg | Val | Gly | Ala | Gln | Pro | Asn | Asp | Pro | Ser | Ala | Ser |      |  |
|     |     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |      |  |
| gag | cac | aca | cag | ttc | aaa | aac | atc | ccc | att | ggt | ttc | tgg | tgg | gct | gtg | 1296 |  |
| Glu | His | Thr | Gln | Phe | Lys | Asn | Ile | Pro | Ile | Gly | Phe | Trp | Trp | Ala | Val |      |  |

|                                                                 |     |     |      |
|-----------------------------------------------------------------|-----|-----|------|
| 420                                                             | 425 | 430 |      |
| gtg acc atg act acc tta ggc tat ggg gat atg tac ccc caa aca tgg |     |     | 1344 |
| Val Thr Met Thr Thr Leu Gly Tyr Gly Asp Met Tyr Pro Gln Thr Trp |     |     |      |
| 435                                                             | 440 | 445 |      |
| tca ggg atg ttg gtg ggg gcc ttg tgt gct ctg gct gga gtg ctg acc |     |     | 1392 |
| Ser Gly Met Leu Val Gly Ala Leu Cys Ala Leu Ala Gly Val Leu Thr |     |     |      |
| 450                                                             | 455 | 460 |      |
| ata gct atg cct gtg ccc gtc att gtc aac aat ttt ggg atg tac tac |     |     | 1440 |
| Ile Ala Met Pro Val Pro Val Ile Val Asn Asn Phe Gly Met Tyr Tyr |     |     |      |
| 465                                                             | 470 | 475 | 480  |
| tcc ttg gca atg gcg aag cag aaa ctt cca aga aaa aga aag aag cac |     |     | 1488 |
| Ser Leu Ala Met Ala Lys Gln Lys Leu Pro Arg Lys Arg Lys Lys His |     |     |      |
| 485                                                             | 490 | 495 |      |
| att cct cct gcc cct ctg gca agc tca cct aca ttt tgc aag aca gaa |     |     | 1536 |
| Ile Pro Pro Ala Pro Leu Ala Ser Ser Pro Thr Phe Cys Lys Thr Glu |     |     |      |
| 500                                                             | 505 | 510 |      |
| tta aac atg gct tgt aac agt acc cag agt gac aca tgt ctg ggc aaa |     |     | 1584 |
| Leu Asn Met Ala Cys Asn Ser Thr Gln Ser Asp Thr Cys Leu Gly Lys |     |     |      |
| 515                                                             | 520 | 525 |      |
| gaa aac cgg ctt ctg gaa cat aac aga tca gtg tta tca ggt gac gac |     |     | 1632 |
| Glu Asn Arg Leu Leu Glu His Asn Arg Ser Val Leu Ser Gly Asp Asp |     |     |      |
| 530                                                             | 535 | 540 |      |
| agt aca gga agt gag ccg cca tta tca cct ccg gaa agg ctc ccc atc |     |     | 1680 |
| Ser Thr Gly Ser Glu Pro Pro Leu Ser Pro Pro Glu Arg Leu Pro Ile |     |     |      |
| 545                                                             | 550 | 555 | 560  |
| aga cgc tct agt acc aga gac aaa aac aga aga ggg gaa aca tgt ttc |     |     | 1728 |
| Arg Arg Ser Ser Thr Arg Asp Lys Asn Arg Arg Gly Glu Thr Cys Phe |     |     |      |
| 565                                                             | 570 | 575 |      |
| ctg ttg acg aca ggt gat tac acg tgc gct tct gat gga gga atc agg |     |     | 1776 |
| Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp Gly Gly Ile Arg |     |     |      |
| 580                                                             | 585 | 590 |      |
| aaa gat aac tgc aaa gat gtt gtc att act ggt tac acg caa gcc gag |     |     | 1824 |
| Lys Asp Asn Cys Lys Asp Val Val Ile Thr Gly Tyr Thr Gln Ala Glu |     |     |      |
| 595                                                             | 600 | 605 |      |
| gcc aga tct ctt act taa                                         |     |     | 1842 |
| Ala Arg Ser Leu Thr                                             |     |     |      |
| 610                                                             |     |     |      |

&lt;210&gt; 12

&lt;211&gt; 613

&lt;212&gt; PRT

&lt;213&gt; Rattus norvegicus

&lt;400&gt; 12

|                                                                 |         |
|-----------------------------------------------------------------|---------|
| Met Gly Lys Ile Glu Asn Asn Glu Arg Val Ile Leu Asn Val Gly Gly |         |
| 1                                                               | 5 10 15 |
| Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr |         |
| 20                                                              | 25 30   |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Leu | Ala | Leu | Leu | Ala | Ser | Ser | Glu | Pro | Gln | Gly | Asp | Cys | Leu | Thr |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Ala | Ala | Gly | Asp | Lys | Leu | Gln | Pro | Leu | Pro | Pro | Pro | Leu | Ser | Pro | Pro |
|     |     | 50  |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Pro | Arg | Pro | Pro | Pro | Leu | Ser | Pro | Val | Pro | Ser | Gly | Cys | Phe | Glu | Gly |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Gly | Ala | Gly | Asn | Cys | Ser | Ser | His | Gly | Gly | Asn | Gly | Ser | Asp | His | Pro |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Gly | Gly | Gly | Arg | Glu | Phe | Phe | Phe | Asp | Arg | His | Pro | Gly | Val | Phe | Ala |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Tyr | Val | Leu | Asn | Tyr | Tyr | Arg | Thr | Gly | Lys | Leu | His | Cys | Pro | Ala | Asp |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Val | Cys | Gly | Pro | Leu | Phe | Glu | Glu | Glu | Leu | Ala | Phe | Trp | Gly | Ile | Asp |
|     |     | 130 |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Glu | Thr | Asp | Val | Glu | Pro | Cys | Cys | Trp | Met | Thr | Tyr | Arg | Gln | His | Arg |
| 145 |     |     |     | 150 |     |     |     |     |     | 155 |     |     |     |     | 160 |
| Asp | Ala | Glu | Glu | Ala | Leu | Asp | Ile | Phe | Glu | Thr | Pro | Asp | Leu | Ile | Gly |
|     |     |     | 165 |     |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Gly | Asp | Pro | Gly | Asp | Asp | Glu | Asp | Leu | Gly | Gly | Lys | Arg | Leu | Gly | Ile |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Glu | Asp | Ala | Ala | Gly | Leu | Gly | Gly | Pro | Asp | Gly | Lys | Ser | Gly | Arg | Trp |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Arg | Lys | Leu | Gln | Pro | Arg | Met | Trp | Ala | Leu | Phe | Glu | Asp | Pro | Tyr | Ser |
|     |     | 210 |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Ser | Arg | Ala | Ala | Arg | Phe | Ile | Ala | Phe | Ala | Ser | Leu | Phe | Phe | Ile | Leu |
| 225 |     |     |     | 230 |     |     |     |     |     | 235 |     |     |     |     | 240 |
| Val | Ser | Ile | Thr | Thr | Phe | Cys | Leu | Glu | Thr | His | Glu | Ala | Phe | Asn | Ile |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Val | Lys | Asn | Lys | Thr | Glu | Pro | Val | Ile | Asn | Gly | Thr | Ser | Ala | Val | Leu |
|     |     | 260 |     |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Gln | Tyr | Glu | Ile | Glu | Thr | Asp | Pro | Ala | Leu | Thr | Tyr | Val | Glu | Gly | Val |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Cys | Val | Val | Trp | Phe | Thr | Phe | Glu | Phe | Leu | Val | Arg | Ile | Val | Phe | Ser |
|     |     | 290 |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Pro | Asn | Lys | Leu | Glu | Phe | Ile | Lys | Asn | Leu | Leu | Asn | Ile | Ile | Asp | Phe |
| 305 |     |     |     | 310 |     |     |     |     |     | 315 |     |     |     |     | 320 |
| Val | Ala | Ile | Leu | Pro | Phe | Tyr | Leu | Glu | Val | Gly | Leu | Ser | Gly | Leu | Ser |
|     |     |     | 325 |     |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Ser | Lys | Ala | Ala | Lys | Asp | Val | Leu | Gly | Phe | Leu | Arg | Val | Val | Arg | Phe |
|     |     | 340 |     |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Val | Arg | Ile | Leu | Arg | Ile | Phe | Lys | Leu | Thr | Arg | His | Phe | Val | Gly | Leu |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |
| Arg | Val | Leu | Gly | His | Thr | Leu | Arg | Ala | Ser | Thr | Asn | Glu | Phe | Leu | Leu |
|     |     | 370 |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |
| Leu | Ile | Ile | Phe | Leu |     |     |     |     |     |     |     |     |     |     |     |

[illegible]

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<211> 1917
<212> DNA
<213> Rattus norvegicus
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<221> CDS
<222> (1)..(1917)
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| <400>                                                           | 13 |  |    |  |  |  |  |    |  |  |  |  |  |    |  |  |  |     |
| atg ggc aag atc gag aac aac gag agg gtg atc ctc aat gtc gga ggc |    |  |    |  |  |  |  |    |  |  |  |  |  |    |  |  |  | 48  |
| Met Gly Lys Ile Glu Asn Asn Glu Arg Val Ile Leu Asn Val Gly Gly |    |  |    |  |  |  |  |    |  |  |  |  |  |    |  |  |  |     |
| 1                                                               |    |  | 5  |  |  |  |  | 10 |  |  |  |  |  | 15 |  |  |  |     |
| acc agg cac gaa acc tac cgc agc act ctc aag acc ctt cct gga act |    |  |    |  |  |  |  |    |  |  |  |  |  |    |  |  |  | 96  |
| Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr |    |  |    |  |  |  |  |    |  |  |  |  |  |    |  |  |  |     |
|                                                                 |    |  | 20 |  |  |  |  | 25 |  |  |  |  |  | 30 |  |  |  |     |
| cgc ctg gcc ctt ctc gcc tcc tct gaa cct cag ggc gac tgc ctg act |    |  |    |  |  |  |  |    |  |  |  |  |  |    |  |  |  | 144 |
| Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Gln Gly Asp Cys Leu Thr |    |  |    |  |  |  |  |    |  |  |  |  |  |    |  |  |  |     |
|                                                                 |    |  | 35 |  |  |  |  | 40 |  |  |  |  |  | 45 |  |  |  |     |
| gct gcg ggt gac aag ctg cag ccg ctg ccc cct ccg ctg tct cca ccg |    |  |    |  |  |  |  |    |  |  |  |  |  |    |  |  |  | 192 |
| Ala Ala Gly Asp Lys Leu Gln Pro Leu Pro Pro Pro Leu Ser Pro Pro |    |  |    |  |  |  |  |    |  |  |  |  |  |    |  |  |  |     |
|                                                                 |    |  | 50 |  |  |  |  | 55 |  |  |  |  |  | 60 |  |  |  |     |

|                                                                 |      |
|-----------------------------------------------------------------|------|
| ccg cga ccg cct ccc ttg tcc cct gtc ccc agc ggc tgc ttc gag ggc | 240  |
| Pro Arg Pro Pro Pro Leu Ser Pro Val Pro Ser Gly Cys Phe Glu Gly |      |
| 65 70 75 80                                                     |      |
| ggc gca ggc aac tgc agt tcg cac ggt ggc aat ggc agc gac cac cct | 288  |
| Gly Ala Gly Asn Cys Ser Ser His Gly Gly Asn Gly Ser Asp His Pro |      |
| 85 90 95                                                        |      |
| ggg gga ggc cgc gaa ttc ttc ttc gat cgc cac cca gga gtc ttc gcc | 336  |
| Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro Gly Val Phe Ala |      |
| 100 105 110                                                     |      |
| tat gtg ctc aac tac tac cgc acg ggc aag ctg cac tgc ccc gcc gac | 384  |
| Tyr Val Leu Asn Tyr Tyr Arg Thr Gly Lys Leu His Cys Pro Ala Asp |      |
| 115 120 125                                                     |      |
| gtg tgt gga ccg ctc ttc gag gaa gag ctg gca ttc tgg ggc atc gat | 432  |
| Val Cys Gly Pro Leu Phe Glu Glu Glu Leu Ala Phe Trp Gly Ile Asp |      |
| 130 135 140                                                     |      |
| gag acc gac gtg gag ccc tgc tgc tgg atg acc tac agg cag cac cgg | 480  |
| Glu Thr Asp Val Glu Pro Cys Cys Trp Met Thr Tyr Arg Gln His Arg |      |
| 145 150 155 160                                                 |      |
| gac gcg gag gag gcc ctg gat atc ttc gag aca ccc gac ctc atc gga | 528  |
| Asp Ala Glu Glu Ala Leu Asp Ile Phe Glu Thr Pro Asp Leu Ile Gly |      |
| 165 170 175                                                     |      |
| ggc gac cct ggt gat gat gag gac cta ggg ggc aag aga ctg ggc att | 576  |
| Gly Asp Pro Gly Asp Asp Glu Asp Leu Gly Gly Lys Arg Leu Gly Ile |      |
| 180 185 190                                                     |      |
| gag gat gct gcg ggg ctg gga gga ccc gat ggc aag tct ggc cgc tgg | 624  |
| Glu Asp Ala Ala Gly Leu Gly Gly Pro Asp Gly Lys Ser Gly Arg Trp |      |
| 195 200 205                                                     |      |
| agg aag ctg cag cct cgc atg tgg gct ctc ttt gag gac ccc tat tca | 672  |
| Arg Lys Leu Gln Pro Arg Met Trp Ala Leu Phe Glu Asp Pro Tyr Ser |      |
| 210 215 220                                                     |      |
| tcc aga gcc gct agg ttt att gct ttt gct tct ctg ttc ttc att ttg | 720  |
| Ser Arg Ala Ala Arg Phe Ile Ala Phe Ala Ser Leu Phe Phe Ile Leu |      |
| 225 230 235 240                                                 |      |
| gtt tcc atc aca acc ttt tgc ctg gag aca cac gaa gct ttc aat att | 768  |
| Val Ser Ile Thr Thr Phe Cys Leu Glu Thr His Glu Ala Phe Asn Ile |      |
| 245 250 255                                                     |      |
| gtt aaa aac aag aca gag cca gtc atc aac ggc acc agc gct gtt ctc | 816  |
| Val Lys Asn Lys Thr Glu Pro Val Ile Asn Gly Thr Ser Ala Val Leu |      |
| 260 265 270                                                     |      |
| cag tat gaa atc gaa acg gat cct gcc ttg aca tat gtg gaa gga gtg | 864  |
| Gln Tyr Glu Ile Glu Thr Asp Pro Ala Leu Thr Tyr Val Glu Gly Val |      |
| 275 280 285                                                     |      |
| tgt gtg gtg tgg ttt act ttt gaa ttt tta gtc cgt att gtt ttc tcg | 912  |
| Cys Val Val Trp Phe Thr Phe Glu Phe Leu Val Arg Ile Val Phe Ser |      |
| 290 295 300                                                     |      |
| ccc aat aaa ctt gag ttc atc aaa aat cta ttg aac atc att gac ttt | 960  |
| Pro Asn Lys Leu Glu Phe Ile Lys Asn Leu Leu Asn Ile Ile Asp Phe |      |
| 305 310 315 320                                                 |      |
| gtg gcc atc ctc ccc ttc tac tta gag gtg gga ctc agc ggg ctg tct | 1008 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|--|
| Val | Ala | Ile | Leu | Pro | Phe | Tyr | Leu | Glu | Val | Gly | Leu | Ser | Gly | Leu | Ser |      |  |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |      |  |
| tcc | aaa | gcg | gct | aaa | gat | gtg | ctc | ggc | ttt | ctc | agg | gtg | ggt | agg | ttt | 1056 |  |
| Ser | Lys | Ala | Ala | Lys | Asp | Val | Leu | Gly | Phe | Leu | Arg | Val | Val | Arg | Phe |      |  |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |      |  |
| gtg | agg | atc | ctg | aga | atc | ttc | aag | ctt | acc | cgc | cat | ttc | gta | ggt | ctg | 1104 |  |
| Val | Arg | Ile | Leu | Arg | Ile | Phe | Lys | Leu | Thr | Arg | His | Phe | Val | Gly | Leu |      |  |
|     |     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |      |  |
| aga | gtg | ctc | gga | cac | act | ctt | cgt | gcg | agc | acc | aat | gaa | ttt | ttg | ttg | 1152 |  |
| Arg | Val | Leu | Gly | His | Thr | Leu | Arg | Ala | Ser | Thr | Asn | Glu | Phe | Leu | Leu |      |  |
|     |     |     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |      |  |
| ctg | atc | atc | ttt | ctg | gct | ctg | gga | gtt | ttg | ata | ttc | gct | acg | atg | atc | 1200 |  |
| Leu | Ile | Ile | Phe | Leu | Ala | Leu | Gly | Val | Leu | Ile | Phe | Ala | Thr | Met | Ile |      |  |
|     |     |     | 385 |     |     |     | 390 |     |     |     | 395 |     |     |     | 400 |      |  |
| tac | tac | gct | gag | cga | gta | ggg | gct | caa | cct | aat | gat | ccc | tca | gcg | agt | 1248 |  |
| Tyr | Tyr | Ala | Glu | Arg | Val | Gly | Ala | Gln | Pro | Asn | Asp | Pro | Ser | Ala | Ser |      |  |
|     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |     |      |  |
| gag | cac | aca | cag | ttc | aaa | aac | atc | ccc | att | ggt | ttc | tgg | tgg | gct | gtg | 1296 |  |
| Glu | His | Thr | Gln | Phe | Lys | Asn | Ile | Pro | Ile | Gly | Phe | Trp | Trp | Ala | Val |      |  |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |      |  |
| gtg | acc | atg | act | acc | tta | ggc | tat | ggg | gat | atg | tac | ccc | caa | aca | tgg | 1344 |  |
| Val | Thr | Met | Thr | Thr | Leu | Gly | Tyr | Gly | Asp | Met | Tyr | Pro | Gln | Thr | Trp |      |  |
|     |     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |      |  |
| tca | ggg | atg | ttg | gtg | ggg | gcc | ttg | tgt | gct | ctg | gct | gga | gtg | ctg | acc | 1392 |  |
| Ser | Gly | Met | Leu | Val | Gly | Ala | Leu | Cys | Ala | Leu | Ala | Gly | Val | Leu | Thr |      |  |
|     |     |     | 450 |     |     |     | 455 |     |     |     |     | 460 |     |     |     |      |  |
| ata | gct | atg | cct | gtg | ccc | gtc | att | gtc | aac | aat | ttt | ggg | atg | tac | tac | 1440 |  |
| Ile | Ala | Met | Pro | Val | Pro | Val | Ile | Val | Asn | Asn | Phe | Gly | Met | Tyr | Tyr |      |  |
|     |     |     | 465 |     |     |     | 470 |     |     |     |     | 475 |     |     | 480 |      |  |
| tcc | ttg | gca | atg | gcg | aag | cag | aaa | ctt | cca | aga | aaa | aga | aag | aag | cac | 1488 |  |
| Ser | Leu | Ala | Met | Ala | Lys | Gln | Lys | Leu | Pro | Arg | Lys | Arg | Lys | Lys | His |      |  |
|     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |     |     |      |  |
| att | cct | cct | gcc | cct | ctg | gca | agc | tca | cct | aca | ttt | tgc | aag | aca | gaa | 1536 |  |
| Ile | Pro | Pro | Ala | Pro | Leu | Ala | Ser | Ser | Pro | Thr | Phe | Cys | Lys | Thr | Glu |      |  |
|     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |     |     |      |  |
| tta | aac | atg | gct | tgt | aac | agt | acc | cag | agt | gac | aca | tgt | ctg | ggc | aaa | 1584 |  |
| Leu | Asn | Met | Ala | Cys | Asn | Ser | Thr | Gln | Ser | Asp | Thr | Cys | Leu | Gly | Lys |      |  |
|     |     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |      |  |
| gaa | aac | cgg | ctt | ctg | gaa | cat | aac | aga | tca | gtg | tta | tca | ggt | gac | gac | 1632 |  |
| Glu | Asn | Arg | Leu | Leu | Glu | His | Asn | Arg | Ser | Val | Leu | Ser | Gly | Asp | Asp |      |  |
|     |     |     | 530 |     |     |     | 535 |     |     |     |     | 540 |     |     |     |      |  |
| agt | aca | gga | agt | gag | ccg | cca | tta | tca | cct | ccg | gaa | agg | ctc | ccc | atc | 1680 |  |
| Ser | Thr | Gly | Ser | Glu | Pro | Pro | Leu | Ser | Pro | Pro | Glu | Arg | Leu | Pro | Ile |      |  |
|     |     |     | 545 |     |     |     | 550 |     |     |     | 555 |     |     |     | 560 |      |  |
| aga | cgc | tct | agt | acc | aga | gac | aaa | aac | aga | aga | ggg | gaa | aca | tgt | ttc | 1728 |  |
| Arg | Arg | Ser | Ser | Thr | Arg | Asp | Lys | Asn | Arg | Arg | Gly | Glu | Thr | Cys | Phe |      |  |
|     |     |     | 565 |     |     |     |     | 570 |     |     |     |     | 575 |     |     |      |  |
| ctg | ttg | acg | aca | ggt | gat | tac | acg | tgc | gct | tct | gat | gga | gga | atc | agg | 1776 |  |
| Leu | Leu | Thr | Thr | Gly | Asp | Tyr | Thr | Cys | Ala | Ser | Asp | Gly | Gly | Ile | Arg |      |  |

|                                                                 |     |     |      |
|-----------------------------------------------------------------|-----|-----|------|
| 580                                                             | 585 | 590 |      |
| aaa gga tat gaa aaa tcc cga agc tta aac aac ata gcg ggc ttg gca |     |     | 1824 |
| Lys Gly Tyr Glu Lys Ser Arg Ser Leu Asn Asn Ile Ala Gly Leu Ala |     |     |      |
| 595                                                             | 600 | 605 |      |
| ggc aat gct ctg aga ctc tct cca gta aca tcc ccc tac aac tct ccg |     |     | 1872 |
| Gly Asn Ala Leu Arg Leu Ser Pro Val Thr Ser Pro Tyr Asn Ser Pro |     |     |      |
| 610                                                             | 615 | 620 |      |
| tgt cct ctg agg cgc tct cgg tct ccc atc cca tct atc ttg taa     |     |     | 1917 |
| Cys Pro Leu Arg Arg Ser Arg Ser Pro Ile Pro Ser Ile Leu         |     |     |      |
| 625                                                             | 630 | 635 |      |

<210> 14  
 <211> 638  
 <212> PRT  
 <213> Rattus norvegicus

<400> 14

|                                                                 |     |     |     |
|-----------------------------------------------------------------|-----|-----|-----|
| Met Gly Lys Ile Glu Asn Asn Glu Arg Val Ile Leu Asn Val Gly Gly |     |     |     |
| 1                                                               | 5   | 10  | 15  |
| Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr |     |     |     |
| 20                                                              | 25  | 30  |     |
| Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Gln Gly Asp Cys Leu Thr |     |     |     |
| 35                                                              | 40  | 45  |     |
| Ala Ala Gly Asp Lys Leu Gln Pro Leu Pro Pro Pro Leu Ser Pro Pro |     |     |     |
| 50                                                              | 55  | 60  |     |
| Pro Arg Pro Pro Pro Leu Ser Pro Val Pro Ser Gly Cys Phe Glu Gly |     |     |     |
| 65                                                              | 70  | 75  | 80  |
| Gly Ala Gly Asn Cys Ser Ser His Gly Gly Asn Gly Ser Asp His Pro |     |     |     |
| 85                                                              | 90  | 95  |     |
| Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro Gly Val Phe Ala |     |     |     |
| 100                                                             | 105 | 110 |     |
| Tyr Val Leu Asn Tyr Tyr Arg Thr Gly Lys Leu His Cys Pro Ala Asp |     |     |     |
| 115                                                             | 120 | 125 |     |
| Val Cys Gly Pro Leu Phe Glu Glu Glu Leu Ala Phe Trp Gly Ile Asp |     |     |     |
| 130                                                             | 135 | 140 |     |
| Glu Thr Asp Val Glu Pro Cys Cys Trp Met Thr Tyr Arg Gln His Arg |     |     |     |
| 145                                                             | 150 | 155 | 160 |
| Asp Ala Glu Glu Ala Leu Asp Ile Phe Glu Thr Pro Asp Leu Ile Gly |     |     |     |
| 165                                                             | 170 | 175 |     |
| Gly Asp Pro Gly Asp Asp Glu Asp Leu Gly Gly Lys Arg Leu Gly Ile |     |     |     |
| 180                                                             | 185 | 190 |     |
| Glu Asp Ala Ala Gly Leu Gly Gly Pro Asp Gly Lys Ser Gly Arg Trp |     |     |     |
| 195                                                             | 200 | 205 |     |
| Arg Lys Leu Gln Pro Arg Met Trp Ala Leu Phe Glu Asp Pro Tyr Ser |     |     |     |
| 210                                                             | 215 | 220 |     |
| Ser Arg Ala Ala Arg Phe Ile Ala Phe Ala Ser Leu Phe Phe Ile Leu |     |     |     |
| 225                                                             | 230 | 235 | 240 |
| Val Ser Ile Thr Thr Phe Cys Leu Glu Thr His Glu Ala Phe Asn Ile |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |  |  |
| Val | Lys | Asn | Lys | Thr | Glu | Pro | Val | Ile | Asn | Gly | Thr | Ser | Ala | Val | Leu |  |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |  |  |
| Gln | Tyr | Glu | Ile | Glu | Thr | Asp | Pro | Ala | Leu | Thr | Tyr | Val | Glu | Gly | Val |  |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |  |  |
| Cys | Val | Val | Trp | Phe | Thr | Phe | Glu | Phe | Leu | Val | Arg | Ile | Val | Phe | Ser |  |  |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |  |  |
| Pro | Asn | Lys | Leu | Glu | Phe | Ile | Lys | Asn | Leu | Leu | Asn | Ile | Ile | Asp | Phe |  |  |
| 305 |     |     |     |     | 310 |     |     |     | 315 |     |     |     |     | 320 |     |  |  |
| Val | Ala | Ile | Leu | Pro | Phe | Tyr | Leu | Glu | Val | Gly | Leu | Ser | Gly | Leu | Ser |  |  |
|     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |     |  |  |
| Ser | Lys | Ala | Ala | Lys | Asp | Val | Leu | Gly | Phe | Leu | Arg | Val | Val | Arg | Phe |  |  |
|     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |     |  |  |
| Val | Arg | Ile | Leu | Arg | Ile | Phe | Lys | Leu | Thr | Arg | His | Phe | Val | Gly | Leu |  |  |
|     | 355 |     |     |     | 360 |     |     |     |     |     | 365 |     |     |     |     |  |  |
| Arg | Val | Leu | Gly | His | Thr | Leu | Arg | Ala | Ser | Thr | Asn | Glu | Phe | Leu | Leu |  |  |
| 370 |     |     |     |     | 375 |     |     |     |     |     | 380 |     |     |     |     |  |  |
| Leu | Ile | Ile | Phe | Leu | Ala | Leu | Gly | Val | Leu | Ile | Phe | Ala | Thr | Met | Ile |  |  |
| 385 |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |     |  |  |
| Tyr | Tyr | Ala | Glu | Arg | Val | Gly | Ala | Gln | Pro | Asn | Asp | Pro | Ser | Ala | Ser |  |  |
|     |     | 405 |     |     |     |     |     | 410 |     |     |     |     |     | 415 |     |  |  |
| Glu | His | Thr | Gln | Phe | Lys | Asn | Ile | Pro | Ile | Gly | Phe | Trp | Trp | Ala | Val |  |  |
|     | 420 |     |     |     |     |     | 425 |     |     |     |     | 430 |     |     |     |  |  |
| Val | Thr | Met | Thr | Thr | Leu | Gly | Tyr | Gly | Asp | Met | Tyr | Pro | Gln | Thr | Trp |  |  |
|     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |     |  |  |
| Ser | Gly | Met | Leu | Val | Gly | Ala | Leu | Cys | Ala | Leu | Ala | Gly | Val | Leu | Thr |  |  |
|     | 450 |     |     |     | 455 |     |     |     | 460 |     |     |     |     |     |     |  |  |
| Ile | Ala | Met | Pro | Val | Pro | Val | Ile | Val | Asn | Asn | Phe | Gly | Met | Tyr | Tyr |  |  |
| 465 |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |     |  |  |
| Ser | Leu | Ala | Met | Ala | Lys | Gln | Lys | Leu | Pro | Arg | Lys | Arg | Lys | Lys | His |  |  |
|     |     | 485 |     |     |     |     |     | 490 |     |     |     |     | 495 |     |     |  |  |
| Ile | Pro | Pro | Ala | Pro | Leu | Ala | Ser | Ser | Pro | Thr | Phe | Cys | Lys | Thr | Glu |  |  |
|     | 500 |     |     |     |     |     |     | 505 |     |     |     | 510 |     |     |     |  |  |
| Leu | Asn | Met | Ala | Cys | Asn | Ser | Thr | Gln | Ser | Asp | Thr | Cys | Leu | Gly | Lys |  |  |
|     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |     |  |  |
| Glu | Asn | Arg | Leu | Leu | Glu | His | Asn | Arg | Ser | Val | Leu | Ser | Gly | Asp | Asp |  |  |
|     | 530 |     |     |     | 535 |     |     |     |     |     | 540 |     |     |     |     |  |  |
| Ser | Thr | Gly | Ser | Glu | Pro | Pro | Leu | Ser | Pro | Pro | Glu | Arg | Leu | Pro | Ile |  |  |
| 545 |     |     |     | 550 |     |     |     |     | 555 |     |     |     |     | 560 |     |  |  |
| Arg | Arg | Ser | Ser | Thr | Arg | Asp | Lys | Asn | Arg | Arg | Gly | Glu | Thr | Cys | Phe |  |  |
|     |     | 565 |     |     |     |     |     | 570 |     |     |     |     | 575 |     |     |  |  |
| Leu | Leu | Thr | Thr | Gly | Asp | Tyr | Thr | Cys | Ala | Ser | Asp | Gly | Gly | Ile | Arg |  |  |
|     | 580 |     |     |     |     |     | 585 |     |     |     | 590 |     |     |     |     |  |  |
| Lys | Gly | Tyr | Glu | Lys | Ser | Arg | Ser | Leu | Asn | Asn | Ile | Ala | Gly | Leu | Ala |  |  |
|     | 595 |     |     |     |     | 600 |     |     |     |     | 605 |     |     |     |     |  |  |
| Gly | Asn | Ala | Leu | Arg | Leu | Ser | Pro | Val | Thr | Ser | Pro | Tyr | Asn | Ser | Pro |  |  |
|     | 610 |     |     |     | 615 |     |     |     |     |     | 620 |     |     |     |     |  |  |
| Cys | Pro | Leu | Arg | Arg | Ser | Arg | Ser | Pro | Ile | Pro | Ser | Ile | Leu |     |     |  |  |
| 625 |     |     |     |     | 630 |     |     |     |     |     | 635 |     |     |     |     |  |  |

<210> 15  
 <211> 1908  
 <212> DNA  
 <213> Rattus norvegicus

<220>  
 <221> CDS  
 <222> (1)..(1908)

<400> 15  
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 acc agg cac gaa acc tac cgc agc act ctc aag acc ctt cct gga act 96  
 Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr  
 20 25 30  
 cgc ctg gcc ctt ctc gcc tcc tct gaa cct cag ggc gac tgc ctg act 144  
 Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Gln Gly Asp Cys Leu Thr  
 35 40 45  
 gct gcg ggt gac aag ctg cag ccg ctg ccc cct ccg ctg tct cca ccg 192  
 Ala Ala Gly Asp Lys Leu Gln Pro Leu Pro Pro Leu Ser Pro Pro  
 50 55 60  
 ccg cga ccg cct ccc ttg tcc cct gtc ccc agc ggc tgc ttc gag ggc 240  
 Pro Arg Pro Pro Pro Leu Ser Pro Val Pro Ser Gly Cys Phe Glu Gly  
 65 70 75 80  
 ggc gca ggc aac tgc agt tgc cac ggt ggc aat ggc agc gac cac cct 288  
 Gly Ala Gly Asn Cys Ser Ser His Gly Gly Asn Gly Ser Asp His Pro  
 85 90 95  
 ggg gga ggc cgc gaa ttc ttc ttc gat cgc cac cca gga gtc ttc gcc 336  
 Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro Gly Val Phe Ala  
 100 105 110  
 tat gtg ctc aac tac tac cgc acg ggc aag ctg cac tgc ccc gcc gac 384  
 Tyr Val Leu Asn Tyr Tyr Arg Thr Gly Lys Leu His Cys Pro Ala Asp  
 115 120 125  
 gtg tgt gga ccg ctc ttc gag gaa gag ctg gca ttc tgg ggc atc gat 432  
 Val Cys Gly Pro Leu Phe Glu Glu Glu Leu Ala Phe Trp Gly Ile Asp  
 130 135 140  
 gag acc gac gtg gag ccc tgc tgc tgg atg acc tac agg cag cac ccg 480  
 Glu Thr Asp Val Glu Pro Cys Cys Trp Met Thr Tyr Arg Gln His Arg  
 145 150 155 160  
 gac gcg gag gag gcc ctg gat atc ttc gag aca ccc gac ctc atc gga 528  
 Asp Ala Glu Glu Ala Leu Asp Ile Phe Glu Thr Pro Asp Leu Ile Gly  
 165 170 175  
 ggc gac cct ggt gat gat gag gac cta ggg ggc aag aga ctg ggc att 576  
 Gly Asp Pro Gly Asp Asp Glu Asp Leu Gly Gly Lys Arg Leu Gly Ile  
 180 185 190  
 gag gat gct gcg ggg ctg gga gga ccc gat ggc aag tct ggc cgc tgg 624

|                                                                 |      |
|-----------------------------------------------------------------|------|
| Glu Asp Ala Ala Gly Leu Gly Gly Pro Asp Gly Lys Ser Gly Arg Trp |      |
| 195                                                             | 200  |
| agg aag ctg cag cct cgc atg tgg gct ctc ttt gag gac ccc tat tca | 672  |
| Arg Lys Leu Gln Pro Arg Met Trp Ala Leu Phe Glu Asp Pro Tyr Ser |      |
| 210                                                             | 215  |
| 220                                                             |      |
| tcc aga gcc gct agg ttt att gct ttt gct tct ctg ttc ttc att ttg | 720  |
| Ser Arg Ala Ala Arg Phe Ile Ala Phe Ala Ser Leu Phe Phe Ile Leu |      |
| 225                                                             | 230  |
| 235                                                             | 240  |
| gtt tcc atc aca acc ttt tgc ctg gag aca cac gaa gct ttc aat att | 768  |
| Val Ser Ile Thr Thr Phe Cys Leu Glu Thr His Glu Ala Phe Asn Ile |      |
| 245                                                             | 250  |
| 255                                                             |      |
| gtt aaa aac aag aca gag cca gtc atc aac ggc acc agc gct gtt ctc | 816  |
| Val Lys Asn Lys Thr Glu Pro Val Ile Asn Gly Thr Ser Ala Val Leu |      |
| 260                                                             | 265  |
| 270                                                             |      |
| cag tat gaa atc gaa acg gat cct gcc ttg aca tat gtg gaa gga gtg | 864  |
| Gln Tyr Glu Ile Glu Thr Asp Pro Ala Leu Thr Tyr Val Glu Gly Val |      |
| 275                                                             | 280  |
| 285                                                             |      |
| tgt gtg gtg tgg ttt act ttt gaa ttt tta gtc cgt att gtt ttc tcg | 912  |
| Cys Val Val Trp Phe Thr Phe Glu Phe Leu Val Arg Ile Val Phe Ser |      |
| 290                                                             | 295  |
| 300                                                             |      |
| ccc aat aaa ctt gag ttc atc aaa aat cta ttg aac atc att gac ttt | 960  |
| Pro Asn Lys Leu Glu Phe Ile Lys Asn Leu Leu Asn Ile Ile Asp Phe |      |
| 305                                                             | 310  |
| 315                                                             | 320  |
| gtg gcc atc ctc ccc ttc tac tta gag gtg gga ctc agc ggg ctg tct | 1008 |
| Val Ala Ile Leu Pro Phe Tyr Leu Glu Val Gly Leu Ser Gly Leu Ser |      |
| 325                                                             | 330  |
| 335                                                             |      |
| tcc aaa gcg gct aaa gat gtg ctc ggc ttt ctc agg gtg gtt agg ttt | 1056 |
| Ser Lys Ala Ala Lys Asp Val Leu Gly Phe Leu Arg Val Val Arg Phe |      |
| 340                                                             | 345  |
| 350                                                             |      |
| gtg agg atc ctg aga atc ttc aag ctt acc cgc cat ttc gta ggt ctg | 1104 |
| Val Arg Ile Leu Arg Ile Phe Lys Leu Thr Arg His Phe Val Gly Leu |      |
| 355                                                             | 360  |
| 365                                                             |      |
| aga gtg ctc gga cac act ctt cgt gcg agc acc aat gaa ttt ttg ttg | 1152 |
| Arg Val Leu Gly His Thr Leu Arg Ala Ser Thr Asn Glu Phe Leu Leu |      |
| 370                                                             | 375  |
| 380                                                             |      |
| ctg atc atc ttt ctg gct ctg gga gtt ttg ata ttc gct acg atg atc | 1200 |
| Leu Ile Ile Phe Leu Ala Leu Gly Val Leu Ile Phe Ala Thr Met Ile |      |
| 385                                                             | 390  |
| 395                                                             | 400  |
| tac tac gct gag cga gta ggg gct caa cct aat gat ccc tca gcg agt | 1248 |
| Tyr Tyr Ala Glu Arg Val Gly Ala Gln Pro Asn Asp Pro Ser Ala Ser |      |
| 405                                                             | 410  |
| 415                                                             |      |
| gag cac aca cag ttc aaa aac atc ccc att ggt ttc tgg tgg gct gtg | 1296 |
| Glu His Thr Gln Phe Lys Asn Ile Pro Ile Gly Phe Trp Trp Ala Val |      |
| 420                                                             | 425  |
| 430                                                             |      |
| gtg acc atg act acc tta ggc tat ggg gat atg tac ccc caa aca tgg | 1344 |
| Val Thr Met Thr Thr Leu Gly Tyr Gly Asp Met Tyr Pro Gln Thr Trp |      |
| 435                                                             | 440  |
| 445                                                             |      |
| tca ggg atg ttg gtg ggg gcc ttg tgt gct ctg gct gga gtg ctg acc | 1392 |
| Ser Gly Met Leu Val Gly Ala Leu Cys Ala Leu Ala Gly Val Leu Thr |      |

|                                                                 |     |     |      |
|-----------------------------------------------------------------|-----|-----|------|
| 450                                                             | 455 | 460 |      |
| ata gct atg cct gtg ccc gtc att gtc aac aat ttt ggg atg tac tac |     |     | 1440 |
| Ile Ala Met Pro Val Pro Val Ile Val Asn Asn Phe Gly Met Tyr Tyr |     |     |      |
| 465                                                             | 470 | 475 | 480  |
| tcc ttg gca atg gcg aag cag aaa ctt cca aga aaa aga aag aag cac |     |     | 1488 |
| Ser Leu Ala Met Ala Lys Gln Lys Leu Pro Arg Lys Arg Lys Lys His |     |     |      |
|                                                                 | 485 | 490 | 495  |
| att cct cct gcc cct ctg gca agc tca cct aca ttt tgc aag aca gaa |     |     | 1536 |
| Ile Pro Pro Ala Pro Leu Ala Ser Ser Pro Thr Phe Cys Lys Thr Glu |     |     |      |
|                                                                 | 500 | 505 | 510  |
| tta aac atg gct tgt aac agt acc cag agt gac aca tgt ctg ggc aaa |     |     | 1584 |
| Leu Asn Met Ala Cys Asn Ser Thr Gln Ser Asp Thr Cys Leu Gly Lys |     |     |      |
|                                                                 | 515 | 520 | 525  |
| gaa aac cgg ctt ctg gaa cat aac aga tca gtg tta tca ggt gac gac |     |     | 1632 |
| Glu Asn Arg Leu Leu Glu His Asn Arg Ser Val Leu Ser Gly Asp Asp |     |     |      |
|                                                                 | 530 | 535 | 540  |
| agt aca gga agt gag ccg cca tta tca cct ccg gaa agg ctc ccc atc |     |     | 1680 |
| Ser Thr Gly Ser Glu Pro Pro Leu Ser Pro Pro Glu Arg Leu Pro Ile |     |     |      |
| 545                                                             | 550 | 555 | 560  |
| aga cgc tct agt acc aga gac aaa aac aga aga ggg gaa aca tgt ttc |     |     | 1728 |
| Arg Arg Ser Ser Thr Arg Asp Lys Asn Arg Arg Gly Glu Thr Cys Phe |     |     |      |
|                                                                 | 565 | 570 | 575  |
| ctg ttg acg aca ggt gat tac acg tgc gct tct gat gga gga atc agg |     |     | 1776 |
| Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp Gly Gly Ile Arg |     |     |      |
|                                                                 | 580 | 585 | 590  |
| aaa gca agc aca cta gag ccc atg gag agt act tca cag act aaa gga |     |     | 1824 |
| Lys Ala Ser Thr Leu Glu Pro Met Glu Ser Thr Ser Gln Thr Lys Gly |     |     |      |
|                                                                 | 595 | 600 | 605  |
| gac acg aga cca gaa gct cac tgg aat tgt gcg cat tta ctc aat ttt |     |     | 1872 |
| Asp Thr Arg Pro Glu Ala His Trp Asn Cys Ala His Leu Leu Asn Phe |     |     |      |
|                                                                 | 610 | 615 | 620  |
| ggc tgt cct acg gga agt tca ttt ccc acc ctc taa                 |     |     | 1908 |
| Gly Cys Pro Thr Gly Ser Ser Phe Pro Thr Leu                     |     |     |      |
| 625                                                             | 630 | 635 |      |

&lt;210&gt; 16

&lt;211&gt; 635

&lt;212&gt; PRT

&lt;213&gt; Rattus norvegicus

&lt;400&gt; 16

|                                                                 |    |    |
|-----------------------------------------------------------------|----|----|
| Met Gly Lys Ile Glu Asn Asn Glu Arg Val Ile Leu Asn Val Gly Gly |    |    |
| 1                                                               | 5  | 10 |
| Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr |    |    |
|                                                                 | 20 | 25 |
| Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Gln Gly Asp Cys Leu Thr |    |    |
|                                                                 | 35 | 40 |
| Ala Ala Gly Asp Lys Leu Gln Pro Leu Pro Pro Pro Leu Ser Pro Pro |    |    |

|                     |                     |                         |
|---------------------|---------------------|-------------------------|
| 50                  | 55                  | 60                      |
| Pro Arg Pro Pro Pro | Leu Ser Pro Val Pro | Ser Gly Cys Phe Glu Gly |
| 65                  | 70                  | 75                      |
| Gly Ala Gly Asn Cys | Ser Ser His Gly Gly | Asn Gly Ser Asp His Pro |
| 85                  | 90                  | 95                      |
| Gly Gly Gly Arg Glu | Phe Phe Phe Asp Arg | His Pro Gly Val Phe Ala |
| 100                 | 105                 | 110                     |
| Tyr Val Leu Asn Tyr | Tyr Arg Thr Gly Lys | Leu His Cys Pro Ala Asp |
| 115                 | 120                 | 125                     |
| Val Cys Gly Pro Leu | Phe Glu Glu Glu Leu | Ala Phe Trp Gly Ile Asp |
| 130                 | 135                 | 140                     |
| Glu Thr Asp Val Glu | Pro Cys Cys Trp Met | Thr Tyr Arg Gln His Arg |
| 145                 | 150                 | 155                     |
| Asp Ala Glu Glu Ala | Leu Asp Ile Phe Glu | Thr Pro Asp Leu Ile Gly |
| 165                 | 170                 | 175                     |
| Gly Asp Pro Gly Asp | Asp Glu Asp Leu Gly | Gly Lys Arg Leu Gly Ile |
| 180                 | 185                 | 190                     |
| Glu Asp Ala Ala Gly | Leu Gly Gly Pro Asp | Gly Lys Ser Gly Arg Trp |
| 195                 | 200                 | 205                     |
| Arg Lys Leu Gln Pro | Arg Met Trp Ala Leu | Phe Glu Asp Pro Tyr Ser |
| 210                 | 215                 | 220                     |
| Ser Arg Ala Ala Arg | Phe Ile Ala Phe Ala | Ser Leu Phe Phe Ile Leu |
| 225                 | 230                 | 235                     |
| Val Ser Ile Thr Thr | Phe Cys Leu Glu Thr | His Glu Ala Phe Asn Ile |
| 245                 | 250                 | 255                     |
| Val Lys Asn Lys Thr | Glu Pro Val Ile Asn | Gly Thr Ser Ala Val Leu |
| 260                 | 265                 | 270                     |
| Gln Tyr Glu Ile Glu | Thr Asp Pro Ala Leu | Thr Tyr Val Glu Gly Val |
| 275                 | 280                 | 285                     |
| Cys Val Val Trp Phe | Thr Phe Glu Phe Leu | Val Arg Ile Val Phe Ser |
| 290                 | 295                 | 300                     |
| Pro Asn Lys Leu Glu | Phe Ile Lys Asn Leu | Leu Asn Ile Ile Asp Phe |
| 305                 | 310                 | 315                     |
| Val Ala Ile Leu Pro | Phe Tyr Leu Glu Val | Gly Leu Ser Gly Leu Ser |
| 325                 | 330                 | 335                     |
| Ser Lys Ala Ala Lys | Asp Val Leu Gly Phe | Leu Arg Val Val Arg Phe |
| 340                 | 345                 | 350                     |
| Val Arg Ile Leu Arg | Ile Phe Lys Leu Thr | Arg His Phe Val Gly Leu |
| 355                 | 360                 | 365                     |
| Arg Val Leu Gly His | Thr Leu Arg Ala Ser | Thr Asn Glu Phe Leu Leu |
| 370                 | 375                 | 380                     |
| Leu Ile Ile Phe Leu | Ala Leu Gly Val Leu | Ile Phe Ala Thr Met Ile |
| 385                 | 390                 | 395                     |
| Tyr Tyr Ala Glu Arg | Val Gly Ala Gln Pro | Asn Asp Pro Ser Ala Ser |
| 405                 | 410                 | 415                     |
| Glu His Thr Gln Phe | Lys Asn Ile Pro Ile | Gly Phe Trp Trp Ala Val |
| 420                 | 425                 | 430                     |
| Val Thr Met Thr Thr | Leu Gly Tyr Gly Asp | Met Tyr Pro Gln Thr Trp |
| 435                 | 440                 | 445                     |

Ser Gly Met Leu Val Gly Ala Leu Cys Ala Leu Ala Gly Val Leu Thr  
 450 455 460  
 Ile Ala Met Pro Val Pro Val Ile Val Asn Asn Phe Gly Met Tyr Tyr  
 465 470 475 480  
 Ser Leu Ala Met Ala Lys Gln Lys Leu Pro Arg Lys Arg Lys Lys His  
 485 490 495  
 Ile Pro Pro Ala Pro Leu Ala Ser Ser Pro Thr Phe Cys Lys Thr Glu  
 500 505 510  
 Leu Asn Met Ala Cys Asn Ser Thr Gln Ser Asp Thr Cys Leu Gly Lys  
 515 520 525  
 Glu Asn Arg Leu Leu Glu His Asn Arg Ser Val Leu Ser Gly Asp Asp  
 530 535 540  
 Ser Thr Gly Ser Glu Pro Pro Leu Ser Pro Pro Glu Arg Leu Pro Ile  
 545 550 555 560  
 Arg Arg Ser Ser Thr Arg Asp Lys Asn Arg Arg Gly Glu Thr Cys Phe  
 565 570 575  
 Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp Gly Gly Ile Arg  
 580 585 590  
 Lys Ala Ser Thr Leu Glu Pro Met Glu Ser Thr Ser Gln Thr Lys Gly  
 595 600 605  
 Asp Thr Arg Pro Glu Ala His Trp Asn Cys Ala His Leu Leu Asn Phe  
 610 615 620  
 Gly Cys Pro Thr Gly Ser Ser Phe Pro Thr Leu  
 625 630 635

<210> 17  
 <211> 1875  
 <212> DNA  
 <213> Rattus norvegicus

<220>  
 <221> CDS  
 <222> (1)..(1875)

<400> 17  
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 Met Gly Lys Ile Glu Asn Asn Glu Arg Val Ile Leu Asn Val Gly Gly  
 1 5 10 15  
 acc agg cac gaa acc tac cgc agc act ctc aag acc ctt cct gga act 96  
 Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr  
 20 25 30  
 cgc ctg gcc ctt ctc gcc tcc tct gaa cct cag ggc gac tgc ctg act 144  
 Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Gln Gly Asp Cys Leu Thr  
 35 40 45  
 gct gcg ggt gac aag ctg cag ccg ctg ccc cct ccg ctg tct cca ccg 192  
 Ala Ala Gly Asp Lys Leu Gln Pro Leu Pro Pro Pro Leu Ser Pro Pro  
 50 55 60  
 ccg cga ccg cct ccc ttg tcc cct gtc ccc agc ggc tgc ttc gag ggc 240

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |      |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|------|
| Pro | Arg | Pro | Pro | Pro | Leu | Ser | Pro | Val | Pro | Ser | Gly | Cys | Phe | Glu | Gly |  |      |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     |     | 80  |  |      |
| ggc | gca | ggc | aac | tgc | agt | tcg | cac | ggt | ggc | aat | ggc | agc | gac | cac | cct |  | 288  |
| Gly | Ala | Gly | Asn | Cys | Ser | Ser | His | Gly | Gly | Asn | Gly | Ser | Asp | His | Pro |  |      |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     |     | 95  |     |  |      |
| ggg | gga | ggc | cgc | gaa | ttc | ttc | ttc | gat | cgc | cac | cca | gga | gtc | ttc | gcc |  | 336  |
| Gly | Gly | Gly | Arg | Glu | Phe | Phe | Phe | Asp | Arg | His | Pro | Gly | Val | Phe | Ala |  |      |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     |     | 110 |     |  |      |
| tat | gtg | ctc | aac | tac | tac | cgc | acg | ggc | aag | ctg | cac | tgc | ccc | gcc | gac |  | 384  |
| Tyr | Val | Leu | Asn | Tyr | Tyr | Arg | Thr | Gly | Lys | Leu | His | Cys | Pro | Ala | Asp |  |      |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |  |      |
| gtg | tgt | gga | ccg | ctc | ttc | gag | gaa | gag | ctg | gca | ttc | tgg | ggc | atc | gat |  | 432  |
| Val | Cys | Gly | Pro | Leu | Phe | Glu | Glu | Glu | Leu | Ala | Phe | Trp | Gly | Ile | Asp |  |      |
|     |     | 130 |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |  |      |
| gag | acc | gac | gtg | gag | ccc | tgc | tgc | tgg | atg | acc | tac | agg | cag | cac | cgg |  | 480  |
| Glu | Thr | Asp | Val | Glu | Pro | Cys | Cys | Trp | Met | Thr | Tyr | Arg | Gln | His | Arg |  |      |
| 145 |     |     |     |     | 150 |     |     |     | 155 |     |     |     |     | 160 |     |  |      |
| gac | gcg | gag | gag | gcc | ctg | gat | atc | ttc | gag | aca | ccc | gac | ctc | atc | gga |  | 528  |
| Asp | Ala | Glu | Glu | Ala | Leu | Asp | Ile | Phe | Glu | Thr | Pro | Asp | Leu | Ile | Gly |  |      |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |  |      |
| ggc | gac | cct | ggt | gat | gat | gag | gac | cta | ggg | ggc | aag | aga | ctg | ggc | att |  | 576  |
| Gly | Asp | Pro | Gly | Asp | Asp | Glu | Asp | Leu | Gly | Gly | Lys | Arg | Leu | Gly | Ile |  |      |
|     |     | 180 |     |     |     |     |     | 185 |     |     |     |     | 190 |     |     |  |      |
| gag | gat | gct | gcg | ggg | ctg | gga | gga | ccc | gat | ggc | aag | tct | ggc | cgc | tgg |  | 624  |
| Glu | Asp | Ala | Ala | Gly | Leu | Gly | Gly | Pro | Asp | Gly | Lys | Ser | Gly | Arg | Trp |  |      |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |  |      |
| agg | aag | ctg | cag | cct | cgc | atg | tgg | gct | ctc | ttt | gag | gac | ccc | tat | tca |  | 672  |
| Arg | Lys | Leu | Gln | Pro | Arg | Met | Trp | Ala | Leu | Phe | Glu | Asp | Pro | Tyr | Ser |  |      |
|     |     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |  |      |
| tcc | aga | gcc | gct | agg | ttt | att | gct | ttt | gct | tct | ctg | ttc | ttc | att | ttg |  | 720  |
| Ser | Arg | Ala | Ala | Arg | Phe | Ile | Ala | Phe | Ala | Ser | Leu | Phe | Phe | Ile | Leu |  |      |
| 225 |     |     |     |     | 230 |     |     |     | 235 |     |     |     |     | 240 |     |  |      |
| gtt | tcc | atc | aca | acc | ttt | tgc | ctg | gag | aca | cac | gaa | gct | ttc | aat | att |  | 768  |
| Val | Ser | Ile | Thr | Thr | Phe | Cys | Leu | Glu | Thr | His | Glu | Ala | Phe | Asn | Ile |  |      |
|     |     |     |     |     | 245 |     |     |     | 250 |     |     |     |     | 255 |     |  |      |
| gtt | aaa | aac | aag | aca | gag | cca | gtc | atc | aac | ggc | acc | agc | gct | gtt | ctc |  | 816  |
| Val | Lys | Asn | Lys | Thr | Glu | Pro | Val | Ile | Asn | Gly | Thr | Ser | Ala | Val | Leu |  |      |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |  |      |
| cag | tat | gaa | atc | gaa | acg | gat | cct | gcc | ttg | aca | tat | gtg | gaa | gga | gtg |  | 864  |
| Gln | Tyr | Glu | Ile | Glu | Thr | Asp | Pro | Ala | Leu | Thr | Tyr | Val | Glu | Gly | Val |  |      |
|     |     | 275 |     |     |     |     |     | 280 |     |     |     |     | 285 |     |     |  |      |
| tgt | gtg | gtg | tgg | ttt | act | ttt | gaa | ttt | tta | gtc | cgt | att | gtt | ttc | tcg |  | 912  |
| Cys | Val | Val | Trp | Phe | Thr | Phe | Glu | Phe | Leu | Val | Arg | Ile | Val | Phe | Ser |  |      |
|     |     | 290 |     |     |     |     | 295 |     |     |     | 300 |     |     |     |     |  |      |
| ccc | aat | aaa | ctt | gag | ttc | atc | aaa | aat | cta | ttg | aac | atc | att | gac | ttt |  | 960  |
| Pro | Asn | Lys | Leu | Glu | Phe | Ile | Lys | Asn | Leu | Leu | Asn | Ile | Ile | Asp | Phe |  |      |
| 305 |     |     |     |     | 310 |     |     |     | 315 |     |     |     |     | 320 |     |  |      |
| gtg | gcc | atc | ctc | ccc | ttc | tac | tta | gag | gtg | gga | ctc | agc | ggg | ctg | tct |  | 1008 |
| Val | Ala | Ile | Leu | Pro | Phe | Tyr | Leu | Glu | Val | Gly | Leu | Ser | Gly | Leu | Ser |  |      |

|                                                                 |     |     |     |      |
|-----------------------------------------------------------------|-----|-----|-----|------|
|                                                                 | 325 | 330 | 335 |      |
| tcc aaa gcg gct aaa gat gtg ctc ggc ttt ctc agg gtg gtt agg ttt |     |     |     | 1056 |
| Ser Lys Ala Ala Lys Asp Val Leu Gly Phe Leu Arg Val Val Arg Phe |     |     |     |      |
|                                                                 | 340 | 345 | 350 |      |
| gtg agg atc ctg aga atc ttc aag ctt acc cgc cat ttc gta ggt ctg |     |     |     | 1104 |
| Val Arg Ile Leu Arg Ile Phe Lys Leu Thr Arg His Phe Val Gly Leu |     |     |     |      |
|                                                                 | 355 | 360 | 365 |      |
| aga gtg ctc gga cac act ctt cgt gcg agc acc aat gaa ttt ttg ttg |     |     |     | 1152 |
| Arg Val Leu Gly His Thr Leu Arg Ala Ser Thr Asn Glu Phe Leu Leu |     |     |     |      |
|                                                                 | 370 | 375 | 380 |      |
| ctg atc atc ttt ctg gct ctg gga gtt ttg ata ttc gct acg atg atc |     |     |     | 1200 |
| Leu Ile Ile Phe Leu Ala Leu Gly Val Leu Ile Phe Ala Thr Met Ile |     |     |     |      |
| 385                                                             | 390 | 395 | 400 |      |
| tac tac gct gag cga gta ggg gct caa cct aat gat ccc tca gcg agt |     |     |     | 1248 |
| Tyr Tyr Ala Glu Arg Val Gly Ala Gln Pro Asn Asp Pro Ser Ala Ser |     |     |     |      |
|                                                                 | 405 | 410 | 415 |      |
| gag cac aca cag ttc aaa aac atc ccc att ggt ttc ttg ttg gct gtg |     |     |     | 1296 |
| Glu His Thr Gln Phe Lys Asn Ile Pro Ile Gly Phe Trp Trp Ala Val |     |     |     |      |
|                                                                 | 420 | 425 | 430 |      |
| gtg acc atg act acc tta ggc tat ggg gat atg tac ccc caa aca tgg |     |     |     | 1344 |
| Val Thr Met Thr Thr Leu Gly Tyr Gly Asp Met Tyr Pro Gln Thr Trp |     |     |     |      |
|                                                                 | 435 | 440 | 445 |      |
| tca ggg atg ttg gtg ggg gcc ttg tgt gct ctg gct gga gtg ctg acc |     |     |     | 1392 |
| Ser Gly Met Leu Val Gly Ala Leu Cys Ala Leu Ala Gly Val Leu Thr |     |     |     |      |
|                                                                 | 450 | 455 | 460 |      |
| ata gct atg cct gtg ccc gtc att gtc aac aat ttt ggg atg tac tac |     |     |     | 1440 |
| Ile Ala Met Pro Val Pro Val Ile Val Asn Asn Phe Gly Met Tyr Tyr |     |     |     |      |
| 465                                                             | 470 | 475 | 480 |      |
| tcc ttg gca atg gcg aag cag aaa ctt cca aga aaa aga aag aag cac |     |     |     | 1488 |
| Ser Leu Ala Met Ala Lys Gln Lys Leu Pro Arg Lys Arg Lys Lys His |     |     |     |      |
|                                                                 | 485 | 490 | 495 |      |
| att cct cct gcc cct ctg gca agc tca cct aca ttt tgc aag aca gaa |     |     |     | 1536 |
| Ile Pro Pro Ala Pro Leu Ala Ser Ser Pro Thr Phe Cys Lys Thr Glu |     |     |     |      |
|                                                                 | 500 | 505 | 510 |      |
| tta aac atg gct tgt aac agt acc cag agt gac aca tgt ctg ggc aaa |     |     |     | 1584 |
| Leu Asn Met Ala Cys Asn Ser Thr Gln Ser Asp Thr Cys Leu Gly Lys |     |     |     |      |
|                                                                 | 515 | 520 | 525 |      |
| gaa aac cgg ctt ctg gaa cat aac aga tca gtg tta tca ggt gac gac |     |     |     | 1632 |
| Glu Asn Arg Leu Leu Glu His Asn Arg Ser Val Leu Ser Gly Asp Asp |     |     |     |      |
|                                                                 | 530 | 535 | 540 |      |
| agt aca gga agt gag ccg cca tta tca cct ccg gaa agg ctc ccc atc |     |     |     | 1680 |
| Ser Thr Gly Ser Glu Pro Pro Leu Ser Pro Pro Glu Arg Leu Pro Ile |     |     |     |      |
| 545                                                             | 550 | 555 | 560 |      |
| aga cgc tct agt acc aga gac aaa aac aga aga ggg gaa aca tgt ttc |     |     |     | 1728 |
| Arg Arg Ser Ser Thr Arg Asp Lys Asn Arg Arg Gly Glu Thr Cys Phe |     |     |     |      |
|                                                                 | 565 | 570 | 575 |      |
| ctg ttg acg aca ggt gat tac acg tgc gct tct gat gga gga atc agg |     |     |     | 1776 |
| Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp Gly Gly Ile Arg |     |     |     |      |
|                                                                 | 580 | 585 | 590 |      |

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aaa gtg ttg tac aga att tat cat gga ttt ttg cct gct gaa aat ggg      1824
Lys Val Leu Tyr Arg Ile Tyr His Gly Phe Leu Pro Ala Glu Asn Gly
      595                      600                      605
aca ttg aga ttt agc cat tcc aag gat tgt act gga aac ttc tgc tac      1872
Thr Leu Arg Phe Ser His Ser Lys Asp Cys Thr Gly Asn Phe Cys Tyr
      610                      615                      620
tga                                                                    1875

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<210> 18
<211> 624
<212> PRT
<213> Rattus norvegicus

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<400> 18
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Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr
      20      25      30
Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Gln Gly Asp Cys Leu Thr
      35      40      45
Ala Ala Gly Asp Lys Leu Gln Pro Leu Pro Pro Pro Leu Ser Pro Pro
      50      55      60
Pro Arg Pro Pro Pro Leu Ser Pro Val Pro Ser Gly Cys Phe Glu Gly
65      70      75      80
Gly Ala Gly Asn Cys Ser Ser His Gly Gly Asn Gly Ser Asp His Pro
      85      90      95
Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro Gly Val Phe Ala
      100     105     110
Tyr Val Leu Asn Tyr Tyr Arg Thr Gly Lys Leu His Cys Pro Ala Asp
      115     120     125
Val Cys Gly Pro Leu Phe Glu Glu Glu Leu Ala Phe Trp Gly Ile Asp
      130     135     140
Glu Thr Asp Val Glu Pro Cys Cys Trp Met Thr Tyr Arg Gln His Arg
145     150     155     160
Asp Ala Glu Glu Ala Leu Asp Ile Phe Glu Thr Pro Asp Leu Ile Gly
      165     170     175
Gly Asp Pro Gly Asp Asp Glu Asp Leu Gly Gly Lys Arg Leu Gly Ile
      180     185     190
Glu Asp Ala Ala Gly Leu Gly Gly Pro Asp Gly Lys Ser Gly Arg Trp
      195     200     205
Arg Lys Leu Gln Pro Arg Met Trp Ala Leu Phe Glu Asp Pro Tyr Ser
210     215     220
Ser Arg Ala Ala Arg Phe Ile Ala Phe Ala Ser Leu Phe Phe Ile Leu
225     230     235     240
Val Ser Ile Thr Thr Phe Cys Leu Glu Thr His Glu Ala Phe Asn Ile
      245     250     255
Val Lys Asn Lys Thr Glu Pro Val Ile Asn Gly Thr Ser Ala Val Leu
      260     265     270

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Gln Tyr Glu Ile Glu Thr Asp Pro Ala Leu Thr Tyr Val Glu Gly Val  
 275 280 285  
 Cys Val Val Trp Phe Thr Phe Glu Phe Leu Val Arg Ile Val Phe Ser  
 290 295 300  
 Pro Asn Lys Leu Glu Phe Ile Lys Asn Leu Leu Asn Ile Ile Asp Phe  
 305 310 315 320  
 Val Ala Ile Leu Pro Phe Tyr Leu Glu Val Gly Leu Ser Gly Leu Ser  
 325 330 335  
 Ser Lys Ala Ala Lys Asp Val Leu Gly Phe Leu Arg Val Val Arg Phe  
 340 345 350  
 Val Arg Ile Leu Arg Ile Phe Lys Leu Thr Arg His Phe Val Gly Leu  
 355 360 365  
 Arg Val Leu Gly His Thr Leu Arg Ala Ser Thr Asn Glu Phe Leu Leu  
 370 375 380  
 Leu Ile Ile Phe Leu Ala Leu Gly Val Leu Ile Phe Ala Thr Met Ile  
 385 390 395 400  
 Tyr Tyr Ala Glu Arg Val Gly Ala Gln Pro Asn Asp Pro Ser Ala Ser  
 405 410 415  
 Glu His Thr Gln Phe Lys Asn Ile Pro Ile Gly Phe Trp Trp Ala Val  
 420 425 430  
 Val Thr Met Thr Thr Leu Gly Tyr Gly Asp Met Tyr Pro Gln Thr Trp  
 435 440 445  
 Ser Gly Met Leu Val Gly Ala Leu Cys Ala Leu Ala Gly Val Leu Thr  
 450 455 460  
 Ile Ala Met Pro Val Pro Val Ile Val Asn Asn Phe Gly Met Tyr Tyr  
 465 470 475 480  
 Ser Leu Ala Met Ala Lys Gln Lys Leu Pro Arg Lys Arg Lys Lys His  
 485 490 495  
 Ile Pro Pro Ala Pro Leu Ala Ser Ser Pro Thr Phe Cys Lys Thr Glu  
 500 505 510  
 Leu Asn Met Ala Cys Asn Ser Thr Gln Ser Asp Thr Cys Leu Gly Lys  
 515 520 525  
 Glu Asn Arg Leu Leu Glu His Asn Arg Ser Val Leu Ser Gly Asp Asp  
 530 535 540  
 Ser Thr Gly Ser Glu Pro Pro Leu Ser Pro Pro Glu Arg Leu Pro Ile  
 545 550 555 560  
 Arg Arg Ser Ser Thr Arg Asp Lys Asn Arg Arg Gly Glu Thr Cys Phe  
 565 570 575  
 Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp Gly Gly Ile Arg  
 580 585 590  
 Lys Val Leu Tyr Arg Ile Tyr His Gly Phe Leu Pro Ala Glu Asn Gly  
 595 600 605  
 Thr Leu Arg Phe Ser His Ser Lys Asp Cys Thr Gly Asn Phe Cys Tyr  
 610 615 620

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&lt;211&gt; 34

&lt;212&gt; DNA

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<220>

<223> primer

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34

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31

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23

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24

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24

<210> 27

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aagaggggtgt ggtcgagagg aaac

24

<210> 28

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<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 28

aagagcacag gtgtgagaca ctgg

24

<210> 29

<211> 36

<212> DNA

<213> Artificial Sequence

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<400> 29

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36

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32

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 ctgttcgcga catgtcgcac acag 24

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 <222> (1)..(1716)

<400> 39  
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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Met | gly | Lys | Ile | asp | glu | asn | glu | Lys | Ile | Ile | Leu | asn | Val | gly | gly |     |  |
| 1   |     |     | 5   |     |     |     |     | 10  |     |     |     | 15  |     |     |     |     |  |
| acg | aga | cac | gag | act | tac | cga | agc | acc | tta | aag | aca | gtg | ccc | ggg | act | 96  |  |
| thr | arg | His | glu | thr | tyr | arg | Ser | thr | Leu | Lys | thr | Val | Pro | gly | thr |     |  |
|     |     | 20  |     |     |     |     | 25  |     |     |     | 30  |     |     |     |     |     |  |
| cgc | ttg | gct | cta | ctt | gcc | tgt | gat | gct | ccc | agt | gac | cag | agg | ctg | gac | 144 |  |
| arg | Leu | ala | Leu | Leu | ala | cys | asp | ala | Pro | Ser | asp | gln | arg | Leu | asp |     |  |
|     | 35  |     |     |     |     | 40  |     |     | 45  |     |     |     |     |     |     |     |  |
| cag | cag | aca | gtg | tcg | ggc | tcc | ttc | aac | atc | acc | tcc | aga | ggc | aat | gaa | 192 |  |
| gln | gln | thr | Val | Ser | gly | Ser | Phe | asn | Ile | thr | Ser | arg | gly | asn | glu |     |  |
|     | 50  |     |     |     | 55  |     |     |     | 60  |     |     |     |     |     |     |     |  |
| ttc | ttc | ttc | gac | aga | cac | ccc | gga | gta | ttt | gcc | tat | gta | ctc | aac | tac | 240 |  |
| Phe | Phe | Phe | asp | arg | His | Pro | gly | Val | Phe | ala | tyr | Val | Leu | asn | tyr |     |  |
| 65  |     |     | 70  |     |     | 75  |     |     | 80  |     |     |     |     |     |     |     |  |
| tac | cgc | acc | ggc | aag | ctg | cac | tgc | ccc | gct | gat | gtg | tgc | ggg | ccc | ctc | 288 |  |
| tyr | arg | thr | gly | Lys | Leu | His | cys | Pro | ala | asp | Val | cys | gly | Pro | Leu |     |  |
|     |     | 85  |     |     |     | 90  |     |     | 95  |     |     |     |     |     |     |     |  |
| ttt | gaa | gag | gag | ttg | gca | ttt | tgg | ggc | att | gat | gag | acg | gac | gtg | gag | 336 |  |
| Phe | glu | glu | glu | Leu | ala | Phe | trp | gly | Ile | asp | glu | thr | asp | Val | glu |     |  |
|     | 100 |     |     |     |     | 105 |     |     | 110 |     |     |     |     |     |     |     |  |
| ccc | tgt | tgc | tgg | atg | acc | tat | cgc | caa | cac | cgg | gat | gca | gaa | gaa | gct | 384 |  |
| Pro | cys | cys | trp | Met | thr | tyr | arg | gln | His | arg | asp | ala | glu | glu | ala |     |  |
|     | 115 |     |     |     |     | 120 |     |     | 125 |     |     |     |     |     |     |     |  |
| ttg | gac | agc | ttt | gaa | aat | ccc | gac | ctg | atc | aca | ggg | gaa | cct | cta | gat | 432 |  |
| Leu | asp | Ser | Phe | glu | asn | Pro | asp | Leu | Ile | thr | gly | glu | Pro | Leu | asp |     |  |
|     | 130 |     |     |     |     | 135 |     |     | 140 |     |     |     |     |     |     |     |  |
| gaa | tat | gag | gag | gag | ttg | ggg | aag | aga | ctg | gca | att | gag | gac | gtg | gtg | 480 |  |
| glu | tyr | glu | glu | glu | Leu | gly | Lys | arg | Leu | ala | Ile | glu | asp | Val | Val |     |  |
|     | 145 |     |     |     | 150 |     |     |     | 155 |     |     |     |     | 160 |     |     |  |
| tgt | ccc | gat | ggc | aag | gtt | ggg | cgt | tgg | aga | aga | cta | agg | cct | cgc | ata | 528 |  |
| cys | Pro | asp | gly | Lys | Val | gly | arg | trp | arg | arg | Leu | arg | Pro | arg | Ile |     |  |
|     |     | 165 |     |     |     | 170 |     |     | 175 |     |     |     |     |     |     |     |  |
| tgg | gct | tta | ttt | gaa | gat | ccc | tat | tct | tcc | aga | gcc | gcc | cgg | ttc | atc | 576 |  |
| trp | ala | Leu | Phe | glu | asp | Pro | tyr | Ser | Ser | arg | ala | ala | arg | Phe | Ile |     |  |
|     | 180 |     |     |     |     | 185 |     |     | 190 |     |     |     |     |     |     |     |  |
| gcc | ttt | gct | tcc | ctg | ttc | ttc | att | ctg | gta | tct | ata | aca | acc | ttt | tgc | 624 |  |
| ala | Phe | ala | Ser | Leu | Phe | Phe | Ile | Leu | Val | Ser | Ile | thr | thr | Phe | cys |     |  |
|     | 195 |     |     |     |     | 200 |     |     | 205 |     |     |     |     |     |     |     |  |
| ttg | gag | act | cat | gaa | gca | ttt | aat | acc | atc | att | aac | aaa | acg | gaa | act | 672 |  |
| Leu | glu | thr | His | glu | ala | Phe | asn | thr | Ile | Ile | asn | Lys | thr | glu | thr |     |  |
|     | 210 |     |     |     |     | 215 |     |     | 220 |     |     |     |     |     |     |     |  |
| gta | aac | aat | ggt | aca | gaa | tta | atc | tca | ttg | att | gaa | ata | gaa | act | gat | 720 |  |
| Val | asn | asn | gly | thr | glu | Leu | Ile | Ser | Leu | Ile | glu | Ile | glu | thr | asp |     |  |
|     | 225 |     |     |     | 230 |     |     |     | 235 |     |     |     |     | 240 |     |     |  |
| cca | gcc | ttg | acg | tat | gtg | gaa | gga | gta | tgc | gtg | gtt | tgg | ttc | aca | ttt | 768 |  |
| Pro | ala | Leu | thr | tyr | Val | glu | gly | Val | cys | Val | Val | trp | Phe | thr | Phe |     |  |
|     |     | 245 |     |     |     | 250 |     |     | 255 |     |     |     |     |     |     |     |  |
| gag | ttt | tta | gta | cgt | gtc | att | ttc | tgc | cct | gac | aaa | ctt | gaa | ttc | atc | 816 |  |
| glu | Phe | Leu | Val | arg | Val | Ile | Phe | cys | Pro | asp | Lys | Leu | glu | Phe | Ile |     |  |

|                                                                 |     |     |     |     |     |      |
|-----------------------------------------------------------------|-----|-----|-----|-----|-----|------|
|                                                                 | 260 |     | 265 |     | 270 |      |
| aga aat ctt tta aat ata ata gat ttt gtg gca att ctg ccc ttt tat |     |     |     |     |     | 864  |
| arg asn Leu Leu asn Ile Ile asp Phe Val ala Ile Leu Pro Phe tyr |     |     |     |     |     |      |
|                                                                 | 275 |     | 280 |     | 285 |      |
| ttg gaa gtt gga cta agt ggg ctt tcc tcc aaa gct gct aag gat gtt |     |     |     |     |     | 912  |
| Leu glu Val gly Leu Ser gly Leu Ser Ser Lys ala ala Lys asp Val |     |     |     |     |     |      |
|                                                                 | 290 |     | 295 |     | 300 |      |
| ctc ggg ttc ctc agg gtt gta aga ttt gtt cgc atc ctt cga att ttt |     |     |     |     |     | 960  |
| Leu gly Phe Leu arg Val Val arg Phe Val arg Ile Leu arg Ile Phe |     |     |     |     |     |      |
| 305                                                             |     | 310 |     | 315 |     | 320  |
| aaa ctg acc cgc cat ttt gta gga ctt aga gtg ctg ggg cac aca ctt |     |     |     |     |     | 1008 |
| Lys Leu thr arg His Phe Val gly Leu arg Val Leu gly His thr Leu |     |     |     |     |     |      |
|                                                                 | 325 |     | 330 |     | 335 |      |
| cgt gcg agc act aat gaa ttt ttg ctc ctt att att ttt ttg gct ctg |     |     |     |     |     | 1056 |
| arg ala Ser thr asn glu Phe Leu Leu Leu Ile Ile Phe Leu ala Leu |     |     |     |     |     |      |
|                                                                 | 340 |     | 345 |     | 350 |      |
| gga gtc ttg ata ttt gcc aca atg atc tat tac gct gaa aga ata ggt |     |     |     |     |     | 1104 |
| gly Val Leu Ile Phe ala thr Met Ile tyr tyr ala glu arg Ile gly |     |     |     |     |     |      |
|                                                                 | 355 |     | 360 |     | 365 |      |
| gcc agt cca agt gat cca tcg gca agt aaa cat aca caa ttc aaa aac |     |     |     |     |     | 1152 |
| ala Ser Pro Ser asp Pro Ser ala Ser Lys His thr gln Phe Lys asn |     |     |     |     |     |      |
|                                                                 | 370 |     | 375 |     | 380 |      |
| att cca att gga ttc tgg tgg gct gtg gta act atg act acc ctg gga |     |     |     |     |     | 1200 |
| Ile Pro Ile gly Phe trp trp ala Val Val thr Met thr thr Leu gly |     |     |     |     |     |      |
| 385                                                             |     | 390 |     | 395 |     | 400  |
| tat ggg gat atg tac cct cag act tgg tca ggg atg ttg gta gga gca |     |     |     |     |     | 1248 |
| tyr gly asp Met tyr Pro gln thr trp Ser gly Met Leu Val gly ala |     |     |     |     |     |      |
|                                                                 | 405 |     | 410 |     | 415 |      |
| tta tgt gct ttg gct ggt gta ctt aca ata gca atg cct gtc cca gtc |     |     |     |     |     | 1296 |
| Leu cys ala Leu ala gly Val Leu thr Ile ala Met Pro Val Pro Val |     |     |     |     |     |      |
|                                                                 | 420 |     | 425 |     | 430 |      |
| att gtt aac aac ttt gga atg tat tac tca ctt gct atg gca aaa cag |     |     |     |     |     | 1344 |
| Ile Val asn asn Phe gly Met tyr tyr Ser Leu ala Met ala Lys gln |     |     |     |     |     |      |
|                                                                 | 435 |     | 440 |     | 445 |      |
| aag ctt cca agg aaa aga aag aaa tac att cct cat gct cct cag gct |     |     |     |     |     | 1392 |
| Lys Leu Pro arg Lys arg Lys Lys tyr Ile Pro His ala Pro gln ala |     |     |     |     |     |      |
|                                                                 | 450 |     | 455 |     | 460 |      |
| gga tcc cct act ttc tgc aag atg gac cta agt att gga tgc aat agc |     |     |     |     |     | 1440 |
| gly Ser Pro thr Phe cys Lys Met asp Leu Ser Ile gly cys asn Ser |     |     |     |     |     |      |
| 465                                                             |     | 470 |     | 475 |     | 480  |
| aca cag gta gac aca tgt ctt gga aaa gac aac aga ctg atg gaa cac |     |     |     |     |     | 1488 |
| thr gln Val asp thr cys Leu gly Lys asp asn arg Leu Met glu His |     |     |     |     |     |      |
|                                                                 | 485 |     | 490 |     | 495 |      |
| aac atg tca ggt gaa gac agt tca gga agt gac cag cca ctt tcc cct |     |     |     |     |     | 1536 |
| asn Met Ser gly glu asp Ser Ser gly Ser asp gln Pro Leu Ser Pro |     |     |     |     |     |      |
|                                                                 | 500 |     | 505 |     | 510 |      |
| ggt gaa aga tat cct ata aga cgt tct agt acc cgc gat aaa aac aga |     |     |     |     |     | 1584 |
| gly glu arg tyr Pro Ile arg arg Ser Ser thr arg asp Lys asn arg |     |     |     |     |     |      |
|                                                                 | 515 |     | 520 |     | 525 |      |

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agg acg gga act tgt ttc cta ctg acc aca ggt gaa tac acg tgc aat      1632
arg thr gly thr cys Phe Leu Leu thr thr gly glu tyr thr cys asn
   530                535                540
aca gat gga ggt ata cgg aaa gat aac tgc aaa gag gtt gtc att act      1680
thr asp gly gly Ile arg Lys asp asn cys Lys glu Val Val Ile thr
545                550                555                560
ggt tac acg caa gca gag gcc aga tct ctt tca taa      1716
gly tyr thr gln ala glu ala arg Ser Leu Ser
                565                570

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<212> PRT
<213> Xenopus laevis

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<400> 40
Met gly Lys Ile asp glu asn glu Lys Ile Ile Leu asn Val gly gly
1                5                10                15
thr arg His glu thr tyr arg Ser thr Leu Lys thr Val Pro gly thr
                20                25                30
arg Leu ala Leu Leu ala cys asp ala Pro Ser asp gln arg Leu asp
                35                40                45
gln gln thr Val Ser gly Ser Phe asn Ile thr Ser arg gly asn glu
                50                55                60
Phe Phe Phe asp arg His Pro gly Val Phe ala tyr Val Leu asn tyr
65                70                75                80
tyr arg thr gly Lys Leu His cys Pro ala asp Val cys gly Pro Leu
                85                90                95
Phe glu glu glu Leu ala Phe trp gly Ile asp glu thr asp Val glu
                100                105                110
Pro cys cys trp Met thr tyr arg gln His arg asp ala glu glu ala
                115                120                125
Leu asp Ser Phe glu asn Pro asp Leu Ile thr gly glu Pro Leu asp
                130                135                140
glu tyr glu glu glu Leu gly Lys arg Leu ala Ile glu asp Val Val
145                150                155                160
cys Pro asp gly Lys Val gly arg trp arg arg Leu arg Pro arg Ile
                165                170                175
trp ala Leu Phe glu asp Pro tyr Ser Ser arg ala ala arg Phe Ile
                180                185                190
ala Phe ala Ser Leu Phe Phe Ile Leu Val Ser Ile thr thr Phe cys
                195                200                205
Leu glu thr His glu ala Phe asn thr Ile Ile asn Lys thr glu thr
                210                215                220
Val asn asn gly thr glu Leu Ile Ser Leu Ile glu Ile glu thr asp
225                230                235                240
Pro ala Leu thr tyr Val glu gly Val cys Val Val trp Phe thr Phe
                245                250                255

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glu Phe Leu Val arg Val Ile Phe cys Pro asp Lys Leu glu Phe Ile
      260                      265                      270
arg asn Leu Leu asn Ile Ile asp Phe Val ala Ile Leu Pro Phe tyr
      275                      280                      285
Leu glu Val gly Leu Ser gly Leu Ser Ser Lys ala ala Lys asp Val
      290                      295                      300
Leu gly Phe Leu arg Val Val arg Phe Val arg Ile Leu arg Ile Phe
305                      310                      315                      320
Lys Leu thr arg His Phe Val gly Leu arg Val Leu gly His thr Leu
      325                      330                      335
arg ala Ser thr asn glu Phe Leu Leu Leu Ile Ile Phe Leu ala Leu
      340                      345                      350
gly Val Leu Ile Phe ala thr Met Ile tyr tyr ala glu arg Ile gly
      355                      360                      365
ala Ser Pro Ser asp Pro Ser ala Ser Lys His thr gln Phe Lys asn
      370                      375                      380
Ile Pro Ile gly Phe trp trp ala Val Val thr Met thr thr Leu gly
385                      390                      395                      400
tyr gly asp Met tyr Pro gln thr trp Ser gly Met Leu Val gly ala
      405                      410                      415
Leu cys ala Leu ala gly Val Leu thr Ile ala Met Pro Val Pro Val
      420                      425                      430
Ile Val asn asn Phe gly Met tyr tyr Ser Leu ala Met ala Lys gln
      435                      440                      445
Lys Leu Pro arg Lys arg Lys Lys tyr Ile Pro His ala Pro gln ala
      450                      455                      460
gly Ser Pro thr Phe cys Lys Met asp Leu Ser Ile gly cys asn Ser
465                      470                      475                      480
thr gln Val asp thr cys Leu gly Lys asp asn arg Leu Met glu His
      485                      490                      495
asn Met Ser gly glu asp Ser Ser gly Ser asp gln Pro Leu Ser Pro
      500                      505                      510
gly glu arg tyr Pro Ile arg arg Ser Ser thr arg asp Lys asn arg
      515                      520                      525
arg thr gly thr cys Phe Leu Leu thr thr gly glu tyr thr cys asn
      530                      535                      540
thr asp gly gly Ile arg Lys asp asn cys Lys glu Val Val Ile thr
545                      550                      555                      560
gly tyr thr gln ala glu ala arg Ser Leu Ser
      565                      570

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<210> 41

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 41  
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<220>  
<223> primer

&lt;400&gt; 45

cacagacgct gaccatgaat gtg

23

&lt;210&gt; 46

&lt;211&gt; 1929

&lt;212&gt; DNA

&lt;213&gt; Mus musculus

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(1929)

&lt;400&gt; 46

|                                                                 |     |
|-----------------------------------------------------------------|-----|
| atg ggc aag atc gag agc aac gag agg gtg atc ctc aat gtc ggg ggt | 48  |
| Met Gly Lys Ile Glu Ser Asn Glu Arg Val Ile Leu Asn Val Gly Gly |     |
| 1 5 10 15                                                       |     |
| acc agg cac gaa acc tac cgc agc acc ctc aag acc ctg cct gga act | 96  |
| Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr |     |
| 20 25 30                                                        |     |
| cgc ctg gcc ctt ctt gcc tcc tct gaa cct cag ggc gac tgc ctg act | 144 |
| Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Gln Gly Asp Cys Leu Thr |     |
| 35 40 45                                                        |     |
| gcg gcc ggg gac aag ctg caa ccg ctg ccc cct ccg ctg tct ccg ccg | 192 |
| Ala Ala Gly Asp Lys Leu Gln Pro Leu Pro Pro Pro Leu Ser Pro Pro |     |
| 50 55 60                                                        |     |
| cca cga ccg cct ccc ttg tcc cct gtc ccc agc ggc tgc ttc gag ggc | 240 |
| Pro Arg Pro Pro Pro Leu Ser Pro Val Pro Ser Gly Cys Phe Glu Gly |     |
| 65 70 75 80                                                     |     |
| ggc gca ggc aac tgc agt tgc cac ggt ggc aac ggc ggc aac ggc ggc | 288 |
| Gly Ala Gly Asn Cys Ser Ser His Gly Gly Asn Gly Gly Asn Gly Gly |     |
| 85 90 95                                                        |     |
| agc gac cac cct ggg gga ggc cgc gaa ttc ttc ttc gat cgc cac cca | 336 |
| Ser Asp His Pro Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro |     |
| 100 105 110                                                     |     |
| gga gta ttc gcc tat gtg ctc aat tac tac cgc acg ggc aag ctg cac | 384 |
| Gly Val Phe Ala Tyr Val Leu Asn Tyr Tyr Arg Thr Gly Lys Leu His |     |
| 115 120 125                                                     |     |
| tgc ccc gcc gac gtg tgc ggg ccg ctc ttc gag gaa gag ctg gct ttc | 432 |
| Cys Pro Ala Asp Val Cys Gly Pro Leu Phe Glu Glu Glu Leu Ala Phe |     |
| 130 135 140                                                     |     |
| tgg ggc atc gat gag acc gac gtg gag ccc tgc tgc tgg atg acc tac | 480 |
| Trp Gly Ile Asp Glu Thr Asp Val Glu Pro Cys Cys Trp Met Thr Tyr |     |
| 145 150 155 160                                                 |     |
| agg cag cac cgg gac gcg gag gag gcc ctg gac atc ttt gag aca ccc | 528 |
| Arg Gln His Arg Asp Ala Glu Glu Ala Leu Asp Ile Phe Glu Thr Pro |     |
| 165 170 175                                                     |     |
| gac ctc atc ggg ggc gac cct ggt gat gat gag gac cta gcg gcc aag | 576 |
| Asp Leu Ile Gly Gly Asp Pro Gly Asp Asp Glu Asp Leu Ala Ala Lys |     |

|                                                                 |      |
|-----------------------------------------------------------------|------|
| aga ttg ggc att gag gat gct gcg ggg ctg gga gga ccc gat ggc aag | 624  |
| Arg Leu Gly Ile Glu Asp Ala Ala Gly Leu Gly Gly Pro Asp Gly Lys |      |
| 180 195 200 205                                                 |      |
| tca ggc cgc tgg agg aag ctg cag cct cgc atg tgg gct ctt ttt gag | 672  |
| Ser Gly Arg Trp Arg Lys Leu Gln Pro Arg Met Trp Ala Leu Phe Glu |      |
| 210 215 220                                                     |      |
| gac ccc tac tca tct aga gcc gct agg ttt att gct ttt gct tct ttg | 720  |
| Asp Pro Tyr Ser Ser Arg Ala Ala Arg Phe Ile Ala Phe Ala Ser Leu |      |
| 225 230 235 240                                                 |      |
| ttc ttc att ttg gtt tcc atc aca acc ttt tgc ctg gag aca cat gaa | 768  |
| Phe Phe Ile Leu Val Ser Ile Thr Thr Phe Cys Leu Glu Thr His Glu |      |
| 245 250 255                                                     |      |
| gct ttc aat att gtt aaa aac aag acg gag ccc gtc atc aat ggc acc | 816  |
| Ala Phe Asn Ile Val Lys Asn Lys Thr Glu Pro Val Ile Asn Gly Thr |      |
| 260 265 270                                                     |      |
| agc ccg gtc ctc cag tac gaa atc gaa acg gat ccc gcc ctg acg tac | 864  |
| Ser Pro Val Leu Gln Tyr Glu Ile Glu Thr Asp Pro Ala Leu Thr Tyr |      |
| 275 280 285                                                     |      |
| gtg gaa gga gta tgt gtg gtg tgg ttt acg ttt gaa ttt tta gtc cga | 912  |
| Val Glu Gly Val Cys Val Val Trp Phe Thr Phe Glu Phe Leu Val Arg |      |
| 290 295 300                                                     |      |
| att gtt ttc tca ccc aat aaa ctt gaa ttc atc aaa aat ctc ttg aac | 960  |
| Ile Val Phe Ser Pro Asn Lys Leu Glu Phe Ile Lys Asn Leu Leu Asn |      |
| 305 310 315 320                                                 |      |
| atc att gac ttt gtg gcc atc ctc ccc ttc tac cta gag gtg gga ctc | 1008 |
| Ile Ile Asp Phe Val Ala Ile Leu Pro Phe Tyr Leu Glu Val Gly Leu |      |
| 325 330 335                                                     |      |
| agc ggg ctg tcc tcc aaa gcg gcc aaa gat gtg ctc ggc ttt ctc agg | 1056 |
| Ser Gly Leu Ser Ser Lys Ala Ala Lys Asp Val Leu Gly Phe Leu Arg |      |
| 340 345 350                                                     |      |
| gtg gtt agg ttt gtg agg atc ctg aga atc ttc aag ctc acc cgc cat | 1104 |
| Val Val Arg Phe Val Arg Ile Leu Arg Ile Phe Lys Leu Thr Arg His |      |
| 355 360 365                                                     |      |
| ttc gta ggt ctg agg gtg ctc gga cat act ctt cgg gcg agc acc aac | 1152 |
| Phe Val Gly Leu Arg Val Leu Gly His Thr Leu Arg Ala Ser Thr Asn |      |
| 370 375 380                                                     |      |
| gaa ttt ttg ttg ctg atc atc ttc ctg gcg ctg gga gtt ttg ata ttc | 1200 |
| Glu Phe Leu Leu Leu Ile Ile Phe Leu Ala Leu Gly Val Leu Ile Phe |      |
| 385 390 395 400                                                 |      |
| gct acg atg atc tac tac gct gag aga gta ggg gct cag ccc aat gac | 1248 |
| Ala Thr Met Ile Tyr Tyr Ala Glu Arg Val Gly Ala Gln Pro Asn Asp |      |
| 405 410 415                                                     |      |
| cct tca gct agt gag cac acg cag ttc aaa aac atc ccc att ggt ttc | 1296 |
| Pro Ser Ala Ser Glu His Thr Gln Phe Lys Asn Ile Pro Ile Gly Phe |      |
| 420 425 430                                                     |      |
| tgg tgg gcc gta gtg acc atg act acc tta ggt tac ggg gat atg tac | 1344 |
| Trp Trp Ala Val Val Thr Met Thr Thr Leu Gly Tyr Gly Asp Met Tyr |      |
| 435 440 445                                                     |      |

```

ccc caa aca tgg tca ggg atg ttg gtg ggg gcc ttg tgt gcc ctg gcc      1392
Pro Gln Thr Trp Ser Gly Met Leu Val Gly Ala Leu Cys Ala Leu Ala
    450                      455                      460

gga gtg ctg aca ata gcc atg cct gtg cct gtc att gtc aac aat ttt      1440
Gly Val Leu Thr Ile Ala Met Pro Val Pro Val Ile Val Asn Asn Phe
465                      470                      475                      480

gga atg tac tac tcc ttg gca atg gcg aag cag aaa ctt cca aga aag      1488
Gly Met Tyr Tyr Ser Leu Ala Met Ala Lys Gln Lys Leu Pro Arg Lys
    485                      490                      495

aga aag aag cat att cct cct gcc cct ctg gca agc tcg cct aca ttt      1536
Arg Lys Lys His Ile Pro Pro Ala Pro Leu Ala Ser Ser Pro Thr Phe
    500                      505                      510

tgc aag aca gaa ttg aac atg gct tgc aac agt acc cag agt gac aca      1584
Cys Lys Thr Glu Leu Asn Met Ala Cys Asn Ser Thr Gln Ser Asp Thr
    515                      520                      525

tgt ctg ggc aaa gaa aac cgg ctt ctg gaa cat aac aga tca gtg tta      1632
Cys Leu Gly Lys Glu Asn Arg Leu Leu Glu His Asn Arg Ser Val Leu
    530                      535                      540

tca ggt gac gac agt aca gga agt gag ccg cca tta tca cct cca gaa      1680
Ser Gly Asp Asp Ser Thr Gly Ser Glu Pro Pro Leu Ser Pro Pro Glu
545                      550                      555                      560

agg ctc cct atc aga cgc tct agt acc aga gac aaa aac aga aga ggg      1728
Arg Leu Pro Ile Arg Arg Ser Ser Thr Arg Asp Lys Asn Arg Arg Gly
    565                      570                      575

gaa acg tgt ttc ctg ttg acg aca ggt gat tac acg tgc gct tct gat      1776
Glu Thr Cys Phe Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp
    580                      585                      590

gga gga atc agg aaa gga tat gaa aaa tcc cga agc tta aac aac ata      1824
Gly Gly Ile Arg Lys Gly Tyr Glu Lys Ser Arg Ser Leu Asn Asn Ile
    595                      600                      605

gcg ggc ttg gca ggc aat gct ctg aga ctc tct cca gta acg tcc ccc      1872
Ala Gly Leu Ala Gly Asn Ala Leu Arg Leu Ser Pro Val Thr Ser Pro
    610                      615                      620

tac aac tct ccg tgt cct ctg agg cgc tct cgg tct ccc atc cca tct      1920
Tyr Asn Ser Pro Cys Pro Leu Arg Arg Ser Arg Ser Pro Ile Pro Ser
625                      630                      635                      640

atc ttg taa
Ile Leu
1929

```

```

<210> 47
<211> 642
<212> PRT
<213> Mus musculus

```

```

<400> 47
Met Gly Lys Ile Glu Ser Asn Glu Arg Val Ile Leu Asn Val Gly Gly
1           5           10           15

```

|     |     |     |     |     |       |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Arg | His | Glu | Thr | Tyr   | Arg | Ser | Thr | Leu | Lys | Thr | Leu | Pro | Gly | Thr |
|     |     |     | 20  |     |       |     |     | 25  |     |     |     |     | 30  |     |     |
| Arg | Leu | Ala | Leu | Leu | Ala   | Ser | Ser | Glu | Pro | Gln | Gly | Asp | Cys | Leu | Thr |
|     |     | 35  |     |     |       |     | 40  |     |     |     |     | 45  |     |     |     |
| Ala | Ala | Gly | Asp | Lys | Leu   | Gln | Pro | Leu | Pro | Pro | Pro | Leu | Ser | Pro | Pro |
|     | 50  |     |     |     |       | 55  |     |     |     |     | 60  |     |     |     |     |
| Pro | Arg | Pro | Pro | Pro | Leu   | Ser | Pro | Val | Pro | Ser | Gly | Cys | Phe | Glu | Gly |
| 65  |     |     |     |     | 70    |     |     |     |     | 75  |     |     |     | 80  |     |
| Gly | Ala | Gly | Asn | Cys | Ser   | Ser | His | Gly | Gly | Asn | Gly | Gly | Asn | Gly | Gly |
|     |     |     | 85  |     |       |     |     | 90  |     |     |     |     | 95  |     |     |
| Ser | Asp | His | Pro | Gly | Gly   | Gly | Arg | Glu | Phe | Phe | Phe | Asp | Arg | His | Pro |
|     |     |     | 100 |     |       |     |     | 105 |     |     |     |     | 110 |     |     |
| Gly | Val | Phe | Ala | Tyr | Val   | Leu | Asn | Tyr | Tyr | Arg | Thr | Gly | Lys | Leu | His |
|     |     | 115 |     |     |       |     | 120 |     |     |     |     | 125 |     |     |     |
| Cys | Pro | Ala | Asp | Val | Cys   | Gly | Pro | Leu | Phe | Glu | Glu | Glu | Leu | Ala | Phe |
|     | 130 |     |     |     |       | 135 |     |     |     |     | 140 |     |     |     |     |
| Trp | Gly | Ile | Asp | Glu | Thr   | Asp | Val | Glu | Pro | Cys | Cys | Trp | Met | Thr | Tyr |
| 145 |     |     |     |     | 150   |     |     |     |     | 155 |     |     |     |     | 160 |
| Arg | Gln | His | Arg | Asp | Ala   | Glu | Glu | Ala | Leu | Asp | Ile | Phe | Glu | Thr | Pro |
|     |     |     |     | 165 |       |     |     |     | 170 |     |     |     |     | 175 |     |
| Asp | Leu | Ile | Gly | Gly | Asp   | Pro | Gly | Asp | Asp | Glu | Asp | Leu | Ala | Ala | Lys |
|     |     |     | 180 |     |       |     |     | 185 |     |     |     |     | 190 |     |     |
| Arg | Leu | Gly | Ile | Glu | Asp   | Ala | Ala | Gly | Leu | Gly | Gly | Pro | Asp | Gly | Lys |
|     |     | 195 |     |     |       |     | 200 |     |     |     |     | 205 |     |     |     |
| Ser | Gly | Arg | Trp | Arg | Lys   | Leu | Gln | Pro | Arg | Met | Trp | Ala | Leu | Phe | Glu |
|     | 210 |     |     |     |       | 215 |     |     |     |     | 220 |     |     |     |     |
| Asp | Pro | Tyr | Ser | Ser | Arg   | Ala | Ala | Arg | Phe | Ile | Ala | Phe | Ala | Ser | Leu |
| 225 |     |     |     |     | 230   |     |     |     |     | 235 |     |     |     |     | 240 |
| Phe | Phe | Ile | Leu | Val | Ser   | Ile | Thr | Thr | Phe | Cys | Leu | Glu | Thr | His | Glu |
|     |     |     |     | 245 |       |     |     |     | 250 |     |     |     |     | 255 |     |
| Ala | Phe | Asn | Ile | Val | Lys   | Asn | Lys | Thr | Glu | Pro | Val | Ile | Asn | Gly | Thr |
|     |     | 260 |     |     |       |     |     | 265 |     |     |     |     | 270 |     |     |
| Ser | Pro | Val | Leu | Gln | Tyr   | Glu | Ile | Glu | Thr | Asp | Pro | Ala | Leu | Thr | Tyr |
|     |     | 275 |     |     |       |     | 280 |     |     |     |     | 285 |     |     |     |
| Val | Glu | Gly | Val | Cys | Val   | Val | Trp | Phe | Thr | Phe | Glu | Phe | Leu | Val | Arg |
|     | 290 |     |     |     |       | 295 |     |     |     |     | 300 |     |     |     |     |
| Ile | Val | Phe | Ser | Pro | Asn   | Lys | Leu | Glu | Phe | Ile | Lys | Asn | Leu | Leu | Asn |
| 305 |     |     |     |     | 310   |     |     |     |     | 315 |     |     |     |     | 320 |
| Ile | Ile | Asp | Phe | Val | Ala   | Ile | Leu | Pro | Phe | Tyr | Leu | Glu | Val | Gly | Leu |
|     |     |     |     | 325 |       |     |     |     | 330 |     |     |     |     | 335 |     |
| Ser | Gly | Leu | Ser | Ser | Lys   | Ala | Ala | Lys | Asp | Val | Leu | Gly | Phe | Leu | Arg |
|     |     |     | 340 |     |       |     |     | 345 |     |     |     |     | 350 |     |     |
| Val | Val | Arg | Phe | Val | Arg   | Ile | Leu | Arg | Ile | Phe | Lys | Leu | Thr | Arg | His |
|     |     | 355 |     |     |       |     | 360 |     |     |     |     | 365 |     |     |     |
| Phe | Val | Gly | Leu | Arg | Val</ |     |     |     |     |     |     |     |     |     |     |

[illegible]

```
<210> 48
<211> 1854
<212> DNA
<213> Mus musculus
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```
<220>
<221> CDS
<222> (1)..(1854)
```

```

<400>      48
atg ggc aag atc gag agc aac gag agg gtg atc ctc aat gtc ggg ggt      48
Met Gly Lys Ile Glu Ser Asn Glu Arg Val Ile Leu Asn Val Gly Gly
1           5           10           15
acc agg cac gaa acc tac cgc agc acc ctc aag acc ctg cct gga act      96
Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr
           20           25           30
cgc ctg gcc ctt ctt gcc tcc tct gaa cct cag gcc gac tgc ctg act      144

```

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Arg | Leu | Ala | Leu | Leu | Ala | Ser | Ser | Glu | Pro | Gln | Gly | Asp | Cys | Leu | Thr |     |  |
|     | 35  |     |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |     |  |
| gcg | gcc | ggg | gac | aag | ctg | caa | ccg | ctg | ccc | cct | ccg | ctg | tct | ccg | ccg | 192 |  |
| Ala | Ala | Gly | Asp | Lys | Leu | Gln | Pro | Leu | Pro | Pro | Pro | Leu | Ser | Pro | Pro |     |  |
|     | 50  |     |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |  |
| cca | cga | ccg | cct | ccc | ttg | tcc | cct | gtc | ccc | agc | ggc | tgc | ttc | gag | ggc | 240 |  |
| Pro | Arg | Pro | Pro | Pro | Leu | Ser | Pro | Val | Pro | Ser | Gly | Cys | Phe | Glu | Gly |     |  |
| 65  |     |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |  |
| ggc | gca | ggc | aac | tgc | agt | tcg | cac | ggc | ggc | aac | ggc | ggc | aac | ggc | ggc | 288 |  |
| Gly | Ala | Gly | Asn | Cys | Ser | Ser | His | Gly | Gly | Asn | Gly | Gly | Asn | Gly | Gly |     |  |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     | 95  |     |     |     |  |
| agc | gac | cac | cct | ggg | gga | ggc | cgc | gaa | ttc | ttc | ttc | gat | cgc | cac | cca | 336 |  |
| Ser | Asp | His | Pro | Gly | Gly | Gly | Arg | Glu | Phe | Phe | Phe | Asp | Arg | His | Pro |     |  |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |     |  |
| gga | gta | ttc | gcc | tat | gtg | ctc | aat | tac | tac | cgc | acg | ggc | aag | ctg | cac | 384 |  |
| Gly | Val | Phe | Ala | Tyr | Val | Leu | Asn | Tyr | Tyr | Arg | Thr | Gly | Lys | Leu | His |     |  |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     |     | 125 |     |     |     |  |
| tgc | ccc | gcc | gac | gtg | tgc | ggg | ccg | ctc | ttc | gag | gaa | gag | ctg | gct | ttc | 432 |  |
| Cys | Pro | Ala | Asp | Val | Cys | Gly | Pro | Leu | Phe | Glu | Glu | Glu | Leu | Ala | Phe |     |  |
|     |     | 130 |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |     |  |
| tgg | ggc | atc | gat | gag | acc | gac | gtg | gag | ccc | tgc | tgc | tgg | atg | acc | tac | 480 |  |
| Trp | Gly | Ile | Asp | Glu | Thr | Asp | Val | Glu | Pro | Cys | Cys | Trp | Met | Thr | Tyr |     |  |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |     |  |
| agg | cag | cac | cgg | gac | gcg | gag | gag | gcc | ctg | gac | atc | ttt | gag | aca | ccc | 528 |  |
| Arg | Gln | His | Arg | Asp | Ala | Glu | Glu | Ala | Leu | Asp | Ile | Phe | Glu | Thr | Pro |     |  |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     | 175 |     |     |     |  |
| gac | ctc | atc | ggg | ggc | gac | cct | ggc | gat | gat | gag | gac | cta | gcg | gcc | aag | 576 |  |
| Asp | Leu | Ile | Gly | Gly | Asp | Pro | Gly | Asp | Asp | Glu | Asp | Leu | Ala | Ala | Lys |     |  |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |  |
| aga | ttg | ggc | att | gag | gat | gct | gcg | ggg | ctg | gga | gga | ccc | gat | ggc | aag | 624 |  |
| Arg | Leu | Gly | Ile | Glu | Asp | Ala | Ala | Gly | Leu | Gly | Gly | Pro | Asp | Gly | Lys |     |  |
|     |     | 195 |     |     |     | 200 |     |     |     |     |     | 205 |     |     |     |     |  |
| tca | ggc | cgc | tgg | agg | aag | ctg | cag | cct | cgc | atg | tgg | gct | ctt | ttt | gag | 672 |  |
| Ser | Gly | Arg | Trp | Arg | Lys | Leu | Gln | Pro | Arg | Met | Trp | Ala | Leu | Phe | Glu |     |  |
|     |     | 210 |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |     |  |
| gac | ccc | tac | tca | tct | aga | gcc | gct | agg | ttt | att | gct | ttt | gct | tct | ttg | 720 |  |
| Asp | Pro | Tyr | Ser | Ser | Arg | Ala | Ala | Arg | Phe | Ile | Ala | Phe | Ala | Ser | Leu |     |  |
| 225 |     |     |     |     | 230 |     |     |     | 235 |     |     |     |     | 240 |     |     |  |
| ttc | ttc | att | ttg | gtt | tcc | atc | aca | acc | ttt | tgc | ctg | gag | aca | cat | gaa | 768 |  |
| Phe | Phe | Ile | Leu | Val | Ser | Ile | Thr | Thr | Phe | Cys | Leu | Glu | Thr | His | Glu |     |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |     |  |
| gct | ttc | aat | att | gtt | aaa | aac | aag | acg | gag | ccc | gtc | atc | aat | ggc | acc | 816 |  |
| Ala | Phe | Asn | Ile | Val | Lys | Asn | Lys | Thr | Glu | Pro | Val | Ile | Asn | Gly | Thr |     |  |
|     |     | 260 |     |     |     |     |     | 265 |     |     |     |     | 270 |     |     |     |  |
| agc | ccg | gtc | ctc | cag | tac | gaa | atc | gaa | acg | gat | ccc | gcc | ctg | acg | tac | 864 |  |
| Ser | Pro | Val | Leu | Gln | Tyr | Glu | Ile | Glu | Thr | Asp | Pro | Ala | Leu | Thr | Tyr |     |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |     |  |
| gtg | gaa | gga | gta | tgt | gtg | gtg | tgg | ttt | acg | ttt | gaa | ttt | tta | gtc | cga | 912 |  |
| Val | Glu | Gly | Val | Cys | Val | Val | Trp | Phe | Thr | Phe | Glu | Phe | Leu | Val | Arg |     |  |

|                                                                 |     |     |      |
|-----------------------------------------------------------------|-----|-----|------|
| 290                                                             | 295 | 300 |      |
| att gtt ttc tca ccc aat aaa ctt gaa ttc atc aaa aat ctc ttg aac |     |     | 960  |
| Ile Val Phe Ser Pro Asn Lys Leu Glu Phe Ile Lys Asn Leu Leu Asn |     |     |      |
| 305                                                             | 310 | 315 | 320  |
| atc att gac ttt gtg gcc atc ctc ccc ttc tac cta gag gtg gga ctc |     |     | 1008 |
| Ile Ile Asp Phe Val Ala Ile Leu Pro Phe Tyr Leu Glu Val Gly Leu |     |     |      |
|                                                                 | 325 | 330 | 335  |
| agc ggg ctg tcc tcc aaa gcg gcc aaa gat gtg ctc ggc ttt ctc agg |     |     | 1056 |
| Ser Gly Leu Ser Ser Lys Ala Ala Lys Asp Val Leu Gly Phe Leu Arg |     |     |      |
|                                                                 | 340 | 345 | 350  |
| gtg gtt agg ttt gtg agg atc ctg aga atc ttc aag ctc acc cgc cat |     |     | 1104 |
| Val Val Arg Phe Val Arg Ile Leu Arg Ile Phe Lys Leu Thr Arg His |     |     |      |
|                                                                 | 355 | 360 | 365  |
| ttc gta ggt ctg agg gtg ctc gga cat act ctt cgg gcg agc acc aac |     |     | 1152 |
| Phe Val Gly Leu Arg Val Leu Gly His Thr Leu Arg Ala Ser Thr Asn |     |     |      |
|                                                                 | 370 | 375 | 380  |
| gaa ttt ttg ttg ctg atc atc ttc ctg gcg ctg gga gtt ttg ata ttc |     |     | 1200 |
| Glu Phe Leu Leu Leu Ile Ile Phe Leu Ala Leu Gly Val Leu Ile Phe |     |     |      |
| 385                                                             | 390 | 395 | 400  |
| gct acg atg atc tac tac gct gag aga gta ggg gct cag ccc aat gac |     |     | 1248 |
| Ala Thr Met Ile Tyr Tyr Ala Glu Arg Val Gly Ala Gln Pro Asn Asp |     |     |      |
|                                                                 | 405 | 410 | 415  |
| cct tca gct agt gag cac acg cag ttc aaa aac atc ccc att ggt ttc |     |     | 1296 |
| Pro Ser Ala Ser Glu His Thr Gln Phe Lys Asn Ile Pro Ile Gly Phe |     |     |      |
|                                                                 | 420 | 425 | 430  |
| tgg tgg gcc gta gtg acc atg act acc tta ggt tac ggg gat atg tac |     |     | 1344 |
| Trp Trp Ala Val Val Thr Met Thr Thr Leu Gly Tyr Gly Asp Met Tyr |     |     |      |
|                                                                 | 435 | 440 | 445  |
| ccc caa aca tgg tca ggg atg ttg gtg ggg gcc ttg tgt gcc ctg gcc |     |     | 1392 |
| Pro Gln Thr Trp Ser Gly Met Leu Val Gly Ala Leu Cys Ala Leu Ala |     |     |      |
|                                                                 | 450 | 455 | 460  |
| gga gtg ctg aca ata gcc atg cct gtg cct gtc att gtc aac aat ttt |     |     | 1440 |
| Gly Val Leu Thr Ile Ala Met Pro Val Pro Val Ile Val Asn Asn Phe |     |     |      |
| 465                                                             | 470 | 475 | 480  |
| gga atg tac tac tcc ttg gca atg gcg aag cag aaa ctt cca aga aag |     |     | 1488 |
| Gly Met Tyr Tyr Ser Leu Ala Met Ala Lys Gln Lys Leu Pro Arg Lys |     |     |      |
|                                                                 | 485 | 490 | 495  |
| aga aag aag cat att cct cct gcc cct ctg gca agc tcg cct aca ttt |     |     | 1536 |
| Arg Lys Lys His Ile Pro Pro Ala Pro Leu Ala Ser Ser Pro Thr Phe |     |     |      |
|                                                                 | 500 | 505 | 510  |
| tgc aag aca gaa ttg aac atg gct tgc aac agt acc cag agt gac aca |     |     | 1584 |
| Cys Lys Thr Glu Leu Asn Met Ala Cys Asn Ser Thr Gln Ser Asp Thr |     |     |      |
|                                                                 | 515 | 520 | 525  |
| tgt ctg ggc aaa gaa aac cgg ctt ctg gaa cat aac aga tca gtg tta |     |     | 1632 |
| Cys Leu Gly Lys Glu Asn Arg Leu Leu Glu His Asn Arg Ser Val Leu |     |     |      |
|                                                                 | 530 | 535 | 540  |
| tca ggt gac gac agt aca gga agt gag ccg cca tta tca cct cca gaa |     |     | 1680 |
| Ser Gly Asp Asp Ser Thr Gly Ser Glu Pro Pro Leu Ser Pro Pro Glu |     |     |      |
| 545                                                             | 550 | 555 | 560  |

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agg ctc cct atc aga cgc tct agt acc aga gac aaa aac aga aga ggg      1728
Arg Leu Pro Ile Arg Arg Ser Ser Thr Arg Asp Lys Asn Arg Arg Gly
      565      570      575
gaa acg tgt ttc ctg ttg acg aca ggt gat tac acg tgc gct tct gat      1776
Glu Thr Cys Phe Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp
      580      585      590
gga gga atc agg aaa gat aac tgc aaa gag gtt gtc att act ggt tac      1824
Gly Gly Ile Arg Lys Asp Asn Cys Lys Glu Val Val Ile Thr Gly Tyr
      595      600      605
acg caa gcc gag gcc aga tct ctt act taa      1854
Thr Gln Ala Glu Ala Arg Ser Leu Thr
      610      615

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<210> 49
<211> 617
<212> PRT
<213> Mus musculus

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<400> 49
Met Gly Lys Ile Glu Ser Asn Glu Arg Val Ile Leu Asn Val Gly Gly
1      5      10      15
Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr
      20      25      30
Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Gln Gly Asp Cys Leu Thr
      35      40      45
Ala Ala Gly Asp Lys Leu Gln Pro Leu Pro Pro Pro Leu Ser Pro Pro
      50      55      60
Pro Arg Pro Pro Pro Leu Ser Pro Val Pro Ser Gly Cys Phe Glu Gly
65      70      75      80
Gly Ala Gly Asn Cys Ser Ser His Gly Gly Asn Gly Gly Asn Gly Gly
      85      90      95
Ser Asp His Pro Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro
      100      105      110
Gly Val Phe Ala Tyr Val Leu Asn Tyr Tyr Arg Thr Gly Lys Leu His
      115      120      125
Cys Pro Ala Asp Val Cys Gly Pro Leu Phe Glu Glu Glu Leu Ala Phe
      130      135      140
Trp Gly Ile Asp Glu Thr Asp Val Glu Pro Cys Cys Trp Met Thr Tyr
145      150      155      160
Arg Gln His Arg Asp Ala Glu Glu Ala Leu Asp Ile Phe Glu Thr Pro
      165      170      175
Asp Leu Ile Gly Gly Asp Pro Gly Asp Asp Glu Asp Leu Ala Ala Lys
      180      185      190
Arg Leu Gly Ile Glu Asp Ala Ala Gly Leu Gly Gly Pro Asp Gly Lys
      195      200      205
Ser Gly Arg Trp Arg Lys Leu Gln Pro Arg Met Trp Ala Leu Phe Glu
      210      215      220
Asp Pro Tyr Ser Ser Arg Ala Ala Arg Phe Ile Ala Phe Ala Ser Leu

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|                                                                 |     |     |     |     |     |     |
|-----------------------------------------------------------------|-----|-----|-----|-----|-----|-----|
| 225                                                             |     | 230 |     | 235 |     | 240 |
| Phe Phe Ile Leu Val Ser Ile Thr Thr Phe Cys Leu Glu Thr His Glu |     |     |     |     |     |     |
|                                                                 | 245 |     | 250 |     | 255 |     |
| Ala Phe Asn Ile Val Lys Asn Lys Thr Glu Pro Val Ile Asn Gly Thr |     |     |     |     |     |     |
|                                                                 | 260 |     | 265 |     | 270 |     |
| Ser Pro Val Leu Gln Tyr Glu Ile Glu Thr Asp Pro Ala Leu Thr Tyr |     |     |     |     |     |     |
|                                                                 | 275 |     | 280 |     | 285 |     |
| Val Glu Gly Val Cys Val Val Trp Phe Thr Phe Glu Phe Leu Val Arg |     |     |     |     |     |     |
|                                                                 | 290 |     | 295 |     | 300 |     |
| Ile Val Phe Ser Pro Asn Lys Leu Glu Phe Ile Lys Asn Leu Leu Asn |     |     |     |     |     |     |
| 305                                                             |     | 310 |     | 315 |     | 320 |
| Ile Ile Asp Phe Val Ala Ile Leu Pro Phe Tyr Leu Glu Val Gly Leu |     |     |     |     |     |     |
|                                                                 | 325 |     | 330 |     | 335 |     |
| Ser Gly Leu Ser Ser Lys Ala Ala Lys Asp Val Leu Gly Phe Leu Arg |     |     |     |     |     |     |
|                                                                 | 340 |     | 345 |     | 350 |     |
| Val Val Arg Phe Val Arg Ile Leu Arg Ile Phe Lys Leu Thr Arg His |     |     |     |     |     |     |
|                                                                 | 355 |     | 360 |     | 365 |     |
| Phe Val Gly Leu Arg Val Leu Gly His Thr Leu Arg Ala Ser Thr Asn |     |     |     |     |     |     |
|                                                                 | 370 |     | 375 |     | 380 |     |
| Glu Phe Leu Leu Leu Ile Ile Phe Leu Ala Leu Gly Val Leu Ile Phe |     |     |     |     |     |     |
| 385                                                             |     | 390 |     | 395 |     | 400 |
| Ala Thr Met Ile Tyr Tyr Ala Glu Arg Val Gly Ala Gln Pro Asn Asp |     |     |     |     |     |     |
|                                                                 | 405 |     | 410 |     | 415 |     |
| Pro Ser Ala Ser Glu His Thr Gln Phe Lys Asn Ile Pro Ile Gly Phe |     |     |     |     |     |     |
|                                                                 | 420 |     | 425 |     | 430 |     |
| Trp Trp Ala Val Val Thr Met Thr Thr Leu Gly Tyr Gly Asp Met Tyr |     |     |     |     |     |     |
|                                                                 | 435 |     | 440 |     | 445 |     |
| Pro Gln Thr Trp Ser Gly Met Leu Val Gly Ala Leu Cys Ala Leu Ala |     |     |     |     |     |     |
|                                                                 | 450 |     | 455 |     | 460 |     |
| Gly Val Leu Thr Ile Ala Met Pro Val Pro Val Ile Val Asn Asn Phe |     |     |     |     |     |     |
| 465                                                             |     | 470 |     | 475 |     | 480 |
| Gly Met Tyr Tyr Ser Leu Ala Met Ala Lys Gln Lys Leu Pro Arg Lys |     |     |     |     |     |     |
|                                                                 | 485 |     | 490 |     | 495 |     |
| Arg Lys Lys His Ile Pro Pro Ala Pro Leu Ala Ser Ser Pro Thr Phe |     |     |     |     |     |     |
|                                                                 | 500 |     | 505 |     | 510 |     |
| Cys Lys Thr Glu Leu Asn Met Ala Cys Asn Ser Thr Gln Ser Asp Thr |     |     |     |     |     |     |
|                                                                 | 515 |     | 520 |     | 525 |     |
| Cys Leu Gly Lys Glu Asn Arg Leu Leu Glu His Asn Arg Ser Val Leu |     |     |     |     |     |     |
|                                                                 | 530 |     | 535 |     | 540 |     |
| Ser Gly Asp Asp Ser Thr Gly Ser Glu Pro Pro Leu Ser Pro Pro Glu |     |     |     |     |     |     |
| 545                                                             |     | 550 |     | 555 |     | 560 |
| Arg Leu Pro Ile Arg Arg Ser Ser Thr Arg Asp Lys Asn Arg Arg Gly |     |     |     |     |     |     |
|                                                                 | 565 |     | 570 |     | 575 |     |
| Glu Thr Cys Phe Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp |     |     |     |     |     |     |
|                                                                 | 580 |     | 585 |     | 590 |     |
| Gly Gly Ile Arg Lys Asp Asn Cys Lys Glu Val Val Ile Thr Gly Tyr |     |     |     |     |     |     |
|                                                                 | 595 |     | 600 |     | 605 |     |
| Thr Gln Ala Glu Ala Arg Ser Leu Thr                             |     |     |     |     |     |     |
|                                                                 | 610 |     | 615 |     |     |     |

<210> 50  
 <211> 1845  
 <212> DNA  
 <213> Mus musculus

<220>  
 <221> CDS  
 <222> (1)..(1845)

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 acc agg cac gaa acc tac cgc agc acc ctc aag acc ctg cct gga act 96  
 Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr  
 20 25 30  
 cgc ctg gcc ctt ctt gcc tcc tct gaa cct cag ggc gac tgc ctg act 144  
 Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Gln Gly Asp Cys Leu Thr  
 35 40 45  
 gcg gcc ggg gac aag ctg caa ccg ctg ccc cct ccg ctg tct ccg ccg 192  
 Ala Ala Gly Asp Lys Leu Gln Pro Leu Pro Pro Pro Leu Ser Pro Pro  
 50 55 60  
 cca cga ccg cct ccc ttg tcc cct gtc ccc agc ggc tgc ttc gag ggc 240  
 Pro Arg Pro Pro Pro Leu Ser Pro Val Pro Ser Gly Cys Phe Glu Gly  
 65 70 75 80  
 ggc gca ggc aac tgc agt tcg cac ggt ggc aac ggc ggc aac ggc ggc 288  
 Gly Ala Gly Asn Cys Ser Ser His Gly Gly Asn Gly Gly Asn Gly Gly  
 85 90 95  
 agc gac cac cct ggg gga ggc cgc gaa ttc ttc ttc gat cgc cac cca 336  
 Ser Asp His Pro Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro  
 100 105 110  
 gga gta ttc gcc tat gtg ctc aat tac tac cgc acg ggc aag ctg cac 384  
 Gly Val Phe Ala Tyr Val Leu Asn Tyr Tyr Arg Thr Gly Lys Leu His  
 115 120 125  
 tgc ccc gcc gac gtg tgc ggg ccg ctc ttc gag gaa gag ctg gct ttc 432  
 Cys Pro Ala Asp Val Cys Gly Pro Leu Phe Glu Glu Glu Leu Ala Phe  
 130 135 140  
 tgg ggc atc gat gag acc gac gtg gag ccc tgc tgc tgg atg acc tac 480  
 Trp Gly Ile Asp Glu Thr Asp Val Glu Pro Cys Cys Trp Met Thr Tyr  
 145 150 155 160  
 agg cag cac cgg gac gcg gag gag gcc ctg gac atc ttt gag aca ccc 528  
 Arg Gln His Arg Asp Ala Glu Glu Ala Leu Asp Ile Phe Glu Thr Pro  
 165 170 175  
 gac ctc atc ggg ggc gac cct ggt gat gat gag gac cta gcg gcc aag 576  
 Asp Leu Ile Gly Gly Asp Pro Gly Asp Asp Glu Asp Leu Ala Ala Lys  
 180 185 190  
 aga ttg ggc att gag gat gct gcg ggg ctg gga gga ccc gat ggc aag 624

|                                                                 |      |
|-----------------------------------------------------------------|------|
| Arg Leu Gly Ile Glu Asp Ala Ala Gly Leu Gly Gly Pro Asp Gly Lys |      |
| 195                                                             | 200  |
| tca ggc cgc tgg agg aag ctg cag cct cgc atg tgg gct ctt ttt gag | 672  |
| Ser Gly Arg Trp Arg Lys Leu Gln Pro Arg Met Trp Ala Leu Phe Glu |      |
| 210                                                             | 215  |
| gac ccc tac tca tct aga gcc gct agg ttt att gct ttt gct tct ttg | 720  |
| Asp Pro Tyr Ser Ser Arg Ala Ala Arg Phe Ile Ala Phe Ala Ser Leu |      |
| 225                                                             | 230  |
| ttc ttc att ttg gtt tcc atc aca acc ttt tgc ctg gag aca cat gaa | 768  |
| Phe Phe Ile Leu Val Ser Ile Thr Thr Phe Cys Leu Glu Thr His Glu |      |
| 245                                                             | 250  |
| gct ttc aat att gtt aaa aac aag acg gag ccc gtc atc aat ggc acc | 816  |
| Ala Phe Asn Ile Val Lys Asn Lys Thr Glu Pro Val Ile Asn Gly Thr |      |
| 260                                                             | 265  |
| agc ccg gtc ctc cag tac gaa atc gaa acg gat ccc gcc ctg acg tac | 864  |
| Ser Pro Val Leu Gln Tyr Glu Ile Glu Thr Asp Pro Ala Leu Thr Tyr |      |
| 275                                                             | 280  |
| gtg gaa gga gta tgt gtg gtg tgg ttt acg ttt gaa ttt tta gtc cga | 912  |
| Val Glu Gly Val Cys Val Val Trp Phe Thr Phe Glu Phe Leu Val Arg |      |
| 290                                                             | 295  |
| att gtt ttc tca ccc aat aaa ctt gaa ttc atc aaa aat ctc ttg aac | 960  |
| Ile Val Phe Ser Pro Asn Lys Leu Glu Phe Ile Lys Asn Leu Leu Asn |      |
| 305                                                             | 310  |
| atc att gac ttt gtg gcc atc ctc ccc ttc tac cta gag gtg gga ctc | 1008 |
| Ile Ile Asp Phe Val Ala Ile Leu Pro Phe Tyr Leu Glu Val Gly Leu |      |
| 325                                                             | 330  |
| agc ggg ctg tcc tcc aaa gcg gcc aaa gat gtg ctc ggc ttt ctc agg | 1056 |
| Ser Gly Leu Ser Ser Lys Ala Ala Lys Asp Val Leu Gly Phe Leu Arg |      |
| 340                                                             | 345  |
| gtg gtt agg ttt gtg agg atc ctg aga atc ttc aag ctc acc cgc cat | 1104 |
| Val Val Arg Phe Val Arg Ile Leu Arg Ile Phe Lys Leu Thr Arg His |      |
| 355                                                             | 360  |
| ttc gta ggt ctg agg gtg ctc gga cat act ctt cgg gcg agc acc aac | 1152 |
| Phe Val Gly Leu Arg Val Leu Gly His Thr Leu Arg Ala Ser Thr Asn |      |
| 370                                                             | 375  |
| gaa ttt ttg ttg ctg atc atc ttc ctg gcg ctg gga gtt ttg ata ttc | 1200 |
| Glu Phe Leu Leu Leu Ile Ile Phe Leu Ala Leu Gly Val Leu Ile Phe |      |
| 385                                                             | 390  |
| gct acg atg atc tac tac gct gag aga gta ggg gct cag ccc aat gac | 1248 |
| Ala Thr Met Ile Tyr Tyr Ala Glu Arg Val Gly Ala Gln Pro Asn Asp |      |
| 405                                                             | 410  |
| cct tca gct agt gag cac acg cag ttc aaa aac atc ccc att ggt ttc | 1296 |
| Pro Ser Ala Ser Glu His Thr Gln Phe Lys Asn Ile Pro Ile Gly Phe |      |
| 420                                                             | 425  |
| tgg tgg gcc gta gtg acc atg act acc tta ggt tac ggg gat atg tac | 1344 |
| Trp Trp Ala Val Val Thr Met Thr Thr Leu Gly Tyr Gly Asp Met Tyr |      |
| 435                                                             | 440  |
| ccc caa aca tgg tca ggg atg ttg gtg ggg gcc ttg tgt gcc ctg gcc | 1392 |
| Pro Gln Thr Trp Ser Gly Met Leu Val Gly Ala Leu Cys Ala Leu Ala |      |

|                                                                 |     |     |      |
|-----------------------------------------------------------------|-----|-----|------|
| 450                                                             | 455 | 460 |      |
| gga gtg ctg aca ata gcc atg cct gtg cct gtc att gtc aac aat ttt |     |     | 1440 |
| Gly Val Leu Thr Ile Ala Met Pro Val Pro Val Ile Val Asn Asn Phe |     |     |      |
| 465                                                             | 470 | 475 | 480  |
| gga atg tac tac tcc ttg gca atg gcg aag cag aaa ctt cca aga aag |     |     | 1488 |
| Gly Met Tyr Tyr Ser Leu Ala Met Ala Lys Gln Lys Leu Pro Arg Lys |     |     |      |
|                                                                 | 485 | 490 | 495  |
| aga aag aag cat att cct cct gcc cct ctg gca agc tcg cct aca ttt |     |     | 1536 |
| Arg Lys Lys His Ile Pro Pro Ala Pro Leu Ala Ser Ser Pro Thr Phe |     |     |      |
|                                                                 | 500 | 505 | 510  |
| tgc aag aca gaa ttg aac atg gct tgc aac agt acc cag agt gac aca |     |     | 1584 |
| Cys Lys Thr Glu Leu Asn Met Ala Cys Asn Ser Thr Gln Ser Asp Thr |     |     |      |
|                                                                 | 515 | 520 | 525  |
| tgt ctg ggc aaa gaa aac cgg ctt ctg gaa cat aac aga tca gtg tta |     |     | 1632 |
| Cys Leu Gly Lys Glu Asn Arg Leu Leu Glu His Asn Arg Ser Val Leu |     |     |      |
|                                                                 | 530 | 535 | 540  |
| tca ggt gac gac agt aca gga agt gag ccg cca tta tca cct cca gaa |     |     | 1680 |
| Ser Gly Asp Asp Ser Thr Gly Ser Glu Pro Pro Leu Ser Pro Pro Glu |     |     |      |
| 545                                                             | 550 | 555 | 560  |
| agg ctc cct atc aga cgc tct agt acc aga gac aaa aac aga aga ggg |     |     | 1728 |
| Arg Leu Pro Ile Arg Arg Ser Ser Thr Arg Asp Lys Asn Arg Arg Gly |     |     |      |
|                                                                 | 565 | 570 | 575  |
| gaa acg tgt ttc ctg ttg acg aca ggt gat tac acg tgc gct tct gat |     |     | 1776 |
| Glu Thr Cys Phe Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp |     |     |      |
|                                                                 | 580 | 585 | 590  |
| gga gga atc agg aaa gtg ttg tac aga att tat cat gga ttt ttg act |     |     | 1824 |
| Gly Gly Ile Arg Lys Val Leu Tyr Arg Ile Tyr His Gly Phe Leu Thr |     |     |      |
|                                                                 | 595 | 600 | 605  |
| gct gaa aaa aaa gga cat tga                                     |     |     | 1845 |
| Ala Glu Lys Lys Gly His                                         |     |     |      |
| 610                                                             |     |     |      |

&lt;210&gt; 51

&lt;211&gt; 614

&lt;212&gt; PRT

&lt;213&gt; Mus musculus

&lt;400&gt; 51

|                                                                 |    |    |    |
|-----------------------------------------------------------------|----|----|----|
| Met Gly Lys Ile Glu Ser Asn Glu Arg Val Ile Leu Asn Val Gly Gly |    |    |    |
| 1                                                               | 5  | 10 | 15 |
| Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr |    |    |    |
|                                                                 | 20 | 25 | 30 |
| Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Gln Gly Asp Cys Leu Thr |    |    |    |
|                                                                 | 35 | 40 | 45 |
| Ala Ala Gly Asp Lys Leu Gln Pro Leu Pro Pro Pro Leu Ser Pro Pro |    |    |    |
|                                                                 | 50 | 55 | 60 |
| Pro Arg Pro Pro Pro Leu Ser Pro Val Pro Ser Gly Cys Phe Glu Gly |    |    |    |
| 65                                                              | 70 | 75 | 80 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Gly | Ala | Gly | Asn | Cys | Ser | Ser | His | Gly | Gly | Asn | Gly | Gly | Asn | Gly | Gly |  |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     | 95  |     |     |  |
| Ser | Asp | His | Pro | Gly | Gly | Gly | Arg | Glu | Phe | Phe | Phe | Asp | Arg | His | Pro |  |
|     |     |     |     | 100 |     |     |     |     | 105 |     |     |     | 110 |     |     |  |
| Gly | Val | Phe | Ala | Tyr | Val | Leu | Asn | Tyr | Tyr | Arg | Thr | Gly | Lys | Leu | His |  |
|     |     |     |     | 115 |     |     |     |     | 120 |     |     |     | 125 |     |     |  |
| Cys | Pro | Ala | Asp | Val | Cys | Gly | Pro | Leu | Phe | Glu | Glu | Glu | Leu | Ala | Phe |  |
|     |     |     |     | 130 |     |     |     |     | 135 |     |     |     | 140 |     |     |  |
| Trp | Gly | Ile | Asp | Glu | Thr | Asp | Val | Glu | Pro | Cys | Cys | Trp | Met | Thr | Tyr |  |
| 145 |     |     |     |     | 150 |     |     |     | 155 |     |     |     | 160 |     |     |  |
| Arg | Gln | His | Arg | Asp | Ala | Glu | Glu | Ala | Leu | Asp | Ile | Phe | Glu | Thr | Pro |  |
|     |     |     |     | 165 |     |     |     | 170 |     |     |     | 175 |     |     |     |  |
| Asp | Leu | Ile | Gly | Gly | Asp | Pro | Gly | Asp | Asp | Glu | Asp | Leu | Ala | Ala | Lys |  |
|     |     |     |     | 180 |     |     |     | 185 |     |     |     | 190 |     |     |     |  |
| Arg | Leu | Gly | Ile | Glu | Asp | Ala | Ala | Gly | Leu | Gly | Gly | Pro | Asp | Gly | Lys |  |
|     |     |     |     | 195 |     |     |     | 200 |     |     |     | 205 |     |     |     |  |
| Ser | Gly | Arg | Trp | Arg | Lys | Leu | Gln | Pro | Arg | Met | Trp | Ala | Leu | Phe | Glu |  |
|     |     |     |     | 210 |     |     |     | 215 |     |     |     | 220 |     |     |     |  |
| Asp | Pro | Tyr | Ser | Ser | Arg | Ala | Ala | Arg | Phe | Ile | Ala | Phe | Ala | Ser | Leu |  |
| 225 |     |     |     |     | 230 |     |     |     | 235 |     |     |     | 240 |     |     |  |
| Phe | Phe | Ile | Leu | Val | Ser | Ile | Thr | Thr | Phe | Cys | Leu | Glu | Thr | His | Glu |  |
|     |     |     |     | 245 |     |     |     | 250 |     |     |     | 255 |     |     |     |  |
| Ala | Phe | Asn | Ile | Val | Lys | Asn | Lys | Thr | Glu | Pro | Val | Ile | Asn | Gly | Thr |  |
|     |     |     |     | 260 |     |     |     | 265 |     |     |     | 270 |     |     |     |  |
| Ser | Pro | Val | Leu | Gln | Tyr | Glu | Ile | Glu | Thr | Asp | Pro | Ala | Leu | Thr | Tyr |  |
|     |     |     |     | 275 |     |     |     | 280 |     |     |     | 285 |     |     |     |  |
| Val | Glu | Gly | Val | Cys | Val | Val | Trp | Phe | Thr | Phe | Glu | Phe | Leu | Val | Arg |  |
|     |     |     |     | 290 |     |     |     | 295 |     |     |     | 300 |     |     |     |  |
| Ile | Val | Phe | Ser | Pro | Asn | Lys | Leu | Glu | Phe | Ile | Lys | Asn | Leu | Leu | Asn |  |
| 305 |     |     |     |     | 310 |     |     |     | 315 |     |     |     | 320 |     |     |  |
| Ile | Ile | Asp | Phe | Val | Ala | Ile | Leu | Pro | Phe | Tyr | Leu | Glu | Val | Gly | Leu |  |
|     |     |     |     | 325 |     |     |     | 330 |     |     |     | 335 |     |     |     |  |
| Ser | Gly | Leu | Ser | Ser | Lys | Ala | Ala | Lys | Asp | Val | Leu | Gly | Phe | Leu | Arg |  |
|     |     |     |     | 340 |     |     |     | 345 |     |     |     | 350 |     |     |     |  |
| Val | Val | Arg | Phe | Val | Arg | Ile | Leu | Arg | Ile | Phe | Lys | Leu | Thr | Arg | His |  |
|     |     |     |     | 355 |     |     |     | 360 |     |     |     | 365 |     |     |     |  |
| Phe | Val | Gly | Leu | Arg | Val | Leu | Gly | His | Thr | Leu | Arg | Ala | Ser | Thr | Asn |  |
|     |     |     |     | 370 |     |     |     | 375 |     |     |     | 380 |     |     |     |  |
| Glu | Phe | Leu | Leu | Leu | Ile | Ile | Phe | Leu | Ala | Leu | Gly | Val | Leu | Ile | Phe |  |
| 385 |     |     |     |     | 390 |     |     |     | 395 |     |     |     | 400 |     |     |  |
| Ala | Thr | Met | Ile | Tyr | Tyr | Ala | Glu | Arg | Val | Gly | Ala | Gln | Pro | Asn | Asp |  |
|     |     |     |     | 405 |     |     |     | 410 |     |     |     | 415 |     |     |     |  |
| Pro | Ser | Ala | Ser | Glu | His | Thr | Gln | Phe | Lys | Asn | Ile | Pro | Ile | Gly | Phe |  |
|     |     |     |     | 420 |     |     |     | 425 |     |     |     | 430 |     |     |     |  |
| Trp | Trp | Ala | Val | Val | Thr | Met | Thr | Thr | Leu | Gly | Tyr | Gly | Asp | Met | Tyr |  |
|     |     |     |     | 435 |     |     |     | 440 |     |     |     | 445 |     |     |     |  |
| Pro | Gln | Thr | Trp | Ser | Gly | Met | Leu | Val | Gly | Ala | Leu | Cys | Ala | Leu | Ala |  |
|     |     |     |     | 450 |     |     |     | 455 |     |     |     | 460 |     |     |     |  |
| Gly | Val | Leu | Thr | Ile | Ala | Met | Pro | Val | Pro | Val | Ile | Val | Asn | Asn | Phe |  |

|                                                                 |     |     |     |     |     |     |
|-----------------------------------------------------------------|-----|-----|-----|-----|-----|-----|
| 465                                                             |     | 470 |     | 475 |     | 480 |
| Gly Met Tyr Tyr Ser Leu Ala Met Ala Lys Gln Lys Leu Pro Arg Lys |     |     |     |     |     |     |
|                                                                 |     | 485 |     | 490 |     | 495 |
| Arg Lys Lys His Ile Pro Pro Ala Pro Leu Ala Ser Ser Pro Thr Phe |     |     |     |     |     |     |
|                                                                 | 500 |     | 505 |     | 510 |     |
| Cys Lys Thr Glu Leu Asn Met Ala Cys Asn Ser Thr Gln Ser Asp Thr |     |     |     |     |     |     |
|                                                                 | 515 |     | 520 |     | 525 |     |
| Cys Leu Gly Lys Glu Asn Arg Leu Leu Glu His Asn Arg Ser Val Leu |     |     |     |     |     |     |
|                                                                 | 530 |     | 535 |     | 540 |     |
| Ser Gly Asp Asp Ser Thr Gly Ser Glu Pro Pro Leu Ser Pro Pro Glu |     |     |     |     |     |     |
| 545                                                             |     | 550 |     | 555 |     | 560 |
| Arg Leu Pro Ile Arg Arg Ser Ser Thr Arg Asp Lys Asn Arg Arg Gly |     |     |     |     |     |     |
|                                                                 | 565 |     | 570 |     | 575 |     |
| Glu Thr Cys Phe Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp |     |     |     |     |     |     |
|                                                                 | 580 |     | 585 |     | 590 |     |
| Gly Gly Ile Arg Lys Val Leu Tyr Arg Ile Tyr His Gly Phe Leu Thr |     |     |     |     |     |     |
|                                                                 | 595 |     | 600 |     | 605 |     |
| Ala Glu Lys Lys Gly His                                         |     |     |     |     |     |     |
| 610                                                             |     |     |     |     |     |     |

<210> 52  
 <211> 1968  
 <212> DNA  
 <213> Mus musculus

<220>  
 <221> CDS  
 <222> (1)..(1868)

|                                                                 |     |
|-----------------------------------------------------------------|-----|
| <400> 52                                                        |     |
| atg ggc aag atc gag agc aac gag agg gtg atc ctc aat gtc ggg ggt | 48  |
| Met Gly Lys Ile Glu Ser Asn Glu Arg Val Ile Leu Asn Val Gly Gly |     |
| 1 5 10 15                                                       |     |
| acc agg cac gaa acc tac cgc agc acc ctc aag acc ctg cct gga act | 96  |
| Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr |     |
| 20 25 30                                                        |     |
| cgc ctg gcc ctt ctt gcc tcc tct gaa cct cag ggc gac tgc ctg act | 144 |
| Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Gln Gly Asp Cys Leu Thr |     |
| 35 40 45                                                        |     |
| gcg gcc ggg gac aag ctg caa ccg ctg ccc cct ccg ctg tct ccg ccg | 192 |
| Ala Ala Gly Asp Lys Leu Gln Pro Leu Pro Pro Pro Leu Ser Pro Pro |     |
| 50 55 60                                                        |     |
| cca cga ccg cct ccc ttg tcc cct gtc ccc agc ggc tgc ttc gag ggc | 240 |
| Pro Arg Pro Pro Pro Leu Ser Pro Val Pro Ser Gly Cys Phe Glu Gly |     |
| 65 70 75 80                                                     |     |
| ggc gca ggc aac tgc agt tcg cac ggt ggc aac ggc ggc aac ggc ggc | 288 |
| Gly Ala Gly Asn Cys Ser Ser His Gly Gly Asn Gly Gly Asn Gly Gly |     |
| 85 90 95                                                        |     |

|                                                                 |      |
|-----------------------------------------------------------------|------|
| agc gac cac cct ggg gga ggc cgc gaa ttc ttc ttc gat cgc cac cca | 336  |
| Ser Asp His Pro Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro |      |
| 100 105 110                                                     |      |
| gga gta ttc gcc tat gtg ctc aat tac tac cgc acg ggc aag ctg cac | 384  |
| Gly Val Phe Ala Tyr Val Leu Asn Tyr Tyr Arg Thr Gly Lys Leu His |      |
| 115 120 125                                                     |      |
| tgc ccc gcc gac gtg tgc ggg ccg ctc ttc gag gaa gag ctg gct ttc | 432  |
| Cys Pro Ala Asp Val Cys Gly Pro Leu Phe Glu Glu Glu Leu Ala Phe |      |
| 130 135 140                                                     |      |
| tgg ggc atc gat gag acc gac gtg gag ccc tgc tgc tgg atg acc tac | 480  |
| Trp Gly Ile Asp Glu Thr Asp Val Glu Pro Cys Cys Trp Met Thr Tyr |      |
| 145 150 155 160                                                 |      |
| agg cag cac cgg gac gcg gag gag gcc ctg gac atc ttt gag aca ccc | 528  |
| Arg Gln His Arg Asp Ala Glu Glu Ala Leu Asp Ile Phe Glu Thr Pro |      |
| 165 170 175                                                     |      |
| gac ctc atc ggg ggc gac cct ggt gat gat gag gac cta gcg gcc aag | 576  |
| Asp Leu Ile Gly Gly Asp Pro Gly Asp Asp Glu Asp Leu Ala Ala Lys |      |
| 180 185 190                                                     |      |
| aga ttg ggc att gag gat gct gcg ggg ctg gga gga ccc gat ggc aag | 624  |
| Arg Leu Gly Ile Glu Asp Ala Ala Gly Leu Gly Gly Pro Asp Gly Lys |      |
| 195 200 205                                                     |      |
| tca ggc cgc tgg agg aag ctg cag cct cgc atg tgg gct ctt ttt gag | 672  |
| Ser Gly Arg Trp Arg Lys Leu Gln Pro Arg Met Trp Ala Leu Phe Glu |      |
| 210 215 220                                                     |      |
| gac ccc tac tca tct aga gcc gct agg ttt att gct ttt gct tct ttg | 720  |
| Asp Pro Tyr Ser Ser Arg Ala Ala Arg Phe Ile Ala Phe Ala Ser Leu |      |
| 225 230 235 240                                                 |      |
| ttc ttc att ttg gtt tcc atc aca acc ttt tgc ctg gag aca cat gaa | 768  |
| Phe Phe Ile Leu Val Ser Ile Thr Thr Phe Cys Leu Glu Thr His Glu |      |
| 245 250 255                                                     |      |
| gct ttc aat att gtt aaa aac aag acg gag ccc gtc atc aat ggc acc | 816  |
| Ala Phe Asn Ile Val Lys Asn Lys Thr Glu Pro Val Ile Asn Gly Thr |      |
| 260 265 270                                                     |      |
| agc ccg gtc ctc cag tac gaa atc gaa acg gat ccc gcc ctg acg tac | 864  |
| Ser Pro Val Leu Gln Tyr Glu Ile Glu Thr Asp Pro Ala Leu Thr Tyr |      |
| 275 280 285                                                     |      |
| gtg gaa gga gta tgt gtg gtg tgg ttt acg ttt gaa ttt tta gtc cga | 912  |
| Val Glu Gly Val Cys Val Val Trp Phe Thr Phe Glu Phe Leu Val Arg |      |
| 290 295 300                                                     |      |
| att gtt ttc tca ccc aat aaa ctt gaa ttc atc aaa aat ctc ttg aac | 960  |
| Ile Val Phe Ser Pro Asn Lys Leu Glu Phe Ile Lys Asn Leu Leu Asn |      |
| 305 310 315 320                                                 |      |
| atc att gac ttt gtg gcc atc ctc ccc ttc tac cta gag gtg gga ctc | 1008 |
| Ile Ile Asp Phe Val Ala Ile Leu Pro Phe Tyr Leu Glu Val Gly Leu |      |
| 325 330 335                                                     |      |
| agc ggg ctg tcc tcc aaa gcg gcc aaa gat gtg ctc ggc ttt ctc agg | 1056 |
| Ser Gly Leu Ser Ser Lys Ala Ala Lys Asp Val Leu Gly Phe Leu Arg |      |
| 340 345 350                                                     |      |
| gtg gtt agg ttt gtg agg atc ctg aga atc ttc aag ctc acc cgc cat | 1104 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Val | Val | Arg | Phe | Val | Arg | Ile | Leu | Arg | Ile | Phe | Lys | Leu | Thr | Arg | His |      |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |      |
| ttc | gta | ggt | ctg | agg | gtg | ctc | gga | cat | act | ctt | cgg | gcg | agc | acc | aac | 1152 |
| Phe | Val | Gly | Leu | Arg | Val | Leu | Gly | His | Thr | Leu | Arg | Ala | Ser | Thr | Asn |      |
|     |     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |      |
| gaa | ttt | ttg | ttg | ctg | atc | atc | ttc | ctg | gcg | ctg | gga | gtt | ttg | ata | ttc | 1200 |
| Glu | Phe | Leu | Leu | Leu | Ile | Ile | Phe | Leu | Ala | Leu | Gly | Val | Leu | Ile | Phe |      |
|     |     | 385 |     |     |     | 390 |     |     |     |     | 395 |     |     |     | 400 |      |
| gct | acg | atg | atc | tac | tac | gct | gag | aga | gta | ggg | gct | cag | ccc | aat | gac | 1248 |
| Ala | Thr | Met | Ile | Tyr | Tyr | Ala | Glu | Arg | Val | Gly | Ala | Gln | Pro | Asn | Asp |      |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |      |
| cct | tca | gct | agt | gag | cac | acg | cag | ttc | aaa | aac | atc | ccc | att | ggt | ttc | 1296 |
| Pro | Ser | Ala | Ser | Glu | His | Thr | Gln | Phe | Lys | Asn | Ile | Pro | Ile | Gly | Phe |      |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |      |
| tgg | tgg | gcc | gta | gtg | acc | atg | act | acc | tta | ggt | tac | ggg | gat | atg | tac | 1344 |
| Trp | Trp | Ala | Val | Val | Thr | Met | Thr | Thr | Leu | Gly | Tyr | Gly | Asp | Met | Tyr |      |
|     |     | 435 |     |     |     |     |     | 440 |     |     |     |     | 445 |     |     |      |
| ccc | caa | aca | tgg | tca | ggg | atg | ttg | gtg | ggg | gcc | ttg | tgt | gcc | ctg | gcc | 1392 |
| Pro | Gln | Thr | Trp | Ser | Gly | Met | Leu | Val | Gly | Ala | Leu | Cys | Ala | Leu | Ala |      |
|     |     | 450 |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |      |
| gga | gtg | ctg | aca | ata | gcc | atg | cct | gtg | cct | gtc | att | gtc | aac | aat | ttt | 1440 |
| Gly | Val | Leu | Thr | Ile | Ala | Met | Pro | Val | Pro | Val | Ile | Val | Asn | Asn | Phe |      |
|     |     | 465 |     |     |     | 470 |     |     |     | 475 |     |     |     |     | 480 |      |
| gga | atg | tac | tac | tcc | ttg | gca | atg | gcg | aag | cag | aaa | ctt | cca | aga | aag | 1488 |
| Gly | Met | Tyr | Tyr | Ser | Leu | Ala | Met | Ala | Lys | Gln | Lys | Leu | Pro | Arg | Lys |      |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |     |      |
| aga | aag | aag | cat | att | cct | cct | gcc | cct | ctg | gca | agc | tcg | cct | aca | ttt | 1536 |
| Arg | Lys | Lys | His | Ile | Pro | Pro | Ala | Pro | Leu | Ala | Ser | Ser | Pro | Thr | Phe |      |
|     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |     |     |      |
| tgc | aag | aca | gaa | ttg | aac | atg | gct | tgc | aac | agt | acc | cag | agt | gac | aca | 1584 |
| Cys | Lys | Thr | Glu | Leu | Asn | Met | Ala | Cys | Asn | Ser | Thr | Gln | Ser | Asp | Thr |      |
|     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |      |
| tgt | ctg | ggc | aaa | gaa | aac | cgg | ctt | ctg | gaa | cat | aac | aga | tca | gtg | tta | 1632 |
| Cys | Leu | Gly | Lys | Glu | Asn | Arg | Leu | Leu | Glu | His | Asn | Arg | Ser | Val | Leu |      |
|     |     | 530 |     |     |     | 535 |     |     |     |     | 540 |     |     |     |     |      |
| tca | ggt | gac | gac | agt | aca | gga | agt | gag | ccg | cca | tta | tca | cct | cca | gaa | 1680 |
| Ser | Gly | Asp | Asp | Ser | Thr | Gly | Ser | Glu | Pro | Pro | Leu | Ser | Pro | Pro | Glu |      |
|     |     |     |     |     | 550 |     |     |     |     | 555 |     |     |     |     | 560 |      |
| agg | ctc | cct | atc | aga | cgc | tct | agt | acc | aga | gac | aaa | aac | aga | aga | ggg | 1728 |
| Arg | Leu | Pro | Ile | Arg | Arg | Ser | Ser | Thr | Arg | Asp | Lys | Asn | Arg | Arg | Gly |      |
|     |     |     |     | 565 |     |     |     |     | 570 |     |     |     |     | 575 |     |      |
| gaa | acg | tgt | ttc | ctg | ttg | acg | aca | ggt | gat | tac | acg | tgc | gct | tct | gat | 1776 |
| Glu | Thr | Cys | Phe | Leu | Leu | Thr | Thr | Gly | Asp | Tyr | Thr | Cys | Ala | Ser | Asp |      |
|     |     |     | 580 |     |     |     |     | 585 |     |     |     |     | 590 |     |     |      |
| gga | gga | atc | agg | aaa | gaa | gag | gtc | ccg | cat | ctt | atg | agg | cat | tta | aag | 1824 |
| Gly | Gly | Ile | Arg | Lys | Glu | Glu | Val | Pro | His | Leu | Met | Arg | His | Leu | Lys |      |
|     |     | 595 |     |     |     |     | 600 |     |     |     |     | 605 |     |     |     |      |
| ctt | ata | aaa | ggg | act | gtg | gct | gga | act | gag | atg | gtg | ctc | gcc | atg | gga | 1872 |
| Leu | Ile | Lys | Gly | Thr | Val | Ala | Gly | Thr | Glu | Met | Val | Leu | Ala | Met | Gly |      |

|                                                                 |     |     |      |
|-----------------------------------------------------------------|-----|-----|------|
| 610                                                             | 615 | 620 |      |
| ata ttc tgc ttg tgc aca gac ctg agt cca cgg aac agc tgt aaa tac |     |     | 1920 |
| Ile Phe Cys Leu Ser Thr Asp Leu Ser Pro Arg Asn Ser Cys Lys Tyr |     |     |      |
| 625                                                             | 630 | 635 | 640  |
| caa ccg tgt gca tgg acc tgc cca ctc tca ccg tct cat aga cag tga |     |     | 1968 |
| Gln Pro Cys Ala Trp Thr Cys Pro Leu Ser Pro Ser His Arg Gln     |     |     |      |
| 645                                                             | 650 | 655 |      |

<210> 53  
 <211> 655  
 <212> PRT  
 <213> Mus musculus

<400> 53

|                                                                 |             |
|-----------------------------------------------------------------|-------------|
| Met Gly Lys Ile Glu Ser Asn Glu Arg Val Ile Leu Asn Val Gly Gly |             |
| 1                                                               | 5 10 15     |
| Thr Arg His Glu Thr Tyr Arg Ser Thr Leu Lys Thr Leu Pro Gly Thr |             |
|                                                                 | 20 25 30    |
| Arg Leu Ala Leu Leu Ala Ser Ser Glu Pro Gln Gly Asp Cys Leu Thr |             |
|                                                                 | 35 40 45    |
| Ala Ala Gly Asp Lys Leu Gln Pro Leu Pro Pro Pro Leu Ser Pro Pro |             |
|                                                                 | 50 55 60    |
| Pro Arg Pro Pro Pro Leu Ser Pro Val Pro Ser Gly Cys Phe Glu Gly |             |
| 65                                                              | 70 75 80    |
| Gly Ala Gly Asn Cys Ser Ser His Gly Gly Asn Gly Gly Asn Gly Gly |             |
|                                                                 | 85 90 95    |
| Ser Asp His Pro Gly Gly Gly Arg Glu Phe Phe Phe Asp Arg His Pro |             |
|                                                                 | 100 105 110 |
| Gly Val Phe Ala Tyr Val Leu Asn Tyr Tyr Arg Thr Gly Lys Leu His |             |
|                                                                 | 115 120 125 |
| Cys Pro Ala Asp Val Cys Gly Pro Leu Phe Glu Glu Glu Leu Ala Phe |             |
|                                                                 | 130 135 140 |
| Trp Gly Ile Asp Glu Thr Asp Val Glu Pro Cys Cys Trp Met Thr Tyr |             |
| 145                                                             | 150 155 160 |
| Arg Gln His Arg Asp Ala Glu Glu Ala Leu Asp Ile Phe Glu Thr Pro |             |
|                                                                 | 165 170 175 |
| Asp Leu Ile Gly Gly Asp Pro Gly Asp Asp Glu Asp Leu Ala Ala Lys |             |
|                                                                 | 180 185 190 |
| Arg Leu Gly Ile Glu Asp Ala Ala Gly Leu Gly Gly Pro Asp Gly Lys |             |
|                                                                 | 195 200 205 |
| Ser Gly Arg Trp Arg Lys Leu Gln Pro Arg Met Trp Ala Leu Phe Glu |             |
|                                                                 | 210 215 220 |
| Asp Pro Tyr Ser Ser Arg Ala Ala Arg Phe Ile Ala Phe Ala Ser Leu |             |
| 225                                                             | 230 235 240 |
| Phe Phe Ile Leu Val Ser Ile Thr Thr Phe Cys Leu Glu Thr His Glu |             |
|                                                                 | 245 250 255 |
| Ala Phe Asn Ile Val Lys Asn Lys Thr Glu Pro Val Ile Asn Gly Thr |             |
|                                                                 | 260 265 270 |

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Ser Pro Val Leu Gln Tyr Glu Ile Glu Thr Asp Pro Ala Leu Thr Tyr
    275                                280                                285
Val Glu Gly Val Cys Val Val Trp Phe Thr Phe Glu Phe Leu Val Arg
    290                                295                                300
Ile Val Phe Ser Pro Asn Lys Leu Glu Phe Ile Lys Asn Leu Leu Asn
305                                310                                315                                320
Ile Ile Asp Phe Val Ala Ile Leu Pro Phe Tyr Leu Glu Val Gly Leu
    325                                330                                335
Ser Gly Leu Ser Ser Lys Ala Ala Lys Asp Val Leu Gly Phe Leu Arg
    340                                345                                350
Val Val Arg Phe Val Arg Ile Leu Arg Ile Phe Lys Leu Thr Arg His
    355                                360                                365
Phe Val Gly Leu Arg Val Leu Gly His Thr Leu Arg Ala Ser Thr Asn
    370                                375                                380
Glu Phe Leu Leu Leu Ile Ile Phe Leu Ala Leu Gly Val Leu Ile Phe
385                                390                                395                                400
Ala Thr Met Ile Tyr Tyr Ala Glu Arg Val Gly Ala Gln Pro Asn Asp
    405                                410                                415
Pro Ser Ala Ser Glu His Thr Gln Phe Lys Asn Ile Pro Ile Gly Phe
    420                                425                                430
Trp Trp Ala Val Val Thr Met Thr Thr Leu Gly Tyr Gly Asp Met Tyr
    435                                440                                445
Pro Gln Thr Trp Ser Gly Met Leu Val Gly Ala Leu Cys Ala Leu Ala
    450                                455                                460
Gly Val Leu Thr Ile Ala Met Pro Val Pro Val Ile Val Asn Asn Phe
465                                470                                475                                480
Gly Met Tyr Tyr Ser Leu Ala Met Ala Lys Gln Lys Leu Pro Arg Lys
    485                                490                                495
Arg Lys Lys His Ile Pro Pro Ala Pro Leu Ala Ser Ser Pro Thr Phe
    500                                505                                510
Cys Lys Thr Glu Leu Asn Met Ala Cys Asn Ser Thr Gln Ser Asp Thr
    515                                520                                525
Cys Leu Gly Lys Glu Asn Arg Leu Leu Glu His Asn Arg Ser Val Leu
    530                                535                                540
Ser Gly Asp Asp Ser Thr Gly Ser Glu Pro Pro Leu Ser Pro Pro Glu
545                                550                                555                                560
Arg Leu Pro Ile Arg Arg Ser Ser Thr Arg Asp Lys Asn Arg Arg Gly
    565                                570                                575
Glu Thr Cys Phe Leu Leu Thr Thr Gly Asp Tyr Thr Cys Ala Ser Asp
    580                                585                                590
Gly Gly Ile Arg Lys Glu Glu Val Pro His Leu Met Arg His Leu Lys
    595                                600                                605
Leu Ile Lys Gly Thr Val Ala Gly Thr Glu Met Val Leu Ala Met Gly
    610                                615                                620
Ile Phe Cys Leu Ser Thr Asp Leu Ser Pro Arg Asn Ser Cys Lys Tyr
625                                630                                635                                640
Gln Pro Cys Ala Trp Thr Cys Pro Leu Ser Pro Ser His Arg Gln
    645                                650                                655

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