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GIRAUDO Enrico
TAMAGNONE Luca

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Cys Thr Tyr Ile Glu Ile Gly His His Pro Glu Asp Asn Ile Phe Lys
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Asp Gly Glu His Ser Gly Lys Ala Thr His Ala Arg Ile Gly Gln Ile
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Val Ala Gln Leu Pro Leu His Arg Cys Asp Ile Tyr Gly Lys Ala Cys
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Gly Ser Lys Thr Lys Glu Met Ser Asn Ser Met Thr Pro Ser Gln Lys
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Asp Leu Val Asn Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser
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Tyr Thr Arg Arg Asp Glu Cys Lys Trp Ala Gly Lys Asp Ile Leu Lys
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Asp Phe Met Gly Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His
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His Pro Ile Arg Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro
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Leu Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala Asp Phe Met
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gga cgg gac ttc gct atc ttc aga aca ctg ggg cac cat cac ccc atc    1282
Gly Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His His Pro Ile
                200                 205                 210

agg acg gag cag cat gac tcc cgg tgg ctc aat gat cct aga ttc atc    1330
Arg Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro Arg Phe Ile
            215                 220                 225

agt gcc cat ctc atc cca gag agt gac aac cct gaa gat gac aaa gta    1378
Ser Ala His Leu Ile Pro Glu Ser Asp Asn Pro Glu Asp Asp Lys Val
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tat ttt ttc ttc cga gaa aat gca ata gac gga gaa cac tct gga aaa    1426
Tyr Phe Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His Ser Gly Lys
    245                 250                 255

gcc act cat gct aga ata ggt cag ata tgc aag aat gac ttt ggt gga    1474
Ala Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp Phe Gly Gly
260                 265                 270                 275

cac aga agt ctt gtg aat aaa tgg aca aca ttc cta aaa gca cgc ctg    1522
His Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu
                280                 285                 290

att tgc tct gtg ccc ggt ccc aat ggc att gac acc cat ttt gat gaa    1570
Ile Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His Phe Asp Glu
            295                 300                 305

ttg cag gat gta ttc cta atg aac tct aaa gat cct aaa aat ccg atc    1618
Leu Gln Asp Val Phe Leu Met Asn Ser Lys Asp Pro Lys Asn Pro Ile
        310                 315                 320

gtc tat gga gtg ttc aca aca tca agc aac atc ttt aag gga tct gct    1666
Val Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys Gly Ser Ala
    325                 330                 335

gtg tgc atg tac agc atg agt gat gta aga agg gtg ttc ctt ggt cca    1714
Val Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe Leu Gly Pro
340                 345                 350                 355

tat gct cac aga gat ggt ccc aac tat cag tgg gtg cct tac caa gga    1762
Tyr Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro Tyr Gln Gly
                360                 365                 370

aga gtc cct tat cca cgg cca gga act tgt ccc agt aaa aca ttt ggc    1810
Arg Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys Thr Phe Gly
            375                 380                 385

gga ttt gac tcc aca aag gac ctt cct gat gat gtc ata act ttt gca    1858
Gly Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile Thr Phe Ala
        390                 395                 400

aga agt cat cca gcc atg tac aac cca gtg ttt cct ata aat aat cgc    1906
Arg Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Ile Asn Asn Arg
    405                 410                 415

ccg atc atg atc aaa aca gat gta aat tat cag ttc aca caa att gtt    1954
Pro Ile Met Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr Gln Ile Val
420                 425                 430                 435

gta gac cga gtg gat gca gaa gat ggc cag tat gat gtt atg ttc atc    2002
Val Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val Met Phe Ile
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gga aca gat gtt gga acc gtt ctt aaa gtg gtt tca gtc ccc aag gag    2050
Gly Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Val Pro Lys Glu
            455                 460                 465

act tgg cat gac cta gaa gaa gtt ctt ctg gaa gaa atg acc gtc ttc    2098
Thr Trp His Asp Leu Glu Glu Val Leu Leu Glu Glu Met Thr Val Phe
        470                 475                 480

cgg gaa cca aca act att tcg gca atg gag ctt tct act aaa cag caa    2146
Arg Glu Pro Thr Thr Ile Ser Ala Met Glu Leu Ser Thr Lys Gln Gln
    485                 490                 495

cag ctg tac att ggc tca act gcg gga gtg gca cag ctt cct cta cac    2194
Gln Leu Tyr Ile Gly Ser Thr Ala Gly Val Ala Gln Leu Pro Leu His
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cgc tgt gac atc tat ggc aaa gcc tgt gca gaa tgc tgc ctc gct cgg    2242
Arg Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys Leu Ala Arg
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gac cct tac tgt gcc tgg gat ggg tcc tca tgc tca cgc tat ttt cct    2290
Asp Pro Tyr Cys Ala Trp Asp Gly Ser Ser Cys Ser Arg Tyr Phe Pro
            535                 540                 545

act gca aag agg cgc aca aga cga caa gat ata agg aat gga gac cca    2338
Thr Ala Lys Arg Arg Thr Arg Arg Gln Asp Ile Arg Asn Gly Asp Pro
        550                 555                 560

ctg act cac tgc tct gac ttg cag cac cat gat aat cat cat ggg ccc    2386
Leu Thr His Cys Ser Asp Leu Gln His His Asp Asn His His Gly Pro
    565                 570                 575

agc ctt gaa gag aga atc atc tat gga gtg gaa aac agt agt aca ttc    2434
Ser Leu Glu Glu Arg Ile Ile Tyr Gly Val Glu Asn Ser Ser Thr Phe
580                 585                 590                 595

ttg gaa tgc agt ccg aag tca cag aga gcc ttg gta tat tgg caa ttt    2482
Leu Glu Cys Ser Pro Lys Ser Gln Arg Ala Leu Val Tyr Trp Gln Phe
                600                 605                 610

cag agg aga aat gaa gat cga aaa gag gag atc aga atg ggt gat cat    2530
Gln Arg Arg Asn Glu Asp Arg Lys Glu Glu Ile Arg Met Gly Asp His
            615                 620                 625

atc atc agg aca gaa caa ggg ctc ctg ctc cgt agc ctg cag aag aag    2578
Ile Ile Arg Thr Glu Gln Gly Leu Leu Leu Arg Ser Leu Gln Lys Lys
        630                 635                 640

gat tca ggc aat tac ctg tgt cac gct gtg gaa cac gga ttc atg caa    2626
Asp Ser Gly Asn Tyr Leu Cys His Ala Val Glu His Gly Phe Met Gln
    645                 650                 655

act ctt ctt aag gta acc ctg gaa gtc att gac aca gaa cat ttg gaa    2674
Thr Leu Leu Lys Val Thr Leu Glu Val Ile Asp Thr Glu His Leu Glu
660                 665                 670                 675

gaa ctt ctt cat aaa gat gac gat gga gat ggc tct aag ata aaa gaa    2722
Glu Leu Leu His Lys Asp Asp Asp Gly Asp Gly Ser Lys Ile Lys Glu
                680                 685                 690

atg tcg agc agc atg acg ccc agc cag aaa gtc tgg tac cga gac ttc    2770
Met Ser Ser Ser Met Thr Pro Ser Gln Lys Val Trp Tyr Arg Asp Phe
            695                 700                 705

atg cag ctc att aac cac ccc aac ctg aac acg atg gat gag ttc tgt    2818
Met Gln Leu Ile Asn His Pro Asn Leu Asn Thr Met Asp Glu Phe Cys
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gaa caa gtg tgg aaa agg gac cga aag caa cgc cga caa agg ccg ggg    2866
Glu Gln Val Trp Lys Arg Asp Arg Lys Gln Arg Arg Gln Arg Pro Gly
    725                 730                 735

cac tct caa ggg agc agc aac aag tgg aag cac atg caa gag agc aag    2914
His Ser Gln Gly Ser Ser Asn Lys Trp Lys His Met Gln Glu Ser Lys
740                 745                 750                 755

aaa ggt aga aac agg agg acc cac gag ttt gag cgg gca ccc aga agt    2962
Lys Gly Arg Asn Arg Arg Thr His Glu Phe Glu Arg Ala Pro Arg Ser
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Lys Leu Ser Tyr Lys Glu Met Leu Glu Ser Asn Asn Val Ile Thr Phe
        35                  40                  45
Asn Gly Leu Ala Asn Ser Ser Ser Tyr His Thr Phe Leu Leu Asp Glu
    50                  55                  60
Glu Arg Ser Arg Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe
65                  70                  75                  80
Asn Leu Val Asn Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser
                85                  90                  95
Tyr Thr Arg Arg Asp Glu Cys Lys Trp Ala Gly Lys Asp Ile Leu Lys
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Glu Cys Ala Asn Phe Ile Lys Val Leu Glu Ala Tyr Asn Gln Thr His
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Leu Tyr Ala Cys Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile
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Glu Val Gly His His Pro Glu Asp Asn Ile Phe Lys Leu Gln Asp Ser
145                 150                 155                 160
His Phe Glu Asn Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu
                165                 170                 175
Thr Ala Ser Leu Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala
            180                 185                 190
Asp Phe Met Gly Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His
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His Pro Ile Arg Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro
    210                 215                 220
Arg Phe Ile Ser Ala His Leu Ile Pro Glu Ser Asp Asn Pro Glu Asp
225                 230                 235                 240
Asp Lys Val Tyr Phe Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His
                245                 250                 255
Ser Gly Lys Ala Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp
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Phe Gly Gly His Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys
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Ala Arg Leu Ile Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His
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Phe Asp Glu Leu Gln Asp Val Phe Leu Met Asn Ser Lys Asp Pro Lys
305                 310                 315                 320
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Gly Ser Ala Val Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe
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Leu Gly Pro Tyr Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro
        355                 360                 365
Tyr Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys
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Thr Phe Gly Gly Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile
385                 390                 395                 400
Thr Phe Ala Arg Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Ile
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Asn Asn Arg Pro Ile Met Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr
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Gln Ile Val Val Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val
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Met Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Val
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Pro Lys Glu Thr Trp His Asp Leu Glu Glu Val Leu Leu Glu Glu Met
465                 470                 475                 480
Thr Val Phe Arg Glu Pro Thr Thr Ile Ser Ala Met Glu Leu Ser Thr
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Lys Gln Gln Gln Leu Tyr Ile Gly Ser Thr Ala Gly Val Ala Gln Leu
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Pro Leu His Arg Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys
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Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ser Ser Cys Ser Arg
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Tyr Phe Pro Thr Ala Lys Arg Arg Thr Arg Arg Gln Asp Ile Arg Asn
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Gly Asp Pro Leu Thr His Cys Ser Asp Leu Gln His His Asp Asn His
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His Gly Pro Ser Leu Glu Glu Arg Ile Ile Tyr Gly Val Glu Asn Ser
            580                 585                 590
Ser Thr Phe Leu Glu Cys Ser Pro Lys Ser Gln Arg Ala Leu Val Tyr
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Trp Gln Phe Gln Arg Arg Asn Glu Asp Arg Lys Glu Glu Ile Arg Met
    610                 615                 620
Gly Asp His Ile Ile Arg Thr Glu Gln Gly Leu Leu Leu Arg Ser Leu
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Gln Lys Lys Asp Ser Gly Asn Tyr Leu Cys His Ala Val Glu His Gly
                645                 650                 655
Phe Met Gln Thr Leu Leu Lys Val Thr Leu Glu Val Ile Asp Thr Glu
            660                 665                 670
His Leu Glu Glu Leu Leu His Lys Asp Asp Asp Gly Asp Gly Ser Lys
        675                 680                 685
Ile Lys Glu Met Ser Ser Ser Met Thr Pro Ser Gln Lys Val Trp Tyr
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Arg Asp Phe Met Gln Leu Ile Asn His Pro Asn Leu Asn Thr Met Asp
705                 710                 715                 720
Glu Phe Cys Glu Gln Val Trp Lys Arg Asp Arg Lys Gln Arg Arg Gln
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Arg Pro Gly His Ser Gln Gly Ser Ser Asn Lys Trp Lys His Met Gln
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       Met Gly Arg Ala Gly Ala Ala Ala Val Ile Pro Gly Leu Ala
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Leu Leu Trp Ala Val Gly Leu Gly Ser Ala Ala Pro Ser Pro Pro Arg
15                  20                  25                  30

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Leu Arg Leu Ser Phe Gln Glu Leu Gln Ala Trp His Gly Leu Gln Thr
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gag cgt gga cgc ctg ttt gtg ggt gcc gag aac cat gtg gcc tcc ctc     480
Glu Arg Gly Arg Leu Phe Val Gly Ala Glu Asn His Val Ala Ser Leu
        65                  70                  75

aac ctg gac aac atc agc aag cgg gcc aag aag ctg gcc tgg ccg gcc     528
Asn Leu Asp Asn Ile Ser Lys Arg Ala Lys Lys Leu Ala Trp Pro Ala
    80                  85                  90

cct gtg gaa tgg cga gag gag tgc aac tgg gca ggg aag gac att ggt     576
Pro Val Glu Trp Arg Glu Glu Cys Asn Trp Ala Gly Lys Asp Ile Gly
95                  100                 105                 110

act gag tgc atg aac ttc gtg aag ttg ctg cat gcc tac aac cgc acc     624
Thr Glu Cys Met Asn Phe Val Lys Leu Leu His Ala Tyr Asn Arg Thr
                115                 120                 125

cat ttg ctg gcc tgt ggc acg gga gcc ttc cac cca acc tgt gcc ttt     672
His Leu Leu Ala Cys Gly Thr Gly Ala Phe His Pro Thr Cys Ala Phe
            130                 135                 140

gtg gaa gtg ggc cac cgg gca gag gag ccc gtc ctc cgg ctg gac cca     720
Val Glu Val Gly His Arg Ala Glu Glu Pro Val Leu Arg Leu Asp Pro
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gga agg ata gag gat ggc aag ggg aag agt cct tat gac ccc agg cat     768
Gly Arg Ile Glu Asp Gly Lys Gly Lys Ser Pro Tyr Asp Pro Arg His
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cgg gct gcc tcc gtg ctg gtg ggg gag gag cta tac tca ggg gtg gca     816
Arg Ala Ala Ser Val Leu Val Gly Glu Glu Leu Tyr Ser Gly Val Ala
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gca gac ctc atg gga cga gac ttt acc atc ttt cgc agc cta ggg caa     864
Ala Asp Leu Met Gly Arg Asp Phe Thr Ile Phe Arg Ser Leu Gly Gln
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cgt cca agt ctc cga aca gag cca cac gac tcc cgc tgg ctc aat gag     912
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Pro Lys Phe Val Lys Val Phe Trp Ile Pro Glu Ser Glu Asn Pro Asp
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gac gac aaa atc tac ttc ttc ttt cgt gag acg gcg gta gag gcg gcg    1008
Asp Asp Lys Ile Tyr Phe Phe Phe Arg Glu Thr Ala Val Glu Ala Ala
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ccg gca ctg gga cgc ctg tcc gtg tcc cgc gtt ggc cag atc tgc cgg    1056
Pro Ala Leu Gly Arg Leu Ser Val Ser Arg Val Gly Gln Ile Cys Arg
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Leu Lys Ala Arg Leu Val Cys Ser Val Pro Gly Val Glu Gly Asp Thr
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cag ggc tct gcg gtg tgc gtg tac agc atg aac gac gtg cgc cgg gcc    1296
Gln Gly Ser Ala Val Cys Val Tyr Ser Met Asn Asp Val Arg Arg Ala
335                 340                 345                 350

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Phe Leu Gly Pro Phe Ala His Lys Glu Gly Pro Met His Gln Trp Val
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tca tac cag ggt cgc gtc ccc tac ccg cgg cca ggc atg tgc ccc agc    1392
Ser Tyr Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Met Cys Pro Ser
            370                 375                 380

aag acc ttt ggc acc ttc agt tcc acc aag gac ttc cca gac gat gtc    1440
Lys Thr Phe Gly Thr Phe Ser Ser Thr Lys Asp Phe Pro Asp Asp Val
        385                 390                 395

atc cag ttt gcg cgg aac cac ccc ctc atg tac aac tct gtc ctg ccc    1488
Ile Gln Phe Ala Arg Asn His Pro Leu Met Tyr Asn Ser Val Leu Pro
    400                 405                 410

act ggg ggg cgc cct ctt ttc cta caa gtt gga gcc aat tac acc ttc    1536
Thr Gly Gly Arg Pro Leu Phe Leu Gln Val Gly Ala Asn Tyr Thr Phe
415                 420                 425                 430

act caa att gcc gcg gac cgg gtt gca gcc gct gac gga cac tat gac    1584
Thr Gln Ile Ala Ala Asp Arg Val Ala Ala Ala Asp Gly His Tyr Asp
                435                 440                 445

gtc ctc ttc att ggc aca gac gtt ggc acg gtg ctg aag gtg atc tcg    1632
Val Leu Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Ile Ser
            450                 455                 460

gtc ccc aag ggc agt agg ccc agc gca gag ggg ctg ctc ctg gag gag    1680
Val Pro Lys Gly Ser Arg Pro Ser Ala Glu Gly Leu Leu Leu Glu Glu
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ctg cac gtg ttt gag gac tcg gcc gct gtc acc agc atg caa att tct    1728
Leu His Val Phe Glu Asp Ser Ala Ala Val Thr Ser Met Gln Ile Ser
    480                 485                 490

tcc aag agg cac cag ctg tac gta gcc tcg cgg agc gcg gtg gcc cag    1776
Ser Lys Arg His Gln Leu Tyr Val Ala Ser Arg Ser Ala Val Ala Gln
495                 500                 505                 510

atc gcg ttg cac cgc tgc gct gcc cac ggc cgc gtc tgc acc gaa tgc    1824
Ile Ala Leu His Arg Cys Ala Ala His Gly Arg Val Cys Thr Glu Cys
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tgt ctg gcg cgt gac ccc tac tgc gcc tgg gac ggg gtc gcg tgc acg    1872
Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Val Ala Cys Thr
            530                 535                 540

cgc ttc cag ccc agt gcc aag agg cgg ttc cgg cgg caa gac gta agg    1920
Arg Phe Gln Pro Ser Ala Lys Arg Arg Phe Arg Arg Gln Asp Val Arg
        545                 550                 555

aat ggc gac ccc agc acg ttg tgc tcc gga gac tcg tct cgt ccc gcg    1968
Asn Gly Asp Pro Ser Thr Leu Cys Ser Gly Asp Ser Ser Arg Pro Ala
    560                 565                 570

ctg ctg gaa cac aag gtg ttc ggc gtg gag ggc agc agc gcc ttt ctg    2016
Leu Leu Glu His Lys Val Phe Gly Val Glu Gly Ser Ser Ala Phe Leu
575                 580                 585                 590
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gag tgt gag ccc cgc tcg ctg cag gcg cgc gtg gag tgg act ttc cag    2064
Glu Cys Glu Pro Arg Ser Leu Gln Ala Arg Val Glu Trp Thr Phe Gln
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cgc gca ggg gtg aca gcc cac acc cag gtg ctg gca gag gag cgc acc    2112
Arg Ala Gly Val Thr Ala His Thr Gln Val Leu Ala Glu Glu Arg Thr
            610                 615                 620

gag cgc acc gcc cgg gga cta ctg ctg cgc agg ctg cgg cgc cgg gac    2160
Glu Arg Thr Ala Arg Gly Leu Leu Leu Arg Arg Leu Arg Arg Arg Asp
        625                 630                 635

tcg ggc gtg tac ttg tgc gcc gcc gtc gag cag ggc ttt acg caa ccg    2208
Ser Gly Val Tyr Leu Cys Ala Ala Val Glu Gln Gly Phe Thr Gln Pro
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ctg cgt cgc ctg tcg ctg cac gtg ttg agt gct acg cag gcc gaa cga    2256
Leu Arg Arg Leu Ser Leu His Val Leu Ser Ala Thr Gln Ala Glu Arg
655                 660                 665                 670

ctg gcg cgg gcc gag gag gct gcg ccc gcc gcg ccg ccg ggc ccc aaa    2304
Leu Ala Arg Ala Glu Glu Ala Ala Pro Ala Ala Pro Pro Gly Pro Lys
                675                 680                 685

ctc tgg tac cgg gac ttt ctg cag ctg gtg gag ccg ggc gga ggt ggc    2352
Leu Trp Tyr Arg Asp Phe Leu Gln Leu Val Glu Pro Gly Gly Gly Gly
            690                 695                 700

agc gcg aac tcc ctg cgc atg tgc cgc ccg cag cct gcg ctg cag tca    2400
Ser Ala Asn Ser Leu Arg Met Cys Arg Pro Gln Pro Ala Leu Gln Ser
        705                 710                 715

ctg ccc ctg gag tcg cgg aga aag ggc cgt aac cgg agg acc cac gcc    2448
Leu Pro Leu Glu Ser Arg Arg Lys Gly Arg Asn Arg Arg Thr His Ala
    720                 725                 730

cct gag cct cgc gct gag cgg ggg ccg cgc agc gca acg cac tgg tga    2496
Pro Glu Pro Arg Ala Glu Arg Gly Pro Arg Ser Ala Thr His Trp
735                 740                 745

ccagactgtc cccacgccgg gaaccaagca ggagacgaca ggcgagagag gagccagaca  2556

gaccctgaaa agaaggacgg gttggggccg ggcacattgg gggtcaccgg ccgatggaga  2616

caccaaccga caggccctgg ctgagggcag ctgcgcgggc ttatttatta acaggataac  2676

ccttgaatgt agcagccccg ggagggcggc acaggtcggg cgcaggattc agccggaggg  2736

aagggacggg gaagccgagc tccagagcaa cgaccagggc cgaggaggtg cctggagtgc  2796

ccaccctggg agacagaccc cacctccttg ggtagtgagc agtgagcaga aagctgtgaa  2856

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Leu Glu Arg Thr Cys Cys Tyr Gln Ala Leu Leu Val Asp Glu Glu Arg
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Gly Arg Leu Phe Val Gly Ala Glu Asn His Val Ala Ser Leu Asn Leu
65                  70                  75                  80
Asp Asn Ile Ser Lys Arg Ala Lys Lys Leu Ala Trp Pro Ala Pro Val
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Glu Trp Arg Glu Glu Cys Asn Trp Ala Gly Lys Asp Ile Gly Thr Glu
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Cys Met Asn Phe Val Lys Leu Leu His Ala Tyr Asn Arg Thr His Leu
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Leu Ala Cys Gly Thr Gly Ala Phe His Pro Thr Cys Ala Phe Val Glu
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Val Gly His Arg Ala Glu Glu Pro Val Leu Arg Leu Asp Pro Gly Arg
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Ile Glu Asp Gly Lys Gly Lys Ser Pro Tyr Asp Pro Arg His Arg Ala
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Ala Ser Val Leu Val Gly Glu Glu Leu Tyr Ser Gly Val Ala Ala Asp
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Leu Met Gly Arg Asp Phe Thr Ile Phe Arg Ser Leu Gly Gln Arg Pro
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Ser Leu Arg Thr Glu Pro His Asp Ser Arg Trp Leu Asn Glu Pro Lys
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Phe Val Lys Val Phe Trp Ile Pro Glu Ser Glu Asn Pro Asp Asp Asp
225                 230                 235                 240
Lys Ile Tyr Phe Phe Phe Arg Glu Thr Ala Val Glu Ala Ala Pro Ala
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Leu Gly Arg Leu Ser Val Ser Arg Val Gly Gln Ile Cys Arg Asn Asp
            260                 265                 270
Val Gly Gly Gln Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys
        275                 280                 285
Ala Arg Leu Val Cys Ser Val Pro Gly Val Glu Gly Asp Thr His Phe
    290                 295                 300
Asp Gln Leu Gln Asp Val Phe Leu Leu Ser Ser Arg Asp His Arg Thr
305                 310                 315                 320
Pro Leu Leu Tyr Ala Val Phe Ser Thr Ser Ser Ser Ile Phe Gln Gly
                325                 330                 335
Ser Ala Val Cys Val Tyr Ser Met Asn Asp Val Arg Arg Ala Phe Leu
            340                 345                 350
Gly Pro Phe Ala His Lys Glu Gly Pro Met His Gln Trp Val Ser Tyr
        355                 360                 365
Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Met Cys Pro Ser Lys Thr
    370                 375                 380
Phe Gly Thr Phe Ser Ser Thr Lys Asp Phe Pro Asp Asp Val Ile Gln
385                 390                 395                 400
Phe Ala Arg Asn His Pro Leu Met Tyr Asn Ser Val Leu Pro Thr Gly
                405                 410                 415
Gly Arg Pro Leu Phe Leu Gln Val Gly Ala Asn Tyr Thr Phe Thr Gln
            420                 425                 430
Ile Ala Ala Asp Arg Val Ala Ala Ala Asp Gly His Tyr Asp Val Leu
        435                 440                 445
Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Ile Ser Val Pro
    450                 455                 460
Lys Gly Ser Arg Pro Ser Ala Glu Gly Leu Leu Glu Glu Leu His
465                 470                 475                 480
Val Phe Glu Asp Ser Ala Ala Val Thr Ser Met Gln Ile Ser Ser Lys
                485                 490                 495
Arg His Gln Leu Tyr Val Ala Ser Arg Ser Ala Val Ala Gln Ile Ala
            500                 505                 510
Leu His Arg Cys Ala Ala His Gly Arg Val Cys Thr Glu Cys Cys Leu
        515                 520                 525
Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Val Ala Cys Thr Arg Phe
    530                 535                 540
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Gln Pro Ser Ala Lys Arg Arg Phe Arg Arg Gln Asp Val Arg Asn Gly
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Asp Pro Ser Thr Leu Cys Ser Gly Asp Ser Ser Arg Pro Ala Leu Leu
                565                 570                 575
Glu His Lys Val Phe Gly Val Glu Gly Ser Ser Ala Phe Leu Glu Cys
            580                 585                 590
Glu Pro Arg Ser Leu Gln Ala Arg Val Glu Trp Thr Phe Gln Arg Ala
        595                 600                 605
Gly Val Thr Ala His Thr Gln Val Leu Ala Glu Glu Arg Thr Glu Arg
    610                 615                 620
Thr Ala Arg Gly Leu Leu Leu Arg Arg Leu Arg Arg Arg Asp Ser Gly
625                 630                 635                 640
Val Tyr Leu Cys Ala Ala Val Glu Gln Gly Phe Thr Gln Pro Leu Arg
                645                 650                 655
Arg Leu Ser Leu His Val Leu Ser Ala Thr Gln Ala Glu Arg Leu Ala
            660                 665                 670
Arg Ala Glu Glu Ala Ala Pro Ala Ala Pro Pro Gly Pro Lys Leu Trp
        675                 680                 685
Tyr Arg Asp Phe Leu Gln Leu Val Glu Pro Gly Gly Gly Gly Ser Ala
    690                 695                 700
Asn Ser Leu Arg Met Cys Arg Pro Gln Pro Ala Leu Gln Ser Leu Pro
705                 710                 715                 720
Leu Glu Ser Arg Arg Lys Gly Arg Asn Arg Arg Thr His Ala Pro Glu
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Pro Arg Ala Glu Arg Gly Pro Arg Ser Ala Thr His Trp
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gctcctggga cctgagcttg ctgtggagtg tacagtcatc ccttagctgt ggagggacag   180

caactgcttt gctctttgca cttggtgccc tctggaatga ccacaggatc tgactctcat   240

ctgtcggctc ttcgcccttt actgcctggg gaccttgtcc gcatcatcag tatccttgtc   300

tctgccccag gctggcatga aatcctgggg cagagtccag gactgctgaa ggctcctcca   360

cacacgcctg ctgaaccctg agcgccctga gctgccggc atg ggg cgg gct gag      414
                                          Met Gly Arg Ala Glu
                                          1               5

gcc gcc gcc atg atc cca ggc ctg gcc ctt ctc tgg gta gca ggg cta     462
Ala Ala Ala Met Ile Pro Gly Leu Ala Leu Leu Trp Val Ala Gly Leu
                10                  15                  20

ggg gat act gcc cct aac ctt ccc cgc ctt cgg ctc tcc ttt caa gaa     510
Gly Asp Thr Ala Pro Asn Leu Pro Arg Leu Arg Leu Ser Phe Gln Glu
            25                  30                  35

tta cag gcc cgg cat ggt gtc cga acc ttc agg ctg gag cgg acc tgc     558
Leu Gln Ala Arg His Gly Val Arg Thr Phe Arg Leu Glu Arg Thr Cys
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        40                  45                  50

tgt tat gaa gcc ttg ctg gtg gat gag gag cgt gga cgc ctg ttt gtg     606
Cys Tyr Glu Ala Leu Leu Val Asp Glu Glu Arg Gly Arg Leu Phe Val
    55                  60                  65

ggt gct gag aac cac gtg gct tcc ctc agc ctg gac aac atc agc aag     654
Gly Ala Glu Asn His Val Ala Ser Leu Ser Leu Asp Asn Ile Ser Lys
70                  75                  80                  85

cga gcc aag aag ctg gcc tgg ccc gcc ccc gtg gaa tgg cgt gaa gaa     702
Arg Ala Lys Lys Leu Ala Trp Pro Ala Pro Val Glu Trp Arg Glu Glu
                90                  95                  100

tgc aac tgg gca ggg aag gac att ggt acc gag tgc atg aac ttc gtg     750
Cys Asn Trp Ala Gly Lys Asp Ile Gly Thr Glu Cys Met Asn Phe Val
            105                 110                 115

aag ctg ctg cac acc tac aac cac acc cac ttg ctg gcc tgt ggc aca     798
Lys Leu Leu His Thr Tyr Asn His Thr His Leu Leu Ala Cys Gly Thr
        120                 125                 130

ggg gct ttc cac cca acc tgt gcc ttt gtg gag gtg ggc cac cgg ctg     846
Gly Ala Phe His Pro Thr Cys Ala Phe Val Glu Val Gly His Arg Leu
    135                 140                 145

gag gaa ccc atg ctt caa ctg gac cgg agg aaa ctt gag gac ggc aag     894
Glu Glu Pro Met Leu Gln Leu Asp Arg Arg Lys Leu Glu Asp Gly Lys
150                 155                 160                 165

ggg aag act cct tat gac cca agg cat cgg gct gcc tcg gtg ctg gtg     942
Gly Lys Thr Pro Tyr Asp Pro Arg His Arg Ala Ala Ser Val Leu Val
                170                 175                 180

ggg gaa gaa ctg tat tct ggg gtg aca gca gac ctt atg ggc cgg gac     990
Gly Glu Glu Leu Tyr Ser Gly Val Thr Ala Asp Leu Met Gly Arg Asp
            185                 190                 195

ttt acc atc ttt cga agc ctt ggt cag aat ccg agt ctc cga aca gag    1038
Phe Thr Ile Phe Arg Ser Leu Gly Gln Asn Pro Ser Leu Arg Thr Glu
        200                 205                 210

ccc cat gat tcc cgc tgg ctc aat gaa ccc aag ttt gtc aag gtc ttt    1086
Pro His Asp Ser Arg Trp Leu Asn Glu Pro Lys Phe Val Lys Val Phe
    215                 220                 225

tgg atc cca gag agt gag aac cct gat gac gat aaa atc tat ttc ttc    1134
Trp Ile Pro Glu Ser Glu Asn Pro Asp Asp Asp Lys Ile Tyr Phe Phe
230                 235                 240                 245

ttc cgc gag tcc gct gtg gaa gca gca cca gca atg ggg cgc atg tct    1182
Phe Arg Glu Ser Ala Val Glu Ala Ala Pro Ala Met Gly Arg Met Ser
                250                 255                 260

gtg tct cgt gtt ggc cag atc tgc agg aat gac ctg ggt ggc cag cgg    1230
Val Ser Arg Val Gly Gln Ile Cys Arg Asn Asp Leu Gly Gly Gln Arg
            265                 270                 275

agc ttg gtc aac aaa tgg acc aca ttt ctg aag gcg cgg ctt gtg tgc    1278
Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu Val Cys
        280                 285                 290

tca gta cct gga gtt gag ggt gac acc cac ttt gac caa ctt cag gat    1326
Ser Val Pro Gly Val Glu Gly Asp Thr His Phe Asp Gln Leu Gln Asp
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gtt ttc ctt ctg tcc tcc cga gac cgc cag aca cct ctt ctc tat gct    1374
Val Phe Leu Leu Ser Ser Arg Asp Arg Gln Thr Pro Leu Leu Tyr Ala
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gtc ttc tcc acc tcc agt ggt gtc ttc cag ggc tct gct gtg tgc gtg    1422
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tac agc atg aac gat gtg cgc cga gcc ttc ttg gga cct ttt gct cac    1470
Tyr Ser Met Asn Asp Val Arg Arg Ala Phe Leu Gly Pro Phe Ala His
            345                 350                 355

aaa gag ggg cct aca cac cag tgg gtg tcc tac cag ggt cgt gtc ccc    1518
Lys Glu Gly Pro Thr His Gln Trp Val Ser Tyr Gln Gly Arg Val Pro
        360                 365                 370

tac cca aga cct ggc atg tgc ccc agc aag acc ttt ggc acc ttc agc    1566
Tyr Pro Arg Pro Gly Met Cys Pro Ser Lys Thr Phe Gly Thr Phe Ser
    375                 380                 385

tcc acc aag gac ttc cca gat gac gtt atc cag ttt gct cgg aac cac    1614
Ser Thr Lys Asp Phe Pro Asp Asp Val Ile Gln Phe Ala Arg Asn His
390                 395                 400                 405

cct ctc atg tac aac cca gtc ctg ccc atg ggg ggg cgc cct ctc ttc    1662
Pro Leu Met Tyr Asn Pro Val Leu Pro Met Gly Gly Arg Pro Leu Phe
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cta caa gtg gga gct ggg tac acc ttc acc caa atc gcc gca gac cga    1710
Leu Gln Val Gly Ala Gly Tyr Thr Phe Thr Gln Ile Ala Ala Asp Arg
            425                 430                 435

gta gca gct gcc gat gga cac tac gat gtt ctc ttc att ggt aca gat    1758
Val Ala Ala Ala Asp Gly His Tyr Asp Val Leu Phe Ile Gly Thr Asp
        440                 445                 450

gtg ggc aca gtg ctg aaa gtg atc tca gtc ccc aaa ggc agc cga cct    1806
Val Gly Thr Val Leu Lys Val Ile Ser Val Pro Lys Gly Ser Arg Pro
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aat tct gaa gga ctt ctc ctg gaa gag ctg cag gtg ttc gag gac tct    1854
Asn Ser Glu Gly Leu Leu Leu Glu Glu Leu Gln Val Phe Glu Asp Ser
470                 475                 480                 485

gcc gct atc acc agc atg caa atc tcc tct aaa agg caa caa ctc tac    1902
Ala Ala Ile Thr Ser Met Gln Ile Ser Ser Lys Arg Gln Gln Leu Tyr
                490                 495                 500

ata gca tcg cgc agc gca gtg gcc cag att gct ttg cat cgc tgc act    1950
Ile Ala Ser Arg Ser Ala Val Ala Gln Ile Ala Leu His Arg Cys Thr
            505                 510                 515

gcc cta ggc cgc gcc tgc gca gaa tgc tgc ttg gcc cgt gat cct tac    1998
Ala Leu Gly Arg Ala Cys Ala Glu Cys Cys Leu Ala Arg Asp Pro Tyr
        520                 525                 530

tgc gcc tgg gat gga tca gct tgc aca cgc ttc cag cct acg gcc aag    2046
Cys Ala Trp Asp Gly Ser Ala Cys Thr Arg Phe Gln Pro Thr Ala Lys
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aga cgg ttc cgg agg caa gac ata agg aat ggc gac ccc agc acc cta    2094
Arg Arg Phe Arg Arg Gln Asp Ile Arg Asn Gly Asp Pro Ser Thr Leu
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tgc tct gga gac tct tct cac tct gtg ctg ctg gag aag aag gtg ttg    2142
Cys Ser Gly Asp Ser Ser His Ser Val Leu Leu Glu Lys Lys Val Leu
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Gly Val Glu Ser Gly Ser Ala Phe Leu Glu Cys Glu Pro Arg Ser Leu
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acc cag gtg ctg gct gag gag aga gta gag cgc act gcg cgg ggg ctg    2286
Thr Gln Val Leu Ala Glu Glu Arg Val Glu Arg Thr Ala Arg Gly Leu
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ctg ttg cgg ggg ctg cgg cgc cag gac tct ggc gtg tat ctt tgc gtc    2334
Leu Leu Arg Gly Leu Arg Arg Gln Asp Ser Gly Val Tyr Leu Cys Val
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gcg gtt gaa caa ggc ttt tca caa cca ctg cgt cgc ctg gtg ctg cat    2382
Ala Val Glu Gln Gly Phe Ser Gln Pro Leu Arg Arg Leu Val Leu His
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Val Leu Ser Ala Ala Gln Ala Glu Arg Leu Ala Arg Ala Glu Glu Ala
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gcc gct cct gca cct cct ggc cct aaa ctc tgg tac cgg gac ttt ctg    2478
Ala Ala Pro Ala Pro Pro Gly Pro Lys Leu Trp Tyr Arg Asp Phe Leu
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Gln Leu Val Glu Pro Gly Gly Gly Gly Gly Ala Asn Ser Leu Arg Met
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tgc cgc ccg cag ccc ggg cac cac tct gtg gca gca gat tca cgt cgt    2574
Cys Arg Pro Gln Pro Gly His His Ser Val Ala Ala Asp Ser Arg Arg
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Gly Pro Arg Ser Ala Ala His Trp
            745

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Gly Arg Leu Phe Val Gly Ala Glu Asn His Val Ala Ser Leu Ser Leu
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Asp Asn Ile Ser Lys Arg Ala Lys Lys Leu Ala Trp Pro Ala Pro Val
85 90 95
Glu Trp Arg Glu Glu Cys Asn Trp Ala Gly Lys Asp Ile Gly Thr Glu
100 105 110
Cys Met Asn Phe Val Lys Leu Leu His Thr Tyr Asn His Thr His Leu
115 120 125
Leu Ala Cys Gly Thr Gly Ala Phe His Pro Thr Cys Ala Phe Val Glu
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Val Gly His Arg Leu Glu Glu Pro Met Leu Gln Leu Asp Arg Arg Lys
145 150 155 160
Leu Glu Asp Gly Lys Gly Lys Thr Pro Tyr Asp Pro Arg His Arg Ala
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Ala Ser Val Leu Val Gly Glu Glu Leu Tyr Ser Gly Val Thr Ala Asp
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Ser Leu Arg Thr Glu Pro His Asp Ser Arg Trp Leu Asn Glu Pro Lys
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Lys Ile Tyr Phe Phe Phe Arg Glu Ser Ala Val Glu Ala Ala Pro Ala
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Met Gly Arg Met Ser Val Ser Arg Val Gly Gln Ile Cys Arg Asn Asp
260 265 270
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Pro Leu Leu Tyr Ala Val Phe Ser Thr Ser Ser Gly Val Phe Gln Gly
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Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Met Cys Pro Ser Lys Thr
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Phe Gly Thr Phe Ser Ser Thr Lys Asp Phe Pro Asp Asp Val Ile Gln

385 390 395 400
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Gly Arg Pro Leu Phe Leu Gln Val Gly Ala Gly Tyr Thr Phe Thr Gln
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Val Phe Glu Asp Ser Ala Ala Ile Thr Ser Met Gln Ile Ser Ser Lys
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Leu His Arg Cys Thr Ala Leu Gly Arg Ala Cys Ala Glu Cys Cys Leu
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Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ser Ala Cys Thr Arg Phe
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Gln Pro Thr Ala Lys Arg Arg Phe Arg Arg Gln Asp Ile Arg Asn Gly
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Glu Pro Arg Ser Leu Gln Ala His Val Gln Trp Thr Phe Gln Gly Ala
595 600 605
Gly Glu Ala Ala His Thr Gln Val Leu Ala Glu Glu Arg Val Glu Arg
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Arg Ala Glu Glu Ala Ala Ala Pro Ala Pro Pro Gly Pro Lys Leu Trp
675 680 685
Tyr Arg Asp Phe Leu Gln Leu Val Glu Pro Gly Gly Gly Gly Gly Ala
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Asn Ser Leu Arg Met Cys Arg Pro Gln Pro Gly His His Ser Val Ala
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                         Met Ala Phe Arg Thr Ile Cys Val Leu Val
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Gly Val Phe Ile Cys Ser Ile Cys Val Lys Gly Ser Ser Gln Pro Gln
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Ala Arg Val Tyr Leu Thr Phe Asp Glu Leu Arg Glu Thr Lys Thr Ser
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Glu Tyr Phe Ser Leu Ser His His Pro Leu Asp Tyr Arg Ile Leu Leu
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atg gat gaa gat cag gac cgg ata tat gtg gga agc aaa gat cac att     784
Met Asp Glu Asp Gln Asp Arg Ile Tyr Val Gly Ser Lys Asp His Ile
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Leu Ser Leu Asn Ile Asn Asn Ile Ser Gln Glu Ala Leu Ser Val Phe
75                  80                  85                  90

tgg cca gca tct aca atc aaa gtt gaa gaa tgc aaa atg gct ggc aaa     880
Trp Pro Ala Ser Thr Ile Lys Val Glu Glu Cys Lys Met Ala Gly Lys
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gat ccc aca cac ggc tgt ggg aac ttt gtc cgt gta att cag act ttc     928
Asp Pro Thr His Gly Cys Gly Asn Phe Val Arg Val Ile Gln Thr Phe
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aat cgc aca cat ttg tat gtc tgt ggg agt ggc gct ttc agt cct gtc     976
Asn Arg Thr His Leu Tyr Val Cys Gly Ser Gly Ala Phe Ser Pro Val
        125                 130                 135

tgt act tac ttg aac aga ggg agg aga tca gag gac caa gtt ttc atg    1024
Cys Thr Tyr Leu Asn Arg Gly Arg Arg Ser Glu Asp Gln Val Phe Met
    140                 145                 150

att gac tcc aag tgt gaa tct gga aaa gga cgc tgc tct ttc aac ccc    1072
Ile Asp Ser Lys Cys Glu Ser Gly Lys Gly Arg Cys Ser Phe Asn Pro
155                 160                 165                 170

aac gtg aac acg gtg tct gtt atg atc aat gag gag ctt ttc tct gga    1120
Asn Val Asn Thr Val Ser Val Met Ile Asn Glu Glu Leu Phe Ser Gly
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atg tat ata gat ttc atg ggg aca gat gct gct att ttt cga agt tta    1168
Met Tyr Ile Asp Phe Met Gly Thr Asp Ala Ala Ile Phe Arg Ser Leu
            190                 195                 200

acc aag agg aat gcg gtc aga act gat caa cat aat tcc aaa tgg cta    1216
Thr Lys Arg Asn Ala Val Arg Thr Asp Gln His Asn Ser Lys Trp Leu
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agt gaa cct atg ttt gta gat gca cat gtc atc cca gat ggt act gat    1264
Ser Glu Pro Met Phe Val Asp Ala His Val Ile Pro Asp Gly Thr Asp
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aat aac agg agc acg aaa cag att cat tcc atg att gct cga ata tgt    1360
Asn Asn Arg Ser Thr Lys Gln Ile His Ser Met Ile Ala Arg Ile Cys
                255                 260                 265

cct aat gac act ggt gga ctg cgt agc ctt gtc aac aag tgg acc act    1408
Pro Asn Asp Thr Gly Gly Leu Arg Ser Leu Val Asn Lys Trp Thr Thr
            270                 275                 280

ttc tta aag gcg agg ctg gtg tgc tcg gta aca gat gaa gac ggc cca    1456
Phe Leu Lys Ala Arg Leu Val Cys Ser Val Thr Asp Glu Asp Gly Pro
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gaa aca cac ttt gat gaa tta gag gat gtg ttt ctg ctg gaa act gat    1504
Glu Thr His Phe Asp Glu Leu Glu Asp Val Phe Leu Leu Glu Thr Asp
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aac ccg agg aca aca cta gtg tat ggc att ttt aca aca tca agc tca    1552
Asn Pro Arg Thr Thr Leu Val Tyr Gly Ile Phe Thr Thr Ser Ser Ser
315                 320                 325                 330

gtt ttc aaa gga tca gcc gtg tgt gtg tat cat tta tct gat ata cag    1600
Val Phe Lys Gly Ser Ala Val Cys Val Tyr His Leu Ser Asp Ile Gln
                335                 340                 345

act gtg ttt aat ggg cct ttt gcc cac aaa gaa ggg ccc aat cat cag    1648
Thr Val Phe Asn Gly Pro Phe Ala His Lys Glu Gly Pro Asn His Gln
            350                 355                 360

ctg att tcc tat cag ggc aga att cca tat cct cgc cct gga act tgt    1696
Leu Ile Ser Tyr Gln Gly Arg Ile Pro Tyr Pro Arg Pro Gly Thr Cys
        365                 370                 375

cca gga gga gca ttt aca ccc aat atg cga acc acc aag gag ttc cca    1744
Pro Gly Gly Ala Phe Thr Pro Asn Met Arg Thr Thr Lys Glu Phe Pro
    380                 385                 390

gat gat gtt gtc act ttt att cgg aac cat cct ctc atg tac aat tcc    1792
Asp Asp Val Val Thr Phe Ile Arg Asn His Pro Leu Met Tyr Asn Ser
395                 400                 405                 410

atc tac cca atc cac aaa agg cct ttg att gtt cgt att ggc act gac    1840
Ile Tyr Pro Ile His Lys Arg Pro Leu Ile Val Arg Ile Gly Thr Asp
                415                 420                 425

tac aag tat aca aag ata gct gtg gat cga gtg aac gct gct gat ggg    1888
Tyr Lys Tyr Thr Lys Ile Ala Val Asp Arg Val Asn Ala Ala Asp Gly
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aga tac cat gtc ctg ttt ctc gga aca gat cgg ggt act gtg caa aaa    1936
Arg Tyr His Val Leu Phe Leu Gly Thr Asp Arg Gly Thr Val Gln Lys
        445                 450                 455

gtg gtt gtt ctt cct act aac aac tct gtc agt ggc gag ctc att ctg    1984
Val Val Val Leu Pro Thr Asn Asn Ser Val Ser Gly Glu Leu Ile Leu
    460                 465                 470

gag gag ctg gaa gtc ttt aag aat cat gct cct ata aca aca atg aaa    2032
Glu Glu Leu Glu Val Phe Lys Asn His Ala Pro Ile Thr Thr Met Lys
475                 480                 485                 490

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Ser Gln Val Ser Leu His Arg Cys His Ile Tyr Gly Thr Ala Cys Ala
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gac tgc tgc ctg gcg cgg gac cct tat tgc gcc tgg gat ggc cat tcc    2176
Asp Cys Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly His Ser
        525                 530                 535

tgt tcc aga ttc tac cca act ggg aaa cgg agg agc cga aga caa gat    2224
Cys Ser Arg Phe Tyr Pro Thr Gly Lys Arg Arg Ser Arg Arg Gln Asp
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gtg aga cat gga aac cca ctg act caa tgc aga gga ttt aat cta aaa    2272
Val Arg His Gly Asn Pro Leu Thr Gln Cys Arg Gly Phe Asn Leu Lys
555                 560                 565                 570

gca tac aga aat gca gct gaa att gtc cag tat gga gta aaa aat aac    2320
Ala Tyr Arg Asn Ala Ala Glu Ile Val Gln Tyr Gly Val Lys Asn Asn
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acc act ttt ctg gag tgt gcc ccc aag tct ccg cag gca tct atc aag    2368
Thr Thr Phe Leu Glu Cys Ala Pro Lys Ser Pro Gln Ala Ser Ile Lys
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tgg ctg tta cag aaa gac aaa gac agg agg aaa gag gtt aag ctg aat    2416
Trp Leu Leu Gln Lys Asp Lys Asp Arg Arg Lys Glu Val Lys Leu Asn
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gaa cga ata ata gcc act tca cag gga ctc ctg atc cgc tct gtt cag    2464
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ggt tct gac caa gga ctt tat cac tgc att gct aca gaa aat agt ttc    2512
Gly Ser Asp Gln Gly Leu Tyr His Cys Ile Ala Thr Glu Asn Ser Phe
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aag cag acc ata gcc aag atc aac ttc aaa gtt tta gat tca gaa atg    2560
Lys Gln Thr Ile Ala Lys Ile Asn Phe Lys Val Leu Asp Ser Glu Met
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gtg gct gtt gtg acg gac aaa tgg tcc cca tgg acc tgg gcc agc tct    2608
Val Ala Val Val Thr Asp Lys Trp Ser Pro Trp Thr Trp Ala Ser Ser
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gtg agg gct tta ccc ttc cac ccg aag gac atc atg ggg gca ttc agc    2656
Val Arg Ala Leu Pro Phe His Pro Lys Asp Ile Met Gly Ala Phe Ser
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cac tca gaa atg cag atg att aac caa tat tgc aaa gac act cgg cag    2704
His Ser Glu Met Gln Met Ile Asn Gln Tyr Cys Lys Asp Thr Arg Gln
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caa cat cag cag gga gat gaa tca cag aaa atg aga ggg gac tat ggc    2752
Gln His Gln Gln Gly Asp Glu Ser Gln Lys Met Arg Gly Asp Tyr Gly
715                 720                 725                 730

aag tta aag gcc ctc atc aat agt cgg aaa agt aga aac agg agg aat    2800
Lys Leu Lys Ala Leu Ile Asn Ser Arg Lys Ser Arg Asn Arg Arg Asn
                735                 740                 745

cag ttg cca gag tca taa tattttctta tgtgggtctt atgcttccat           2848
Gln Leu Pro Glu Ser
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His His Pro Leu Asp Tyr Arg Ile Leu Leu Met Asp Glu Asp Gln Asp
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Arg Ile Tyr Val Gly Ser Lys Asp His Ile Leu Ser Leu Asn Ile Asn
65 70 75 80
Asn Ile Ser Gln Glu Ala Leu Ser Val Phe Trp Pro Ala Ser Thr Ile
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Lys Val Glu Glu Cys Lys Met Ala Gly Lys Asp Pro Thr His Gly Cys
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Gly Asn Phe Val Arg Val Ile Gln Thr Phe Asn Arg Thr His Leu Tyr
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Val Cys Gly Ser Gly Ala Phe Ser Pro Val Cys Thr Tyr Leu Asn Arg
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Gly Arg Arg Ser Glu Asp Gln Val Phe Met Ile Asp Ser Lys Cys Glu
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Ser Gly Lys Gly Arg Cys Ser Phe Asn Pro Asn Val Asn Thr Val Ser
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Val Met Ile Asn Glu Glu Leu Phe Ser Gly Met Tyr Ile Asp Phe Met
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Gly Thr Asp Ala Ala Ile Phe Arg Ser Leu Thr Lys Arg Asn Ala Val
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Arg Thr Asp Gln His Asn Ser Lys Trp Leu Ser Glu Pro Met Phe Val
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Asp Ala His Val Ile Pro Asp Gly Thr Asp Pro Asn Asp Ala Lys Val
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Gln Ile His Ser Met Ile Ala Arg Ile Cys Pro Asn Asp Thr Gly Gly
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Val Cys Ser Val Thr Asp Glu Asp Gly Pro Glu Thr His Phe Asp Glu
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Val Tyr Gly Ile Phe Thr Thr Ser Ser Ser Val Phe Lys Gly Ser Ala
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Phe Ala His Lys Glu Gly Pro Asn His Gln Leu Ile Ser Tyr Gln Gly
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385 390 395 400
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Leu Thr Phe Asp Glu Leu Arg Glu Thr Lys Thr Ser Glu Tyr Phe Ser
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ctg tcc cac cag cag tta gac tac aga ata ttg ctg atg gat gaa gat     374
Leu Ser His Gln Gln Leu Asp Tyr Arg Ile Leu Leu Met Asp Glu Asp
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caa gac cgg ata tat gtg ggg agc aaa gac cac atc ctg tct ttg aat     422
Gln Asp Arg Ile Tyr Val Gly Ser Lys Asp His Ile Leu Ser Leu Asn
        65                  70                  75

atc aac aat atc agt caa gaa cct ttg agt gtt ttc tgg cca gca tca     470
Ile Asn Asn Ile Ser Gln Glu Pro Leu Ser Val Phe Trp Pro Ala Ser
    80                  85                  90

aca atc aaa gtt gaa gag tgc aaa atg gct ggc aaa gat cct aca cat     518
Thr Ile Lys Val Glu Glu Cys Lys Met Ala Gly Lys Asp Pro Thr His
95                  100                 105                 110

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Gly Cys Gly Asn Phe Val Arg Val Ile Gln Thr Phe Asn Arg Thr His
                115                 120                 125

ctg tat gtc tgt ggg agt gga gcg ttc agc cca gtg tgc acc tac ctg     614
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aac cgg gga agg agg tca gag gac cag gta ttc atg atc gac tct aag     662
Asn Arg Gly Arg Arg Ser Glu Asp Gln Val Phe Met Ile Asp Ser Lys
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tgt gaa tct ggc aaa gga cga tgc tct ttc aac ccg aat gtg aac act     710
Cys Glu Ser Gly Lys Gly Arg Cys Ser Phe Asn Pro Asn Val Asn Thr
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gtg tct gtt atg atc aat gag gaa ctc ttc tca gga atg tat ata gac     758
Val Ser Val Met Ile Asn Glu Glu Leu Phe Ser Gly Met Tyr Ile Asp
175                 180                 185                 190

ttc atg gga aca gat gct gct att ttc cga agt tta act aag agg aat     806
Phe Met Gly Thr Asp Ala Ala Ile Phe Arg Ser Leu Thr Lys Arg Asn
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Ala Val Arg Thr Asp Gln His Asn Ser Lys Trp Leu Ser Glu Pro Met
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Phe Val Asp Ala His Val Ile Pro Asp Gly Thr Asp Pro Asn Asp Ala
        225                 230                 235

aag gtc tat ttc ttc ttc aaa gaa aga ctg act gac aac aat agg agc     950
Lys Val Tyr Phe Phe Phe Lys Glu Arg Leu Thr Asp Asn Asn Arg Ser
    240                 245                 250

aca aaa cag att cat tcc atg att gca aga ata tgc cct aat gac act     998
Thr Lys Gln Ile His Ser Met Ile Ala Arg Ile Cys Pro Asn Asp Thr
255                 260                 265                 270

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aga ctt gta tgc tca gtc aca gat gaa gat ggc cca gag aca cat ttt    1094
Arg Leu Val Cys Ser Val Thr Asp Glu Asp Gly Pro Glu Thr His Phe
            290                 295                 300

gat gaa cta gag gat gtc ttt ctg ctg gaa act gac aat cca agg aca    1142
Asp Glu Leu Glu Asp Val Phe Leu Leu Glu Thr Asp Asn Pro Arg Thr
        305                 310                 315

aca ctc gtg tat ggc atc ttc acc aca tca agc tct gtt ttt aag gga    1190
Thr Leu Val Tyr Gly Ile Phe Thr Thr Ser Ser Ser Val Phe Lys Gly
    320                 325                 330

tcg gca gtg tgt gtg tat cat tta tct gat ata cag act gta ttc aat    1238
Ser Ala Val Cys Val Tyr His Leu Ser Asp Ile Gln Thr Val Phe Asn
335                 340                 345                 350

ggg ccc ttt gcc cac aag gaa ggg ccc aat cac cag ctg atc tcc tat    1286
Gly Pro Phe Ala His Lys Glu Gly Pro Asn His Gln Leu Ile Ser Tyr
                355                 360                 365

caa ggt aga atc cca tat cct cgc cca gga act tgc cca gga ggg gcc    1334
Gln Gly Arg Ile Pro Tyr Pro Arg Pro Gly Thr Cys Pro Gly Gly Ala
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ttt aca ccc aat atg aga acc acc aag gac ttc cca gat gac gtt gtc    1382
Phe Thr Pro Asn Met Arg Thr Thr Lys Asp Phe Pro Asp Asp Val Val
        385                 390                 395

act ttt att cgg aac cac cct ctc atg tac aat tcc atc tac ccc atc    1430
Thr Phe Ile Arg Asn His Pro Leu Met Tyr Asn Ser Ile Tyr Pro Ile
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cac aga agg cct ctg ata gtc cgc ata ggc act gac tac aag tac aca    1478
His Arg Arg Pro Leu Ile Val Arg Ile Gly Thr Asp Tyr Lys Tyr Thr
415                 420                 425                 430

aag att gct gtg gac cgt gtc aac gct gct gat ggg aga tac cac gtt    1526
Lys Ile Ala Val Asp Arg Val Asn Ala Ala Asp Gly Arg Tyr His Val
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ctg ttt ctg ggc aca gat cgg ggc acc gtg cag aag gtc gta gtc ctt    1574
Leu Phe Leu Gly Thr Asp Arg Gly Thr Val Gln Lys Val Val Val Leu
            450                 455                 460

cct acc aat agc tct gcc agt ggg gaa ctc atc ctg gag gag ctg gaa    1622
Pro Thr Asn Ser Ser Ala Ser Gly Glu Leu Ile Leu Glu Glu Leu Glu
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gtc ttc aag aat cat gtt ccc ata aca aca atg aaa atc tca tcc aaa    1670
Val Phe Lys Asn His Val Pro Ile Thr Thr Met Lys Ile Ser Ser Lys
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aag caa cag ttg tac gtg agc tcc aat gag ggg gtt tcc caa gtc tct    1718
Lys Gln Gln Leu Tyr Val Ser Ser Asn Glu Gly Val Ser Gln Val Ser
495                 500                 505                 510

ctg cat cgc tgc cat atc tac ggc aca gcc tgt gcg gac tgc tgc ttg    1766
Leu His Arg Cys His Ile Tyr Gly Thr Ala Cys Ala Asp Cys Cys Leu
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gcg agg gat cca tac tgt gcc tgg gat ggc cac tct tgc tct agg ttc    1814
Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly His Ser Cys Ser Arg Phe
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Tyr Pro Thr Gly Lys Arg Arg Ser Arg Arg Gln Asp Val Arg His Gly
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Asn Pro Leu Thr Gln Cys Arg Gly Phe Asn Leu Lys Ala Tyr Arg Asn
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gca gct gaa att gtt cag tat gga gta aga aat aac agc act ttc ctt    1958
Ala Ala Glu Ile Val Gln Tyr Gly Val Arg Asn Asn Ser Thr Phe Leu
575                 580                 585                 590

gag tgt gct ccc aag tct cca cag gca tct atc aag tgg ttg ctg cag    2006
Glu Cys Ala Pro Lys Ser Pro Gln Ala Ser Ile Lys Trp Leu Leu Gln
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aaa gac aaa gac agg agg aag gag gtt aaa ctg aac gag cgc att ata    2054
Lys Asp Lys Asp Arg Arg Lys Glu Val Lys Leu Asn Glu Arg Ile Ile
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gct act tcc caa gga cta ctg att cgc tct gtt caa gat tct gac caa    2102
Ala Thr Ser Gln Gly Leu Leu Ile Arg Ser Val Gln Asp Ser Asp Gln
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gga ctc tac cac tgc att gcc act gag aac agc ttc aaa cag acc ata    2150
Gly Leu Tyr His Cys Ile Ala Thr Glu Asn Ser Phe Lys Gln Thr Ile
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gcc aag atc aac ttc aaa gtt tta gat tca gaa atg gtg gcc gtt gtg    2198
Ala Lys Ile Asn Phe Lys Val Leu Asp Ser Glu Met Val Ala Val Val
655                 660                 665                 670

aca gac aag tgg tcc ccg tgg aca tgg gct ggc tct gtg agg gct cta    2246
Thr Asp Lys Trp Ser Pro Trp Thr Trp Ala Gly Ser Val Arg Ala Leu
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ccc ttc cat cca aag gac atc ctg ggg gca ttc agc cac tcg gaa atg    2294
Pro Phe His Pro Lys Asp Ile Leu Gly Ala Phe Ser His Ser Glu Met
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cag ctc atc aat cag tac tgc aaa gac acc cgg cag cag cag cag ctg    2342
Gln Leu Ile Asn Gln Tyr Cys Lys Asp Thr Arg Gln Gln Gln Gln Leu
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ggg gaa gaa cca cag aag atg aga ggg gac tat ggc aag ctg aag gct    2390
Gly Glu Glu Pro Gln Lys Met Arg Gly Asp Tyr Gly Lys Leu Lys Ala
    720                 725                 730

ctc atc aac agc agg aaa agc aga aac agg agg aat cag ctt cca gag    2438
Leu Ile Asn Ser Arg Lys Ser Arg Asn Arg Arg Asn Gln Leu Pro Glu
735                 740                 745                 750

tca taa aacattcatc catgaagttt tgcttccagg aacaaatgct ctgtcttcac    2494
Ser

tagtcaacta ttaaataaaa tcttgtgctt tacccatgag aaatttctga caaaagctgg  2554

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cagattttat ttatatcttt atgtgtcttt tcttcaaaat caatgcgaca acagaagcag  2734

aactgttaca gcctcggttg agcgagggcc ataaatttcc ctgtgctctt ccttccgtgc  2794

tctaggggtt tagctttcta attgtcactg gcttttatac atgaaaaaga attccagttc  2854

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35 40 45
His Gln Gln Leu Asp Tyr Arg Ile Leu Leu Met Asp Glu Asp Gln Asp
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Arg Ile Tyr Val Gly Ser Lys Asp His Ile Leu Ser Leu Asn Ile Asn
65 70 75 80
Asn Ile Ser Gln Glu Pro Leu Ser Val Phe Trp Pro Ala Ser Thr Ile
85 90 95
Lys Val Glu Glu Cys Lys Met Ala Gly Lys Asp Pro Thr His Gly Cys
100 105 110
Gly Asn Phe Val Arg Val Ile Gln Thr Phe Asn Arg Thr His Leu Tyr
115 120 125
Val Cys Gly Ser Gly Ala Phe Ser Pro Val Cys Thr Tyr Leu Asn Arg
130 135 140
Gly Arg Arg Ser Glu Asp Gln Val Phe Met Ile Asp Ser Lys Cys Glu
145 150 155 160
Ser Gly Lys Gly Arg Cys Ser Phe Asn Pro Asn Val Asn Thr Val Ser
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Val Met Ile Asn Glu Glu Leu Phe Ser Gly Met Tyr Ile Asp Phe Met
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Gly Thr Asp Ala Ala Ile Phe Arg Ser Leu Thr Lys Arg Asn Ala Val
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Arg Thr Asp Gln His Asn Ser Lys Trp Leu Ser Glu Pro Met Phe Val
210 215 220
Asp Ala His Val Ile Pro Asp Gly Thr Asp Pro Asn Asp Ala Lys Val
225 230 235 240
Tyr Phe Phe Phe Lys Glu Arg Leu Thr Asp Asn Asn Arg Ser Thr Lys
245 250 255
Gln Ile His Ser Met Ile Ala Arg Ile Cys Pro Asn Asp Thr Gly Gly
260 265 270
Gln Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu
275 280 285
Val Cys Ser Val Thr Asp Glu Asp Gly Pro Glu Thr His Phe Asp Glu
290 295 300
Leu Glu Asp Val Phe Leu Leu Glu Thr Asp Asn Pro Arg Thr Thr Leu
305 310 315 320
Val Tyr Gly Ile Phe Thr Thr Ser Ser Ser Val Phe Lys Gly Ser Ala
325 330 335
Val Cys Val Tyr His Leu Ser Asp Ile Gln Thr Val Phe Asn Gly Pro
340 345 350
Phe Ala His Lys Glu Gly Pro Asn His Gln Leu Ile Ser Tyr Gln Gly
355 360 365
Arg Ile Pro Tyr Pro Arg Pro Gly Thr Cys Pro Gly Gly Ala Phe Thr
370 375 380
Pro Asn Met Arg Thr Thr Lys Asp Phe Pro Asp Asp Val Val Thr Phe
385 390 395 400
Ile Arg Asn His Pro Leu Met Tyr Asn Ser Ile Tyr Pro Ile His Arg
405 410 415
Arg Pro Leu Ile Val Arg Ile Gly Thr Asp Tyr Lys Tyr Thr Lys Ile
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Ala Val Asp Arg Val Asn Ala Ala Asp Gly Arg Tyr His Val Leu Phe
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Leu Gly Thr Asp Arg Gly Thr Val Gln Lys Val Val Val Leu Pro Thr

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Gln Leu Tyr Val Ser Ser Asn Glu Gly Val Ser Gln Val Ser Leu His
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Arg Cys His Ile Tyr Gly Thr Ala Cys Ala Asp Cys Cys Leu Ala Arg
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Asp Pro Tyr Cys Ala Trp Asp Gly His Ser Cys Ser Arg Phe Tyr Pro
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Thr Gly Lys Arg Arg Ser Arg Arg Gln Asp Val Arg His Gly Asn Pro
545                 550                 555                 560
Leu Thr Gln Cys Arg Gly Phe Asn Leu Lys Ala Tyr Arg Asn Ala Ala
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Glu Ile Val Gln Tyr Gly Val Arg Asn Asn Ser Thr Phe Leu Glu Cys
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Ala Pro Lys Ser Pro Gln Ala Ser Ile Lys Trp Leu Leu Gln Lys Asp
        595                 600                 605
Lys Asp Arg Arg Lys Glu Val Lys Leu Asn Glu Arg Ile Ile Ala Thr
    610                 615                 620
Ser Gln Gly Leu Leu Ile Arg Ser Val Gln Asp Ser Asp Gln Gly Leu
625                 630                 635                 640
Tyr His Cys Ile Ala Thr Glu Asn Ser Phe Lys Gln Thr Ile Ala Lys
                645                 650                 655
Ile Asn Phe Lys Val Leu Asp Ser Glu Met Val Ala Val Val Thr Asp
            660                 665                 670
Lys Trp Ser Pro Trp Thr Trp Ala Gly Ser Val Arg Ala Leu Pro Phe
        675                 680                 685
His Pro Lys Asp Ile Leu Gly Ala Phe Ser His Ser Glu Met Gln Leu
    690                 695                 700
Ile Asn Gln Tyr Cys Lys Asp Thr Arg Gln Gln Gln Gln Leu Gly Glu
705                 710                 715                 720
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Asp Glu Arg Leu Lys Ala Arg Ser Gln Asp Phe His Leu Phe Pro Ala
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ttg atg atg cta agc atg acc atg ttg ttt ctt cca gtc act ggc act     151
Leu Met Met Leu Ser Met Thr Met Leu Phe Leu Pro Val Thr Gly Thr
            25                  30                  35

ttg aag caa aat att cca aga ctc aag cta acc tac aaa gac ttg ctg     199
Leu Lys Gln Asn Ile Pro Arg Leu Lys Leu Thr Tyr Lys Asp Leu Leu
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ctt tca aat agc tgt att ccc ttt ttg ggt tca tca gaa gga ctg gat     247
Leu Ser Asn Ser Cys Ile Pro Phe Leu Gly Ser Ser Glu Gly Leu Asp
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ttt caa act ctt ctc tta gat gag gaa aga ggc agg ctg ctc ttg gga     295
Phe Gln Thr Leu Leu Leu Asp Glu Glu Arg Gly Arg Leu Leu Leu Gly
70                  75                  80                  85

gcc aaa gac cac atc ttt cta ctc agt ctg gtt gac tta aac aaa aat     343
Ala Lys Asp His Ile Phe Leu Leu Ser Leu Val Asp Leu Asn Lys Asn
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ttt aag aag att tat tgg cct gct gca aag gaa cgg gtg gaa tta tgt     391
Phe Lys Lys Ile Tyr Trp Pro Ala Ala Lys Glu Arg Val Glu Leu Cys
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aaa tta gct ggg aaa gat gcc aat aca gaa tgt gca aat ttc atc aga     439
Lys Leu Ala Gly Lys Asp Ala Asn Thr Glu Cys Ala Asn Phe Ile Arg
        120                 125                 130

gta ctt cag ccc tat aac aaa act cac ata tat gtg tgt gga act gga     487
Val Leu Gln Pro Tyr Asn Lys Thr His Ile Tyr Val Cys Gly Thr Gly
    135                 140                 145

gca ttt cat cca ata tgt ggg tat att gat ctt gga gtc tac aag gag     535
Ala Phe His Pro Ile Cys Gly Tyr Ile Asp Leu Gly Val Tyr Lys Glu
150                 155                 160                 165

gat att ata ttc aaa cta gac aca cat aat ttg gag tct ggc aga ctg     583
Asp Ile Ile Phe Lys Leu Asp Thr His Asn Leu Glu Ser Gly Arg Leu
                170                 175                 180

aaa tgt cct ttc gat cct cag cag cct ttt gct tca gta atg aca gat     631
Lys Cys Pro Phe Asp Pro Gln Gln Pro Phe Ala Ser Val Met Thr Asp
            185                 190                 195

gag tac ctc tac tct gga aca gct tct gat ttc ctt ggc aaa gat act     679
Glu Tyr Leu Tyr Ser Gly Thr Ala Ser Asp Phe Leu Gly Lys Asp Thr
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gca ttc act cga tcc ctt ggg cct act cat gac cac cac tac atc aga     727
Ala Phe Thr Arg Ser Leu Gly Pro Thr His Asp His His Tyr Ile Arg
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act gac att tca gag cac tac tgg ctc aat gga gca aaa ttt att gga     775
Thr Asp Ile Ser Glu His Tyr Trp Leu Asn Gly Ala Lys Phe Ile Gly
230                 235                 240                 245

act ttc ttc ata cca gac acc tac aat cca gat gat gat aaa ata tat     823
Thr Phe Phe Ile Pro Asp Thr Tyr Asn Pro Asp Asp Asp Lys Ile Tyr
                250                 255                 260

ttc ttc ttt cgt gaa tca tct caa gaa ggc agt acc tcc gat aaa acc     871
Phe Phe Phe Arg Glu Ser Ser Gln Glu Gly Ser Thr Ser Asp Lys Thr
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atc ctt tct cga gtt gga aga gtt tgt aag aat gat gta gga gga caa     919
Ile Leu Ser Arg Val Gly Arg Val Cys Lys Asn Asp Val Gly Gly Gln
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cgc agc ctg ata aac aag tgg acg act ttt ctt aag gcc aga ctg att     967
Arg Ser Leu Ile Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu Ile
    295                 300                 305

tgc tca att cct gga agt gat ggg gca gat act tac ttt gat gag ctt    1015
Cys Ser Ile Pro Gly Ser Asp Gly Ala Asp Thr Tyr Phe Asp Glu Leu
310                 315                 320                 325
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tat gga gtc ttt act aca acc agc tcc atc ttc aaa ggc tct gct gtt    1111
Tyr Gly Val Phe Thr Thr Thr Ser Ser Ile Phe Lys Gly Ser Ala Val
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tgt gtg tat agc atg gct gac atc aga gca gtt ttt aat ggt cca tat    1159
Cys Val Tyr Ser Met Ala Asp Ile Arg Ala Val Phe Asn Gly Pro Tyr
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Ala His Lys Glu Ser Ala Asp His Arg Trp Val Gln Tyr Asp Gly Arg
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Ile Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys Thr Tyr Asp Pro
390                 395                 400                 405

ctg att aag tcc acc cga gat ttt cca gat gat gtc atc agt ttc ata    1303
Leu Ile Lys Ser Thr Arg Asp Phe Pro Asp Asp Val Ile Ser Phe Ile
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Lys Arg His Ser Val Met Tyr Lys Ser Val Tyr Pro Val Ala Gly Gly
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cca acg ttc aag aga atc aat gtg gat tac aga ctg aca cag ata gtg    1399
Pro Thr Phe Lys Arg Ile Asn Val Asp Tyr Arg Leu Thr Gln Ile Val
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gtg gat cat gtc att gca gaa gat ggc cag tac gat gta atg ttt ctt    1447
Val Asp His Val Ile Ala Glu Asp Gly Gln Tyr Asp Val Met Phe Leu
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gga aca gac att gga act gtc ctc aaa gtt gtc agc att tca aag gaa    1495
Gly Thr Asp Ile Gly Thr Val Leu Lys Val Val Ser Ile Ser Lys Glu
470                 475                 480                 485

aag tgg aat atg gaa gag gta gtg ctg gag gag ttg cag ata ttc aag    1543
Lys Trp Asn Met Glu Glu Val Val Leu Glu Glu Leu Gln Ile Phe Lys
                490                 495                 500

cac tca tca atc atc ttg aac atg gaa ttg tct ctg aag cag caa caa    1591
His Ser Ser Ile Ile Leu Asn Met Glu Leu Ser Leu Lys Gln Gln Gln
            505                 510                 515

ttg tac att ggt tcc cga gat gga ttg gtt cag ctc tcc ttg cac aga    1639
Leu Tyr Ile Gly Ser Arg Asp Gly Leu Val Gln Leu Ser Leu His Arg
        520                 525                 530

tgc gac act tat ggg aaa gct tgc gca gac tgt tgt ctt gcc aga gac    1687
Cys Asp Thr Tyr Gly Lys Ala Cys Ala Asp Cys Cys Leu Ala Arg Asp
    535                 540                 545

ccc tac tgt gcc tgg gat gga aat gca tgc tct cga tat gct cct act    1735
Pro Tyr Cys Ala Trp Asp Gly Asn Ala Cys Ser Arg Tyr Ala Pro Thr
550                 555                 560                 565

tct aaa agg aga gct aga cgc caa gat gta aaa tat ggc gac cca atc    1783
Ser Lys Arg Arg Ala Arg Arg Gln Asp Val Lys Tyr Gly Asp Pro Ile
                570                 575                 580

acc cag tgc tgg gac atc gaa gac agc att agt cat gaa act gct gat    1831
Thr Gln Cys Trp Asp Ile Glu Asp Ser Ile Ser His Glu Thr Ala Asp
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ata cct aaa tcc caa caa gca act att aaa tgg tat atc cag agg tca    1927
Ile Pro Lys Ser Gln Gln Ala Thr Ile Lys Trp Tyr Ile Gln Arg Ser
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ggg gat gag cat cga gag gag ttg aag ccc gat gaa aga atc atc aaa    1975
Gly Asp Glu His Arg Glu Glu Leu Lys Pro Asp Glu Arg Ile Ile Lys
630                 635                 640                 645

acg gaa tat ggg cta ctg att cga agt ttg cag aag aag gat tct ggg    2023
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Met Tyr Tyr Cys Lys Ala Gln Glu His Thr Phe Ile His Thr Ile Val
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aag ctg act ttg aat gtc att gag aat gaa cag atg gaa aat acc cag    2119
Lys Leu Thr Leu Asn Val Ile Glu Asn Glu Gln Met Glu Asn Thr Gln
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Arg Ala Glu His Glu Glu Gly Lys Val Lys Asp Leu Leu Ala Glu Ser
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Arg Leu Arg Tyr Lys Asp Tyr Ile Gln Ile Leu Ser Ser Pro Asn Phe
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agc ctc gac cag tac tgc gaa cag atg tgg cac agg gag aag cgg aga    2263
Ser Leu Asp Gln Tyr Cys Glu Gln Met Trp His Arg Glu Lys Arg Arg
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Gln Arg Asn Lys Gly Gly Pro Lys Trp Lys His Met Gln Glu Met Lys
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aag aaa cga aat cga aga cat cac aga gac ctg gat gag ctc cct aga    2359
Lys Lys Arg Asn Arg Arg His His Arg Asp Leu Asp Glu Leu Pro Arg
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Ala Val Ala Thr
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Tyr Lys Asp Leu Leu Leu Ser Asn Ser Cys Ile Pro Phe Leu Gly Ser
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Ser Glu Gly Leu Asp Phe Gln Thr Leu Leu Leu Asp Glu Glu Arg Gly
65 70 75 80
Arg Leu Leu Leu Gly Ala Lys Asp His Ile Phe Leu Leu Ser Leu Val
85 90 95
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Ser Val Met Thr Asp Glu Tyr Leu Tyr Ser Gly Thr Ala Ser Asp Phe
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His His Tyr Ile Arg Thr Asp Ile Ser Glu His Tyr Trp Leu Asn Gly
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Lys Lys Asp Ser Gly Met Tyr Tyr Cys Lys Ala Gln Glu His Thr Phe
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Pro Ser Lys Thr Tyr Asp Pro Leu Ile Lys Ser Thr Arg Asp Phe Pro
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Tyr Arg Leu Thr Gln Ile Val Val Asp His Val Val Ala Glu Asp Gly
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gacgtttcct ttgtgctata ctttgattct ttgcatatat taattattac atgctattcc  5830
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cacttcttag cattgtcagt ggtgggtatc aatgaatttg aataatttta cttttaaaaa 6430

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Pro Val Thr Glu Thr Ser Lys Gln Asn Ile Pro Arg Leu Lys Leu Thr
        35                  40                  45
Tyr Lys Asp Leu Leu Leu Ser Asn Thr Cys Ile Pro Phe Leu Gly Ser
    50                  55                  60
Ser Glu Gly Leu Asp Phe Gln Thr Leu Leu Leu Asp Glu Glu Arg Gly
65                  70                  75                  80
Ile Leu Leu Leu Gly Ala Lys Asp His Val Phe Leu Leu Ser Leu Val
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Asp Leu Asn Lys Asn Phe Lys Lys Ile Tyr Trp Pro Ala Ala Lys Glu
            100                 105                 110
Arg Val Glu Leu Cys Lys Leu Ala Gly Lys Asp Ala Asn Ala Glu Cys
        115                 120                 125
Ala Asn Phe Ile Arg Val Leu Gln Pro Tyr Asn Lys Thr His Val Tyr
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Val Cys Gly Thr Gly Ala Phe His Pro Leu Cys Gly Tyr Ile Asp Leu
145                 150                 155                 160
Gly Ala Asn Lys Glu Glu Leu Ile Phe Lys Leu Asp Thr His Asn Leu
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Glu Ser Gly Arg Leu Lys Cys Pro Phe Asp Pro Gln Gln Pro Phe Ala
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Ser Val Met Thr Asp Glu His Leu Tyr Ser Gly Thr Ala Ser Asp Phe
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His His Ser Ile Arg Thr Asp Ile Ser Glu His His Trp Leu Asn Gly
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Thr Ser Asp Arg Ser Ile Leu Ser Arg Val Gly Arg Val Cys Lys Asn
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Arg Asn Pro Val Val Tyr Gly Val Phe Thr Thr Thr Ser Ser Ile Phe
            340                 345                 350
Lys Gly Ser Ala Val Cys Val Tyr Ser Met Ala Asp Ile Arg Ala Val
        355                 360                 365
Phe Asn Gly Pro Tyr Ala His Lys Glu Ser Ala Asp His Arg Trp Val
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Gln Tyr Asp Gly Arg Ile Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser
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Lys Thr Tyr Asp Pro Leu Ile Lys Ser Thr Arg Asp Phe Pro Asp Asp
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Val Ile Ser Phe Ile Arg Arg His Pro Val Met Tyr Lys Ser Val Tyr
            420                 425                 430
Pro Val Ala Gly Ala Pro Thr Phe Lys Arg Ile Asn Val Asp Tyr Arg
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Leu Thr Gln Ile Val Val Asp His Val Val Ala Glu Asp Gly Gln Tyr
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Asp Val Met Phe Leu Gly Thr Asp Ile Gly Thr Val Leu Lys Val Val
465                 470                 475                 480
Ser Ile Ser Lys Glu Lys Trp Asn Met Glu Glu Val Val Leu Glu Glu
                485                 490                 495
Leu Gln Val Phe Lys His Pro Thr Ala Ile Leu Asn Met Glu Leu Ser
            500                 505                 510
Leu Lys Gln Gln Gln Leu Tyr Val Gly Ser Trp Asp Gly Leu Val Gln
        515                 520                 525
Leu Ser Leu His Arg Cys Asp Thr Tyr Gly Lys Ala Cys Ala Asp Cys
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Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Asn Ala Cys Ser
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Arg Tyr Ala Pro Thr Ser Lys Arg Arg Ala Arg Arg Gln Asp Val Lys
                565                 570                 575
Tyr Gly Asp Pro Ile Thr Gln Cys Trp Asp Ile Glu Asp Ser Ile Ser
            580                 585                 590
His Glu Thr Ala Asp Glu Lys Val Ile Phe Gly Ile Glu Phe Asn Ser
        595                 600                 605
Thr Phe Leu Glu Cys Ile Pro Lys Ser Gln Gln Ala Ser Val Glu Trp
    610                 615                 620
Tyr Ile Gln Arg Ser Gly Asp Glu His Arg Glu Glu Leu Lys Pro Asp
625                 630                 635                 640
Glu Arg Ile Ile Lys Thr Asp Tyr Gly Leu Leu Ile Arg Ser Leu Gln
                645                 650                 655
Lys Lys Asp Ser Gly Met Tyr Tyr Cys Lys Ala Gln Glu His Thr Phe
            660                 665                 670
Ile His Thr Ile Val Lys Leu Thr Leu Asn Val Ile Glu Asn Glu Gln
        675                 680                 685
Met Glu Asn Thr Gln Arg Ala Glu Tyr Gln Glu Gly Gln Val Lys Asp
    690                 695                 700
Leu Leu Ala Glu Ser Arg Leu Arg Tyr Lys Asp Tyr Ile Gln Ile Leu
705                 710                 715                 720
Ser Ser Pro Asn Phe Ser Leu Asp Gln Tyr Cys Glu Gln Met Trp Tyr
                725                 730                 735
Lys Glu Lys Arg Arg Gln Arg Asn Lys Gly Ser Pro Lys Trp Lys His
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1               5                  10                  15

acc gcc aga gcc aac tac cag aac ggc aag aac aac gtg ccc cgg ctg      96
Thr Ala Arg Ala Asn Tyr Gln Asn Gly Lys Asn Asn Val Pro Arg Leu
            20                  25                  30

aag ctg agc tac aaa gag atg ctg gaa agc aac aac gtg atc acc ttc     144
Lys Leu Ser Tyr Lys Glu Met Leu Glu Ser Asn Asn Val Ile Thr Phe
        35                  40                  45

aac ggc ctg gcc aac agc agc agc tac cac acc ttt ctg ctg gac gag     192
Asn Gly Leu Ala Asn Ser Ser Ser Tyr His Thr Phe Leu Leu Asp Glu
    50                  55                  60

gaa cgg tcc cgg ctg tac gtg gga gcc aag gac cac atc ttc agc ttc     240
Glu Arg Ser Arg Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe
65                  70                  75                  80

gac ctc gtg aac atc aag gac ttc cag aaa atc gtg tgg ccc gtg tcc     288
Asp Leu Val Asn Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser
                85                  90                  95

tac acc aga cgg gac gag tgc aag tgg aag ggc aag gac atc ctg aaa     336
Tyr Thr Arg Arg Asp Glu Cys Lys Trp Lys Gly Lys Asp Ile Leu Lys
            100                 105                 110

gag tgc gcc aac ttc atc aag gtg ctg aag gcc tac aac cag acc cac     384
Glu Cys Ala Asn Phe Ile Lys Val Leu Lys Ala Tyr Asn Gln Thr His
        115                 120                 125

ctg tac gcc tgt ggc acc ggc gcc ttc cac cct atc tgc acc tac atc     432
Leu Tyr Ala Cys Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile
    130                 135                 140

gag atc ggc cac cac ccc gag gac aat atc ttc aag ctg gaa aac agc     480
Glu Ile Gly His His Pro Glu Asp Asn Ile Phe Lys Leu Glu Asn Ser
145                 150                 155                 160

cac ttc gag aac ggc aga ggc aag agc ccc tac gac ccc aag ctg ctg     528
His Phe Glu Asn Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu
                165                 170                 175

aca gcc tcc ctg ctg atc gac ggc gag ctg tac tct ggc aca gcc gcc     576
Thr Ala Ser Leu Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala
            180                 185                 190

gac ttc atg ggc cgg gac ttc gcc atc ttc aga acc ctg gga cac cac     624
Asp Phe Met Gly Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His
        195                 200                 205

cac cca atc cgg acc gag cag cac gac agc aga tgg ctg aac gac cct     672
His Pro Ile Arg Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro
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aag ttc atc agc gcc cac ctg atc agc gag agc gac aac cct gag gac     720
Lys Phe Ile Ser Ala His Leu Ile Ser Glu Ser Asp Asn Pro Glu Asp
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agc gga aag gcc aca cac gcc aga atc ggc cag atc tgc aag aac gac     816
Ser Gly Lys Ala Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp
            260                 265                 270

ttc ggc ggc cac cgg tcc ctc gtg aac aag tgg acc acc ttc ctg aag     864
Phe Gly Gly His Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys
        275                 280                 285

gcc cgg ctg atc tgt agc gtg cca ggc ccc aat ggc atc gac acc cac     912
Ala Arg Leu Ile Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His
    290                 295                 300

ttc gac gag ctg cag gac gtg ttc ctg atg aat ttc aag gac ccc aag     960
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305                 310                 315                 320

aac ccc gtg gtg tac ggc gtg ttc acc acc agc agc aac atc ttc aag    1008
Asn Pro Val Val Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys
                325                 330                 335

ggc agc gcc gtg tgc atg tac agc atg agc gac gtg cgg cgg gtg ttc    1056
Gly Ser Ala Val Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe
            340                 345                 350

ctg gga cct tac gcc cat aga gat ggc ccc aat tac cag tgg gtg ccc    1104
Leu Gly Pro Tyr Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro
        355                 360                 365

tac cag ggc aga gtg cct tac ccc aga cct ggc acc tgt ccc agc aag    1152
Tyr Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys
    370                 375                 380

acc ttt ggc ggc ttc gac agc acc aag gac ctg ccc gac gat gtg att    1200
Thr Phe Gly Gly Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile
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acc ttc gcc aga tcc cac ccc gcc atg tac aac ccc gtg ttc ccc atg    1248
Thr Phe Ala Arg Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Met
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aac aac cgg ccc atc gtg atc aag acc gac gtg aac tac cag ttc acc    1296
Asn Asn Arg Pro Ile Val Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr
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cag atc gtg gtg gac aga gtg gac gcc gag gac ggc cag tac gac gtg    1344
Gln Ile Val Val Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val
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atg ttc atc ggc acc gac gtg ggc acc gtg ctg aaa gtg gtg tcc atc    1392
Met Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Ile
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ccc aaa gag act tgg tac gac ctg gaa gag gtg ctg ctg gaa gag atg    1440
Pro Lys Glu Thr Trp Tyr Asp Leu Glu Glu Val Leu Leu Glu Glu Met
465                 470                 475                 480

acc gtg ttc aga gag ccc acc gcc atc tcc gcc atg gaa ctg agc aca    1488
Thr Val Phe Arg Glu Pro Thr Ala Ile Ser Ala Met Glu Leu Ser Thr
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aag cag cag cag ctg tac atc ggc agc aca gct ggc gtg gca cag ctg    1536
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cct ctg cac aga tgc gac atc tac ggc aag gcc tgc gcc gag tgt tgc    1584
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ctg gcc aga gat cct tac tgc gcc tgg gat ggc agc gcc tgc agc aga    1632
Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ser Ala Cys Ser Arg
    530                 535                 540

tac ttc ccc acc gac aag acc cac aca tgc ccc cct tgt cct gcc cct    1680
Tyr Phe Pro Thr Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro
545                 550                 555                 560

gaa ctg ctg gga ggc ccc tcc gtg ttt ctg ttc ccc cca aag ccc aag    1728
Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys
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gat acc ctg atg atc agc aga acc ccc gaa gtg acc tgc gtg gtg gtg    1776
Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val
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gac gtg tcc cac gag gac cct gaa gtg aag ttc aat tgg tac gtg gac    1824
Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp
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ggc gtg gaa gtg cac aac gcc aag acc aag ccc aga gag gaa cag tac    1872
Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr
    610                 615                 620

aac agc acc tac cgc gtg gtg tcc gtg ctg acc gtg ctg cac cag gac    1920
Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp
625                 630                 635                 640

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cct gcc ccc atc gag aaa acc atc agc aag gcc aag ggc cag ccc cgc    2016
Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg
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gaa ccc cag gtg tac aca ctg ccc cct agc agg gac gag ctg acc aag    2064
Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys
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aac cag gtg tcc ctg acc tgt ctc gtg aag ggc ttc tac ccc tcc gat    2112
Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp
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atc gcc gtg gaa tgg gag agc aac ggc cag ccc gag aac aac tac aag    2160
Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys
705                 710                 715                 720

acc acc ccc cct gtg ctg gac agc gac ggc tca ttc ttc ctg tac agc    2208
Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser
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aag ctg aca gtg gac aag agc cgg tgg cag cag ggc aac gtg ttc agc    2256
Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser
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tgc agc gtg atg cac gag gcc ctg cac aac cac tac acc cag aag tcc    2304
Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser
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Lys Leu Ser Tyr Lys Glu Met Leu Glu Ser Asn Asn Val Ile Thr Phe
35 40 45
Asn Gly Leu Ala Asn Ser Ser Ser Tyr His Thr Phe Leu Leu Asp Glu
50 55 60
Glu Arg Ser Arg Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe
65 70 75 80
Asp Leu Val Asn Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser
85 90 95
Tyr Thr Arg Arg Asp Glu Cys Lys Trp Lys Gly Lys Asp Ile Leu Lys
100 105 110
Glu Cys Ala Asn Phe Ile Lys Val Leu Lys Ala Tyr Asn Gln Thr His
115 120 125
Leu Tyr Ala Cys Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile
130 135 140
Glu Ile Gly His His Pro Glu Asp Asn Ile Phe Lys Leu Glu Asn Ser
145 150 155 160
His Phe Glu Asn Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu
165 170 175
Thr Ala Ser Leu Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala
180 185 190
Asp Phe Met Gly Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His
195 200 205
His Pro Ile Arg Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro
210 215 220
Lys Phe Ile Ser Ala His Leu Ile Ser Glu Ser Asp Asn Pro Glu Asp
225 230 235 240
Asp Lys Val Tyr Phe Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His
245 250 255
Ser Gly Lys Ala Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp
260 265 270
Phe Gly Gly His Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys
275 280 285
Ala Arg Leu Ile Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His
290 295 300
Phe Asp Glu Leu Gln Asp Val Phe Leu Met Asn Phe Lys Asp Pro Lys
305 310 315 320
Asn Pro Val Val Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys
325 330 335
Gly Ser Ala Val Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe
340 345 350
Leu Gly Pro Tyr Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro
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Tyr Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys
370 375 380
Thr Phe Gly Gly Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile
385 390 395 400
Thr Phe Ala Arg Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Met
405 410 415
Asn Asn Arg Pro Ile Val Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr
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Met Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Ile

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Lys Gln Gln Gln Leu Tyr Ile Gly Ser Thr Ala Gly Val Ala Gln Leu
            500                 505                 510
Pro Leu His Arg Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys
        515                 520                 525
Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ser Ala Cys Ser Arg
    530                 535                 540
Tyr Phe Pro Thr Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro
545                 550                 555                 560
Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys
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Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val
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Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu
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Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg
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Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys
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Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser
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Thr Ala Arg Ala Asn Tyr Ala Asn Gly Lys Asn Asn Val Pro Arg Leu
            20                  25                  30

aag ctc tct tac aag gag atg ctg gag tct aac aat gtg att aca ttc     144
Lys Leu Ser Tyr Lys Glu Met Leu Glu Ser Asn Asn Val Ile Thr Phe
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gag cgc tca cgg ctg tat gtg gga gcc aag gac cat att ttc agt ttt     240
Glu Arg Ser Arg Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe
65                  70                  75                  80

aat ctc gtg aat atc aag gat ttt cag aag atc gta tgg cct gtc tca     288
Asn Leu Val Asn Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser
                85                  90                  95

tat acc cgc aga gac gag tgc aaa tgg aag ggc aaa gat ata ctg aag     336
Tyr Thr Arg Arg Asp Glu Cys Lys Trp Lys Gly Lys Asp Ile Leu Lys
            100                 105                 110

gaa tgc gca aat ttc att aag gtg ctc gag gca tac aac cag aca cac     384
Glu Cys Ala Asn Phe Ile Lys Val Leu Glu Ala Tyr Asn Gln Thr His
        115                 120                 125

ttg tat gcc tgt ggg act ggc gcg ttc cat cct att tgt aca tac atc     432
Leu Tyr Ala Cys Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile
    130                 135                 140

gag gtg gga cat cat ccg gag gac aac atc ttc aag ttg cag gat agc     480
Glu Val Gly His His Pro Glu Asp Asn Ile Phe Lys Leu Gln Asp Ser
145                 150                 155                 160

cac ttc gag aac ggc agg gga aag tca cct tac gac cca aaa ctc ctg     528
His Phe Glu Asn Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu
                165                 170                 175

act gct tcc ctg ctt atc gac ggt gaa ctc tac tct ggc acc gca gcc     576
Thr Ala Ser Leu Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala
            180                 185                 190

gac ttt atg ggc aga gac ttt gct ata ttc agg acc ctc gga cat cat     624
Asp Phe Met Gly Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His
        195                 200                 205

cat ccg att cgg acc gag caa cac gac tca cgc tgg ctg aat gac ccc     672
His Pro Ile Arg Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro
    210                 215                 220

aga ttc att tca gcc cac ctg atc ccc gaa agt gat aac cca gag gac     720
Arg Phe Ile Ser Ala His Leu Ile Pro Glu Ser Asp Asn Pro Glu Asp
225                 230                 235                 240

gac aaa gta tac ttc ttc ttt cgc gag aat gct ata gac ggc gag cac     768
Asp Lys Val Tyr Phe Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His
                245                 250                 255

agc gga aag gct act cat gct cgg atc ggg caa atc tgt aaa aac gat     816
Ser Gly Lys Ala Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp
            260                 265                 270

ttt gga ggc cat cga tca ttg gtt aac aag tgg acc aca ttt ctt aaa     864
Phe Gly Gly His Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys
        275                 280                 285

gca aga ctt atc tgc tct gtg cct ggt cca aac ggg ata gat act cat     912
Ala Arg Leu Ile Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His
    290                 295                 300

ttc gac gag ctg cag gac gtg ttc ctt atg aac agt aag gac ccg aag     960
Phe Asp Glu Leu Gln Asp Val Phe Leu Met Asn Ser Lys Asp Pro Lys
305                 310                 315                 320
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aac cct atc gtg tac gga gtt ttt acg acg tcc tcc aac atc ttc aag    1008
Asn Pro Ile Val Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys
                325                 330                 335

ggc tca gca gtc tgc atg tat agc atg agc gac gtc cgg agg gtc ttc    1056
Gly Ser Ala Val Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe
            340                 345                 350

ctc gga ccc tac gca cac cgc gat ggc ccc aat tat cag tgg gtt cct    1104
Leu Gly Pro Tyr Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro
        355                 360                 365

tat caa ggg aga gta cct tac cct aga cca ggg aca tgt cca tcc aag    1152
Tyr Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys
    370                 375                 380

aca ttc gga ggt ttt gat tca acc aag gac ttg cca gac gat gtc ata    1200
Thr Phe Gly Gly Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile
385                 390                 395                 400

acc ttc gcc aga tca cac ccc gcc atg tac aat cct gtt ttt ccg att    1248
Thr Phe Ala Arg Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Ile
                405                 410                 415

aac aac cgc ccc att atg atc aaa act gat gtg aac tat caa ttc acc    1296
Asn Asn Arg Pro Ile Met Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr
            420                 425                 430

cag att gtt gta gat aga gtt gat gct gag gat ggc cag tat gat gtc    1344
Gln Ile Val Val Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val
        435                 440                 445

atg ttc atc ggt aca gac gtg gga aca gtc ttg aaa gtc gtt tct gtc    1392
Met Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Val
    450                 455                 460

cct aaa gag acc tgg cac gac ctg gaa gag gtc ctc ctg gag gag atg    1440
Pro Lys Glu Thr Trp His Asp Leu Glu Glu Val Leu Leu Glu Glu Met
465                 470                 475                 480

aca gtg ttc cgg gag ccc acc aca atc agc gcc atg gaa ctc tct acc    1488
Thr Val Phe Arg Glu Pro Thr Thr Ile Ser Ala Met Glu Leu Ser Thr
                485                 490                 495

aag cag cag cag ctc tac atc ggt tcc aca gct ggg gtg gct cag ctt    1536
Lys Gln Gln Gln Leu Tyr Ile Gly Ser Thr Ala Gly Val Ala Gln Leu
            500                 505                 510

ccc ctc cac aga tgc gac ata tac ggg aag gcc tgt gct gag tgc tgc    1584
Pro Leu His Arg Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys
        515                 520                 525

ctg gcc aga gat ccc tac tgc gcg tgg gat ggt tca agt tgc agt cga    1632
Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ser Ser Cys Ser Arg
    530                 535                 540

tac ttc ccc aca ggg tgc aag cct tgt att tgt act gtg ccc gaa gtg    1680
Tyr Phe Pro Thr Gly Cys Lys Pro Cys Ile Cys Thr Val Pro Glu Val
545                 550                 555                 560

tcc tcc gtg ttc atc ttt cca ccc aag cct aag gac gtt ttg aca ata    1728
Ser Ser Val Phe Ile Phe Pro Pro Lys Pro Lys Asp Val Leu Thr Ile
                565                 570                 575

acg ctg acc cca aag gtg acg tgc gtt gtg gtc gat atc agc aag gac    1776
Thr Leu Thr Pro Lys Val Thr Cys Val Val Val Asp Ile Ser Lys Asp
            580                 585                 590
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gat cca gaa gtc cag ttt tct tgg ttt gtt gat gat gtg gaa gta cac    1824
Asp Pro Glu Val Gln Phe Ser Trp Phe Val Asp Asp Val Glu Val His
        595                 600                 605

act gcg caa aca cag cct agg gaa gag cag ttt aac tct act ttt agg    1872
Thr Ala Gln Thr Gln Pro Arg Glu Glu Gln Phe Asn Ser Thr Phe Arg
    610                 615                 620

agc gta agc gag ctg ccg att atg cat cag gac tgg ttg aat ggg aag    1920
Ser Val Ser Glu Leu Pro Ile Met His Gln Asp Trp Leu Asn Gly Lys
625                 630                 635                 640

gag ttc aaa tgt cgc gtt aac tcc gca gcc ttc ccc gca cct atc gaa    1968
Glu Phe Lys Cys Arg Val Asn Ser Ala Ala Phe Pro Ala Pro Ile Glu
                645                 650                 655

aaa acg atc tca aag act aag ggt agg cca aaa gcg cca cag gta tac    2016
Lys Thr Ile Ser Lys Thr Lys Gly Arg Pro Lys Ala Pro Gln Val Tyr
            660                 665                 670

acc att cct cca ccg aag gaa cag atg gca aaa gat aag gtt tca ctg    2064
Thr Ile Pro Pro Pro Lys Glu Gln Met Ala Lys Asp Lys Val Ser Leu
        675                 680                 685

aca tgc atg att act gac ttt ttc ccc gag gat atc acc gtg gaa tgg    2112
Thr Cys Met Ile Thr Asp Phe Phe Pro Glu Asp Ile Thr Val Glu Trp
    690                 695                 700

cag tgg aat ggc caa ccc gca gag aac tat aag aac act caa cca att    2160
Gln Trp Asn Gly Gln Pro Ala Glu Asn Tyr Lys Asn Thr Gln Pro Ile
705                 710                 715                 720

atg gac aca gac ggc tca tat ttc gtg tac tct aag ctg aat gtc cag    2208
Met Asp Thr Asp Gly Ser Tyr Phe Val Tyr Ser Lys Leu Asn Val Gln
                725                 730                 735

aag tca aat tgg gaa gct gga aac acg ttt acc tgt agt gtg ttg cat    2256
Lys Ser Asn Trp Glu Ala Gly Asn Thr Phe Thr Cys Ser Val Leu His
            740                 745                 750

gag gga ctg cac aac cat cat acc gaa aag tca ttg tcc cat agc cca    2304
Glu Gly Leu His Asn His His Thr Glu Lys Ser Leu Ser His Ser Pro
        755                 760                 765

gga aag tga                                                        2313
Gly Lys
    770
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<210> 20
<211> 770
<212> PRT
<213> Mus musculus

<220>
<223> [CDS]:1..2313 from SEQ ID NO 19

<400> 20

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Met Gly Trp Phe Thr Gly Ile Ala Cys Leu Phe Trp Gly Val Leu Leu
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Thr Ala Arg Ala Asn Tyr Ala Asn Gly Lys Asn Asn Val Pro Arg Leu
            20                  25                  30
Lys Leu Ser Tyr Lys Glu Met Leu Glu Ser Asn Asn Val Ile Thr Phe
        35                  40                  45
Asn Gly Leu Ala Asn Ser Ser Ser Tyr His Thr Phe Leu Leu Asp Glu
    50                  55                  60
Glu Arg Ser Arg Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe
65                  70                  75                  80
Asn Leu Val Asn Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser
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                85                  90                  95
Tyr Thr Arg Arg Asp Glu Cys Lys Trp Lys Gly Lys Asp Ile Leu Lys
            100                 105                 110
Glu Cys Ala Asn Phe Ile Lys Val Leu Glu Ala Tyr Asn Gln Thr His
        115                 120                 125
Leu Tyr Ala Cys Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile
    130                 135                 140
Glu Val Gly His His Pro Glu Asp Asn Ile Phe Lys Leu Gln Asp Ser
145                 150                 155                 160
His Phe Glu Asn Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu
                165                 170                 175
Thr Ala Ser Leu Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala
            180                 185                 190
Asp Phe Met Gly Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His
        195                 200                 205
His Pro Ile Arg Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro
    210                 215                 220
Arg Phe Ile Ser Ala His Leu Ile Pro Glu Ser Asp Asn Pro Glu Asp
225                 230                 235                 240
Asp Lys Val Tyr Phe Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His
                245                 250                 255
Ser Gly Lys Ala Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp
            260                 265                 270
Phe Gly Gly His Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys
        275                 280                 285
Ala Arg Leu Ile Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His
    290                 295                 300
Phe Asp Glu Leu Gln Asp Val Phe Leu Met Asn Ser Lys Asp Pro Lys
305                 310                 315                 320
Asn Pro Ile Val Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys
                325                 330                 335
Gly Ser Ala Val Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe
            340                 345                 350
Leu Gly Pro Tyr Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro
        355                 360                 365
Tyr Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys
    370                 375                 380
Thr Phe Gly Gly Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile
385                 390                 395                 400
Thr Phe Ala Arg Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Ile
                405                 410                 415
Asn Asn Arg Pro Ile Met Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr
            420                 425                 430
Gln Ile Val Val Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val
        435                 440                 445
Met Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Val
    450                 455                 460
Pro Lys Glu Thr Trp His Asp Leu Glu Glu Val Leu Leu Glu Glu Met
465                 470                 475                 480
Thr Val Phe Arg Glu Pro Thr Thr Ile Ser Ala Met Glu Leu Ser Thr
                485                 490                 495
Lys Gln Gln Gln Leu Tyr Ile Gly Ser Thr Ala Gly Val Ala Gln Leu
            500                 505                 510
Pro Leu His Arg Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys
        515                 520                 525
Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ser Ser Cys Ser Arg
    530                 535                 540
Tyr Phe Pro Thr Gly Cys Lys Pro Cys Ile Cys Thr Val Pro Glu Val
545                 550                 555                 560
Ser Ser Val Phe Ile Phe Pro Pro Lys Pro Lys Asp Val Leu Thr Ile
                565                 570                 575
Thr Leu Thr Pro Lys Val Thr Cys Val Val Val Asp Ile Ser Lys Asp
            580                 585                 590
Asp Pro Glu Val Gln Phe Ser Trp Phe Val Asp Asp Val Glu Val His
        595                 600                 605
Thr Ala Gln Thr Gln Pro Arg Glu Glu Gln Phe Asn Ser Thr Phe Arg
    610                 615                 620
Ser Val Ser Glu Leu Pro Ile Met His Gln Asp Trp Leu Asn Gly Lys
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625 630 635 640
Glu Phe Lys Cys Arg Val Asn Ser Ala Ala Phe Pro Ala Pro Ile Glu
645 650 655
Lys Thr Ile Ser Lys Thr Lys Gly Arg Pro Lys Ala Pro Gln Val Tyr
660 665 670
Thr Ile Pro Pro Pro Lys Glu Gln Met Ala Lys Asp Lys Val Ser Leu
675 680 685
Thr Cys Met Ile Thr Asp Phe Phe Pro Glu Asp Ile Thr Val Glu Trp
690 695 700
Gln Trp Asn Gly Gln Pro Ala Glu Asn Tyr Lys Asn Thr Gln Pro Ile
705 710 715 720
Met Asp Thr Asp Gly Ser Tyr Phe Val Tyr Ser Lys Leu Asn Val Gln
725 730 735
Lys Ser Asn Trp Glu Ala Gly Asn Thr Phe Thr Cys Ser Val Leu His
740 745 750
Glu Gly Leu His Asn His His Thr Glu Lys Ser Leu Ser His Ser Pro
755 760 765
Gly Lys
770

<210> 21
<211> 202
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3A: 96-297

<400> 21
Ser Tyr Thr Arg Arg Asp Glu Cys Lys Trp Ala Gly Lys Asp Ile Leu
1 5 10 15
Lys Glu Cys Ala Asn Phe Ile Lys Val Leu Lys Ala Tyr Asn Gln Thr
20 25 30
His Leu Tyr Ala Cys Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr
35 40 45
Ile Glu Ile Gly His His Pro Glu Asp Asn Ile Phe Lys Leu Glu Asn
50 55 60
Ser His Phe Glu Asn Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu
65 70 75 80
Leu Thr Ala Ser Leu Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala
85 90 95
Ala Asp Phe Met Gly Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His
100 105 110
His His Pro Ile Arg Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp
115 120 125
Pro Lys Phe Ile Ser Ala His Leu Ile Ser Glu Ser Asp Asn Pro Glu
130 135 140
Asp Asp Lys Val Tyr Phe Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu
145 150 155 160
His Ser Gly Lys Ala Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn
165 170 175
Asp Phe Gly Gly His Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu
180 185 190
Lys Ala Arg Leu Ile Cys Ser Val Pro Gly
195 200

<210> 22
<211> 203
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3B: 95-297

<400> 22
Pro Val Glu Trp Arg Glu Glu Cys Asn Trp Ala Gly Lys Asp Ile Gly
1 5 10 15
Thr Glu Cys Met Asn Phe Val Lys Leu Leu His Ala Tyr Asn Arg Thr

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

<210> 23
<211> 201
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3C: 94-294

<400> 23
Ser Thr Ile Lys Val Glu Glu Cys Lys Met Ala Gly Lys Asp Pro Thr
1               5                   10                  15
His Gly Cys Gly Asn Phe Val Arg Val Ile Gln Thr Phe Asn Arg Thr
            20                  25                  30
His Leu Tyr Val Cys Gly Ser Gly Ala Phe Ser Pro Val Cys Thr Tyr
        35                  40                  45
Leu Asn Arg Gly Arg Arg Ser Glu Asp Gln Val Phe Met Ile Asp Ser
    50                  55                  60
Lys Cys Glu Ser Gly Lys Gly Arg Cys Ser Phe Asn Pro Asn Val Asn
65                  70                  75                  80
Thr Val Ser Val Met Ile Asn Glu Glu Leu Phe Ser Gly Met Tyr Ile
                85                  90                  95
Asp Phe Met Gly Thr Asp Ala Ala Ile Phe Arg Ser Leu Thr Lys Arg
            100                 105                 110
Asn Ala Val Arg Thr Asp Gln His Asn Ser Lys Trp Leu Ser Glu Pro
        115                 120                 125
Met Phe Val Asp Ala His Val Ile Pro Asp Gly Thr Asp Pro Asn Asp
    130                 135                 140
Ala Lys Val Tyr Phe Phe Phe Lys Glu Lys Leu Thr Asp Asn Asn Arg
145                 150                 155                 160
Ser Thr Lys Gln Ile His Ser Met Ile Ala Arg Ile Cys Pro Asn Asp
                165                 170                 175
Thr Gly Gly Leu Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys
            180                 185                 190
Ala Arg Leu Val Cys Ser Val Thr Asp
        195                 200

<210> 24
<211> 205
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3D: 110-314
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<400> 24
Ala Lys Glu Arg Val Glu Leu Cys Lys Leu Ala Gly Lys Asp Ala Asn
1   5   10   15
Thr Glu Cys Ala Asn Phe Ile Arg Val Leu Gln Pro Tyr Asn Lys Thr
            20   25   30
His Ile Tyr Val Cys Gly Thr Gly Ala Phe His Pro Ile Cys Gly Tyr
        35   40   45
Ile Asp Leu Gly Val Tyr Lys Glu Asp Ile Ile Phe Lys Leu Asp Thr
    50   55   60
His Asn Leu Glu Ser Gly Arg Leu Lys Cys Pro Phe Asp Pro Gln Gln
65   70   75   80
Pro Phe Ala Ser Val Met Thr Asp Glu Tyr Leu Tyr Ser Gly Thr Ala
                85   90   95
Ser Asp Phe Leu Gly Lys Asp Thr Ala Phe Thr Arg Ser Leu Gly Pro
            100   105   110
Thr His Asp His His Tyr Ile Arg Thr Asp Ile Ser Glu His Tyr Trp
        115   120   125
Leu Asn Gly Ala Lys Phe Ile Gly Thr Phe Phe Ile Pro Asp Thr Tyr
    130   135   140
Asn Pro Asp Asp Asp Lys Ile Tyr Phe Phe Phe Arg Glu Ser Ser Gln
145   150   155   160
Glu Gly Ser Thr Ser Asp Lys Thr Ile Leu Ser Arg Val Gly Arg Val
                165   170   175
Cys Lys Asn Asp Val Gly Gly Gln Arg Ser Leu Ile Asn Lys Trp Thr
            180   185   190
Thr Phe Leu Lys Ala Arg Leu Ile Cys Ser Ile Pro Gly
        195   200   205

<210> 25
<211> 10
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3A: 104-113

<400> 25
Lys Trp Ala Gly Lys Asp Ile Leu Lys Glu
1   5   10

<210> 26
<211> 8
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3A: 214-221

<400> 26
Glu Gln His Asp Ser Arg Trp Leu
1   5

<210> 27
<211> 14
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3A: 274-287

<400> 27
Gly Gly His Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu
1   5   10

<210> 28
<211> 10
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3B: 103-112

<400> 28
Asn Trp Ala Gly Lys Asp Ile Gly Thr Glu
1   5   10

<210> 29
<211> 8
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3B: 213-220

<400> 29
Glu Pro His Asp Ser Arg Trp Leu
1   5

<210> 30
<211> 14
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3B: 274-287

<400> 30
Gly Gly Gln Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu
1   5   10

<210> 31
<211> 10
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3C: 102-111

<400> 31
Lys Met Ala Gly Lys Asp Pro Thr His Gly
1   5   10

<210> 32
<211> 8
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3C: 211-218

<400> 32
Asp Gln His Asn Ser Lys Trp Leu
1   5

<210> 33
<211> 14
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3C: 271-284

<400> 33
Gly Gly Leu Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu
1   5   10

<210> 34
<211> 10
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3D: 118-127

<400> 34
Lys Leu Ala Gly Lys Asp Ala Asn Thr Glu
1 5 10

<210> 35
<211> 8
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3D: 231-238

<400> 35
Asp Ile Ser Glu His Tyr Trp Leu
1 5

<210> 36
<211> 14
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3D: 291-304

<400> 36
Gly Gly Gln Arg Ser Leu Ile Asn Lys Trp Thr Thr Phe Leu
1 5 10

<210> 37
<211> 990
<212> DNA
<213> Homo sapiens

<220>
<223> immunoglobulin heavy chain constant region gamma 1 (IGHG1 gene)
(>gi| 12054071|ref| AJ294730.1|)

<220>
<221> CDS
<222> 1..990
<223> /transl_table=1

<400> 37
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Ala Ser Phe Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys
1 5 10 15

agc acc tct ggg ggc aca gcg gcc ctg ggc tgc ctg gtc aag gac tac 96
Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
20 25 30

ttc ccc gaa ccg gtg acg gtg tcg tgg aac tca ggc gcc ctg acc agc 144
Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
35 40 45

ggc gtg cac acc ttc ccg gct gtc cta cag tcc tca gga ctc tac tcc 192
Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

ctc agc agc gtg gtg acc gtg ccc tcc agc agc ttg ggc acc cag acc 240

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

tac atc tgc aac gtg aat cac aag ccc agc aac acc aag gtg gac aag    288
Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
                85                  90                  95

aaa gtt gag ccc aaa tct tgt gac aaa act cac aca tgc cca ccg tgc    336
Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
            100                 105                 110

cca gca cct gaa ctc ctg ggg gga ccg tca gtc ttc ctc ttc ccc cca    384
Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro
        115                 120                 125

aaa ccc aag gac acc ctc atg atc tcc cgg acc cct gag gtc aca tgc    432
Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
    130                 135                 140

gtg gtg gtg gac gtg agc cac gaa gac cct gag gtc aag ttc aac tgg    480
Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
145                 150                 155                 160

tac gtg gac ggc gtg gag gtg cat aat gcc aag aca aag ccg cgg gag    528
Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
                165                 170                 175

gag cag tac aac agc acg tac cgt gtg gtc agc gtc ctc acc gtc ctg    576
Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
            180                 185                 190

cac cag gac tgg ctg aat ggc aag gag tac aag tgc aag gtc tcc aac    624
His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
        195                 200                 205

aaa gcc ctc cca gcc ccc atc gag aaa acc atc tcc aaa gcc aaa ggg    672
Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly
    210                 215                 220

cag ccc cga gaa cca cag gtg tac acc ctg ccc cca tcc cgg gat gag    720
Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu
225                 230                 235                 240

ctg acc aag aac cag gtc agc ctg acc tgc ctg gtc aaa ggc ttc tat    768
Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
                245                 250                 255

ccc agc gac atc gcc gtg gag tgg gag agc aat ggg cag ccg gag aac    816
Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
            260                 265                 270

aac tac aag acc acg cct ccc gtg ctg gac tcc gac ggc tcc ttc ttc    864
Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
        275                 280                 285

ctc tac agc aag ctc acc gtg gac aag agc agg tgg cag cag ggg aac    912
Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
    290                 295                 300

gtc ttc tca tgc tcc gtg atg cat gag gct ctg cac aac cac tac acg    960
Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
305                 310                 315                 320

cag aag agc ctc tcc ctg tct ccg ggt aaa                            990
Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
                325                 330
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<210> 38

<211> 330
<212> PRT
<213> Homo sapiens

<220>
<223> [CDS]:1..990 from SEQ ID NO 37

<400> 38
Ala Ser Phe Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys
1 5 10 15
Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
20 25 30
Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
35 40 45
Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60
Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr
65 70 75 80
Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
85 90 95
Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
100 105 110
Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro
115 120 125
Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
130 135 140
Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
145 150 155 160
Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
165 170 175
Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
180 185 190
His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
195 200 205
Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly
210 215 220
Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu
225 230 235 240
Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
245 250 255
Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
260 265 270
Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
275 280 285
Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
290 295 300
Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
305 310 315 320
Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
325 330

<210> 39
<211> 1047
<212> DNA
<213> Mus musculus

<220>
<223> hybridoma 36-35 immunoglobulin heavy chain constant region,
partial cds (>gi| 195165|ref| M60435.1|)

<220>
<221> CDS
<222> 1..975
<223> /transl_table=1

<400> 39
gcc aaa acg aca ccc cca tct gtc tat cca ctg gcc cct gga tct gct 48
Ala Lys Thr Thr Pro Pro Ser Val Tyr Pro Leu Ala Pro Gly Ser Ala

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1               5                  10                  15

gcc caa act aac tcc atg gtg acc ctg gga tgc ctg gtc aag ggc tat      96
Ala Gln Thr Asn Ser Met Val Thr Leu Gly Cys Leu Val Lys Gly Tyr
            20                  25                  30

ttc cct gag cca gtg aca gtg acc tgg aac tct gga tcc ctg tcc agc     144
Phe Pro Glu Pro Val Thr Val Thr Trp Asn Ser Gly Ser Leu Ser Ser
        35                  40                  45

ggt gtg cac acc ttc cca gct gtc ctg cag tct gac ctc tac act ctg     192
Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Asp Leu Tyr Thr Leu
    50                  55                  60

agc agc tca gtg act gtc ccc tcc agc acc tgg ccc agc gag acc gtc     240
Ser Ser Ser Val Thr Val Pro Ser Ser Thr Trp Pro Ser Glu Thr Val
65                  70                  75                  80

acc tgc aac gtt gcc cac ccg gcc agc agc acc aag gtg gac aag aaa     288
Thr Cys Asn Val Ala His Pro Ala Ser Ser Thr Lys Val Asp Lys Lys
                85                  90                  95

att gtg ccc agg gat tgt ggt tgt aag cct tgc ata tgt aca gtc cca     336
Ile Val Pro Arg Asp Cys Gly Cys Lys Pro Cys Ile Cys Thr Val Pro
            100                 105                 110

gaa gta tca tct gtc ttc atc ttc ccc cca aag ccc aag gat gtg ctc     384
Glu Val Ser Ser Val Phe Ile Phe Pro Pro Lys Pro Lys Asp Val Leu
        115                 120                 125

acc att act ctg act cct aag gtc acg tgt gtt gtg gta gac atc agc     432
Thr Ile Thr Leu Thr Pro Lys Val Thr Cys Val Val Val Asp Ile Ser
    130                 135                 140

aag gat gat ccc gag gtc cag ttc agc tgg ttt gta gat gat gtg gag     480
Lys Asp Asp Pro Glu Val Gln Phe Ser Trp Phe Val Asp Asp Val Glu
145                 150                 155                 160

gtg cac aca gct cag acg caa ccc cgg gag gag cag ttc aac agc act     528
Val His Thr Ala Gln Thr Gln Pro Arg Glu Glu Gln Phe Asn Ser Thr
                165                 170                 175

ttc cgc tca gtc agt gaa ctt ccc atc atg cac cag gac tgg ctc aat     576
Phe Arg Ser Val Ser Glu Leu Pro Ile Met His Gln Asp Trp Leu Asn
            180                 185                 190

ggc aag gag ttc aaa tgc agg gtc aac agt gca gct ttc cct gcc ccc     624
Gly Lys Glu Phe Lys Cys Arg Val Asn Ser Ala Ala Phe Pro Ala Pro
        195                 200                 205

atc gag aaa acc atc tcc aaa acc aaa ggc aga ccg aag gct cca cag     672
Ile Glu Lys Thr Ile Ser Lys Thr Lys Gly Arg Pro Lys Ala Pro Gln
    210                 215                 220

gtg tac acc att cca cct ccc aag gag cag atg gcc aag gat aaa gtc     720
Val Tyr Thr Ile Pro Pro Pro Lys Glu Gln Met Ala Lys Asp Lys Val
225                 230                 235                 240

agt ctg acc tgc atg ata aca gac ttc ttc cct gaa gac att act gtg     768
Ser Leu Thr Cys Met Ile Thr Asp Phe Phe Pro Glu Asp Ile Thr Val
                245                 250                 255

gag tgg cag tgg aat ggg cag cca gcg gag aac tac aag aac act cag     816
Glu Trp Gln Trp Asn Gly Gln Pro Ala Glu Asn Tyr Lys Asn Thr Gln
            260                 265                 270

ccc atc atg gac aca gat ggc tct tac ttc gtc tac agc aag ctc aat     864
Pro Ile Met Asp Thr Asp Gly Ser Tyr Phe Val Tyr Ser Lys Leu Asn
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        275                 280                 285

gtg cag aag agc aac tgg gag gca gga aat act ttc acc tgc tct gtg     912
Val Gln Lys Ser Asn Trp Glu Ala Gly Asn Thr Phe Thr Cys Ser Val
    290                 295                 300

tta cat gag ggc ctg cac aac cac cat act gag aag agc ctc tcc cac     960
Leu His Glu Gly Leu His Asn His His Thr Glu Lys Ser Leu Ser His
305                 310                 315                 320

tct cct ggt aaa tga tctcagtgtc cttggagccc tctggtccta caggactctg    1015
Ser Pro Gly Lys

acacctacct ccacccctcc ctgtgtaaat aa                                1047

<210> 40
<211> 324
<212> PRT
<213> Mus musculus

<220>
<223> [CDS]:1..975 from SEQ ID NO 39

<400> 40
Ala Lys Thr Thr Pro Pro Ser Val Tyr Pro Leu Ala Pro Gly Ser Ala
1               5                   10                  15
Ala Gln Thr Asn Ser Met Val Thr Leu Gly Cys Leu Val Lys Gly Tyr
            20                  25                  30
Phe Pro Glu Pro Val Thr Val Thr Trp Asn Ser Gly Ser Leu Ser Ser
        35                  40                  45
Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Asp Leu Tyr Thr Leu
    50                  55                  60
Ser Ser Ser Val Thr Val Pro Ser Ser Thr Trp Pro Ser Glu Thr Val
65                  70                  75                  80
Thr Cys Asn Val Ala His Pro Ala Ser Ser Thr Lys Val Asp Lys Lys
                85                  90                  95
Ile Val Pro Arg Asp Cys Gly Cys Lys Pro Cys Ile Cys Thr Val Pro
            100                 105                 110
Glu Val Ser Ser Val Phe Ile Phe Pro Pro Lys Pro Lys Asp Val Leu
        115                 120                 125
Thr Ile Thr Leu Thr Pro Lys Val Thr Cys Val Val Val Asp Ile Ser
    130                 135                 140
Lys Asp Asp Pro Glu Val Gln Phe Ser Trp Phe Val Asp Asp Val Glu
145                 150                 155                 160
Val His Thr Ala Gln Thr Gln Pro Arg Glu Glu Gln Phe Asn Ser Thr
                165                 170                 175
Phe Arg Ser Val Ser Glu Leu Pro Ile Met His Gln Asp Trp Leu Asn
            180                 185                 190
Gly Lys Glu Phe Lys Cys Arg Val Asn Ser Ala Ala Phe Pro Ala Pro
        195                 200                 205
Ile Glu Lys Thr Ile Ser Lys Thr Lys Gly Arg Pro Lys Ala Pro Gln
    210                 215                 220
Val Tyr Thr Ile Pro Pro Pro Lys Glu Gln Met Ala Lys Asp Lys Val
225                 230                 235                 240
Ser Leu Thr Cys Met Ile Thr Asp Phe Phe Pro Glu Asp Ile Thr Val
                245                 250                 255
Glu Trp Gln Trp Asn Gly Gln Pro Ala Glu Asn Tyr Lys Asn Thr Gln
            260                 265                 270
Pro Ile Met Asp Thr Asp Gly Ser Tyr Phe Val Tyr Ser Lys Leu Asn
        275                 280                 285
Val Gln Lys Ser Asn Trp Glu Ala Gly Asn Thr Phe Thr Cys Ser Val
    290                 295                 300
Leu His Glu Gly Leu His Asn His His Thr Glu Lys Ser Leu Ser His
305                 310                 315                 320
Ser Pro Gly Lys
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<210> 41
<211> 232
<212> PRT
<213> Homo sapiens

<220>
<223> Human immunoglobulin heavy chain constant region gamma 1, aa 104-330 encoded by nucleotides 295-990 of gi|12054071|ref|AJ294730.1|

<400> 41
Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala
1 5 10 15
Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro
20 25 30
Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val
35 40 45
Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val
50 55 60
Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln
65 70 75 80
Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln
85 90 95
Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala
100 105 110
Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro
115 120 125
Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr
130 135 140
Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser
145 150 155 160
Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr
165 170 175
Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr
180 185 190
Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe
195 200 205
Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys
210 215 220
Ser Leu Ser Leu Ser Pro Gly Lys
225 230

<210> 42
<211> 222
<212> PRT
<213> Mus musculus

<220>
<223> Mouse immunoglobulin heavy chain constant region gamma 1, aa 103-324 encoded by nucleotides 307-975 of gi|195165|ref|M60435.1|

<400> 42
Gly Cys Lys Pro Cys Ile Cys Thr Val Pro Glu Val Ser Ser Val Phe
1 5 10 15
Ile Phe Pro Pro Lys Pro Lys Asp Val Leu Thr Ile Thr Leu Thr Pro
20 25 30
Lys Val Thr Cys Val Val Val Asp Ile Ser Lys Asp Asp Pro Glu Val
35 40 45
Gln Phe Ser Trp Phe Val Asp Asp Val Glu Val His Thr Ala Gln Thr
50 55 60
Gln Pro Arg Glu Glu Gln Phe Asn Ser Thr Phe Arg Ser Val Ser Glu
65 70 75 80
Leu Pro Ile Met His Gln Asp Trp Leu Asn Gly Lys Glu Phe Lys Cys
85 90 95
Arg Val Asn Ser Ala Ala Phe Pro Ala Pro Ile Glu Lys Thr Ile Ser
100 105 110
Lys Thr Lys Gly Arg Pro Lys Ala Pro Gln Val Tyr Thr Ile Pro Pro

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        115                 120                 125
Pro Lys Glu Gln Met Ala Lys Asp Lys Val Ser Leu Thr Cys Met Ile
    130                 135                 140
Thr Asp Phe Phe Pro Glu Asp Ile Thr Val Glu Trp Gln Trp Asn Gly
145                 150                 155                 160
Gln Pro Ala Glu Asn Tyr Lys Asn Thr Gln Pro Ile Met Asp Thr Asp
                165                 170                 175
Gly Ser Tyr Phe Val Tyr Ser Lys Leu Asn Val Gln Lys Ser Asn Trp
            180                 185                 190
Glu Ala Gly Asn Thr Phe Thr Cys Ser Val Leu His Glu Gly Leu His
        195                 200                 205
Asn His His Thr Glu Lys Ser Leu Ser His Ser Pro Gly Lys
    210                 215                 220
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<210> 43
<211> 2328
<212> DNA
<213> Homo sapiens

<220>
<223> Human SEMA3A-delta Ig-b

<400> 43

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atgggatggc tgaccagaat cgtgtgcctg ttctggggcg tgctgctgac cgccagagcc      60

aactaccaga acggcaagaa caacgtgccc cggctgaagc tgagctacaa agagatgctg     120

gaaagcaaca acgtgatcac cttcaacggc ctggccaaca gcagcagcta ccacaccttt     180

ctgctggacg aggaacggtc ccggctgtac gtgggagcca aggaccacat cttcagcttc     240

gacctcgtga acatcaagga cttccagaaa atcgtgtggc ccgtgtccta caccagacgg     300

gacgagtgca agtgggccgg caaggacatc ctgaaagagt gcgccaactt catcaaggtg     360

ctgaaggcct acaaccagac ccacctgtac gcctgtggca ccggcgcctt ccaccctatc     420

tgcacctaca tcgagatcgg ccaccacccc gaggacaata tcttcaagct ggaaaacagc     480

cacttcgaga acggcagagg caagagcccc tacgacccca agctgctgac agcctccctg     540

ctgatcgacg gcgagctgta ctctggcaca gccgccgact tcatgggccg ggacttcgcc     600

atcttcagaa ccctgggaca ccaccaccca atccggaccg agcagcacga cagcagatgg     660

ctgaacgacc ctaagttcat cagcgcccac ctgatcagcg agagcgacaa ccctgaggac     720

gacaaggtgt acttcttctt ccgggaaaac gccatcgacg gggagcacag cggaaaggcc     780

acacacgcca gaatcggcca gatctgcaag aacgacttcg gcggccaccg gtccctcgtg     840

aacaagtgga ccaccttcct gaaggcccgg ctgatctgta gcgtgccagg ccccaatggc     900

atcgacaccc acttcgacga gctgcaggac gtgttcctga tgaatttcaa ggaccccaag     960

aaccccgtgg tgtacggcgt gttcaccacc agcagcaaca tcttcaaggg cagcgccgtg    1020

tgcatgtaca gcatgagcga cgtgcggcgg gtgttcctgg gaccttacgc ccatagagat    1080

ggccccaatt accagtgggt gccctaccag ggcagagtgc cttaccccag acctggcacc    1140

tgtcccagca agacctttgg cggcttcgac agcaccaagg acctgcccga cgatgtgatt    1200

accttcgcca gatcccaccc cgccatgtac aaccccgtgt tccccatgaa caaccggccc    1260

atcgtgatca agaccgacgt gaactaccag ttcacccaga tcgtggtgga cagagtggac    1320

gccgaggacg gccagtacga cgtgatgttc atcggcaccg acgtgggcac cgtgctgaaa    1380
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gtggtgtcca tccccaaaga gacttggtac gacctggaag aggtgctgct ggaagagatg 1440

accgtgttca gagagcccac cgccatctcc gccatggaac tgagcacaaa gcagcagcag 1500

ctgtacatcg gcagcacagc tggcgtggca cagctgcctc tgcacagatg cgacatctac 1560

ggcaaggcct gcgccgagtg ttgcctggcc agagatcctt actgcgcctg ggatggcagc 1620

gcctgcagca gatacttccc caccgacaag acccacacat gccccccttg tcctgccccc 1680

gaactgctgg gaggcccctc cgtgtttctg ttcccccaa agcccaagga taccctgatg 1740

atcagcagaa cccccgaagt gacctgcgtg gtggtggacg tgtcccacga ggaccctgaa 1800

gtgaagttca attggtacgt ggacggcgtg gaagtgcaca acgccaagac caagcccaga 1860

gaggaacagt acaacagcac ctaccgcgtg gtgtccgtgc tgaccgtgct gcaccaggac 1920

tggctgaatg gcaaagagta caagtgcaag gtgtccaaca aggccctgcc tgcccccatc 1980

gagaaaacca tcagcaaggc caagggccag ccccgcgaac cccaggtgta cacactgccc 2040

cctagcaggg acgagctgac caagaaccag gtgtccctga cctgtctcgt gaagggcttc 2100

taccctccg atatcgccgt ggaatgggag agcaacggcc agcccgagaa caactacaag 2160

accacccccc ctgtgctgga cagcgacggc tcattcttcc tgtacagcaa gctgacagtg 2220

gacaagagcc ggtggcagca gggcaacgtg ttcagctgca gcgtgatgca cgaggccctg 2280

cacaaccact acacccagaa gtccctgagc ctgagccccg gcaaatga 2328

<210> 44
<211> 2313
<212> DNA
<213> Mus musculus

<220>
<223> Mouse Sema3A-delta Ig-b

<400> 44
atgggatggt ttactggaat tgcctgtctg ttttggggag tgcttctgac tgccagagca 60

aattacgcca atggcaagaa caacgtcccc agactgaagc tctcttacaa ggagatgctg 120

gagtctaaca atgtgattac attcaatggc cttgccaact cttcctcata ccacaccttt 180

ctgctggatg aggagcgctc acggctgtat gtgggagcca aggaccatat tttcagtttt 240

aatctcgtga atatcaagga ttttcagaag atcgtatggc ctgtctcata tacccgcaga 300

gacgagtgca aatgggcagg caaagatata ctgaaggaat gcgcaaattt cattaaggtg 360

ctcgaggcat acaaccagac acacttgtat gcctgtggga ctggcgcgtt ccatcctatt 420

tgtacataca tcgaggtggg acatcatccg gaggacaaca tcttcaagtt gcaggatagc 480

cacttcgaga acggcagggg aaagtcacct tacgacccaa aactcctgac tgcttccctg 540

cttatcgacg gtgaactcta ctctggcacc gcagccgact ttatgggcag agactttgct 600

atattcagga ccctcggaca tcatcatccg attcggaccg agcaacacga ctcacgctgg 660

ctgaatgacc ccagattcat ttcagcccac ctgatccccg aaagtgataa cccagaggac 720

gacaaagtat acttcttctt tcgcgagaat gctatagacg gcgagcacag cggaaaggct 780

actcatgctc ggatcgggca aatctgtaaa aacgattttg gaggccatcg atcattggtt 840

aacaagtgga ccacatttct taaagcaaga cttatctgct ctgtgcctgg tccaaacggg 900

atagatactc atttcgacga gctgcaggac gtgttcctta tgaacagtaa ggacccgaag 960

aaccctatcg tgtacggagt ttttacgacg tcctccaaca tcttcaaggg ctcagcagtc 1020

tgcatgtata gcatgagcga cgtccggagg gtcttcctcg gaccctacgc acaccgcgat 1080

ggccccaatt atcagtgggt tccttatcaa gggagagtac cttaccctag accagggaca 1140

tgtccatcca agacattcgg aggttttgat tcaaccaagg acttgccaga cgatgtcata 1200

accttcgcca gatcacaccc cgccatgtac aatcctgttt ttccgattaa caaccgcccc 1260

attatgatca aaactgatgt gaactatcaa ttcacccaga ttgttgtaga tagagttgat 1320

gctgaggatg gccagtatga tgtcatgttc atcggtacag acgtgggaac agtcttgaaa 1380

gtcgtttctg tccctaaaga gacctggcac gacctggaag aggtcctcct ggaggagatg 1440

acagtgttcc gggagcccac cacaatcagc gccatggaac tctctaccaa gcagcagcag 1500

ctctacatcg gttccacagc tggggtggct cagcttcccc tccacagatg cgacatatac 1560

gggaaggcct gtgctgagtg ctgcctggcc agagatccct actgcgcgtg ggatggttca 1620

agttgcagtc gatacttccc cacagggtgc aagccttgta tttgtactgt gcccgaagtg 1680

tcctccgtgt tcatctttcc acccaagcct aaggacgttt tgacaataac gctgacccca 1740

aaggtgacgt gcgttgtggt cgatatcagc aaggacgatc cagaagtcca gttttcttgg 1800

tttgttgatg atgtggaagt acacactgcg caaacacagc ctagggaaga gcagtttaac 1860

tctactttta ggagcgtaag cgagctgccg attatgcatc aggactggtt gaatgggaag 1920

gagttcaaat gtcgcgttaa ctccgcagcc ttccccgcac ctatcgaaaa aacgatctca 1980

aagactaagg gtaggccaaa agcgccacag gtatacacca ttcctccacc gaaggaacag 2040

atggcaaaag ataaggtttc actgacatgc atgattactg acttttccc cgaggatatc 2100

accgtggaat ggcagtggaa tggccaaccc gcagagaact ataagaacac tcaaccaatt 2160

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gaaaagtcat tgtcccatag cccaggaaag tga 2313

<210> 45
<211> 13
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3A: 527-539

<400> 45
Cys Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly
1 5 10

<210> 46
<211> 13

<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3B: 526-538

<400> 46
Cys Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly
1   5   10

<210> 47
<211> 13
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3C: 524-536

<400> 47
Cys Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly
1   5   10

<210> 48
<211> 13
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3D: 544-556

<400> 48
Cys Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly
1   5   10

<210> 49
<211> 202
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3A: 96-297

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

195 200

<210> 50
<211> 203
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3B: 95-297

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

<210> 51
<211> 201
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3C: 94-294

<400> 51
Ser Thr Ile Lys Val Glu Glu Cys Lys Met Lys Gly Lys Asp Pro Thr
1 5 10 15
His Gly Cys Gly Asn Phe Val Arg Val Ile Gln Thr Phe Asn Arg Thr
20 25 30
His Leu Tyr Val Cys Gly Ser Gly Ala Phe Ser Pro Val Cys Thr Tyr
35 40 45
Leu Asn Arg Gly Arg Arg Ser Glu Asp Gln Val Phe Met Ile Asp Ser
50 55 60
Lys Cys Glu Ser Gly Lys Gly Arg Cys Ser Phe Asn Pro Asn Val Asn
65 70 75 80
Thr Val Ser Val Met Ile Asn Glu Glu Leu Phe Ser Gly Met Tyr Ile
85 90 95
Asp Phe Met Gly Thr Asp Ala Ala Ile Phe Arg Ser Leu Thr Lys Arg
100 105 110
Asn Ala Val Arg Thr Asp Gln His Asn Ser Lys Trp Leu Ser Glu Pro
115 120 125
Met Phe Val Asp Ala His Val Ile Pro Asp Gly Thr Asp Pro Asn Asp
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Ala Lys Val Tyr Phe Phe Phe Lys Glu Lys Leu Thr Asp Asn Asn Arg
145 150 155 160
Ser Thr Lys Gln Ile His Ser Met Ile Ala Arg Ile Cys Pro Asn Asp

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Ile Asp Leu Gly Val Tyr Lys Glu Asp Ile Ile Phe Lys Leu Asp Thr
50 55 60
His Asn Leu Glu Ser Gly Arg Leu Lys Cys Pro Phe Asp Pro Gln Gln
65 70 75 80
Pro Phe Ala Ser Val Met Thr Asp Glu Tyr Leu Tyr Ser Gly Thr Ala
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Ser Asp Phe Leu Gly Lys Asp Thr Ala Phe Thr Arg Ser Leu Gly Pro
100 105 110
Thr His Asp His His Tyr Ile Arg Thr Asp Ile Ser Glu His Tyr Trp
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Leu Asn Gly Ala Lys Phe Ile Gly Thr Phe Phe Ile Pro Asp Thr Tyr
130 135 140
Asn Pro Asp Asp Asp Lys Ile Tyr Phe Phe Phe Arg Glu Ser Ser Gln
145 150 155 160
Glu Gly Ser Thr Ser Asp Lys Thr Ile Leu Ser Arg Val Gly Arg Val
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gaagtttctg tgcttcagtg actgttacag aagaagaggt gttagtgttg ccatgaggtc 180

ttgattgtct gcatttatga atgaaactga cctaaatcac ctgttacctc cagtttccag 240

attgtttgaa cttctctggc cgcacaatac aggaaggaag actaaagcag caaagggacc 300

tacagcgtct gcagc atg ggc tgg tta act agg att gtc tgt ctt ttc tgg 351
Met Gly Trp Leu Thr Arg Ile Val Cys Leu Phe Trp
1 5 10

gga gta tta ctt aca gca aga gca aac tat cag aat ggg aag aac aat 399
Gly Val Leu Leu Thr Ala Arg Ala Asn Tyr Gln Asn Gly Lys Asn Asn
15 20 25

gtg cca agg ctg aaa tta tcc tac aaa gaa atg ttg gaa tcc aac aat 447
Val Pro Arg Leu Lys Leu Ser Tyr Lys Glu Met Leu Glu Ser Asn Asn
30 35 40

gtg atc act ttc aat ggc ttg gcc aac agc tcc agt tat cat acc ttc 495
Val Ile Thr Phe Asn Gly Leu Ala Asn Ser Ser Ser Tyr His Thr Phe
45 50 55 60

ctt ttg gat gag gaa cgg agt agg ctg tat gtt gga gca aag gat cac 543
Leu Leu Asp Glu Glu Arg Ser Arg Leu Tyr Val Gly Ala Lys Asp His
65 70 75

ata ttt tca ttc gac ctg gtt aat atc aag gat ttt caa aag att gtg 591
Ile Phe Ser Phe Asp Leu Val Asn Ile Lys Asp Phe Gln Lys Ile Val

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tgg cca gta tct tac acc aga aga gat gaa tgc aag tgg aag gga aaa     639
Trp Pro Val Ser Tyr Thr Arg Arg Asp Glu Cys Lys Trp Lys Gly Lys
        95                  100                 105

gac atc ctg aaa gaa tgt gct aat ttc atc aag gta ctt aag gca tat     687
Asp Ile Leu Lys Glu Cys Ala Asn Phe Ile Lys Val Leu Lys Ala Tyr
    110                 115                 120

aat cag act cac ttg tac gcc tgt gga acg ggg gct ttt cat cca att     735
Asn Gln Thr His Leu Tyr Ala Cys Gly Thr Gly Ala Phe His Pro Ile
125                 130                 135                 140

tgc acc tac att gaa att gga cat cat cct gag gac aat att ttt aag     783
Cys Thr Tyr Ile Glu Ile Gly His His Pro Glu Asp Asn Ile Phe Lys
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ctg gag aac tca cat ttt gaa aac ggc cgt ggg aag agt cca tat gac     831
Leu Glu Asn Ser His Phe Glu Asn Gly Arg Gly Lys Ser Pro Tyr Asp
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cct aag ctg ctg aca gca tcc ctt tta ata gat gga gaa tta tac tct     879
Pro Lys Leu Leu Thr Ala Ser Leu Leu Ile Asp Gly Glu Leu Tyr Ser
        175                 180                 185

gga act gca gct gat ttt atg ggg cga gac ttt gct atc ttc cga act     927
Gly Thr Ala Ala Asp Phe Met Gly Arg Asp Phe Ala Ile Phe Arg Thr
    190                 195                 200

ctt ggg cac cac cac cca atc agg aca gag cag cat gat tcc agg tgg     975
Leu Gly His His His Pro Ile Arg Thr Glu Gln His Asp Ser Arg Trp
205                 210                 215                 220

ctc aat gat cca aag ttc att agt gcc cac ctc atc tca gag agt gac    1023
Leu Asn Asp Pro Lys Phe Ile Ser Ala His Leu Ile Ser Glu Ser Asp
                225                 230                 235

aat cct gaa gat gac aaa gta tac ttt ttc ttc cgt gaa aat gca ata    1071
Asn Pro Glu Asp Asp Lys Val Tyr Phe Phe Phe Arg Glu Asn Ala Ile
            240                 245                 250

gat gga gaa cac tct gga aaa gct act cac gct aga ata ggt cag ata    1119
Asp Gly Glu His Ser Gly Lys Ala Thr His Ala Arg Ile Gly Gln Ile
        255                 260                 265

tgc aag aat gac ttt gga ggg cac aga agt ctg gtg aat aaa tgg aca    1167
Cys Lys Asn Asp Phe Gly Gly His Arg Ser Leu Val Asn Lys Trp Thr
    270                 275                 280

aca ttc ctc aaa gct cgt ctg att tgc tca gtg cca ggt cca aat ggc    1215
Thr Phe Leu Lys Ala Arg Leu Ile Cys Ser Val Pro Gly Pro Asn Gly
285                 290                 295                 300

att gac act cat ttt gat gaa ctg cag gat gta ttc cta atg aac ttt    1263
Ile Asp Thr His Phe Asp Glu Leu Gln Asp Val Phe Leu Met Asn Phe
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aaa gat cct aaa aat cca gtt gta tat gga gtg ttt acg act tcc agt    1311
Lys Asp Pro Lys Asn Pro Val Val Tyr Gly Val Phe Thr Thr Ser Ser
            320                 325                 330

aac att ttc aag gga tca gcc gtg tgt atg tat agc atg agt gat gtg    1359
Asn Ile Phe Lys Gly Ser Ala Val Cys Met Tyr Ser Met Ser Asp Val
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aga agg gtg ttc ctt ggt cca tat gcc cac agg gat gga ccc aac tat    1407
Arg Arg Val Phe Leu Gly Pro Tyr Ala His Arg Asp Gly Pro Asn Tyr
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    350                 355                 360

caa tgg gtg cct tat caa gga aga gtc ccc tat cca cgg cca gga act    1455
Gln Trp Val Pro Tyr Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Thr
365                 370                 375                 380

tgt ccc agc aaa aca ttt ggt ggt ttt gac tct aca aag gac ctt cct    1503
Cys Pro Ser Lys Thr Phe Gly Gly Phe Asp Ser Thr Lys Asp Leu Pro
                385                 390                 395

gat gat gtt ata acc ttt gca aga agt cat cca gcc atg tac aat cca    1551
Asp Asp Val Ile Thr Phe Ala Arg Ser His Pro Ala Met Tyr Asn Pro
            400                 405                 410

gtg ttt cct atg aac aat cgc cca ata gtg atc aaa acg gat gta aat    1599
Val Phe Pro Met Asn Asn Arg Pro Ile Val Ile Lys Thr Asp Val Asn
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tat caa ttt aca caa att gtc gta gac cga gtg gat gca gaa gat gga    1647
Tyr Gln Phe Thr Gln Ile Val Val Asp Arg Val Asp Ala Glu Asp Gly
    430                 435                 440

cag tat gat gtt atg ttt atc gga aca gat gtt ggg acc gtt ctt aaa    1695
Gln Tyr Asp Val Met Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys
445                 450                 455                 460

gta gtt tca att cct aag gag act tgg tat gat tta gaa gag gtt ctg    1743
Val Val Ser Ile Pro Lys Glu Thr Trp Tyr Asp Leu Glu Glu Val Leu
                465                 470                 475

ctg gaa gaa atg aca gtt ttt cgg gaa ccg act gct att tca gca atg    1791
Leu Glu Glu Met Thr Val Phe Arg Glu Pro Thr Ala Ile Ser Ala Met
            480                 485                 490

gag ctt tcc act aag cag caa caa cta tat att ggt tca acg gct ggg    1839
Glu Leu Ser Thr Lys Gln Gln Gln Leu Tyr Ile Gly Ser Thr Ala Gly
        495                 500                 505

gtt gcc cag ctc cct tta cac cgg tgt gat att tac ggg aaa gcg tgt    1887
Val Ala Gln Leu Pro Leu His Arg Cys Asp Ile Tyr Gly Lys Ala Cys
    510                 515                 520

gct gag tgt tgc ctc gcc cga gac cct tac tgt gct tgg gat ggt tct    1935
Ala Glu Cys Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ser
525                 530                 535                 540

gca tgt tct cgc tat ttt ccc act gca aag aga cgc aca aga cga caa    1983
Ala Cys Ser Arg Tyr Phe Pro Thr Ala Lys Arg Arg Thr Arg Arg Gln
                545                 550                 555

gat ata aga aat gga gac cca ctg act cac tgt tca gac tta cac cat    2031
Asp Ile Arg Asn Gly Asp Pro Leu Thr His Cys Ser Asp Leu His His
            560                 565                 570

gat aat cac cat ggc cac agc cct gaa gag aga atc atc tat ggt gta    2079
Asp Asn His His Gly His Ser Pro Glu Glu Arg Ile Ile Tyr Gly Val
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gag aat agt agc aca ttt ttg gaa tgc agt ccg aag tcg cag aga gcg    2127
Glu Asn Ser Ser Thr Phe Leu Glu Cys Ser Pro Lys Ser Gln Arg Ala
    590                 595                 600

ctg gtc tat tgg caa ttc cag agg cga aat gaa gag cga aaa gaa gag    2175
Leu Val Tyr Trp Gln Phe Gln Arg Arg Asn Glu Glu Arg Lys Glu Glu
605                 610                 615                 620

atc aga gtg gat gat cat atc atc agg aca gat caa ggc ctt ctg cta    2223
Ile Arg Val Asp Asp His Ile Ile Arg Thr Asp Gln Gly Leu Leu Leu
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cgt agt cta caa cag aag gat tca ggc aat tac ctc tgc cat gcg gtg    2271
Arg Ser Leu Gln Gln Lys Asp Ser Gly Asn Tyr Leu Cys His Ala Val
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gaa cat ggg ttc ata caa act ctt ctt aag gta acc ctg gaa gtc att    2319
Glu His Gly Phe Ile Gln Thr Leu Leu Lys Val Thr Leu Glu Val Ile
        655                 660                 665

gac aca gag cat ttg gaa gaa ctt ctt cat aaa gat gat gat gga gat    2367
Asp Thr Glu His Leu Glu Glu Leu Leu His Lys Asp Asp Asp Gly Asp
    670                 675                 680

ggc tct aag acc aaa gaa atg tcc aat agc atg aca cct agc cag aag    2415
Gly Ser Lys Thr Lys Glu Met Ser Asn Ser Met Thr Pro Ser Gln Lys
685                 690                 695                 700

gtc tgg tac aga gac ttc atg cag ctc atc aac cac ccc aat ctc aac    2463
Val Trp Tyr Arg Asp Phe Met Gln Leu Ile Asn His Pro Asn Leu Asn
                705                 710                 715

aca atg gat gag ttc tgt gaa caa gtt tgg aaa agg gac cga aaa caa    2511
Thr Met Asp Glu Phe Cys Glu Gln Val Trp Lys Arg Asp Arg Lys Gln
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cgt cgg caa agg cca gga cat acc cca ggg aac agt aac aaa tgg aag    2559
Arg Arg Gln Arg Pro Gly His Thr Pro Gly Asn Ser Asn Lys Trp Lys
        735                 740                 745

cac tta caa gaa aat aag aaa ggt aga aac agg agg acc cac gaa ttt    2607
His Leu Gln Glu Asn Lys Lys Gly Arg Asn Arg Arg Thr His Glu Phe
    750                 755                 760

gag agg gca ccc agg agt gtc tga gctgcattac ctctagaaac ctcaaacaag   2661
Glu Arg Ala Pro Arg Ser Val
765                 770

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Lys Leu Ser Tyr Lys Glu Met Leu Glu Ser Asn Asn Val Ile Thr Phe
35 40 45
Asn Gly Leu Ala Asn Ser Ser Ser Tyr His Thr Phe Leu Leu Asp Glu
50 55 60
Glu Arg Ser Arg Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe
65 70 75 80
Asp Leu Val Asn Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser
85 90 95
Tyr Thr Arg Arg Asp Glu Cys Lys Trp Lys Gly Lys Asp Ile Leu Lys
100 105 110
Glu Cys Ala Asn Phe Ile Lys Val Leu Lys Ala Tyr Asn Gln Thr His
115 120 125
Leu Tyr Ala Cys Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile
130 135 140
Glu Ile Gly His His Pro Glu Asp Asn Ile Phe Lys Leu Glu Asn Ser
145 150 155 160
His Phe Glu Asn Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu
165 170 175
Thr Ala Ser Leu Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala
180 185 190
Asp Phe Met Gly Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His
195 200 205
His Pro Ile Arg Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro
210 215 220
Lys Phe Ile Ser Ala His Leu Ile Ser Glu Ser Asp Asn Pro Glu Asp
225 230 235 240
Asp Lys Val Tyr Phe Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His
245 250 255
Ser Gly Lys Ala Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp
260 265 270
Phe Gly Gly His Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys
275 280 285
Ala Arg Leu Ile Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His
290 295 300
Phe Asp Glu Leu Gln Asp Val Phe Leu Met Asn Phe Lys Asp Pro Lys
305 310 315 320
Asn Pro Val Val Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys
325 330 335
Gly Ser Ala Val Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe
340 345 350
Leu Gly Pro Tyr Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro
355 360 365
Tyr Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys
370 375 380
Thr Phe Gly Gly Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile
385 390 395 400
Thr Phe Ala Arg Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Met
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Gln Ile Val Val Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val

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Thr Val Phe Arg Glu Pro Thr Ala Ile Ser Ala Met Glu Leu Ser Thr
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Lys Gln Gln Gln Leu Tyr Ile Gly Ser Thr Ala Gly Val Ala Gln Leu
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Pro Leu His Arg Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys
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Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ser Ala Cys Ser Arg
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Tyr Phe Pro Thr Ala Lys Arg Arg Thr Arg Arg Gln Asp Ile Arg Asn
545                 550                 555                 560
Gly Asp Pro Leu Thr His Cys Ser Asp Leu His His Asp Asn His His
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Gly His Ser Pro Glu Glu Arg Ile Ile Tyr Gly Val Glu Asn Ser Ser
            580                 585                 590
Thr Phe Leu Glu Cys Ser Pro Lys Ser Gln Arg Ala Leu Val Tyr Trp
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Gln Phe Gln Arg Arg Asn Glu Glu Arg Lys Glu Glu Ile Arg Val Asp
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Asp His Ile Ile Arg Thr Asp Gln Gly Leu Leu Leu Arg Ser Leu Gln
625                 630                 635                 640
Gln Lys Asp Ser Gly Asn Tyr Leu Cys His Ala Val Glu His Gly Phe
                645                 650                 655
Ile Gln Thr Leu Leu Lys Val Thr Leu Glu Val Ile Asp Thr Glu His
            660                 665                 670
Leu Glu Glu Leu Leu His Lys Asp Asp Asp Gly Asp Gly Ser Lys Thr
        675                 680                 685
Lys Glu Met Ser Asn Ser Met Thr Pro Ser Gln Lys Val Trp Tyr Arg
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Asp Phe Met Gln Leu Ile Asn His Pro Asn Leu Asn Thr Met Asp Glu
705                 710                 715                 720
Phe Cys Glu Gln Val Trp Lys Arg Asp Arg Lys Gln Arg Arg Gln Arg
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Pro Gly His Thr Pro Gly Asn Ser Asn Lys Trp Lys His Leu Gln Glu
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Phe Thr Gly Ile Ala Cys Leu Phe Trp Gly Val Leu Leu Thr Ala Arg
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Ala Asn Tyr Ala Asn Gly Lys Asn Asn Val Pro Arg Leu Lys Leu Ser
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tac aaa gaa atg ttg gaa tcc aac aat gtg atc act ttt aat ggc ttg     802
Tyr Lys Glu Met Leu Glu Ser Asn Asn Val Ile Thr Phe Asn Gly Leu
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gcc aac agc tcc agt tac cac acc ttc ctt ctg gat gaa gaa cgg agt     850
Ala Asn Ser Ser Ser Tyr His Thr Phe Leu Leu Asp Glu Glu Arg Ser
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aga cta tat gtt gga gca aaa gat cat ata ttt tca ttc aac ttg gtg     898
Arg Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe Asn Leu Val
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aac att aaa gat ttt caa aag att gtg tgg cca gta tct tac aca agg     946
Asn Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser Tyr Thr Arg
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aga gat gaa tgc aaa tgg aag gga aaa gat atc ctg aaa gaa tgt gcc     994
Arg Asp Glu Cys Lys Trp Lys Gly Lys Asp Ile Leu Lys Glu Cys Ala
100                 105                 110                 115

aat ttc atc aag gtc ctg gag gct tat aat cag act cac ttg tat gcc    1042
Asn Phe Ile Lys Val Leu Glu Ala Tyr Asn Gln Thr His Leu Tyr Ala
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tgt gga act ggg gct ttc cat cca atc tgc acc tat att gaa gtt gga    1090
Cys Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile Glu Val Gly
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cat cat cct gag gac aac att ttt aag ctg cag gac tca cat ttt gaa    1138
His His Pro Glu Asp Asn Ile Phe Lys Leu Gln Asp Ser His Phe Glu
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aac ggt cgt ggg aag agc cct tat gat ccc aaa cta ctg act gcc tct    1186
Asn Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu Thr Ala Ser
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ctt cta ata gac ggt gag ttg tac tct gga act gct gcg gac ttc atg    1234
Leu Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala Asp Phe Met
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gga cgg gac ttc gct atc ttc aga aca ctg ggg cac cat cac ccc atc    1282
Gly Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His His Pro Ile
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Arg Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro Arg Phe Ile
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agt gcc cat ctc atc cca gag agt gac aac cct gaa gat gac aaa gta    1378
Ser Ala His Leu Ile Pro Glu Ser Asp Asn Pro Glu Asp Asp Lys Val
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tat ttt ttc ttc cga gaa aat gca ata gac gga gaa cac tct gga aaa    1426
Tyr Phe Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His Ser Gly Lys
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gcc act cat gct aga ata ggt cag ata tgc aag aat gac ttt ggt gga    1474
Ala Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp Phe Gly Gly
260                 265                 270                 275

cac aga agt ctt gtg aat aaa tgg aca aca ttc cta aaa gca cgc ctg    1522
His Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu
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att tgc tct gtg ccc ggt ccc aat ggc att gac acc cat ttt gat gaa    1570
Ile Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His Phe Asp Glu
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Leu Gln Asp Val Phe Leu Met Asn Ser Lys Asp Pro Lys Asn Pro Ile
        310                 315                 320

gtc tat gga gtg ttc aca aca tca agc aac atc ttt aag gga tct gct    1666
Val Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys Gly Ser Ala
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Val Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe Leu Gly Pro
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tat gct cac aga gat ggt ccc aac tat cag tgg gtg cct tac caa gga    1762
Tyr Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro Tyr Gln Gly
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aga gtc cct tat cca cgg cca gga act tgt ccc agt aaa aca ttt ggc    1810
Arg Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys Thr Phe Gly
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gga ttt gac tcc aca aag gac ctt cct gat gat gtc ata act ttt gca    1858
Gly Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile Thr Phe Ala
        390                 395                 400

aga agt cat cca gcc atg tac aac cca gtg ttt cct ata aat aat cgc    1906
Arg Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Ile Asn Asn Arg
    405                 410                 415

ccg atc atg atc aaa aca gat gta aat tat cag ttc aca caa att gtt    1954
Pro Ile Met Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr Gln Ile Val
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Val Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val Met Phe Ile
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Gly Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Val Pro Lys Glu
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act tgg cat gac cta gaa gaa gtt ctt ctg gaa gaa atg acc gtc ttc    2098
Thr Trp His Asp Leu Glu Glu Val Leu Leu Glu Glu Met Thr Val Phe
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cgc tgt gac atc tat ggc aaa gcc tgt gca gaa tgc tgc ctc gct cgg    2242
Arg Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys Leu Ala Arg
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Asp Pro Tyr Cys Ala Trp Asp Gly Ser Ser Cys Ser Arg Tyr Phe Pro
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act gca aag agg cgc aca aga cga caa gat ata agg aat gga gac cca    2338
Thr Ala Lys Arg Arg Thr Arg Arg Gln Asp Ile Arg Asn Gly Asp Pro
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ctg act cac tgc tct gac ttg cag cac cat gat aat cat cat ggg ccc    2386
Leu Thr His Cys Ser Asp Leu Gln His His Asp Asn His His Gly Pro
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agc ctt gaa gag aga atc atc tat gga gtg gaa aac agt agt aca ttc    2434
Ser Leu Glu Glu Arg Ile Ile Tyr Gly Val Glu Asn Ser Ser Thr Phe
580                 585                 590                 595

ttg gaa tgc agt ccg aag tca cag aga gcc ttg gta tat tgg caa ttt    2482
Leu Glu Cys Ser Pro Lys Ser Gln Arg Ala Leu Val Tyr Trp Gln Phe
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cag agg aga aat gaa gat cga aaa gag gag atc aga atg ggt gat cat    2530
Gln Arg Arg Asn Glu Asp Arg Lys Glu Glu Ile Arg Met Gly Asp His
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atc atc agg aca gaa caa ggg ctc ctg ctc cgt agc ctg cag aag aag    2578
Ile Ile Arg Thr Glu Gln Gly Leu Leu Leu Arg Ser Leu Gln Lys Lys
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gat tca ggc aat tac ctg tgt cac gct gtg gaa cac gga ttc atg caa    2626
Asp Ser Gly Asn Tyr Leu Cys His Ala Val Glu His Gly Phe Met Gln
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act ctt ctt aag gta acc ctg gaa gtc att gac aca gaa cat ttg gaa    2674
Thr Leu Leu Lys Val Thr Leu Glu Val Ile Asp Thr Glu His Leu Glu
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gaa ctt ctt cat aaa gat gac gat gga gat ggc tct aag ata aaa gaa    2722
Glu Leu Leu His Lys Asp Asp Asp Gly Asp Gly Ser Lys Ile Lys Glu
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Met Ser Ser Ser Met Thr Pro Ser Gln Lys Val Trp Tyr Arg Asp Phe
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Met Gln Leu Ile Asn His Pro Asn Leu Asn Thr Met Asp Glu Phe Cys
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His Ser Gln Gly Ser Ser Asn Lys Trp Lys His Met Gln Glu Ser Lys
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His Pro Ile Arg Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro
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Asn Asp Val Gly Gly Gln Arg Ser Leu Val Asn Lys Trp Thr Thr Phe
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ctg aag gcg cgg ctg gtg tgc tcg gtg ccc ggc gtc gag ggc gac acc    1152
Leu Lys Ala Arg Leu Val Cys Ser Val Pro Gly Val Glu Gly Asp Thr
            290                 295                 300
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cac ttc gat cag ctc cag gat gtg ttt ctg ttg tcc tcg cgg gac cac    1200
His Phe Asp Gln Leu Gln Asp Val Phe Leu Leu Ser Ser Arg Asp His
        305                 310                 315

cgg acc ccg ctg ctc tat gcc gtc ttc tcc acg tcc agc agc atc ttc    1248
Arg Thr Pro Leu Leu Tyr Ala Val Phe Ser Thr Ser Ser Ser Ile Phe
    320                 325                 330

cag ggc tct gcg gtg tgc gtg tac agc atg aac gac gtg cgc cgg gcc    1296
Gln Gly Ser Ala Val Cys Val Tyr Ser Met Asn Asp Val Arg Arg Ala
335                 340                 345                 350

ttc ttg gga ccc ttt gca cac aag gag ggg ccc atg cac cag tgg gtg    1344
Phe Leu Gly Pro Phe Ala His Lys Glu Gly Pro Met His Gln Trp Val
                355                 360                 365

tca tac cag ggt cgc gtc ccc tac ccg cgg cca ggc atg tgc ccc agc    1392
Ser Tyr Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Met Cys Pro Ser
            370                 375                 380

aag acc ttt ggc acc ttc agt tcc acc aag gac ttc cca gac gat gtc    1440
Lys Thr Phe Gly Thr Phe Ser Ser Thr Lys Asp Phe Pro Asp Asp Val
        385                 390                 395

atc cag ttt gcg cgg aac cac ccc ctc atg tac aac tct gtc ctg ccc    1488
Ile Gln Phe Ala Arg Asn His Pro Leu Met Tyr Asn Ser Val Leu Pro
    400                 405                 410

act ggg ggg cgc cct ctt ttc cta caa gtt gga gcc aat tac acc ttc    1536
Thr Gly Gly Arg Pro Leu Phe Leu Gln Val Gly Ala Asn Tyr Thr Phe
415                 420                 425                 430

act caa att gcc gcg gac cgg gtt gca gcc gct gac gga cac tat gac    1584
Thr Gln Ile Ala Ala Asp Arg Val Ala Ala Ala Asp Gly His Tyr Asp
                435                 440                 445

gtc ctc ttc att ggc aca gac gtt ggc acg gtg ctg aag gtg atc tcg    1632
Val Leu Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Ile Ser
            450                 455                 460

gtc ccc aag ggc agt agg ccc agc gca gag ggg ctg ctc ctg gag gag    1680
Val Pro Lys Gly Ser Arg Pro Ser Ala Glu Gly Leu Leu Leu Glu Glu
        465                 470                 475

ctg cac gtg ttt gag gac tcg gcc gct gtc acc agc atg caa att tct    1728
Leu His Val Phe Glu Asp Ser Ala Ala Val Thr Ser Met Gln Ile Ser
    480                 485                 490

tcc aag agg cac cag ctg tac gta gcc tcg cgg agc gcg gtg gcc cag    1776
Ser Lys Arg His Gln Leu Tyr Val Ala Ser Arg Ser Ala Val Ala Gln
495                 500                 505                 510

atc gcg ttg cac cgc tgc gct gcc cac ggc cgc gtc tgc acc gaa tgc    1824
Ile Ala Leu His Arg Cys Ala Ala His Gly Arg Val Cys Thr Glu Cys
                515                 520                 525

tgt ctg gcg cgt gac ccc tac tgc gcc tgg gac ggg gtc gcg tgc acg    1872
Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Val Ala Cys Thr
            530                 535                 540

cgc ttc cag ccc agt gcc aag agg cgg ttc cgg cgg caa gac gta agg    1920
Arg Phe Gln Pro Ser Ala Lys Arg Arg Phe Arg Arg Gln Asp Val Arg
        545                 550                 555

aat ggc gac ccc agc acg ttg tgc tcc gga gac tcg tct cgt ccc gcg    1968
Asn Gly Asp Pro Ser Thr Leu Cys Ser Gly Asp Ser Ser Arg Pro Ala
    560                 565                 570
```

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ctg ctg gaa cac aag gtg ttc ggc gtg gag ggc agc agc gcc ttt ctg    2016
Leu Leu Glu His Lys Val Phe Gly Val Glu Gly Ser Ser Ala Phe Leu
575                 580                 585                 590

gag tgt gag ccc cgc tcg ctg cag gcg cgc gtg gag tgg act ttc cag    2064
Glu Cys Glu Pro Arg Ser Leu Gln Ala Arg Val Glu Trp Thr Phe Gln
                595                 600                 605

cgc gca ggg gtg aca gcc cac acc cag gtg ctg gca gag gag cgc acc    2112
Arg Ala Gly Val Thr Ala His Thr Gln Val Leu Ala Glu Glu Arg Thr
            610                 615                 620

gag cgc acc gcc cgg gga cta ctg ctg cgc agg ctg cgg cgc cgg gac    2160
Glu Arg Thr Ala Arg Gly Leu Leu Leu Arg Arg Leu Arg Arg Arg Asp
        625                 630                 635

tcg ggc gtg tac ttg tgc gcc gcc gtc gag cag ggc ttt acg caa ccg    2208
Ser Gly Val Tyr Leu Cys Ala Ala Val Glu Gln Gly Phe Thr Gln Pro
    640                 645                 650

ctg cgt cgc ctg tcg ctg cac gtg ttg agt gct acg cag gcc gaa cga    2256
Leu Arg Arg Leu Ser Leu His Val Leu Ser Ala Thr Gln Ala Glu Arg
655                 660                 665                 670

ctg gcg cgg gcc gag gag gct gcg ccc gcc gcg ccg ccg ggc ccc aaa    2304
Leu Ala Arg Ala Glu Glu Ala Ala Pro Ala Ala Pro Pro Gly Pro Lys
                675                 680                 685

ctc tgg tac cgg gac ttt ctg cag ctg gtg gag ccg ggc gga ggt ggc    2352
Leu Trp Tyr Arg Asp Phe Leu Gln Leu Val Glu Pro Gly Gly Gly Gly
            690                 695                 700

agc gcg aac tcc ctg cgc atg tgc cgc ccg cag cct gcg ctg cag tca    2400
Ser Ala Asn Ser Leu Arg Met Cys Arg Pro Gln Pro Ala Leu Gln Ser
        705                 710                 715

ctg ccc ctg gag tcg cgg aga aag ggc cgt aac cgg agg acc cac gcc    2448
Leu Pro Leu Glu Ser Arg Arg Lys Gly Arg Asn Arg Arg Thr His Ala
    720                 725                 730

cct gag cct cgc gct gag cgg ggg ccg cgc agc gca acg cac tgg tga    2496
Pro Glu Pro Arg Ala Glu Arg Gly Pro Arg Ser Ala Thr His Trp
735                 740                 745

ccagactgtc cccacgccgg gaaccaagca ggagacgaca ggcgagagag gagccagaca  2556

gaccctgaaa agaaggacgg gttggggccg ggcacattgg gggtcaccgg ccgatggaga  2616

caccaaccga caggccctgg ctgagggcag ctgcgcgggc ttatttatta acaggataac  2676

ccttgaatgt agcagccccg ggagggcggc acaggtcggg cgcaggattc agccggaggg  2736

aagggacggg gaagccgagc tccagagcaa cgaccagggc cgaggaggtg cctggagtgc  2796

ccaccctggg agacagaccc cacctccttg ggtagtgagc agtgagcaga aagctgtgaa  2856

caggctgggc tgctggaggt ggggcgaggc aggccgactg tactaaagta acgcaataaa  2916

cgcattatca gccaaagctg gaatggcccc agcagaaaac cccagaaaaa aaaaaaaaaa  2976

aaaaa                                                              2981
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Trp Ala Val Gly Leu Gly Ser Ala Ala Pro Ser Pro Pro Arg Leu Arg
            20                  25                  30
Leu Ser Phe Gln Glu Leu Gln Ala Trp His Gly Leu Gln Thr Phe Ser
        35                  40                  45
Leu Glu Arg Thr Cys Cys Tyr Gln Ala Leu Leu Val Asp Glu Glu Arg
    50                  55                  60
Gly Arg Leu Phe Val Gly Ala Glu Asn His Val Ala Ser Leu Asn Leu
65                  70                  75                  80
Asp Asn Ile Ser Lys Arg Ala Lys Lys Leu Ala Trp Pro Ala Pro Val
                85                  90                  95
Glu Trp Arg Glu Glu Cys Asn Trp Lys Gly Lys Asp Ile Gly Thr Glu
            100                 105                 110
Cys Met Asn Phe Val Lys Leu Leu His Ala Tyr Asn Arg Thr His Leu
        115                 120                 125
Leu Ala Cys Gly Thr Gly Ala Phe His Pro Thr Cys Ala Phe Val Glu
    130                 135                 140
Val Gly His Arg Ala Glu Glu Pro Val Leu Arg Leu Asp Pro Gly Arg
145                 150                 155                 160
Ile Glu Asp Gly Lys Gly Lys Ser Pro Tyr Asp Pro Arg His Arg Ala
                165                 170                 175
Ala Ser Val Leu Val Gly Glu Glu Leu Tyr Ser Gly Val Ala Ala Asp
            180                 185                 190
Leu Met Gly Arg Asp Phe Thr Ile Phe Arg Ser Leu Gly Gln Arg Pro
        195                 200                 205
Ser Leu Arg Thr Glu Pro His Asp Ser Arg Trp Leu Asn Glu Pro Lys
    210                 215                 220
Phe Val Lys Val Phe Trp Ile Pro Glu Ser Glu Asn Pro Asp Asp Asp
225                 230                 235                 240
Lys Ile Tyr Phe Phe Phe Arg Glu Thr Ala Val Glu Ala Ala Pro Ala
                245                 250                 255
Leu Gly Arg Leu Ser Val Ser Arg Val Gly Gln Ile Cys Arg Asn Asp
            260                 265                 270
Val Gly Gly Gln Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys
        275                 280                 285
Ala Arg Leu Val Cys Ser Val Pro Gly Val Glu Gly Asp Thr His Phe
    290                 295                 300
Asp Gln Leu Gln Asp Val Phe Leu Leu Ser Ser Arg Asp His Arg Thr
305                 310                 315                 320
Pro Leu Leu Tyr Ala Val Phe Ser Thr Ser Ser Ser Ile Phe Gln Gly
                325                 330                 335
Ser Ala Val Cys Val Tyr Ser Met Asn Asp Val Arg Arg Ala Phe Leu
            340                 345                 350
Gly Pro Phe Ala His Lys Glu Gly Pro Met His Gln Trp Val Ser Tyr
        355                 360                 365
Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Met Cys Pro Ser Lys Thr
    370                 375                 380
Phe Gly Thr Phe Ser Ser Thr Lys Asp Phe Pro Asp Asp Val Ile Gln
385                 390                 395                 400
Phe Ala Arg Asn His Pro Leu Met Tyr Asn Ser Val Leu Pro Thr Gly
                405                 410                 415
Gly Arg Pro Leu Phe Leu Gln Val Gly Ala Asn Tyr Thr Phe Thr Gln
            420                 425                 430
Ile Ala Ala Asp Arg Val Ala Ala Ala Asp Gly His Tyr Asp Val Leu
        435                 440                 445
Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Ile Ser Val Pro
    450                 455                 460
Lys Gly Ser Arg Pro Ser Ala Glu Gly Leu Leu Leu Glu Glu Leu His
465                 470                 475                 480
Val Phe Glu Asp Ser Ala Ala Val Thr Ser Met Gln Ile Ser Ser Lys
                485                 490                 495
Arg His Gln Leu Tyr Val Ala Ser Arg Ser Ala Val Ala Gln Ile Ala
            500                 505                 510
Leu His Arg Cys Ala Ala His Gly Arg Val Cys Thr Glu Cys Cys Leu
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        515                 520                 525
Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Val Ala Cys Thr Arg Phe
    530                 535                 540
Gln Pro Ser Ala Lys Arg Arg Phe Arg Arg Gln Asp Val Arg Asn Gly
545                 550                 555                 560
Asp Pro Ser Thr Leu Cys Ser Gly Asp Ser Ser Arg Pro Ala Leu Leu
                565                 570                 575
Glu His Lys Val Phe Gly Val Glu Gly Ser Ser Ala Phe Leu Glu Cys
            580                 585                 590
Glu Pro Arg Ser Leu Gln Ala Arg Val Glu Trp Thr Phe Gln Arg Ala
        595                 600                 605
Gly Val Thr Ala His Thr Gln Val Leu Ala Glu Glu Arg Thr Glu Arg
    610                 615                 620
Thr Ala Arg Gly Leu Leu Leu Arg Arg Leu Arg Arg Arg Asp Ser Gly
625                 630                 635                 640
Val Tyr Leu Cys Ala Ala Val Glu Gln Gly Phe Thr Gln Pro Leu Arg
                645                 650                 655
Arg Leu Ser Leu His Val Leu Ser Ala Thr Gln Ala Glu Arg Leu Ala
            660                 665                 670
Arg Ala Glu Glu Ala Ala Pro Ala Ala Pro Pro Gly Pro Lys Leu Trp
        675                 680                 685
Tyr Arg Asp Phe Leu Gln Leu Val Glu Pro Gly Gly Gly Gly Ser Ala
    690                 695                 700
Asn Ser Leu Arg Met Cys Arg Pro Gln Pro Ala Leu Gln Ser Leu Pro
705                 710                 715                 720
Leu Glu Ser Arg Arg Lys Gly Arg Asn Arg Arg Thr His Ala Pro Glu
                725                 730                 735
Pro Arg Ala Glu Arg Gly Pro Arg Ser Ala Thr His Trp
            740                 745
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gctcctggga cctgagcttg ctgtggagtg tacagtcatc ccttagctgt ggagggacag   180

caactgcttt gctctttgca cttggtgccc tctggaatga ccacaggatc tgactctcat   240

ctgtcggctc ttcgcccttt actgcctggg gaccttgtcc gcatcatcag tatccttgtc   300

tctgccccag gctggcatga aatcctgggg cagagtccag gactgctgaa ggctcctcca   360

cacacgcctg ctgaaccctg agcgccctga gctgccggc atg ggg cgg gct gag      414
                                          Met Gly Arg Ala Glu
                                          1               5

gcc gcc gcc atg atc cca ggc ctg gcc ctt ctc tgg gta gca ggg cta     462
Ala Ala Ala Met Ile Pro Gly Leu Ala Leu Leu Trp Val Ala Gly Leu
                10                  15                  20

ggg gat act gcc cct aac ctt ccc cgc ctt cgg ctc tcc ttt caa gaa     510
Gly Asp Thr Ala Pro Asn Leu Pro Arg Leu Arg Leu Ser Phe Gln Glu
            25                  30                  35
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tta cag gcc cgg cat ggt gtc cga acc ttc agg ctg gag cgg acc tgc     558
Leu Gln Ala Arg His Gly Val Arg Thr Phe Arg Leu Glu Arg Thr Cys
        40                  45                  50

tgt tat gaa gcc ttg ctg gtg gat gag gag cgt gga cgc ctg ttt gtg     606
Cys Tyr Glu Ala Leu Leu Val Asp Glu Glu Arg Gly Arg Leu Phe Val
    55                  60                  65

ggt gct gag aac cac gtg gct tcc ctc agc ctg gac aac atc agc aag     654
Gly Ala Glu Asn His Val Ala Ser Leu Ser Leu Asp Asn Ile Ser Lys
70                  75                  80                  85

cga gcc aag aag ctg gcc tgg ccc gcc ccc gtg gaa tgg cgt gaa gaa     702
Arg Ala Lys Lys Leu Ala Trp Pro Ala Pro Val Glu Trp Arg Glu Glu
                90                  95                  100

tgc aac tgg aag ggg aag gac att ggt acc gag tgc atg aac ttc gtg     750
Cys Asn Trp Lys Gly Lys Asp Ile Gly Thr Glu Cys Met Asn Phe Val
            105                 110                 115

aag ctg ctg cac acc tac aac cac acc cac ttg ctg gcc tgt ggc aca     798
Lys Leu Leu His Thr Tyr Asn His Thr His Leu Leu Ala Cys Gly Thr
        120                 125                 130

ggg gct ttc cac cca acc tgt gcc ttt gtg gag gtg ggc cac cgg ctg     846
Gly Ala Phe His Pro Thr Cys Ala Phe Val Glu Val Gly His Arg Leu
    135                 140                 145

gag gaa ccc atg ctt caa ctg gac cgg agg aaa ctt gag gac ggc aag     894
Glu Glu Pro Met Leu Gln Leu Asp Arg Arg Lys Leu Glu Asp Gly Lys
150                 155                 160                 165

ggg aag act cct tat gac cca agg cat cgg gct gcc tcg gtg ctg gtg     942
Gly Lys Thr Pro Tyr Asp Pro Arg His Arg Ala Ala Ser Val Leu Val
                170                 175                 180

ggg gaa gaa ctg tat tct ggg gtg aca gca gac ctt atg ggc cgg gac     990
Gly Glu Glu Leu Tyr Ser Gly Val Thr Ala Asp Leu Met Gly Arg Asp
            185                 190                 195

ttt acc atc ttt cga agc ctt ggt cag aat ccg agt ctc cga aca gag    1038
Phe Thr Ile Phe Arg Ser Leu Gly Gln Asn Pro Ser Leu Arg Thr Glu
        200                 205                 210

ccc cat gat tcc cgc tgg ctc aat gaa ccc aag ttt gtc aag gtc ttt    1086
Pro His Asp Ser Arg Trp Leu Asn Glu Pro Lys Phe Val Lys Val Phe
    215                 220                 225

tgg atc cca gag agt gag aac cct gat gac gat aaa atc tat ttc ttc    1134
Trp Ile Pro Glu Ser Glu Asn Pro Asp Asp Asp Lys Ile Tyr Phe Phe
230                 235                 240                 245

ttc cgc gag tcc gct gtg gaa gca gca cca gca atg ggg cgc atg tct    1182
Phe Arg Glu Ser Ala Val Glu Ala Ala Pro Ala Met Gly Arg Met Ser
                250                 255                 260

gtg tct cgt gtt ggc cag atc tgc agg aat gac ctg ggt ggc cag cgg    1230
Val Ser Arg Val Gly Gln Ile Cys Arg Asn Asp Leu Gly Gly Gln Arg
            265                 270                 275

agc ttg gtc aac aaa tgg acc aca ttt ctg aag gcg cgg ctt gtg tgc    1278
Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu Val Cys
        280                 285                 290

tca gta cct gga gtt gag ggt gac acc cac ttt gac caa ctt cag gat    1326
Ser Val Pro Gly Val Glu Gly Asp Thr His Phe Asp Gln Leu Gln Asp
    295                 300                 305
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gtt ttc ctt ctg tcc tcc cga gac cgc cag aca cct ctt ctc tat gct    1374
Val Phe Leu Leu Ser Ser Arg Asp Arg Gln Thr Pro Leu Leu Tyr Ala
310                 315                 320                 325

gtc ttc tcc acc tcc agt ggt gtc ttc cag ggc tct gct gtg tgc gtg    1422
Val Phe Ser Thr Ser Ser Gly Val Phe Gln Gly Ser Ala Val Cys Val
                330                 335                 340

tac agc atg aac gat gtg cgc cga gcc ttc ttg gga cct ttt gct cac    1470
Tyr Ser Met Asn Asp Val Arg Arg Ala Phe Leu Gly Pro Phe Ala His
            345                 350                 355

aaa gag ggg cct aca cac cag tgg gtg tcc tac cag ggt cgt gtc ccc    1518
Lys Glu Gly Pro Thr His Gln Trp Val Ser Tyr Gln Gly Arg Val Pro
        360                 365                 370

tac cca aga cct ggc atg tgc ccc agc aag acc ttt ggc acc ttc agc    1566
Tyr Pro Arg Pro Gly Met Cys Pro Ser Lys Thr Phe Gly Thr Phe Ser
    375                 380                 385

tcc acc aag gac ttc cca gat gac gtt atc cag ttt gct cgg aac cac    1614
Ser Thr Lys Asp Phe Pro Asp Asp Val Ile Gln Phe Ala Arg Asn His
390                 395                 400                 405

cct ctc atg tac aac cca gtc ctg ccc atg ggg ggg cgc cct ctc ttc    1662
Pro Leu Met Tyr Asn Pro Val Leu Pro Met Gly Gly Arg Pro Leu Phe
                410                 415                 420

cta caa gtg gga gct ggg tac acc ttc acc caa atc gcc gca gac cga    1710
Leu Gln Val Gly Ala Gly Tyr Thr Phe Thr Gln Ile Ala Ala Asp Arg
            425                 430                 435

gta gca gct gcc gat gga cac tac gat gtt ctc ttc att ggt aca gat    1758
Val Ala Ala Ala Asp Gly His Tyr Asp Val Leu Phe Ile Gly Thr Asp
        440                 445                 450

gtg ggc aca gtg ctg aaa gtg atc tca gtc ccc aaa ggc agc cga cct    1806
Val Gly Thr Val Leu Lys Val Ile Ser Val Pro Lys Gly Ser Arg Pro
    455                 460                 465

aat tct gaa gga ctt ctc ctg gaa gag ctg cag gtg ttc gag gac tct    1854
Asn Ser Glu Gly Leu Leu Leu Glu Glu Leu Gln Val Phe Glu Asp Ser
470                 475                 480                 485

gcc gct atc acc agc atg caa atc tcc tct aaa agg caa caa ctc tac    1902
Ala Ala Ile Thr Ser Met Gln Ile Ser Ser Lys Arg Gln Gln Leu Tyr
                490                 495                 500

ata gca tcg cgc agc gca gtg gcc cag att gct ttg cat cgc tgc act    1950
Ile Ala Ser Arg Ser Ala Val Ala Gln Ile Ala Leu His Arg Cys Thr
            505                 510                 515

gcc cta ggc cgc gcc tgc gca gaa tgc tgc ttg gcc cgt gat cct tac    1998
Ala Leu Gly Arg Ala Cys Ala Glu Cys Cys Leu Ala Arg Asp Pro Tyr
        520                 525                 530

tgc gcc tgg gat gga tca gct tgc aca cgc ttc cag cct acg gcc aag    2046
Cys Ala Trp Asp Gly Ser Ala Cys Thr Arg Phe Gln Pro Thr Ala Lys
    535                 540                 545

aga cgg ttc cgg agg caa gac ata agg aat ggc gac ccc agc acc cta    2094
Arg Arg Phe Arg Arg Gln Asp Ile Arg Asn Gly Asp Pro Ser Thr Leu
550                 555                 560                 565

tgc tct gga gac tct tct cac tct gtg ctg ctg gag aag aag gtg ttg    2142
Cys Ser Gly Asp Ser Ser His Ser Val Leu Leu Glu Lys Lys Val Leu
                570                 575                 580
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ggt gtg gag agc ggc agc gcg ttt ctg gag tgt gag ccc cgc tcg ctc    2190
Gly Val Glu Ser Gly Ser Ala Phe Leu Glu Cys Glu Pro Arg Ser Leu
            585                 590                 595

cag gcg cat gtg cag tgg acc ttc caa ggt gca ggg gag gca gct cac    2238
Gln Ala His Val Gln Trp Thr Phe Gln Gly Ala Gly Glu Ala Ala His
        600                 605                 610

acc cag gtg ctg gct gag gag aga gta gag cgc act gcg cgg ggg ctg    2286
Thr Gln Val Leu Ala Glu Glu Arg Val Glu Arg Thr Ala Arg Gly Leu
    615                 620                 625

ctg ttg cgg ggg ctg cgg cgc cag gac tct ggc gtg tat ctt tgc gtc    2334
Leu Leu Arg Gly Leu Arg Arg Gln Asp Ser Gly Val Tyr Leu Cys Val
630                 635                 640                 645

gcg gtt gaa caa ggc ttt tca caa cca ctg cgt cgc ctg gtg ctg cat    2382
Ala Val Glu Gln Gly Phe Ser Gln Pro Leu Arg Arg Leu Val Leu His
                650                 655                 660

gtg ttg agt gcg gcg cag gct gaa cga ctg gca cgg gca gag gaa gca    2430
Val Leu Ser Ala Ala Gln Ala Glu Arg Leu Ala Arg Ala Glu Glu Ala
            665                 670                 675

gcc gct cct gca cct cct ggc cct aaa ctc tgg tac cgg gac ttt ctg    2478
Ala Ala Pro Ala Pro Pro Gly Pro Lys Leu Trp Tyr Arg Asp Phe Leu
        680                 685                 690

cag ttg gtg gag cca ggc ggt ggc gga ggt gca aac tcc ctg cga atg    2526
Gln Leu Val Glu Pro Gly Gly Gly Gly Gly Ala Asn Ser Leu Arg Met
    695                 700                 705

tgc cgc ccg cag ccc ggg cac cac tct gtg gca gca gat tca cgt cgt    2574
Cys Arg Pro Gln Pro Gly His His Ser Val Ala Ala Asp Ser Arg Arg
710                 715                 720                 725

aag ggt cgc aac aga cgg atg cat gtc tct gag ctc cgt gct gag cgt    2622
Lys Gly Arg Asn Arg Arg Met His Val Ser Glu Leu Arg Ala Glu Arg
                730                 735                 740

gga cca cgt agt gca gct cac tgg tga ctcggctgtc cccacaatgg          2669
Gly Pro Arg Ser Ala Ala His Trp
            745

gacgaggctg aatatgacac tccaaagagg ggcagacaga tgccaggaag acaaatgagt  2729

tatggctggg ccacactgag gtccttgggc caacagagac acctaaccct tacataggcc  2789

ctggccaaag ggtagcttat ttattaacaa gataacccgt ggatgtagcc tcaaagagtg  2849

gcctaagctc aattcaggat ctaaccagga gggaggggac agagacgtgg ggttccagag  2909

tggaccagga ccagagagtt gtcttgggtg gcagccctgg ggaaagaatt ctctttcttg  2969

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aacaggtagt cctagacctt gctgggggct cttgggtatc gccctagggg tctcaagacc  3149

tgcattttcc tcatccaaga atgctaaagt gaagattaaa cgtgttagta gacgactacg  3209

ctggttccag tgagcctctg gggtactggc aatacacagt gcattagtgg caggaccaag  3269

ctctctgaag taaaaccaat actggctgtt gtgggcaagg atgtattaat tcactgaacg  3329

ggtggtgttt gagctgaata agaaggagcc aatcaccaat gtctggtgac agaacattcc  3389
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gcctgcaagc tggaccagca cccttcaaga gagccacgtg cctctctctc cgtggcctgt 3629

caagcccttg tgaagaggag agggaggacc caaaacctct taagtgcttt agccatgctt 3689

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20 25 30
Leu Ser Phe Gln Glu Leu Gln Ala Arg His Gly Val Arg Thr Phe Arg
35 40 45
Leu Glu Arg Thr Cys Cys Tyr Glu Ala Leu Leu Val Asp Glu Glu Arg
50 55 60
Gly Arg Leu Phe Val Gly Ala Glu Asn His Val Ala Ser Leu Ser Leu
65 70 75 80
Asp Asn Ile Ser Lys Arg Ala Lys Lys Leu Ala Trp Pro Ala Pro Val
85 90 95
Glu Trp Arg Glu Glu Cys Asn Trp Lys Gly Lys Asp Ile Gly Thr Glu
100 105 110
Cys Met Asn Phe Val Lys Leu Leu His Thr Tyr Asn His Thr His Leu
115 120 125
Leu Ala Cys Gly Thr Gly Ala Phe His Pro Thr Cys Ala Phe Val Glu
130 135 140
Val Gly His Arg Leu Glu Glu Pro Met Leu Gln Leu Asp Arg Arg Lys
145 150 155 160
Leu Glu Asp Gly Lys Gly Lys Thr Pro Tyr Asp Pro Arg His Arg Ala
165 170 175
Ala Ser Val Leu Val Gly Glu Glu Leu Tyr Ser Gly Val Thr Ala Asp
180 185 190
Leu Met Gly Arg Asp Phe Thr Ile Phe Arg Ser Leu Gly Gln Asn Pro
195 200 205
Ser Leu Arg Thr Glu Pro His Asp Ser Arg Trp Leu Asn Glu Pro Lys
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Phe Val Lys Val Phe Trp Ile Pro Glu Ser Glu Asn Pro Asp Asp Asp
225 230 235 240
Lys Ile Tyr Phe Phe Phe Arg Glu Ser Ala Val Glu Ala Ala Pro Ala
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Met Gly Arg Met Ser Val Ser Arg Val Gly Gln Ile Cys Arg Asn Asp
260 265 270
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Ala Arg Leu Val Cys Ser Val Pro Gly Val Glu Gly Asp Thr His Phe
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Asp Gln Leu Gln Asp Val Phe Leu Leu Ser Ser Arg Asp Arg Gln Thr
305 310 315 320
Pro Leu Leu Tyr Ala Val Phe Ser Thr Ser Ser Gly Val Phe Gln Gly
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Ser Ala Val Cys Val Tyr Ser Met Asn Asp Val Arg Arg Ala Phe Leu
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Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Met Cys Pro Ser Lys Thr

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Gly Arg Pro Leu Phe Leu Gln Val Gly Ala Gly Tyr Thr Phe Thr Gln
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Ile Ala Ala Asp Arg Val Ala Ala Ala Asp Gly His Tyr Asp Val Leu
        435                 440                 445
Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Ile Ser Val Pro
    450                 455                 460
Lys Gly Ser Arg Pro Asn Ser Glu Gly Leu Leu Leu Glu Glu Leu Gln
465                 470                 475                 480
Val Phe Glu Asp Ser Ala Ala Ile Thr Ser Met Gln Ile Ser Ser Lys
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Arg Gln Gln Leu Tyr Ile Ala Ser Arg Ser Ala Val Ala Gln Ile Ala
            500                 505                 510
Leu His Arg Cys Thr Ala Leu Gly Arg Ala Cys Ala Glu Cys Cys Leu
        515                 520                 525
Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ser Ala Cys Thr Arg Phe
    530                 535                 540
Gln Pro Thr Ala Lys Arg Arg Phe Arg Arg Gln Asp Ile Arg Asn Gly
545                 550                 555                 560
Asp Pro Ser Thr Leu Cys Ser Gly Asp Ser Ser His Ser Val Leu Leu
                565                 570                 575
Glu Lys Lys Val Leu Gly Val Glu Ser Gly Ser Ala Phe Leu Glu Cys
            580                 585                 590
Glu Pro Arg Ser Leu Gln Ala His Val Gln Trp Thr Phe Gln Gly Ala
        595                 600                 605
Gly Glu Ala Ala His Thr Gln Val Leu Ala Glu Glu Arg Val Glu Arg
    610                 615                 620
Thr Ala Arg Gly Leu Leu Leu Arg Gly Leu Arg Arg Gln Asp Ser Gly
625                 630                 635                 640
Val Tyr Leu Cys Val Ala Val Glu Gln Gly Phe Ser Gln Pro Leu Arg
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Arg Leu Val Leu His Val Leu Ser Ala Ala Gln Ala Glu Arg Leu Ala
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Arg Ala Glu Glu Ala Ala Ala Pro Ala Pro Pro Gly Pro Lys Leu Trp
        675                 680                 685
Tyr Arg Asp Phe Leu Gln Leu Val Glu Pro Gly Gly Gly Gly Gly Ala
    690                 695                 700
Asn Ser Leu Arg Met Cys Arg Pro Gln Pro Gly His His Ser Val Ala
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Ala Asp Ser Arg Arg Lys Gly Arg Asn Arg Arg Met His Val Ser Glu
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gccaggctct cgcgggcgcg ctcggggtgg ggcctcgcgg ctggcggaga tgcggccggg   180
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gctgagattc ctttacaaag aaactcagag gaccgggaag aaagaatttc acctttgcga   420

cgtgctagaa aataaggtcg tctgggaaaa ggactggaga cacaagcgca tccaaccccg   480

gtagcaaact gatgactttt ccgtgctgat ttctttcaac ctcggtattt tcccttggat   540

attaacttgc atatctgaag aa atg gca ttc cgg aca att tgc gtg ttg gtt    592
                         Met Ala Phe Arg Thr Ile Cys Val Leu Val
                         1               5                   10

gga gta ttt att tgt tct atc tgt gtg aaa gga tct tcc cag ccc caa     640
Gly Val Phe Ile Cys Ser Ile Cys Val Lys Gly Ser Ser Gln Pro Gln
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gaa tac ttc agc ctt tcc cac cat cct tta gac tac agg att tta tta     736
Glu Tyr Phe Ser Leu Ser His His Pro Leu Asp Tyr Arg Ile Leu Leu
        45                  50                  55

atg gat gaa gat cag gac cgg ata tat gtg gga agc aaa gat cac att     784
Met Asp Glu Asp Gln Asp Arg Ile Tyr Val Gly Ser Lys Asp His Ile
    60                  65                  70

ctt tcc ctg aat att aac aat ata agt caa gaa gct ttg agt gtt ttc     832
Leu Ser Leu Asn Ile Asn Asn Ile Ser Gln Glu Ala Leu Ser Val Phe
75                  80                  85                  90

tgg cca gca tct aca atc aaa gtt gaa gaa tgc aaa atg aag ggc aaa     880
Trp Pro Ala Ser Thr Ile Lys Val Glu Glu Cys Lys Met Lys Gly Lys
                95                  100                 105

gat ccc aca cac ggc tgt ggg aac ttt gtc cgt gta att cag act ttc     928
Asp Pro Thr His Gly Cys Gly Asn Phe Val Arg Val Ile Gln Thr Phe
            110                 115                 120

aat cgc aca cat ttg tat gtc tgt ggg agt ggc gct ttc agt cct gtc     976
Asn Arg Thr His Leu Tyr Val Cys Gly Ser Gly Ala Phe Ser Pro Val
        125                 130                 135

tgt act tac ttg aac aga ggg agg aga tca gag gac caa gtt ttc atg    1024
Cys Thr Tyr Leu Asn Arg Gly Arg Arg Ser Glu Asp Gln Val Phe Met
    140                 145                 150

att gac tcc aag tgt gaa tct gga aaa gga cgc tgc tct ttc aac ccc    1072
Ile Asp Ser Lys Cys Glu Ser Gly Lys Gly Arg Cys Ser Phe Asn Pro
155                 160                 165                 170

aac gtg aac acg gtg tct gtt atg atc aat gag gag ctt ttc tct gga    1120
Asn Val Asn Thr Val Ser Val Met Ile Asn Glu Glu Leu Phe Ser Gly
                175                 180                 185

atg tat ata gat ttc atg ggg aca gat gct gct att ttt cga agt tta    1168
Met Tyr Ile Asp Phe Met Gly Thr Asp Ala Ala Ile Phe Arg Ser Leu
            190                 195                 200

acc aag agg aat gcg gtc aga act gat caa cat aat tcc aaa tgg cta    1216
Thr Lys Arg Asn Ala Val Arg Thr Asp Gln His Asn Ser Lys Trp Leu
        205                 210                 215
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agt gaa cct atg ttt gta gat gca cat gtc atc cca gat ggt act gat    1264
Ser Glu Pro Met Phe Val Asp Ala His Val Ile Pro Asp Gly Thr Asp
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cca aat gat gct aag gtg tac ttc ttc ttc aaa gaa aaa ctg act gac    1312
Pro Asn Asp Ala Lys Val Tyr Phe Phe Phe Lys Glu Lys Leu Thr Asp
235                 240                 245                 250

aat aac agg agc acg aaa cag att cat tcc atg att gct cga ata tgt    1360
Asn Asn Arg Ser Thr Lys Gln Ile His Ser Met Ile Ala Arg Ile Cys
                255                 260                 265

cct aat gac act ggt gga ctg cgt agc ctt gtc aac aag tgg acc act    1408
Pro Asn Asp Thr Gly Gly Leu Arg Ser Leu Val Asn Lys Trp Thr Thr
            270                 275                 280

ttc tta aag gcg agg ctg gtg tgc tcg gta aca gat gaa gac ggc cca    1456
Phe Leu Lys Ala Arg Leu Val Cys Ser Val Thr Asp Glu Asp Gly Pro
        285                 290                 295

gaa aca cac ttt gat gaa tta gag gat gtg ttt ctg ctg gaa act gat    1504
Glu Thr His Phe Asp Glu Leu Glu Asp Val Phe Leu Leu Glu Thr Asp
    300                 305                 310

aac ccg agg aca aca cta gtg tat ggc att ttt aca aca tca agc tca    1552
Asn Pro Arg Thr Thr Leu Val Tyr Gly Ile Phe Thr Thr Ser Ser Ser
315                 320                 325                 330

gtt ttc aaa gga tca gcc gtg tgt gtg tat cat tta tct gat ata cag    1600
Val Phe Lys Gly Ser Ala Val Cys Val Tyr His Leu Ser Asp Ile Gln
                335                 340                 345

act gtg ttt aat ggg cct ttt gcc cac aaa gaa ggg ccc aat cat cag    1648
Thr Val Phe Asn Gly Pro Phe Ala His Lys Glu Gly Pro Asn His Gln
            350                 355                 360

ctg att tcc tat cag ggc aga att cca tat cct cgc cct gga act tgt    1696
Leu Ile Ser Tyr Gln Gly Arg Ile Pro Tyr Pro Arg Pro Gly Thr Cys
        365                 370                 375

cca gga gga gca ttt aca ccc aat atg cga acc acc aag gag ttc cca    1744
Pro Gly Gly Ala Phe Thr Pro Asn Met Arg Thr Thr Lys Glu Phe Pro
    380                 385                 390

gat gat gtt gtc act ttt att cgg aac cat cct ctc atg tac aat tcc    1792
Asp Asp Val Val Thr Phe Ile Arg Asn His Pro Leu Met Tyr Asn Ser
395                 400                 405                 410

atc tac cca atc cac aaa agg cct ttg att gtt cgt att ggc act gac    1840
Ile Tyr Pro Ile His Lys Arg Pro Leu Ile Val Arg Ile Gly Thr Asp
                415                 420                 425

tac aag tat aca aag ata gct gtg gat cga gtg aac gct gct gat ggg    1888
Tyr Lys Tyr Thr Lys Ile Ala Val Asp Arg Val Asn Ala Ala Asp Gly
            430                 435                 440

aga tac cat gtc ctg ttt ctc gga aca gat cgg ggt act gtg caa aaa    1936
Arg Tyr His Val Leu Phe Leu Gly Thr Asp Arg Gly Thr Val Gln Lys
        445                 450                 455

gtg gtt gtt ctt cct act aac aac tct gtc agt ggc gag ctc att ctg    1984
Val Val Val Leu Pro Thr Asn Asn Ser Val Ser Gly Glu Leu Ile Leu
    460                 465                 470

gag gag ctg gaa gtc ttt aag aat cat gct cct ata aca aca atg aaa    2032
Glu Glu Leu Glu Val Phe Lys Asn His Ala Pro Ile Thr Thr Met Lys
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tcc cag gta tct ctg cac cgc tgc cac atc tat ggt aca gcc tgt gct    2128
Ser Gln Val Ser Leu His Arg Cys His Ile Tyr Gly Thr Ala Cys Ala
            510                 515                 520

gac tgc tgc ctg gcg cgg gac cct tat tgc gcc tgg gat ggc cat tcc    2176
Asp Cys Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly His Ser
        525                 530                 535

tgt tcc aga ttc tac cca act ggg aaa cgg agg agc cga aga caa gat    2224
Cys Ser Arg Phe Tyr Pro Thr Gly Lys Arg Arg Ser Arg Arg Gln Asp
    540                 545                 550

gtg aga cat gga aac cca ctg act caa tgc aga gga ttt aat cta aaa    2272
Val Arg His Gly Asn Pro Leu Thr Gln Cys Arg Gly Phe Asn Leu Lys
555                 560                 565                 570

gca tac aga aat gca gct gaa att gtc cag tat gga gta aaa aat aac    2320
Ala Tyr Arg Asn Ala Ala Glu Ile Val Gln Tyr Gly Val Lys Asn Asn
                575                 580                 585

acc act ttt ctg gag tgt gcc ccc aag tct ccg cag gca tct atc aag    2368
Thr Thr Phe Leu Glu Cys Ala Pro Lys Ser Pro Gln Ala Ser Ile Lys
            590                 595                 600

tgg ctg tta cag aaa gac aaa gac agg agg aaa gag gtt aag ctg aat    2416
Trp Leu Leu Gln Lys Asp Lys Asp Arg Arg Lys Glu Val Lys Leu Asn
        605                 610                 615

gaa cga ata ata gcc act tca cag gga ctc ctg atc cgc tct gtt cag    2464
Glu Arg Ile Ile Ala Thr Ser Gln Gly Leu Leu Ile Arg Ser Val Gln
    620                 625                 630

ggt tct gac caa gga ctt tat cac tgc att gct aca gaa aat agt ttc    2512
Gly Ser Asp Gln Gly Leu Tyr His Cys Ile Ala Thr Glu Asn Ser Phe
635                 640                 645                 650

aag cag acc ata gcc aag atc aac ttc aaa gtt tta gat tca gaa atg    2560
Lys Gln Thr Ile Ala Lys Ile Asn Phe Lys Val Leu Asp Ser Glu Met
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gtg gct gtt gtg acg gac aaa tgg tcc cca tgg acc tgg gcc agc tct    2608
Val Ala Val Val Thr Asp Lys Trp Ser Pro Trp Thr Trp Ala Ser Ser
            670                 675                 680

gtg agg gct tta ccc ttc cac ccg aag gac atc atg ggg gca ttc agc    2656
Val Arg Ala Leu Pro Phe His Pro Lys Asp Ile Met Gly Ala Phe Ser
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cac tca gaa atg cag atg att aac caa tat tgc aaa gac act cgg cag    2704
His Ser Glu Met Gln Met Ile Asn Gln Tyr Cys Lys Asp Thr Arg Gln
    700                 705                 710

caa cat cag cag gga gat gaa tca cag aaa atg aga ggg gac tat ggc    2752
Gln His Gln Gln Gly Asp Glu Ser Gln Lys Met Arg Gly Asp Tyr Gly
715                 720                 725                 730

aag tta aag gcc ctc atc aat agt cgg aaa agt aga aac agg agg aat    2800
Lys Leu Lys Ala Leu Ile Asn Ser Arg Lys Ser Arg Asn Arg Arg Asn
                735                 740                 745

cag ttg cca gag tca taa tattttctta tgtgggtctt atgcttccat           2848
Gln Leu Pro Glu Ser
            750
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ttcaatctgt gtaagaaaac aaactaaatg tagttgtcac actaaaattt aattggatat 5128

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

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Ile Arg Asn His Pro Leu Met Tyr Asn Ser Ile Tyr Pro Ile His Lys
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Arg Pro Leu Ile Val Arg Ile Gly Thr Asp Tyr Lys Tyr Thr Lys Ile
            420                 425                 430
Ala Val Asp Arg Val Asn Ala Ala Asp Gly Arg Tyr His Val Leu Phe
        435                 440                 445
Leu Gly Thr Asp Arg Gly Thr Val Gln Lys Val Val Val Leu Pro Thr
    450                 455                 460
Asn Asn Ser Val Ser Gly Glu Leu Ile Leu Glu Glu Leu Glu Val Phe
465                 470                 475                 480
Lys Asn His Ala Pro Ile Thr Thr Met Lys Ile Ser Ser Lys Lys Gln
                485                 490                 495
Gln Leu Tyr Val Ser Ser Asn Glu Gly Val Ser Gln Val Ser Leu His
            500                 505                 510
Arg Cys His Ile Tyr Gly Thr Ala Cys Ala Asp Cys Cys Leu Ala Arg
        515                 520                 525
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    530                 535                 540
Thr Gly Lys Arg Arg Ser Arg Arg Gln Asp Val Arg His Gly Asn Pro
545                 550                 555                 560
Leu Thr Gln Cys Arg Gly Phe Asn Leu Lys Ala Tyr Arg Asn Ala Ala
                565                 570                 575
Glu Ile Val Gln Tyr Gly Val Lys Asn Asn Thr Thr Phe Leu Glu Cys
            580                 585                 590
Ala Pro Lys Ser Pro Gln Ala Ser Ile Lys Trp Leu Leu Gln Lys Asp
        595                 600                 605
Lys Asp Arg Arg Lys Glu Val Lys Leu Asn Glu Arg Ile Ile Ala Thr
    610                 615                 620
Ser Gln Gly Leu Leu Ile Arg Ser Val Gln Gly Ser Asp Gln Gly Leu
625                 630                 635                 640
Tyr His Cys Ile Ala Thr Glu Asn Ser Phe Lys Gln Thr Ile Ala Lys
                645                 650                 655
Ile Asn Phe Lys Val Leu Asp Ser Glu Met Val Ala Val Val Thr Asp
            660                 665                 670
Lys Trp Ser Pro Trp Thr Trp Ala Ser Ser Val Arg Ala Leu Pro Phe
        675                 680                 685
His Pro Lys Asp Ile Met Gly Ala Phe Ser His Ser Glu Met Gln Met
    690                 695                 700
Ile Asn Gln Tyr Cys Lys Asp Thr Arg Gln Gln His Gln Gln Gly Asp
705                 710                 715                 720
Glu Ser Gln Lys Met Arg Gly Asp Tyr Gly Lys Leu Lys Ala Leu Ile
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Cys Ser Ile Cys Val Arg Gly Ser Ser Gln Pro Gln Ala Arg Val Tyr
15                  20                  25                  30

tta aca ttt gat gag ctt cga gaa acc aaa acc tct gag tac ttt agt    326
Leu Thr Phe Asp Glu Leu Arg Glu Thr Lys Thr Ser Glu Tyr Phe Ser
                35                  40                  45

ctg tcc cac cag cag tta gac tac aga ata ttg ctg atg gat gaa gat    374
Leu Ser His Gln Gln Leu Asp Tyr Arg Ile Leu Leu Met Asp Glu Asp
            50                  55                  60

caa gac cgg ata tat gtg ggg agc aaa gac cac atc ctg tct ttg aat    422
Gln Asp Arg Ile Tyr Val Gly Ser Lys Asp His Ile Leu Ser Leu Asn
        65                  70                  75

atc aac aat atc agt caa gaa cct ttg agt gtt ttc tgg cca gca tca    470
Ile Asn Asn Ile Ser Gln Glu Pro Leu Ser Val Phe Trp Pro Ala Ser
    80                  85                  90

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Thr Ile Lys Val Glu Glu Cys Lys Met Lys Gly Lys Asp Pro Thr His
95                  100                 105                 110

ggc tgt gga aat ttc gtc cgg gtg att cag aca ttc aac cgt act cac    566
Gly Cys Gly Asn Phe Val Arg Val Ile Gln Thr Phe Asn Arg Thr His
                115                 120                 125

ctg tat gtc tgt ggg agt gga gcg ttc agc cca gtg tgc acc tac ctg    614
Leu Tyr Val Cys Gly Ser Gly Ala Phe Ser Pro Val Cys Thr Tyr Leu
            130                 135                 140

aac cgg gga agg agg tca gag gac cag gta ttc atg atc gac tct aag    662
Asn Arg Gly Arg Arg Ser Glu Asp Gln Val Phe Met Ile Asp Ser Lys
        145                 150                 155

tgt gaa tct ggc aaa gga cga tgc tct ttc aac ccg aat gtg aac act    710
Cys Glu Ser Gly Lys Gly Arg Cys Ser Phe Asn Pro Asn Val Asn Thr
    160                 165                 170

gtg tct gtt atg atc aat gag gaa ctc ttc tca gga atg tat ata gac    758
Val Ser Val Met Ile Asn Glu Glu Leu Phe Ser Gly Met Tyr Ile Asp
175                 180                 185                 190

ttc atg gga aca gat gct gct att ttc cga agt tta act aag agg aat    806
Phe Met Gly Thr Asp Ala Ala Ile Phe Arg Ser Leu Thr Lys Arg Asn
                195                 200                 205

gca gtt cga act gat caa cat aat tca aaa tgg ctg agt gaa ccc atg    854
Ala Val Arg Thr Asp Gln His Asn Ser Lys Trp Leu Ser Glu Pro Met
            210                 215                 220

ttt gtg gac gca cat gtg atc cca gat ggc act gat cca aat gat gct    902
Phe Val Asp Ala His Val Ile Pro Asp Gly Thr Asp Pro Asn Asp Ala
        225                 230                 235

aag gtc tat ttc ttc ttc aaa gaa aga ctg act gac aac aat agg agc    950
Lys Val Tyr Phe Phe Phe Lys Glu Arg Leu Thr Asp Asn Asn Arg Ser
    240                 245                 250

aca aaa cag att cat tcc atg att gca aga ata tgc cct aat gac act    998
Thr Lys Gln Ile His Ser Met Ile Ala Arg Ile Cys Pro Asn Asp Thr
255                 260                 265                 270
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ggt gga caa cgt agt ctt gtc aac aag tgg acc aca ttc tta aag gca    1046
Gly Gly Gln Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala
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aga ctt gta tgc tca gtc aca gat gaa gat ggc cca gag aca cat ttt    1094
Arg Leu Val Cys Ser Val Thr Asp Glu Asp Gly Pro Glu Thr His Phe
            290                 295                 300

gat gaa cta gag gat gtc ttt ctg ctg gaa act gac aat cca agg aca    1142
Asp Glu Leu Glu Asp Val Phe Leu Leu Glu Thr Asp Asn Pro Arg Thr
        305                 310                 315

aca ctc gtg tat ggc atc ttc acc aca tca agc tct gtt ttt aag gga    1190
Thr Leu Val Tyr Gly Ile Phe Thr Thr Ser Ser Ser Val Phe Lys Gly
    320                 325                 330

tcg gca gtg tgt gtg tat cat tta tct gat ata cag act gta ttc aat    1238
Ser Ala Val Cys Val Tyr His Leu Ser Asp Ile Gln Thr Val Phe Asn
335                 340                 345                 350

ggg ccc ttt gcc cac aag gaa ggg ccc aat cac cag ctg atc tcc tat    1286
Gly Pro Phe Ala His Lys Glu Gly Pro Asn His Gln Leu Ile Ser Tyr
                355                 360                 365

caa ggt aga atc cca tat cct cgc cca gga act tgc cca gga ggg gcc    1334
Gln Gly Arg Ile Pro Tyr Pro Arg Pro Gly Thr Cys Pro Gly Gly Ala
            370                 375                 380

ttt aca ccc aat atg aga acc acc aag gac ttc cca gat gac gtt gtc    1382
Phe Thr Pro Asn Met Arg Thr Thr Lys Asp Phe Pro Asp Asp Val Val
        385                 390                 395

act ttt att cgg aac cac cct ctc atg tac aat tcc atc tac ccc atc    1430
Thr Phe Ile Arg Asn His Pro Leu Met Tyr Asn Ser Ile Tyr Pro Ile
    400                 405                 410

cac aga agg cct ctg ata gtc cgc ata ggc act gac tac aag tac aca    1478
His Arg Arg Pro Leu Ile Val Arg Ile Gly Thr Asp Tyr Lys Tyr Thr
415                 420                 425                 430

aag att gct gtg gac cgt gtc aac gct gct gat ggg aga tac cac gtt    1526
Lys Ile Ala Val Asp Arg Val Asn Ala Ala Asp Gly Arg Tyr His Val
                435                 440                 445

ctg ttt ctg ggc aca gat cgg ggc acc gtg cag aag gtc gta gtc ctt    1574
Leu Phe Leu Gly Thr Asp Arg Gly Thr Val Gln Lys Val Val Val Leu
            450                 455                 460

cct acc aat agc tct gcc agt ggg gaa ctc atc ctg gag gag ctg gaa    1622
Pro Thr Asn Ser Ser Ala Ser Gly Glu Leu Ile Leu Glu Glu Leu Glu
        465                 470                 475

gtc ttc aag aat cat gtt ccc ata aca aca atg aaa atc tca tcc aaa    1670
Val Phe Lys Asn His Val Pro Ile Thr Thr Met Lys Ile Ser Ser Lys
    480                 485                 490

aag caa cag ttg tac gtg agc tcc aat gag ggg gtt tcc caa gtc tct    1718
Lys Gln Gln Leu Tyr Val Ser Ser Asn Glu Gly Val Ser Gln Val Ser
495                 500                 505                 510

ctg cat cgc tgc cat atc tac ggc aca gcc tgt gcg gac tgc tgc ttg    1766
Leu His Arg Cys His Ile Tyr Gly Thr Ala Cys Ala Asp Cys Cys Leu
                515                 520                 525

gcg agg gat cca tac tgt gcc tgg gat ggc cac tct tgc tct agg ttc    1814
Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly His Ser Cys Ser Arg Phe
            530                 535                 540
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tac ccc act ggg aag cgg agg agc cga aga caa gat gtg aga cat gga    1862
Tyr Pro Thr Gly Lys Arg Arg Ser Arg Arg Gln Asp Val Arg His Gly
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aac cca ctg aca caa tgc cga ggg ttc aat ctg aaa gca tac aga aat    1910
Asn Pro Leu Thr Gln Cys Arg Gly Phe Asn Leu Lys Ala Tyr Arg Asn
    560                 565                 570

gca gct gaa att gtt cag tat gga gta aga aat aac agc act ttc ctt    1958
Ala Ala Glu Ile Val Gln Tyr Gly Val Arg Asn Asn Ser Thr Phe Leu
575                 580                 585                 590

gag tgt gct ccc aag tct cca cag gca tct atc aag tgg ttg ctg cag    2006
Glu Cys Ala Pro Lys Ser Pro Gln Ala Ser Ile Lys Trp Leu Leu Gln
                595                 600                 605

aaa gac aaa gac agg agg aag gag gtt aaa ctg aac gag cgc att ata    2054
Lys Asp Lys Asp Arg Arg Lys Glu Val Lys Leu Asn Glu Arg Ile Ile
            610                 615                 620

gct act tcc caa gga cta ctg att cgc tct gtt caa gat tct gac caa    2102
Ala Thr Ser Gln Gly Leu Leu Ile Arg Ser Val Gln Asp Ser Asp Gln
        625                 630                 635

gga ctc tac cac tgc att gcc act gag aac agc ttc aaa cag acc ata    2150
Gly Leu Tyr His Cys Ile Ala Thr Glu Asn Ser Phe Lys Gln Thr Ile
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gcc aag atc aac ttc aaa gtt tta gat tca gaa atg gtg gcc gtt gtg    2198
Ala Lys Ile Asn Phe Lys Val Leu Asp Ser Glu Met Val Ala Val Val
655                 660                 665                 670

aca gac aag tgg tcc ccg tgg aca tgg gct ggc tct gtg agg gct cta    2246
Thr Asp Lys Trp Ser Pro Trp Thr Trp Ala Gly Ser Val Arg Ala Leu
                675                 680                 685

ccc ttc cat cca aag gac atc ctg ggg gca ttc agc cac tcg gaa atg    2294
Pro Phe His Pro Lys Asp Ile Leu Gly Ala Phe Ser His Ser Glu Met
            690                 695                 700

cag ctc atc aat cag tac tgc aaa gac acc cgg cag cag cag cag ctg    2342
Gln Leu Ile Asn Gln Tyr Cys Lys Asp Thr Arg Gln Gln Gln Gln Leu
        705                 710                 715

ggg gaa gaa cca cag aag atg aga ggg gac tat ggc aag ctg aag gct    2390
Gly Glu Glu Pro Gln Lys Met Arg Gly Asp Tyr Gly Lys Leu Lys Ala
    720                 725                 730

ctc atc aac agc agg aaa agc aga aac agg agg aat cag ctt cca gag    2438
Leu Ile Asn Ser Arg Lys Ser Arg Asn Arg Arg Asn Gln Leu Pro Glu
735                 740                 745                 750

tca taa aacattcatc catgaagttt tgcttccagg aacaaatgct ctgtcttcac    2494
Ser

tagtcaacta ttaaataaaa tcttgtgctt tacccatgag aaatttctga caaaagctgg  2554

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cagattttat ttatatcttt atgtgtcttt tcttcaaaat caatgcgaca acagaagcag  2734

aactgttaca gcctcggttg agcgagggcc ataaatttcc ctgtgctctt ccttccgtgc  2794

tctaggggtt tagctttcta attgtcactg gcttttatac atgaaaaaga attccagttc  2854
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Phe Asp Glu Leu Arg Glu Thr Lys Thr Ser Glu Tyr Phe Ser Leu Ser
35 40 45
His Gln Gln Leu Asp Tyr Arg Ile Leu Leu Met Asp Glu Asp Gln Asp
50 55 60
Arg Ile Tyr Val Gly Ser Lys Asp His Ile Leu Ser Leu Asn Ile Asn
65 70 75 80
Asn Ile Ser Gln Glu Pro Leu Ser Val Phe Trp Pro Ala Ser Thr Ile
85 90 95
Lys Val Glu Glu Cys Lys Met Lys Gly Lys Asp Pro Thr His Gly Cys
100 105 110
Gly Asn Phe Val Arg Val Ile Gln Thr Phe Asn Arg Thr His Leu Tyr
115 120 125
Val Cys Gly Ser Gly Ala Phe Ser Pro Val Cys Thr Tyr Leu Asn Arg
130 135 140
Gly Arg Arg Ser Glu Asp Gln Val Phe Met Ile Asp Ser Lys Cys Glu
145 150 155 160
Ser Gly Lys Gly Arg Cys Ser Phe Asn Pro Asn Val Asn Thr Val Ser
165 170 175
Val Met Ile Asn Glu Glu Leu Phe Ser Gly Met Tyr Ile Asp Phe Met
180 185 190
Gly Thr Asp Ala Ala Ile Phe Arg Ser Leu Thr Lys Arg Asn Ala Val
195 200 205
Arg Thr Asp Gln His Asn Ser Lys Trp Leu Ser Glu Pro Met Phe Val
210 215 220
Asp Ala His Val Ile Pro Asp Gly Thr Asp Pro Asn Asp Ala Lys Val
225 230 235 240
Tyr Phe Phe Phe Lys Glu Arg Leu Thr Asp Asn Asn Arg Ser Thr Lys
245 250 255
Gln Ile His Ser Met Ile Ala Arg Ile Cys Pro Asn Asp Thr Gly Gly
260 265 270
Gln Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu
275 280 285
Val Cys Ser Val Thr Asp Glu Asp Gly Pro Glu Thr His Phe Asp Glu
290 295 300
Leu Glu Asp Val Phe Leu Leu Glu Thr Asp Asn Pro Arg Thr Thr Leu
305 310 315 320
Val Tyr Gly Ile Phe Thr Thr Ser Ser Ser Val Phe Lys Gly Ser Ala
325 330 335
Val Cys Val Tyr His Leu Ser Asp Ile Gln Thr Val Phe Asn Gly Pro
340 345 350
Phe Ala His Lys Glu Gly Pro Asn His Gln Leu Ile Ser Tyr Gln Gly
355 360 365
Arg Ile Pro Tyr Pro Arg Pro Gly Thr Cys Pro Gly Gly Ala Phe Thr
370 375 380
Pro Asn Met Arg Thr Thr Lys Asp Phe Pro Asp Asp Val Val Thr Phe
385 390 395 400
Ile Arg Asn His Pro Leu Met Tyr Asn Ser Ile Tyr Pro Ile His Arg
405 410 415
Arg Pro Leu Ile Val Arg Ile Gly Thr Asp Tyr Lys Tyr Thr Lys Ile
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Ala Val Asp Arg Val Asn Ala Ala Asp Gly Arg Tyr His Val Leu Phe

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Leu Gly Thr Asp Arg Gly Thr Val Gln Lys Val Val Val Leu Pro Thr
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Asn Ser Ser Ala Ser Gly Glu Leu Ile Leu Glu Glu Leu Glu Val Phe
465                 470                 475                 480
Lys Asn His Val Pro Ile Thr Thr Met Lys Ile Ser Ser Lys Lys Gln
                485                 490                 495
Gln Leu Tyr Val Ser Ser Asn Glu Gly Val Ser Gln Val Ser Leu His
            500                 505                 510
Arg Cys His Ile Tyr Gly Thr Ala Cys Ala Asp Cys Cys Leu Ala Arg
        515                 520                 525
Asp Pro Tyr Cys Ala Trp Asp Gly His Ser Cys Ser Arg Phe Tyr Pro
    530                 535                 540
Thr Gly Lys Arg Arg Ser Arg Arg Gln Asp Val Arg His Gly Asn Pro
545                 550                 555                 560
Leu Thr Gln Cys Arg Gly Phe Asn Leu Lys Ala Tyr Arg Asn Ala Ala
                565                 570                 575
Glu Ile Val Gln Tyr Gly Val Arg Asn Asn Ser Thr Phe Leu Glu Cys
            580                 585                 590
Ala Pro Lys Ser Pro Gln Ala Ser Ile Lys Trp Leu Leu Gln Lys Asp
        595                 600                 605
Lys Asp Arg Arg Lys Glu Val Lys Leu Asn Glu Arg Ile Ile Ala Thr
    610                 615                 620
Ser Gln Gly Leu Leu Ile Arg Ser Val Gln Asp Ser Asp Gln Gly Leu
625                 630                 635                 640
Tyr His Cys Ile Ala Thr Glu Asn Ser Phe Lys Gln Thr Ile Ala Lys
                645                 650                 655
Ile Asn Phe Lys Val Leu Asp Ser Glu Met Val Ala Val Val Thr Asp
            660                 665                 670
Lys Trp Ser Pro Trp Thr Trp Ala Gly Ser Val Arg Ala Leu Pro Phe
        675                 680                 685
His Pro Lys Asp Ile Leu Gly Ala Phe Ser His Ser Glu Met Gln Leu
    690                 695                 700
Ile Asn Gln Tyr Cys Lys Asp Thr Arg Gln Gln Gln Gln Leu Gly Glu
705                 710                 715                 720
Glu Pro Gln Lys Met Arg Gly Asp Tyr Gly Lys Leu Lys Ala Leu Ile
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Asp Glu Arg Leu Lys Ala Arg Ser Gln Asp Phe His Leu Phe Pro Ala
                10                  15                  20

ttg atg atg cta agc atg acc atg ttg ttt ctt cca gtc act ggc act     151
Leu Met Met Leu Ser Met Thr Met Leu Phe Leu Pro Val Thr Gly Thr
            25                  30                  35

ttg aag caa aat att cca aga ctc aag cta acc tac aaa gac ttg ctg     199
Leu Lys Gln Asn Ile Pro Arg Leu Lys Leu Thr Tyr Lys Asp Leu Leu
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ctt tca aat agc tgt att ccc ttt ttg ggt tca tca gaa gga ctg gat     247
Leu Ser Asn Ser Cys Ile Pro Phe Leu Gly Ser Ser Glu Gly Leu Asp
    55                  60                  65

ttt caa act ctt ctc tta gat gag gaa aga ggc agg ctg ctc ttg gga     295
Phe Gln Thr Leu Leu Leu Asp Glu Glu Arg Gly Arg Leu Leu Leu Gly
70                  75                  80                  85

gcc aaa gac cac atc ttt cta ctc agt ctg gtt gac tta aac aaa aat     343
Ala Lys Asp His Ile Phe Leu Leu Ser Leu Val Asp Leu Asn Lys Asn
                90                  95                  100

ttt aag aag att tat tgg cct gct gca aag gaa cgg gtg gaa tta tgt     391
Phe Lys Lys Ile Tyr Trp Pro Ala Ala Lys Glu Arg Val Glu Leu Cys
            105                 110                 115

aaa tta aag ggg aaa gat gcc aat aca gaa tgt gca aat ttc atc aga     439
Lys Leu Lys Gly Lys Asp Ala Asn Thr Glu Cys Ala Asn Phe Ile Arg
        120                 125                 130

gta ctt cag ccc tat aac aaa act cac ata tat gtg tgt gga act gga     487
Val Leu Gln Pro Tyr Asn Lys Thr His Ile Tyr Val Cys Gly Thr Gly
    135                 140                 145

gca ttt cat cca ata tgt ggg tat att gat ctt gga gtc tac aag gag     535
Ala Phe His Pro Ile Cys Gly Tyr Ile Asp Leu Gly Val Tyr Lys Glu
150                 155                 160                 165

gat att ata ttc aaa cta gac aca cat aat ttg gag tct ggc aga ctg     583
Asp Ile Ile Phe Lys Leu Asp Thr His Asn Leu Glu Ser Gly Arg Leu
                170                 175                 180

aaa tgt cct ttc gat cct cag cag cct ttt gct tca gta atg aca gat     631
Lys Cys Pro Phe Asp Pro Gln Gln Pro Phe Ala Ser Val Met Thr Asp
            185                 190                 195

gag tac ctc tac tct gga aca gct tct gat ttc ctt ggc aaa gat act     679
Glu Tyr Leu Tyr Ser Gly Thr Ala Ser Asp Phe Leu Gly Lys Asp Thr
        200                 205                 210

gca ttc act cga tcc ctt ggg cct act cat gac cac cac tac atc aga     727
Ala Phe Thr Arg Ser Leu Gly Pro Thr His Asp His His Tyr Ile Arg
    215                 220                 225

act gac att tca gag cac tac tgg ctc aat gga gca aaa ttt att gga     775
Thr Asp Ile Ser Glu His Tyr Trp Leu Asn Gly Ala Lys Phe Ile Gly
230                 235                 240                 245

act ttc ttc ata cca gac acc tac aat cca gat gat gat aaa ata tat     823
Thr Phe Phe Ile Pro Asp Thr Tyr Asn Pro Asp Asp Asp Lys Ile Tyr
                250                 255                 260

ttc ttc ttt cgt gaa tca tct caa gaa ggc agt acc tcc gat aaa acc     871
Phe Phe Phe Arg Glu Ser Ser Gln Glu Gly Ser Thr Ser Asp Lys Thr
            265                 270                 275

atc ctt tct cga gtt gga aga gtt tgt aag aat gat gta gga gga caa     919
Ile Leu Ser Arg Val Gly Arg Val Cys Lys Asn Asp Val Gly Gly Gln
        280                 285                 290

cgc agc ctg ata aac aag tgg acg act ttt ctt aag gcc aga ctg att     967
Arg Ser Leu Ile Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu Ile
    295                 300                 305

tgc tca att cct gga agt gat ggg gca gat act tac ttt gat gag ctt    1015
Cys Ser Ile Pro Gly Ser Asp Gly Ala Asp Thr Tyr Phe Asp Glu Leu
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caa gat att tat tta ctc ccc aca aga gat gaa aga aat cct gta gta    1063
Gln Asp Ile Tyr Leu Leu Pro Thr Arg Asp Glu Arg Asn Pro Val Val
                330                 335                 340

tat gga gtc ttt act aca acc agc tcc atc ttc aaa ggc tct gct gtt    1111
Tyr Gly Val Phe Thr Thr Thr Ser Ser Ile Phe Lys Gly Ser Ala Val
            345                 350                 355

tgt gtg tat agc atg gct gac atc aga gca gtt ttt aat ggt cca tat    1159
Cys Val Tyr Ser Met Ala Asp Ile Arg Ala Val Phe Asn Gly Pro Tyr
        360                 365                 370

gct cat aag gaa agt gca gac cat cgt tgg gtg cag tat gat ggg aga    1207
Ala His Lys Glu Ser Ala Asp His Arg Trp Val Gln Tyr Asp Gly Arg
    375                 380                 385

att cct tat cca cgg cct ggt aca tgt cca agc aaa acc tat gac cca    1255
Ile Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys Thr Tyr Asp Pro
390                 395                 400                 405

ctg att aag tcc acc cga gat ttt cca gat gat gtc atc agt ttc ata    1303
Leu Ile Lys Ser Thr Arg Asp Phe Pro Asp Asp Val Ile Ser Phe Ile
                410                 415                 420

aag cgg cac tct gtg atg tat aag tcc gta tac cca gtt gca gga gga    1351
Lys Arg His Ser Val Met Tyr Lys Ser Val Tyr Pro Val Ala Gly Gly
            425                 430                 435

cca acg ttc aag aga atc aat gtg gat tac aga ctg aca cag ata gtg    1399
Pro Thr Phe Lys Arg Ile Asn Val Asp Tyr Arg Leu Thr Gln Ile Val
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gtg gat cat gtc att gca gaa gat ggc cag tac gat gta atg ttt ctt    1447
Val Asp His Val Ile Ala Glu Asp Gly Gln Tyr Asp Val Met Phe Leu
    455                 460                 465

gga aca gac att gga act gtc ctc aaa gtt gtc agc att tca aag gaa    1495
Gly Thr Asp Ile Gly Thr Val Leu Lys Val Val Ser Ile Ser Lys Glu
470                 475                 480                 485

aag tgg aat atg gaa gag gta gtg ctg gag gag ttg cag ata ttc aag    1543
Lys Trp Asn Met Glu Glu Val Val Leu Glu Glu Leu Gln Ile Phe Lys
                490                 495                 500

cac tca tca atc atc ttg aac atg gaa ttg tct ctg aag cag caa caa    1591
His Ser Ser Ile Ile Leu Asn Met Glu Leu Ser Leu Lys Gln Gln Gln
            505                 510                 515

ttg tac att ggt tcc cga gat gga ttg gtt cag ctc tcc ttg cac aga    1639
Leu Tyr Ile Gly Ser Arg Asp Gly Leu Val Gln Leu Ser Leu His Arg
        520                 525                 530

tgc gac act tat ggg aaa gct tgc gca gac tgt tgt ctt gcc aga gac    1687
Cys Asp Thr Tyr Gly Lys Ala Cys Ala Asp Cys Cys Leu Ala Arg Asp
    535                 540                 545

ccc tac tgt gcc tgg gat gga aat gca tgc tct cga tat gct cct act    1735
Pro Tyr Cys Ala Trp Asp Gly Asn Ala Cys Ser Arg Tyr Ala Pro Thr
550                 555                 560                 565

tct aaa agg aga gct aga cgc caa gat gta aaa tat ggc gac cca atc    1783
Ser Lys Arg Arg Ala Arg Arg Gln Asp Val Lys Tyr Gly Asp Pro Ile
                570                 575                 580

acc cag tgc tgg gac atc gaa gac agc att agt cat gaa act gct gat    1831
Thr Gln Cys Trp Asp Ile Glu Asp Ser Ile Ser His Glu Thr Ala Asp
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gaa aag gtg att ttt ggc att gaa ttt aac tca acc ttt ctg gaa tgt    1879
Glu Lys Val Ile Phe Gly Ile Glu Phe Asn Ser Thr Phe Leu Glu Cys
        600                 605                 610

ata cct aaa tcc caa caa gca act att aaa tgg tat atc cag agg tca    1927
Ile Pro Lys Ser Gln Gln Ala Thr Ile Lys Trp Tyr Ile Gln Arg Ser
    615                 620                 625

ggg gat gag cat cga gag gag ttg aag ccc gat gaa aga atc atc aaa    1975
Gly Asp Glu His Arg Glu Glu Leu Lys Pro Asp Glu Arg Ile Ile Lys
630                 635                 640                 645

acg gaa tat ggg cta ctg att cga agt ttg cag aag aag gat tct ggg    2023
Thr Glu Tyr Gly Leu Leu Ile Arg Ser Leu Gln Lys Lys Asp Ser Gly
                650                 655                 660

atg tat tac tgc aaa gcc cag gag cac act ttc atc cac acc ata gtg    2071
Met Tyr Tyr Cys Lys Ala Gln Glu His Thr Phe Ile His Thr Ile Val
            665                 670                 675

aag ctg act ttg aat gtc att gag aat gaa cag atg gaa aat acc cag    2119
Lys Leu Thr Leu Asn Val Ile Glu Asn Glu Gln Met Glu Asn Thr Gln
        680                 685                 690

agg gca gag cat gag gag ggg aag gtc aag gat cta ttg gct gag tca    2167
Arg Ala Glu His Glu Glu Gly Lys Val Lys Asp Leu Leu Ala Glu Ser
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cgg ttg aga tac aaa gac tac atc caa atc ctt agc agc cca aac ttc    2215
Arg Leu Arg Tyr Lys Asp Tyr Ile Gln Ile Leu Ser Ser Pro Asn Phe
710                 715                 720                 725

agc ctc gac cag tac tgc gaa cag atg tgg cac agg gag aag cgg aga    2263
Ser Leu Asp Gln Tyr Cys Glu Gln Met Trp His Arg Glu Lys Arg Arg
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cag aga aac aag ggg ggc cca aag tgg aag cac atg cag gaa atg aag    2311
Gln Arg Asn Lys Gly Gly Pro Lys Trp Lys His Met Gln Glu Met Lys
            745                 750                 755

aag aaa cga aat cga aga cat cac aga gac ctg gat gag ctc cct aga    2359
Lys Lys Arg Asn Arg Arg His His Arg Asp Leu Asp Glu Leu Pro Arg
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gct gta gcc acg tag ttttctactt aatttaaaga aaagaattcc ttacctataa    2414
Ala Val Ala Thr
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caaaaaattc atttgaacca gttttccaag aacaaatctt gcacaagcaa agtataagaa  2594

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aacacactat atacttcctc accactgact attttatcaa atttgcctta aaataatgaa  4994
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Pro Val Thr Gly Thr Leu Lys Gln Asn Ile Pro Arg Leu Lys Leu Thr
        35                  40                  45
Tyr Lys Asp Leu Leu Leu Ser Asn Ser Cys Ile Pro Phe Leu Gly Ser
    50                  55                  60
Ser Glu Gly Leu Asp Phe Gln Thr Leu Leu Asp Glu Glu Arg Gly
65                  70                  75                  80
Arg Leu Leu Leu Gly Ala Lys Asp His Ile Phe Leu Leu Ser Leu Val
                85                  90                  95
Asp Leu Asn Lys Asn Phe Lys Lys Ile Tyr Trp Pro Ala Ala Lys Glu
            100                 105                 110
Arg Val Glu Leu Cys Lys Leu Lys Gly Lys Asp Ala Asn Thr Glu Cys
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        115                 120                 125
Ala Asn Phe Ile Arg Val Leu Gln Pro Tyr Asn Lys Thr His Ile Tyr
    130                 135                 140
Val Cys Gly Thr Gly Ala Phe His Pro Ile Cys Gly Tyr Ile Asp Leu
145                 150                 155                 160
Gly Val Tyr Lys Glu Asp Ile Ile Phe Lys Leu Asp Thr His Asn Leu
                165                 170                 175
Glu Ser Gly Arg Leu Lys Cys Pro Phe Asp Pro Gln Gln Pro Phe Ala
            180                 185                 190
Ser Val Met Thr Asp Glu Tyr Leu Tyr Ser Gly Thr Ala Ser Asp Phe
        195                 200                 205
Leu Gly Lys Asp Thr Ala Phe Thr Arg Ser Leu Gly Pro Thr His Asp
    210                 215                 220
His His Tyr Ile Arg Thr Asp Ile Ser Glu His Tyr Trp Leu Asn Gly
225                 230                 235                 240
Ala Lys Phe Ile Gly Thr Phe Phe Ile Pro Asp Thr Tyr Asn Pro Asp
                245                 250                 255
Asp Asp Lys Ile Tyr Phe Phe Phe Arg Glu Ser Ser Gln Glu Gly Ser
            260                 265                 270
Thr Ser Asp Lys Thr Ile Leu Ser Arg Val Gly Arg Val Cys Lys Asn
        275                 280                 285
Asp Val Gly Gly Gln Arg Ser Leu Ile Asn Lys Trp Thr Thr Phe Leu
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Lys Ala Arg Leu Ile Cys Ser Ile Pro Gly Ser Asp Gly Ala Asp Thr
305                 310                 315                 320
Tyr Phe Asp Glu Leu Gln Asp Ile Tyr Leu Leu Pro Thr Arg Asp Glu
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Arg Asn Pro Val Val Tyr Gly Val Phe Thr Thr Thr Ser Ser Ile Phe
            340                 345                 350
Lys Gly Ser Ala Val Cys Val Tyr Ser Met Ala Asp Ile Arg Ala Val
        355                 360                 365
Phe Asn Gly Pro Tyr Ala His Lys Glu Ser Ala Asp His Arg Trp Val
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Gln Tyr Asp Gly Arg Ile Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser
385                 390                 395                 400
Lys Thr Tyr Asp Pro Leu Ile Lys Ser Thr Arg Asp Phe Pro Asp Asp
                405                 410                 415
Val Ile Ser Phe Ile Lys Arg His Ser Val Met Tyr Lys Ser Val Tyr
            420                 425                 430
Pro Val Ala Gly Gly Pro Thr Phe Lys Arg Ile Asn Val Asp Tyr Arg
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Leu Thr Gln Ile Val Val Asp His Val Ile Ala Glu Asp Gly Gln Tyr
    450                 455                 460
Asp Val Met Phe Leu Gly Thr Asp Ile Gly Thr Val Leu Lys Val Val
465                 470                 475                 480
Ser Ile Ser Lys Glu Lys Trp Asn Met Glu Glu Val Val Leu Glu Glu
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Leu Gln Ile Phe Lys His Ser Ser Ile Ile Leu Asn Met Glu Leu Ser
            500                 505                 510
Leu Lys Gln Gln Gln Leu Tyr Ile Gly Ser Arg Asp Gly Leu Val Gln
        515                 520                 525
Leu Ser Leu His Arg Cys Asp Thr Tyr Gly Lys Ala Cys Ala Asp Cys
    530                 535                 540
Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Asn Ala Cys Ser
545                 550                 555                 560
Arg Tyr Ala Pro Thr Ser Lys Arg Arg Ala Arg Arg Gln Asp Val Lys
                565                 570                 575
Tyr Gly Asp Pro Ile Thr Gln Cys Trp Asp Ile Glu Asp Ser Ile Ser
            580                 585                 590
His Glu Thr Ala Asp Glu Lys Val Ile Phe Gly Ile Glu Phe Asn Ser
        595                 600                 605
Thr Phe Leu Glu Cys Ile Pro Lys Ser Gln Gln Ala Thr Ile Lys Trp
    610                 615                 620
Tyr Ile Gln Arg Ser Gly Asp Glu His Arg Glu Glu Leu Lys Pro Asp
625                 630                 635                 640
Glu Arg Ile Ile Lys Thr Glu Tyr Gly Leu Leu Ile Arg Ser Leu Gln
                645                 650                 655
Lys Lys Asp Ser Gly Met Tyr Tyr Cys Lys Ala Gln Glu His Thr Phe
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660 665 670
Ile His Thr Ile Val Lys Leu Thr Leu Asn Val Ile Glu Asn Glu Gln
675 680 685
Met Glu Asn Thr Gln Arg Ala Glu His Glu Glu Gly Lys Val Lys Asp
690 695 700
Leu Leu Ala Glu Ser Arg Leu Arg Tyr Lys Asp Tyr Ile Gln Ile Leu
705 710 715 720
Ser Ser Pro Asn Phe Ser Leu Asp Gln Tyr Cys Glu Gln Met Trp His
725 730 735
Arg Glu Lys Arg Arg Gln Arg Asn Lys Gly Gly Pro Lys Trp Lys His
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Met Asn Val Thr Lys Asp Glu Asn Pro Arg Ser Arg Ser Gln
1 5 10

gat ctt cac ctt ttt cat gct tgg atg atg tta atc atg acg gtg ctc 636
Asp Leu His Leu Phe His Ala Trp Met Met Leu Ile Met Thr Val Leu
15 20 25 30

ttt ctt cct gtc act gaa acg tct aaa caa aat att cca aga ctc aag 684
Phe Leu Pro Val Thr Glu Thr Ser Lys Gln Asn Ile Pro Arg Leu Lys
35 40 45

cta acc tac aaa gac ttg ctg ctt tca aac acc tgt atc ccc ttt ttg 732
Leu Thr Tyr Lys Asp Leu Leu Leu Ser Asn Thr Cys Ile Pro Phe Leu
50 55 60

ggt tca tca gaa gga ttg gat ttc cag act ctt ctt ttg gat gag gag 780
Gly Ser Ser Glu Gly Leu Asp Phe Gln Thr Leu Leu Leu Asp Glu Glu
65 70 75

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agg ggc ata ctg ctc cta gga gcc aaa gac cat gtc ttc ctg ctc agt     828
Arg Gly Ile Leu Leu Leu Gly Ala Lys Asp His Val Phe Leu Leu Ser
    80                  85                  90

ctg gtt gac ttg aac aag aat ttt aag aag att tat tgg cct gct gca     876
Leu Val Asp Leu Asn Lys Asn Phe Lys Lys Ile Tyr Trp Pro Ala Ala
95                  100                 105                 110

aaa gaa cga gtg gag cta tgt aaa tta aag ggg aaa gat gcc aat gca     924
Lys Glu Arg Val Glu Leu Cys Lys Leu Lys Gly Lys Asp Ala Asn Ala
                115                 120                 125

gaa tgt gca aat ttc atc cgt gtg ctt caa ccc tat aat aag act cac     972
Glu Cys Ala Asn Phe Ile Arg Val Leu Gln Pro Tyr Asn Lys Thr His
            130                 135                 140

gtt tac gtg tgt gga act gga gcg ttt cat ccg ctg tgt ggg tac att    1020
Val Tyr Val Cys Gly Thr Gly Ala Phe His Pro Leu Cys Gly Tyr Ile
        145                 150                 155

gat ctc ggc gcc aac aag gag gaa ctc ata ttt aaa cta gac acg cac    1068
Asp Leu Gly Ala Asn Lys Glu Glu Leu Ile Phe Lys Leu Asp Thr His
    160                 165                 170

aac ctg gag tct ggc aga ctg aaa tgt ccc ttt gat cct cag cag cct    1116
Asn Leu Glu Ser Gly Arg Leu Lys Cys Pro Phe Asp Pro Gln Gln Pro
175                 180                 185                 190

ttt gct tca gta atg aca gat gag cac ctc tac tct gga aca gct tct    1164
Phe Ala Ser Val Met Thr Asp Glu His Leu Tyr Ser Gly Thr Ala Ser
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gat ttc ctt ggc aaa gac act gca ttc aca agg tct ctg ggg cta atg    1212
Asp Phe Leu Gly Lys Asp Thr Ala Phe Thr Arg Ser Leu Gly Leu Met
            210                 215                 220

cag gac cac cat tcc atc aga act gac att tca gag cac cac tgg ctc    1260
Gln Asp His His Ser Ile Arg Thr Asp Ile Ser Glu His His Trp Leu
        225                 230                 235

aat gga gca aaa ttt atc gga aca ttc ccc att cca gac acc tat aat    1308
Asn Gly Ala Lys Phe Ile Gly Thr Phe Pro Ile Pro Asp Thr Tyr Asn
    240                 245                 250

cca gat gat gat aaa ata tat ttc ttc ttt cga gaa tca tcc cag gaa    1356
Pro Asp Asp Asp Lys Ile Tyr Phe Phe Phe Arg Glu Ser Ser Gln Glu
255                 260                 265                 270

ggc agt act tct gac aga agc att ctt tca aga gtt gga aga gtt tgt    1404
Gly Ser Thr Ser Asp Arg Ser Ile Leu Ser Arg Val Gly Arg Val Cys
                275                 280                 285

aag aat gat gta ggt ggg caa cga agt ctg ata aac aaa tgg aca act    1452
Lys Asn Asp Val Gly Gly Gln Arg Ser Leu Ile Asn Lys Trp Thr Thr
            290                 295                 300

ttt cta aag gca aga ctg att tgc tcg att cct gga agc gat ggg gca    1500
Phe Leu Lys Ala Arg Leu Ile Cys Ser Ile Pro Gly Ser Asp Gly Ala
        305                 310                 315

gat acc cat ttt gat gaa ctc caa gat att tac tta ctc cct acg aga    1548
Asp Thr His Phe Asp Glu Leu Gln Asp Ile Tyr Leu Leu Pro Thr Arg
    320                 325                 330

gat gaa aga aat cct gta gta tat gga gtc ttt acc aca acc agc tcc    1596
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gca gtc ttt aat ggt ccc tat gct cat aag gaa agt gct gac cat cgc    1692
Ala Val Phe Asn Gly Pro Tyr Ala His Lys Glu Ser Ala Asp His Arg
            370                 375                 380

tgg gtg caa tat gat gga agg ata cct tac ccc cga cct gga acg tgt    1740
Trp Val Gln Tyr Asp Gly Arg Ile Pro Tyr Pro Arg Pro Gly Thr Cys
        385                 390                 395

cca agc aaa acc tat gac cca ctg att aag tcc acc cga gac ttt cca    1788
Pro Ser Lys Thr Tyr Asp Pro Leu Ile Lys Ser Thr Arg Asp Phe Pro
    400                 405                 410

gac gat gtt atc agt ttc ata agg cgg cac cct gtg atg tat aag tcc    1836
Asp Asp Val Ile Ser Phe Ile Arg Arg His Pro Val Met Tyr Lys Ser
415                 420                 425                 430

gtg tac cca gtg gca gga gca ccg acc ttc aag aga atc aac gtg gat    1884
Val Tyr Pro Val Ala Gly Ala Pro Thr Phe Lys Arg Ile Asn Val Asp
                435                 440                 445

tac aga ctg acg cag ata gtg gtg gat cac gtg gtc gct gaa gac ggg    1932
Tyr Arg Leu Thr Gln Ile Val Val Asp His Val Val Ala Glu Asp Gly
            450                 455                 460

cag tat gat gtc atg ttt ctc gga aca gac att gga aca gtc ctg aaa    1980
Gln Tyr Asp Val Met Phe Leu Gly Thr Asp Ile Gly Thr Val Leu Lys
        465                 470                 475

gtt gtg agc atc tcc aag gag aag tgg aat atg gaa gag gtc gta ctg    2028
Val Val Ser Ile Ser Lys Glu Lys Trp Asn Met Glu Glu Val Val Leu
    480                 485                 490

gag gag ctt cag gta ttc aag cac cca aca gct atc ttg aac atg gag    2076
Glu Glu Leu Gln Val Phe Lys His Pro Thr Ala Ile Leu Asn Met Glu
495                 500                 505                 510

ttg tcg ctg aag cag caa cag ttg tac gtt ggt tcc tgg gat gga ttg    2124
Leu Ser Leu Lys Gln Gln Gln Leu Tyr Val Gly Ser Trp Asp Gly Leu
                515                 520                 525

gtc cag ctc tcc ttg cac aga tgc gac act tac ggg aaa gca tgt gca    2172
Val Gln Leu Ser Leu His Arg Cys Asp Thr Tyr Gly Lys Ala Cys Ala
            530                 535                 540

gac tgc tgt ctc gcc aga gac cct tac tgt gcc tgg gat gga aat gct    2220
Asp Cys Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Asn Ala
        545                 550                 555

tgc tcc aga tat gca ccc acg tct aaa agg cga gct aga cgc cag gat    2268
Cys Ser Arg Tyr Ala Pro Thr Ser Lys Arg Arg Ala Arg Arg Gln Asp
    560                 565                 570

gta aaa tat ggg gac cca atc act cag tgc tgg gac ata gaa gac agc    2316
Val Lys Tyr Gly Asp Pro Ile Thr Gln Cys Trp Asp Ile Glu Asp Ser
575                 580                 585                 590

att agt cat gaa aca gct gat gaa aag gtg att ttt gga att gaa ttt    2364
Ile Ser His Glu Thr Ala Asp Glu Lys Val Ile Phe Gly Ile Glu Phe
                595                 600                 605

aat tca acc ttt ttg gag tgt ata cct aaa tcc caa caa gcc tct gtt    2412
Asn Ser Thr Phe Leu Glu Cys Ile Pro Lys Ser Gln Gln Ala Ser Val
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Pro Asp Glu Arg Ile Ile Lys Thr Asp Tyr Gly Leu Leu Ile Arg Ser
    640                 645                 650

ctg cag aag aag gat tct ggg atg tat tac tgc aaa gca cag gag cac    2556
Leu Gln Lys Lys Asp Ser Gly Met Tyr Tyr Cys Lys Ala Gln Glu His
655                 660                 665                 670

act ttc atc cac acc ata gtg aag ctg act ttg aat gtc att gag aat    2604
Thr Phe Ile His Thr Ile Val Lys Leu Thr Leu Asn Val Ile Glu Asn
                675                 680                 685

gaa cag atg gaa aat acc cag agg gca gaa tac cag gag ggg cag gtc    2652
Glu Gln Met Glu Asn Thr Gln Arg Ala Glu Tyr Gln Glu Gly Gln Val
            690                 695                 700

aag gat ctg ttg gct gag tca cgg ttg aga tac aaa gac tac atc caa    2700
Lys Asp Leu Leu Ala Glu Ser Arg Leu Arg Tyr Lys Asp Tyr Ile Gln
        705                 710                 715

atc ctt agc agc ccg aac ttc agc ctg gac cag tac tgt gag cag atg    2748
Ile Leu Ser Ser Pro Asn Phe Ser Leu Asp Gln Tyr Cys Glu Gln Met
    720                 725                 730

tgg tac aag gag aag cgg aga cag cgc aac aag ggc agc cca aag tgg    2796
Trp Tyr Lys Glu Lys Arg Arg Gln Arg Asn Lys Gly Ser Pro Lys Trp
735                 740                 745                 750

aag cac atg cag gaa atg aag aag aaa cga aat cga cga cat cac aga    2844
Lys His Met Gln Glu Met Lys Lys Lys Arg Asn Arg Arg His His Arg
                755                 760                 765

gac ctc gat gag ctc cag aga tca gta gct aca tag ttttctattt         2890
Asp Leu Asp Glu Leu Gln Arg Ser Val Ala Thr
            770                 775

aatttaaaga gggaattatt tacctgcctg cacaaataat gtcttctgtt ttgtacatcc  2950

cttatactaa ctcatacatg cttcccatgg agtctcacgg aggcacagga tgctatgctg  3010

agtaagacta tataggacat catctgaacc agctttccaa gaacaaaatc tgtatcagca  3070

aagttaagaa ttgtcttaaa aataggggcc ttatgtttgt aaatgtctca tagtttgaat  3130

ttaatgtcat gtaaataatc aagttaaatg aacccaggtc cacttagtaa gggcgttatt  3190

cccgtgcatg tccattaagc atggactttc ccatgctgct ggctatgtgc ttaatcattc  3250

cattctagaa caggtgatca tgtaggaact ggagaaaagg cacactttaa aacagcttat  3310

gttagcaaaa aaaaaacttt ctcaaggagc caacaggcca cacttggagt caggcgtggg  3370

aatttagaaa ggcatgttcc ctctttgtgg accaggctac atctagtgta ctgcagtaat  3430

gctctgtgag agggtagtaa tgatcctcac caatttcctt ttgattgctc aagcacagca  3490

tcatggacag aaccccatgg tgtgctctag agtacagaca atggaactta gtacacactt  3550

cctgtgctct ttgggaagca tggtaaaaga tcttaatata ataataaggg tgacatgata  3610

tacactgtat cctaatctgt agatgggaat tatttggaga cagacaagat agctgtaaat  3670

tctgtctctg agaaaaactt atattgccat aaaaaaggag aaagccacaa agtagataga  3730
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atgtaatgga attctttcca ctggagtata aatatctgcc aacttataat gttttggtta 3790

aaaataattt agattatagc aaattgttag caaaaatgca agtgaaagta aaatttgtaa 3850

aaaaaattat gggatggcaa tatattattt ataaccaatg tatttctgtg ttctcttttt 3910

ttctaagtat ttatcgtatt ctgtatattg tttgcattta catccttttt tttattatat 3970

ttgagtaaat aggagaaagc aatacgtaat acatagagat aattgagtag atgaccaagg 4030

tggggagtgg ggctatatat ttgttgaatg gatggataat ggcaaaattt tgatgacggg 4090

aagggttaaa ttaactcttc gacatcctct cgttacataa actttcaagc agtgttgttt 4150

tcagcagttt cacaaggaag tcttcaacat ctaaagaaaa cactcacacc gttagcataa 4210

gtaccatttg tattttgcta gcctgtgtca aattcaactt tgcctttgaa cagtgttttc 4270

ctgccagtct ctccagaaat caactttcct tcctgtagca caaaaccctt agccttcctc 4330

tgttttgcct tttcacgctc tttatagtgt gaaatgaaca attagtcact tcctcacaaa 4390

gaatgcagct ttttagaaaa ccaacagacc ttgtttgttt ctcatgcatt ctacatgttt 4450

tgaaagattc tgtgagaagc ctgtgtgatt aaaaagcagt tttacagagt caagcaatct 4510

atctcttcaa agtagcatca gtattttaca ttcatttaat ttgcattggg tacctatctc 4570

aagggcataa cattatctgc aagggactag tataataatg aatatttgtt gatgtttcac 4630

tcttggaaaa agcaaaaatg aaggaacaat tttaatttgt aaaccagaat gaatcacatc 4690

tccagcagaa gtgcatacaa atccttgtgt catggttaga ctactaatca tagatcacac 4750

aataatgttt atctactggc ttactgagtc ctgcaaagtc acagcaaaca tgtcagtggg 4810

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ttttatatag ataataatgt ccaaactatt ttctaattac ttatgtaatt agaaatgtaa 4990

tgttttatca acattctgta aatctatttt acatcttaga tttaaaattt tggctgtttt 5050

gggcataaaa cttctaatta tgattaaata tattataaac attattagga aaatatgatt 5110

ccataataaa ggtagggcta tggtttattt tgaaatgcag actatagcta agcagcattc 5170

attcttattc aaaagactta gaagagtgtt gtgaaagatc agttgacaaa tgtaatgtgt 5230

agttccttac cattgaggat gaacaactct gttttgaaat aataaaaagc agaatattgc 5290

tcaaagttta aatattaaag gtaccagatc ccccagaagc aactctgaac tatgtagtta 5350

ttcatttttt tttaaatcta tttttctgtc ttcagtacaa gtctctagct tctgtgagtg 5410

tttttgctgc atttttattc agtcctttgt gctgctaaat agtagtatgc ctgaatgagt 5470

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aagcaattta tgtaaaatcc tttgtttttc tttcccaaaa gagttcataa tcatatatca 5590

cacgacagag taaacatttc agaagaaaca gtcaagttac ttaaaaaact gcaaagtagt 5650

catagaaaaa ctgagcacac tgcagaatcc acaatagctc tcggatgcac aattccagga 5710

tgatttgttt aaagcaagac ttacttacaa catgcctgca atatgatggt cacgcttttg 5770

gacgtttcct ttgtgctata ctttgattct ttgcatatat taattattac atgctattcc 5830

tactgaattg gtgatcttac ctagaggcta acaagagtga ctacttgtta gactaacata 5890

accaagaata atttcccagg acaacttgtg tcatttcatt cacatgaaaa aataaaatta 5950

aacaagacca ctcagtaaac attgattctt cttaaacata tgtctaagat gtattgtaca 6010

tattttactg aaacagaata aagttaactt gggaatccct tctcttcata ataccacatt 6070

gttgcagtca gtgtgtttca actaacaagc cattttgagg gatgggtaac tttttaaaaa 6130

tagaaatgta tattttctca taatagatga tcacaatatt tcaatttaca gtatgtaagg 6190

ttaaaaatac ataagactta aattttccag acttgttaaa ctgaaaatcc atgtacacaa 6250

taaatctcac gctttgtaac tcttgcttaa atcttttgta atgtaaggta tttatgaaaa 6310

tttgaagcat acctttttgg gaaagaaaaa taaaacctgt cagaagccac agttggtctt 6370

cacttcttag cattgtcagt ggtgggtatc aatgaatttg aataatttta cttttaaaaa 6430

actgtagtct tgtagtatag catacttaaa attgttaaat gtatattttg tttgtattat 6490

aataaaacaa gtatcagtgt tctattatta t 6521

<210> 72
<211> 777
<212> PRT
<213> Artificial Sequence

<220>
<223> [CDS]:547..2880 from SEQ ID NO 71

<400> 72

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His Leu Phe His Ala Trp Met Met Leu Ile Met Thr Val Leu Phe Leu
            20                  25                  30
Pro Val Thr Glu Thr Ser Lys Gln Asn Ile Pro Arg Leu Lys Leu Thr
        35                  40                  45
Tyr Lys Asp Leu Leu Leu Ser Asn Thr Cys Ile Pro Phe Leu Gly Ser
    50                  55                  60
Ser Glu Gly Leu Asp Phe Gln Thr Leu Leu Leu Asp Glu Glu Arg Gly
65                  70                  75                  80
Ile Leu Leu Leu Gly Ala Lys Asp His Val Phe Leu Leu Ser Leu Val
                85                  90                  95
Asp Leu Asn Lys Asn Phe Lys Lys Ile Tyr Trp Pro Ala Ala Lys Glu
            100                 105                 110
Arg Val Glu Leu Cys Lys Leu Lys Gly Lys Asp Ala Asn Ala Glu Cys
        115                 120                 125
Ala Asn Phe Ile Arg Val Leu Gln Pro Tyr Asn Lys Thr His Val Tyr
    130                 135                 140
Val Cys Gly Thr Gly Ala Phe His Pro Leu Cys Gly Tyr Ile Asp Leu
145                 150                 155                 160
Gly Ala Asn Lys Glu Glu Leu Ile Phe Lys Leu Asp Thr His Asn Leu
                165                 170                 175
Glu Ser Gly Arg Leu Lys Cys Pro Phe Asp Pro Gln Gln Pro Phe Ala
            180                 185                 190
Ser Val Met Thr Asp Glu His Leu Tyr Ser Gly Thr Ala Ser Asp Phe
        195                 200                 205
Leu Gly Lys Asp Thr Ala Phe Thr Arg Ser Leu Gly Leu Met Gln Asp
    210                 215                 220
His His Ser Ile Arg Thr Asp Ile Ser Glu His His Trp Leu Asn Gly
225                 230                 235                 240
Ala Lys Phe Ile Gly Thr Phe Pro Ile Pro Asp Thr Tyr Asn Pro Asp
                245                 250                 255
Asp Asp Lys Ile Tyr Phe Phe Phe Arg Glu Ser Ser Gln Glu Gly Ser
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            260                 265                 270
Thr Ser Asp Arg Ser Ile Leu Ser Arg Val Gly Arg Val Cys Lys Asn
        275                 280                 285
Asp Val Gly Gly Gln Arg Ser Leu Ile Asn Lys Trp Thr Thr Phe Leu
    290                 295                 300
Lys Ala Arg Leu Ile Cys Ser Ile Pro Gly Ser Asp Gly Ala Asp Thr
305                 310                 315                 320
His Phe Asp Glu Leu Gln Asp Ile Tyr Leu Leu Pro Thr Arg Asp Glu
                325                 330                 335
Arg Asn Pro Val Val Tyr Gly Val Phe Thr Thr Thr Ser Ser Ile Phe
            340                 345                 350
Lys Gly Ser Ala Val Cys Val Tyr Ser Met Ala Asp Ile Arg Ala Val
        355                 360                 365
Phe Asn Gly Pro Tyr Ala His Lys Glu Ser Ala Asp His Arg Trp Val
    370                 375                 380
Gln Tyr Asp Gly Arg Ile Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser
385                 390                 395                 400
Lys Thr Tyr Asp Pro Leu Ile Lys Ser Thr Arg Asp Phe Pro Asp Asp
                405                 410                 415
Val Ile Ser Phe Ile Arg Arg His Pro Val Met Tyr Lys Ser Val Tyr
            420                 425                 430
Pro Val Ala Gly Ala Pro Thr Phe Lys Arg Ile Asn Val Asp Tyr Arg
        435                 440                 445
Leu Thr Gln Ile Val Val Asp His Val Val Ala Glu Asp Gly Gln Tyr
    450                 455                 460
Asp Val Met Phe Leu Gly Thr Asp Ile Gly Thr Val Leu Lys Val Val
465                 470                 475                 480
Ser Ile Ser Lys Glu Lys Trp Asn Met Glu Glu Val Val Leu Glu Glu
                485                 490                 495
Leu Gln Val Phe Lys His Pro Thr Ala Ile Leu Asn Met Glu Leu Ser
            500                 505                 510
Leu Lys Gln Gln Gln Leu Tyr Val Gly Ser Trp Asp Gly Leu Val Gln
        515                 520                 525
Leu Ser Leu His Arg Cys Asp Thr Tyr Gly Lys Ala Cys Ala Asp Cys
    530                 535                 540
Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Asn Ala Cys Ser
545                 550                 555                 560
Arg Tyr Ala Pro Thr Ser Lys Arg Arg Ala Arg Arg Gln Asp Val Lys
                565                 570                 575
Tyr Gly Asp Pro Ile Thr Gln Cys Trp Asp Ile Glu Asp Ser Ile Ser
            580                 585                 590
His Glu Thr Ala Asp Glu Lys Val Ile Phe Gly Ile Glu Phe Asn Ser
        595                 600                 605
Thr Phe Leu Glu Cys Ile Pro Lys Ser Gln Gln Ala Ser Val Glu Trp
    610                 615                 620
Tyr Ile Gln Arg Ser Gly Asp Glu His Arg Glu Glu Leu Lys Pro Asp
625                 630                 635                 640
Glu Arg Ile Ile Lys Thr Asp Tyr Gly Leu Leu Ile Arg Ser Leu Gln
                645                 650                 655
Lys Lys Asp Ser Gly Met Tyr Tyr Cys Lys Ala Gln Glu His Thr Phe
            660                 665                 670
Ile His Thr Ile Val Lys Leu Thr Leu Asn Val Ile Glu Asn Glu Gln
        675                 680                 685
Met Glu Asn Thr Gln Arg Ala Glu Tyr Gln Glu Gly Gln Val Lys Asp
    690                 695                 700
Leu Leu Ala Glu Ser Arg Leu Arg Tyr Lys Asp Tyr Ile Gln Ile Leu
705                 710                 715                 720
Ser Ser Pro Asn Phe Ser Leu Asp Gln Tyr Cys Glu Gln Met Trp Tyr
                725                 730                 735
Lys Glu Lys Arg Arg Gln Arg Asn Lys Gly Ser Pro Lys Trp Lys His
            740                 745                 750
Met Gln Glu Met Lys Lys Lys Arg Asn Arg Arg His His Arg Asp Leu
        755                 760                 765
Asp Glu Leu Gln Arg Ser Val Ala Thr
    770                 775
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<210> 73
<211> 7

<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid comprised in mutated Semaphorin 3 or functional fragment thereof

<220>
<221> UNSURE
<222> 2
<223> X is K or N

<220>
<221> UNSURE
<222> 3
<223> X is W, M or L

<220>
<221> VARIANT
<222> 4
<223> replace/=hydrophilic amino acid

<400> 73
Cys Xaa Xaa Ala Gly Lys Asp
1 5

<210> 74
<211> 774
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3B deltaIg-b-Fc

<400> 74
Met Gly Arg Ala Gly Ala Ala Ala Val Ile Pro Gly Leu Ala Leu Leu
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Trp Ala Val Gly Leu Gly Ser Ala Ala Pro Ser Pro Pro Arg Leu Arg
20 25 30
Leu Ser Phe Gln Glu Leu Gln Ala Trp His Gly Leu Gln Thr Phe Ser
35 40 45
Leu Glu Arg Thr Cys Cys Tyr Gln Ala Leu Leu Val Asp Glu Glu Arg
50 55 60
Gly Arg Leu Phe Val Gly Ala Glu Asn His Val Ala Ser Leu Asn Leu
65 70 75 80
Asp Asn Ile Ser Lys Arg Ala Lys Lys Leu Ala Trp Pro Ala Pro Val
85 90 95
Glu Trp Arg Glu Glu Cys Asn Trp Ala Gly Lys Asp Ile Gly Thr Glu
100 105 110
Cys Met Asn Phe Val Lys Leu Leu His Ala Tyr Asn Arg Thr His Leu
115 120 125
Leu Ala Cys Gly Thr Gly Ala Phe His Pro Thr Cys Ala Phe Val Glu
130 135 140
Val Gly His Arg Ala Glu Glu Pro Val Leu Arg Leu Asp Pro Gly Arg
145 150 155 160
Ile Glu Asp Gly Lys Gly Lys Ser Pro Tyr Asp Pro Arg His Arg Ala
165 170 175
Ala Ser Val Leu Val Gly Glu Glu Leu Tyr Ser Gly Val Ala Ala Asp
180 185 190
Leu Met Gly Arg Asp Phe Thr Ile Phe Arg Ser Leu Gly Gln Arg Pro
195 200 205
Ser Leu Arg Thr Glu Pro His Asp Ser Arg Trp Leu Asn Glu Pro Lys
210 215 220
Phe Val Lys Val Phe Trp Ile Pro Glu Ser Glu Asn Pro Asp Asp Asp
225 230 235 240
Lys Ile Tyr Phe Phe Phe Arg Glu Thr Ala Val Glu Ala Ala Pro Ala
245 250 255
Leu Gly Arg Leu Ser Val Ser Arg Val Gly Gln Ile Cys Arg Asn Asp

260 265 270
Val Gly Gly Gln Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys
275 280 285
Ala Arg Leu Val Cys Ser Val Pro Gly Val Glu Gly Asp Thr His Phe
290 295 300
Asp Gln Leu Gln Asp Val Phe Leu Leu Ser Ser Arg Asp His Arg Thr
305 310 315 320
Pro Leu Leu Tyr Ala Val Phe Ser Thr Ser Ser Ser Ile Phe Gln Gly
325 330 335
Ser Ala Val Cys Val Tyr Ser Met Asn Asp Val Arg Arg Ala Phe Leu
340 345 350
Gly Pro Phe Ala His Lys Glu Gly Pro Met His Gln Trp Val Ser Tyr
355 360 365
Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Met Cys Pro Ser Lys Thr
370 375 380
Phe Gly Thr Phe Ser Ser Thr Lys Asp Phe Pro Asp Asp Val Ile Gln
385 390 395 400
Phe Ala Arg Asn His Pro Leu Met Tyr Asn Ser Val Leu Pro Thr Gly
405 410 415
Gly Arg Pro Leu Phe Leu Gln Val Gly Ala Asn Tyr Thr Phe Thr Gln
420 425 430
Ile Ala Ala Asp Arg Val Ala Ala Ala Asp Gly His Tyr Asp Val Leu
435 440 445
Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Ile Ser Val Pro
450 455 460
Lys Gly Ser Arg Pro Ser Ala Glu Gly Leu Leu Leu Glu Glu Leu His
465 470 475 480
Val Phe Glu Asp Ser Ala Ala Val Thr Ser Met Gln Ile Ser Ser Lys
485 490 495
Arg His Gln Leu Tyr Val Ala Ser Arg Ser Ala Val Ala Gln Ile Ala
500 505 510
Leu His Arg Cys Ala Ala His Gly Arg Val Cys Thr Glu Cys Cys Leu
515 520 525
Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Val Ala Cys Thr Arg Phe
530 535 540
Gln Pro Ser Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu
545 550 555 560
Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp
565 570 575
Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp
580 585 590
Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly
595 600 605
Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn
610 615 620
Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp
625 630 635 640
Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro
645 650 655
Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu
660 665 670
Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn
675 680 685
Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile
690 695 700
Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr
705 710 715 720
Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys
725 730 735
Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys
740 745 750
Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu
755 760 765
Ser Leu Ser Pro Gly Lys
770

<210> 75
<211> 2325

<212> DNA
<213> Homo sapiens

<220>
<223> SEMA3B deltaIg-b-Fc

<400> 75
atgggcagag ctggcgctgc tgctgtgatt cctggactgg ctctgctgtg ggccgtgggc 60

ctgggatctg ctgctccatc tcccccaaga ctgcggctga gcttccagga actgcaggcc 120

tggcacggac tgcagacctt cagcctggaa cggacatgct gttatcaggc cctgctggtg 180

gacgaggaac ggggcagact gtttgtgggc gccgagaatc atgtggccag cctgaacctg 240

gacaacatca gcaagcgggc caagaagctg gcctggcctg ctcctgtgga atggcgggaa 300

gagtgcaact gggccggcaa ggatatcggc accgagtgca tgaacttcgt gaagctgctg 360

cacgcctaca accggaccca tctgctggcc tgtggaaccg gcgccttcca ccctacctgc 420

gcctttgtgg aagtgggcca cagagccgag gaacccgtgc tgagactgga ccccggcaga 480

atcgaggacg gcaagggcaa gagcccctac gaccctagac atagagccgc cagcgtgctc 540

gtgggagagg aactgtattc tggcgtggcc gccgacctga tgggccggga cttcaccatc 600

ttcagaagcc tgggccagag gcccagcctg agaaccgagc ctcacgactc cagatggctg 660

aacgagccca agttcgtgaa ggtgttctgg attcccgaga gcgagaaccc cgacgacgac 720

aaaatctact tcttcttccg ggaaaccgcc gtggaagccg cccctgctct gggaaggctg 780

tccgtgtcta gagtgggcca gatttgccgg aacgacgtgg gcggacagcg gagcctcgtg 840

aacaagtgga ccaccttcct gaaggccaga ctcgtgtgta gcgtgcccgg cgtggaaggg 900

gacacccact ttgaccagct gcaggacgtg ttcctgctga gcagccggga ccacagaacc 960

cctctgctgt acgccgtgtt cagcaccagc tccagcatct tccagggcag cgccgtgtgc 1020

gtgtacagca tgaacgatgt gcggagagcc ttcctgggcc cctttgccca caaagagggc 1080

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gtgttcgagg actctgccgc cgtgacctcc atgcagatca gcagcaagag acaccagctg 1500

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aagttcaatt ggtacgtgga cggggtggaa gtgcacaacg ccaagaccaa gcccagagag 1860

gaacagtaca actccaccta ccgggtggtg tccgtgctga ccgtgctgca ccaggactgg 1920

ctgaatggca aagagtacaa gtgcaaggtg tccaacaagg ccctgcctgc ccccatcgag 1980

aaaaccatct ccaaggccaa gggccagccc cgcgaacccc aggtgtacac actgccccct 2040

agcagggacg agctgaccaa gaaccaggtg tccctgacct gtctcgtgaa gggcttctac 2100

ccctccgaca ttgccgtgga atgggagagc aatggccagc ccgagaacaa ctacaagacc 2160

acccccccctg tgctggacag cgacggctca ttcttcctgt acagcaagct gacagtggac 2220

aagagccggt ggcagcaggg caacgtgttc tcctgcagcg tgatgcacga ggccctgcac 2280

aaccactaca cccagaagtc cctgagcctg agccccggca aatga 2325

<210> 76
<211> 774
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3B (A105K) deltaIg-b-Fc

<400> 76
Met Gly Arg Ala Gly Ala Ala Ala Val Ile Pro Gly Leu Ala Leu Leu
1 5 10 15
Trp Ala Val Gly Leu Gly Ser Ala Ala Pro Ser Pro Pro Arg Leu Arg
20 25 30
Leu Ser Phe Gln Glu Leu Gln Ala Trp His Gly Leu Gln Thr Phe Ser
35 40 45
Leu Glu Arg Thr Cys Cys Tyr Gln Ala Leu Leu Val Asp Glu Glu Arg
50 55 60
Gly Arg Leu Phe Val Gly Ala Glu Asn His Val Ala Ser Leu Asn Leu
65 70 75 80
Asp Asn Ile Ser Lys Arg Ala Lys Lys Leu Ala Trp Pro Ala Pro Val
85 90 95
Glu Trp Arg Glu Glu Cys Asn Trp Lys Gly Lys Asp Ile Gly Thr Glu
100 105 110
Cys Met Asn Phe Val Lys Leu Leu His Ala Tyr Asn Arg Thr His Leu
115 120 125
Leu Ala Cys Gly Thr Gly Ala Phe His Pro Thr Cys Ala Phe Val Glu
130 135 140
Val Gly His Arg Ala Glu Glu Pro Val Leu Arg Leu Asp Pro Gly Arg
145 150 155 160
Ile Glu Asp Gly Lys Gly Lys Ser Pro Tyr Asp Pro Arg His Arg Ala
165 170 175
Ala Ser Val Leu Val Gly Glu Glu Leu Tyr Ser Gly Val Ala Ala Asp
180 185 190
Leu Met Gly Arg Asp Phe Thr Ile Phe Arg Ser Leu Gly Gln Arg Pro
195 200 205
Ser Leu Arg Thr Glu Pro His Asp Ser Arg Trp Leu Asn Glu Pro Lys
210 215 220
Phe Val Lys Val Phe Trp Ile Pro Glu Ser Glu Asn Pro Asp Asp Asp
225 230 235 240
Lys Ile Tyr Phe Phe Phe Arg Glu Thr Ala Val Glu Ala Ala Pro Ala
245 250 255
Leu Gly Arg Leu Ser Val Ser Arg Val Gly Gln Ile Cys Arg Asn Asp
260 265 270
Val Gly Gly Gln Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys
275 280 285
Ala Arg Leu Val Cys Ser Val Pro Gly Val Glu Gly Asp Thr His Phe
290 295 300
Asp Gln Leu Gln Asp Val Phe Leu Leu Ser Ser Arg Asp His Arg Thr
305 310 315 320
Pro Leu Leu Tyr Ala Val Phe Ser Thr Ser Ser Ser Ile Phe Gln Gly

325 330 335
Ser Ala Val Cys Val Tyr Ser Met Asn Asp Val Arg Arg Ala Phe Leu
340 345 350
Gly Pro Phe Ala His Lys Glu Gly Pro Met His Gln Trp Val Ser Tyr
355 360 365
Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Met Cys Pro Ser Lys Thr
370 375 380
Phe Gly Thr Phe Ser Ser Thr Lys Asp Phe Pro Asp Asp Val Ile Gln
385 390 395 400
Phe Ala Arg Asn His Pro Leu Met Tyr Asn Ser Val Leu Pro Thr Gly
405 410 415
Gly Arg Pro Leu Phe Leu Gln Val Gly Ala Asn Tyr Thr Phe Thr Gln
420 425 430
Ile Ala Ala Asp Arg Val Ala Ala Ala Asp Gly His Tyr Asp Val Leu
435 440 445
Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Ile Ser Val Pro
450 455 460
Lys Gly Ser Arg Pro Ser Ala Glu Gly Leu Leu Leu Glu Glu Leu His
465 470 475 480
Val Phe Glu Asp Ser Ala Ala Val Thr Ser Met Gln Ile Ser Ser Lys
485 490 495
Arg His Gln Leu Tyr Val Ala Ser Arg Ser Ala Val Ala Gln Ile Ala
500 505 510
Leu His Arg Cys Ala Ala His Gly Arg Val Cys Thr Glu Cys Cys Leu
515 520 525
Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Val Ala Cys Thr Arg Phe
530 535 540
Gln Pro Ser Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu
545 550 555 560
Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp
565 570 575
Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp
580 585 590
Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly
595 600 605
Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn
610 615 620
Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp
625 630 635 640
Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro
645 650 655
Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu
660 665 670
Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn
675 680 685
Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile
690 695 700
Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr
705 710 715 720
Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys
725 730 735
Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys
740 745 750
Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu
755 760 765
Ser Leu Ser Pro Gly Lys
770

<210> 77
<211> 2325
<212> DNA
<213> Homo sapiens

<220>
<223> SEMA3B (A105K) deltaIg-b-Fc

<400> 77
atgggcagag ctggcgctgc tgctgtgatt cctggactgg ctctgctgtg ggccgtgggc 60

ctgggatctg ctgctccatc tcccccaaga ctgcggctga gcttccagga actgcaggcc 120

tggcacggac tgcagacctt cagcctggaa cggacatgct gttatcaggc cctgctggtg 180

gacgaggaac ggggcagact gtttgtgggc gccgagaatc atgtggccag cctgaacctg 240

gacaacatca gcaagcgggc caagaagctg gcctggcctg ctcctgtgga atggcgggaa 300

gagtgcaact ggaagggcaa ggacatcggc accgagtgca tgaacttcgt gaagctgctg 360

cacgcctaca accggaccca tctgctggcc tgtggaaccg gcgccttcca ccctacctgc 420

gcctttgtgg aagtgggcca cagagccgag gaacccgtgc tgagactgga ccccggcaga 480

atcgaggacg gcaagggcaa gagcccctac gaccctagac atagagccgc cagcgtgctc 540

gtgggagagg aactgtattc tggcgtggcc gccgacctga tgggccggga cttcaccatc 600

ttcagaagcc tgggccagag gcccagcctg agaaccgagc ctcacgactc cagatggctg 660

aacgagccca agttcgtgaa ggtgttctgg attcccgaga gcgagaaccc cgacgacgac 720

aaaatctact tcttcttccg ggaaaccgcc gtggaagccg cccctgctct gggaaggctg 780

tccgtgtcta gagtgggcca gatttgccgg aacgacgtgg gcggacagcg gagcctcgtg 840

aacaagtgga ccaccttcct gaaggccaga ctcgtgtgta gcgtgcccgg cgtggaaggg 900

gacacccact ttgaccagct gcaggacgtg ttcctgctga gcagccggga ccacagaacc 960

cctctgctgt acgccgtgtt cagcaccagc tccagcatct tccagggcag cgccgtgtgc 1020

gtgtacagca tgaacgatgt gcggagagcc ttcctgggcc cctttgccca caaagagggc 1080

cccatgcatc agtgggtgtc ataccagggc agagtgccct accccagacc cggcatgtgt 1140

cccagcaaga ccttcggcac cttcagcagc accaaggact tccccgacga tgtgatccag 1200

ttcgcccgga accacccccct gatgtacaac agcgtgctgc ccactggcgg cagaccactg 1260

tttctgcaag tgggcgccaa ctacaccttt acccagatcg ccgccgacag agtggccgct 1320

gccgatggcc attacgacgt gctgttcatc ggcacagacg tgggcaccgt gctgaaagtg 1380

atcagcgtgc ccaagggcag cagacctagc gccgaaggac tgctgctgga agaactgcac 1440

gtgttcgagg actctgccgc cgtgacctcc atgcagatca gcagcaagag acaccagctg 1500

tacgtggcct ccagatccgc cgtggcccag attgccctgc atagatgtgc cgcccacggc 1560

agagtgtgta ccgagtgttg cctggcccgg gacccttact gtgcttggga tggggtggcc 1620

tgcaccagat tccagcccag cgacaagacc cacacctgtc ccccttgtcc tgcccctgaa 1680

ctgctgggcg gaccctccgt gtttctgttc cccccaaagc ccaaggacac cctgatgatc 1740

agccggaccc ccgaagtgac ctgcgtggtg gtggatgtgt ctcacgagga ccctgaagtg 1800

aagttcaatt ggtacgtgga cggggtggaa gtgcacaacg ccaagaccaa gcccagagag 1860

gaacagtaca actccaccta ccgggtggtg tccgtgctga ccgtgctgca ccaggactgg 1920

ctgaatggca aagagtacaa gtgcaaggtg tccaacaagg ccctgcctgc ccccatcgag 1980

aaaaccatct ccaaggccaa gggccagccc cgcgaacccc aggtgtacac actgccccct 2040

agcagggacg agctgaccaa gaaccaggtg tccctgacct gtctcgtgaa gggcttctac 2100

ccctccgaca ttgccgtgga atgggagagc aatggccagc ccgagaacaa ctacaagacc 2160

acccccccctg tgctggacag cgacggctca ttcttcctgt acagcaagct gacagtggac 2220

aagagccggt ggcagcaggg caacgtgttc tcctgcagcg tgatgcacga ggccctgcac 2280

aaccactaca cccagaagtc cctgagcctg agccccggca aatga 2325

<210> 78
<211> 772
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3C A104K deltaIg-b-Fc

<400> 78
Met Ala Phe Arg Thr Ile Cys Val Leu Val Gly Val Phe Ile Cys Ser
1 5 10 15
Ile Cys Val Lys Gly Ser Ser Gln Pro Gln Ala Arg Val Tyr Leu Thr
20 25 30
Phe Asp Glu Leu Arg Glu Thr Lys Thr Ser Glu Tyr Phe Ser Leu Ser
35 40 45
His His Pro Leu Asp Tyr Arg Ile Leu Leu Met Asp Glu Asp Gln Asp
50 55 60
Arg Ile Tyr Val Gly Ser Lys Asp His Ile Leu Ser Leu Asn Ile Asn
65 70 75 80
Asn Ile Ser Gln Glu Ala Leu Ser Val Phe Trp Pro Ala Ser Thr Ile
85 90 95
Lys Val Glu Glu Cys Lys Met Lys Gly Lys Asp Pro Thr His Gly Cys
100 105 110
Gly Asn Phe Val Arg Val Ile Gln Thr Phe Asn Arg Thr His Leu Tyr
115 120 125
Val Cys Gly Ser Gly Ala Phe Ser Pro Val Cys Thr Tyr Leu Asn Arg
130 135 140
Gly Arg Arg Ser Glu Asp Gln Val Phe Met Ile Asp Ser Lys Cys Glu
145 150 155 160
Ser Gly Lys Gly Arg Cys Ser Phe Asn Pro Asn Val Asn Thr Val Ser
165 170 175
Val Met Ile Asn Glu Glu Leu Phe Ser Gly Met Tyr Ile Asp Phe Met
180 185 190
Gly Thr Asp Ala Ala Ile Phe Arg Ser Leu Thr Lys Arg Asn Ala Val
195 200 205
Arg Thr Asp Gln His Asn Ser Lys Trp Leu Ser Glu Pro Met Phe Val
210 215 220
Asp Ala His Val Ile Pro Asp Gly Thr Asp Pro Asn Asp Ala Lys Val
225 230 235 240
Tyr Phe Phe Phe Lys Glu Lys Leu Thr Asp Asn Asn Arg Ser Thr Lys
245 250 255
Gln Ile His Ser Met Ile Ala Arg Ile Cys Pro Asn Asp Thr Gly Gly
260 265 270
Leu Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu
275 280 285
Val Cys Ser Val Thr Asp Glu Asp Gly Pro Glu Thr His Phe Asp Glu
290 295 300
Leu Glu Asp Val Phe Leu Leu Glu Thr Asp Asn Pro Arg Thr Thr Leu
305 310 315 320
Val Tyr Gly Ile Phe Thr Thr Ser Ser Ser Val Phe Lys Gly Ser Ala
325 330 335
Val Cys Val Tyr His Leu Ser Asp Ile Gln Thr Val Phe Asn Gly Pro
340 345 350
Phe Ala His Lys Glu Gly Pro Asn His Gln Leu Ile Ser Tyr Gln Gly
355 360 365
Arg Ile Pro Tyr Pro Arg Pro Gly Thr Cys Pro Gly Gly Ala Phe Thr
370 375 380
Pro Asn Met Arg Thr Thr Lys Glu Phe Pro Asp Asp Val Val Thr Phe

385 390 395 400
Ile Arg Asn His Pro Leu Met Tyr Asn Ser Ile Tyr Pro Ile His Lys
405 410 415
Arg Pro Leu Ile Val Arg Ile Gly Thr Asp Tyr Lys Tyr Thr Lys Ile
420 425 430
Ala Val Asp Arg Val Asn Ala Ala Asp Gly Arg Tyr His Val Leu Phe
435 440 445
Leu Gly Thr Asp Arg Gly Thr Val Gln Lys Val Val Val Leu Pro Thr
450 455 460
Asn Asn Ser Val Ser Gly Glu Leu Ile Leu Glu Glu Leu Glu Val Phe
465 470 475 480
Lys Asn His Ala Pro Ile Thr Thr Met Lys Ile Ser Ser Lys Lys Gln
485 490 495
Gln Leu Tyr Val Ser Ser Asn Glu Gly Val Ser Gln Val Ser Leu His
500 505 510
Arg Cys His Ile Tyr Gly Thr Ala Cys Ala Asp Cys Cys Leu Ala Arg
515 520 525
Asp Pro Tyr Cys Ala Trp Asp Gly His Ser Cys Ser Arg Phe Tyr Pro
530 535 540
Thr Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu
545 550 555 560
Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu
565 570 575
Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser
580 585 590
His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu
595 600 605
Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr
610 615 620
Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn
625 630 635 640
Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro
645 650 655
Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln
660 665 670
Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val
675 680 685
Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val
690 695 700
Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro
705 710 715 720
Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr
725 730 735
Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val
740 745 750
Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu
755 760 765
Ser Pro Gly Lys
770

<210> 79
<211> 792
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3D A120K deltaIg-b-Fc

<400> 79
Met Asn Ala Asn Lys Asp Glu Arg Leu Lys Ala Arg Ser Gln Asp Phe
1 5 10 15
His Leu Phe Pro Ala Leu Met Met Leu Ser Met Thr Met Leu Phe Leu
20 25 30
Pro Val Thr Gly Thr Leu Lys Gln Asn Ile Pro Arg Leu Lys Leu Thr
35 40 45
Tyr Lys Asp Leu Leu Leu Ser Asn Ser Cys Ile Pro Phe Leu Gly Ser
50 55 60
Ser Glu Gly Leu Asp Phe Gln Thr Leu Leu Leu Asp Glu Glu Arg Gly

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65                  70                  75                  80
Arg Leu Leu Leu Gly Ala Lys Asp His Ile Phe Leu Leu Ser Leu Val
                85                  90                  95
Asp Leu Asn Lys Asn Phe Lys Lys Ile Tyr Trp Pro Ala Ala Lys Glu
            100                 105                 110
Arg Val Glu Leu Cys Lys Leu Lys Gly Lys Asp Ala Asn Thr Glu Cys
        115                 120                 125
Ala Asn Phe Ile Arg Val Leu Gln Pro Tyr Asn Lys Thr His Ile Tyr
    130                 135                 140
Val Cys Gly Thr Gly Ala Phe His Pro Ile Cys Gly Tyr Ile Asp Leu
145                 150                 155                 160
Gly Val Tyr Lys Glu Asp Ile Ile Phe Lys Leu Asp Thr His Asn Leu
                165                 170                 175
Glu Ser Gly Arg Leu Lys Cys Pro Phe Asp Pro Gln Gln Pro Phe Ala
            180                 185                 190
Ser Val Met Thr Asp Glu Tyr Leu Tyr Ser Gly Thr Ala Ser Asp Phe
        195                 200                 205
Leu Gly Lys Asp Thr Ala Phe Thr Arg Ser Leu Gly Pro Thr His Asp
    210                 215                 220
His His Tyr Ile Arg Thr Asp Ile Ser Glu His Tyr Trp Leu Asn Gly
225                 230                 235                 240
Ala Lys Phe Ile Gly Thr Phe Phe Ile Pro Asp Thr Tyr Asn Pro Asp
                245                 250                 255
Asp Asp Lys Ile Tyr Phe Phe Phe Arg Glu Ser Ser Gln Glu Gly Ser
            260                 265                 270
Thr Ser Asp Lys Thr Ile Leu Ser Arg Val Gly Arg Val Cys Lys Asn
        275                 280                 285
Asp Val Gly Gly Gln Arg Ser Leu Ile Asn Lys Trp Thr Thr Phe Leu
    290                 295                 300
Lys Ala Arg Leu Ile Cys Ser Ile Pro Gly Ser Asp Gly Ala Asp Thr
305                 310                 315                 320
Tyr Phe Asp Glu Leu Gln Asp Ile Tyr Leu Leu Pro Thr Arg Asp Glu
                325                 330                 335
Arg Asn Pro Val Val Tyr Gly Val Phe Thr Thr Thr Ser Ser Ile Phe
            340                 345                 350
Lys Gly Ser Ala Val Cys Val Tyr Ser Met Ala Asp Ile Arg Ala Val
        355                 360                 365
Phe Asn Gly Pro Tyr Ala His Lys Glu Ser Ala Asp His Arg Trp Val
    370                 375                 380
Gln Tyr Asp Gly Arg Ile Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser
385                 390                 395                 400
Lys Thr Tyr Asp Pro Leu Ile Lys Ser Thr Arg Asp Phe Pro Asp Asp
                405                 410                 415
Val Ile Ser Phe Ile Lys Arg His Ser Val Met Tyr Lys Ser Val Tyr
            420                 425                 430
Pro Val Ala Gly Gly Pro Thr Phe Lys Arg Ile Asn Val Asp Tyr Arg
        435                 440                 445
Leu Thr Gln Ile Val Val Asp His Val Ile Ala Glu Asp Gly Gln Tyr
    450                 455                 460
Asp Val Met Phe Leu Gly Thr Asp Ile Gly Thr Val Leu Lys Val Val
465                 470                 475                 480
Ser Ile Ser Lys Glu Lys Trp Asn Met Glu Glu Val Val Leu Glu Glu
                485                 490                 495
Leu Gln Ile Phe Lys His Ser Ser Ile Ile Leu Asn Met Glu Leu Ser
            500                 505                 510
Leu Lys Gln Gln Gln Leu Tyr Ile Gly Ser Arg Asp Gly Leu Val Gln
        515                 520                 525
Leu Ser Leu His Arg Cys Asp Thr Tyr Gly Lys Ala Cys Ala Asp Cys
    530                 535                 540
Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Asn Ala Cys Ser
545                 550                 555                 560
Arg Tyr Ala Pro Thr Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala
                565                 570                 575
Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro
            580                 585                 590
Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val
        595                 600                 605
Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val
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610 615 620
Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln
625 630 635 640
Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln
645 650 655
Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala
660 665 670
Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro
675 680 685
Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr
690 695 700
Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser
705 710 715 720
Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr
725 730 735
Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr
740 745 750
Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe
755 760 765
Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys
770 775 780
Ser Leu Ser Leu Ser Pro Gly Lys
785 790

<210> 80
<211> 775
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3E

<400> 80
Met Ala Ser Ala Gly His Ile Ile Thr Leu Leu Leu Trp Gly Tyr Leu
1 5 10 15
Leu Glu Leu Trp Thr Gly Gly His Thr Ala Asp Thr Thr His Pro Arg
20 25 30
Leu Arg Leu Ser His Lys Glu Leu Leu Asn Leu Asn Arg Thr Ser Ile
35 40 45
Phe His Ser Pro Phe Gly Phe Leu Asp Leu His Thr Met Leu Leu Asp
50 55 60
Glu Tyr Gln Glu Arg Leu Phe Val Gly Gly Arg Asp Leu Val Tyr Ser
65 70 75 80
Leu Ser Leu Glu Arg Ile Ser Asp Gly Tyr Lys Glu Ile His Trp Pro
85 90 95
Ser Thr Ala Leu Lys Met Glu Glu Cys Ile Met Lys Gly Lys Asp Ala
100 105 110
Gly Glu Cys Ala Asn Tyr Val Arg Val Leu His His Tyr Asn Arg Thr
115 120 125
His Leu Leu Thr Cys Gly Thr Gly Ala Phe Asp Pro Val Cys Ala Phe
130 135 140
Ile Arg Val Gly Tyr His Leu Glu Asp Pro Leu Phe His Leu Glu Ser
145 150 155 160
Pro Arg Ser Glu Arg Gly Arg Gly Arg Cys Pro Phe Asp Pro Ser Ser
165 170 175
Ser Phe Ile Ser Thr Leu Ile Gly Ser Glu Leu Phe Ala Gly Leu Tyr
180 185 190
Ser Asp Tyr Trp Ser Arg Asp Ala Ala Ile Phe Arg Ser Met Gly Arg
195 200 205
Leu Ala His Ile Arg Thr Glu His Asp Asp Glu Arg Leu Leu Lys Glu
210 215 220
Pro Lys Phe Val Gly Ser Tyr Met Ile Pro Asp Asn Glu Asp Arg Asp
225 230 235 240
Asp Asn Lys Val Tyr Phe Phe Phe Thr Glu Lys Ala Leu Glu Ala Glu
245 250 255
Asn Asn Ala His Ala Ile Tyr Thr Arg Val Gly Arg Leu Cys Val Asn
260 265 270
Asp Val Gly Gly Gln Arg Ile Leu Val Asn Lys Trp Ser Thr Phe Leu

275 280 285
Lys Ala Arg Leu Val Cys Ser Val Pro Gly Met Asn Gly Ile Asp Thr
290 295 300
Tyr Phe Asp Glu Leu Glu Asp Val Phe Leu Leu Pro Thr Arg Asp His
305 310 315 320
Lys Asn Pro Val Ile Phe Gly Leu Phe Asn Thr Thr Ser Asn Ile Phe
325 330 335
Arg Gly His Ala Ile Cys Val Tyr His Met Ser Ser Ile Arg Ala Ala
340 345 350
Phe Asn Gly Pro Tyr Ala His Lys Glu Gly Pro Glu Tyr His Trp Ser
355 360 365
Val Tyr Glu Gly Lys Val Pro Tyr Pro Arg Pro Gly Ser Cys Ala Ser
370 375 380
Lys Val Asn Gly Gly Arg Tyr Gly Thr Thr Lys Asp Tyr Pro Asp Asp
385 390 395 400
Ala Ile Arg Phe Ala Arg Ser His Pro Leu Met Tyr Gln Ala Ile Lys
405 410 415
Pro Ala His Lys Lys Pro Ile Leu Val Lys Thr Asp Gly Lys Tyr Asn
420 425 430
Leu Lys Gln Ile Ala Val Asp Arg Val Glu Ala Glu Asp Gly Gln Tyr
435 440 445
Asp Val Leu Phe Ile Gly Thr Asp Asn Gly Ile Val Leu Lys Val Ile
450 455 460
Thr Ile Tyr Asn Gln Glu Met Glu Ser Met Glu Glu Val Ile Leu Glu
465 470 475 480
Glu Leu Gln Ile Phe Lys Asp Pro Val Pro Ile Ile Ser Met Glu Ile
485 490 495
Ser Ser Lys Arg Gln Gln Leu Tyr Ile Gly Ser Ala Ser Ala Val Ala
500 505 510
Gln Val Arg Phe His His Cys Asp Met Tyr Gly Ser Ala Cys Ala Asp
515 520 525
Cys Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ile Ser Cys
530 535 540
Ser Arg Tyr Tyr Pro Thr Gly Thr His Ala Lys Arg Arg Phe Arg Arg
545 550 555 560
Gln Asp Val Arg His Gly Asn Ala Ala Gln Gln Cys Phe Gly Gln Gln
565 570 575
Phe Val Gly Asp Ala Leu Asp Lys Thr Glu Glu His Leu Ala Tyr Gly
580 585 590
Ile Glu Asn Asn Ser Thr Leu Leu Glu Cys Thr Pro Arg Ser Leu Gln
595 600 605
Ala Lys Val Ile Trp Phe Val Gln Lys Gly Arg Glu Thr Arg Lys Glu
610 615 620
Glu Val Lys Thr Asp Asp Arg Val Val Lys Met Asp Leu Gly Leu Leu
625 630 635 640
Phe Leu Arg Leu His Lys Ser Asp Ala Gly Thr Tyr Phe Cys Gln Thr
645 650 655
Val Glu His Ser Phe Val His Thr Val Arg Lys Ile Thr Leu Glu Val
660 665 670
Val Glu Glu Glu Lys Val Glu Asp Met Phe Asn Lys Asp Asp Glu Glu
675 680 685
Asp Arg His His Arg Met Pro Cys Pro Ala Gln Ser Ser Ile Ser Gln
690 695 700
Gly Ala Lys Pro Trp Tyr Lys Glu Phe Leu Gln Leu Ile Gly Tyr Ser
705 710 715 720
Asn Phe Gln Arg Val Glu Glu Tyr Cys Glu Lys Val Trp Cys Thr Asp
725 730 735
Arg Lys Arg Lys Lys Leu Lys Met Ser Pro Ser Lys Trp Lys Tyr Ala
740 745 750
Asn Pro Gln Glu Lys Lys Leu Arg Ser Lys Pro Glu His Tyr Arg Leu
755 760 765
Pro Arg His Thr Leu Asp Ser
770 775

<210> 81
<211> 775
<212> PRT
<213> Mus musculus

<220>
<223> Sema3E

<400> 81
Met Ala Pro Ala Gly His Ile Leu Thr Leu Leu Leu Trp Gly His Leu
1 5 10 15
Leu Glu Leu Trp Thr Pro Gly His Ser Ala Asn Pro Ser Tyr Pro Arg
20 25 30
Leu Arg Leu Ser His Lys Glu Leu Leu Glu Leu Asn Arg Thr Ser Ile
35 40 45
Phe Gln Ser Pro Leu Gly Phe Leu Asp Leu His Thr Met Leu Leu Asp
50 55 60
Glu Tyr Gln Glu Arg Leu Phe Val Gly Gly Arg Asp Leu Val Tyr Ser
65 70 75 80
Leu Asn Leu Glu Arg Val Ser Asp Gly Tyr Arg Glu Ile Tyr Trp Pro
85 90 95
Ser Thr Ala Val Lys Val Glu Glu Cys Ile Met Lys Gly Lys Asp Ala
100 105 110
Asn Glu Cys Ala Asn Tyr Ile Arg Val Leu His His Tyr Asn Arg Thr
115 120 125
His Leu Leu Thr Cys Ala Thr Gly Ala Phe Asp Pro His Cys Ala Phe
130 135 140
Ile Arg Val Gly His His Ser Glu Glu Pro Leu Phe His Leu Glu Ser
145 150 155 160
His Arg Ser Glu Arg Gly Arg Gly Arg Cys Pro Phe Asp Pro Asn Ser
165 170 175
Ser Phe Val Ser Thr Leu Val Gly Asn Glu Leu Phe Ala Gly Leu Tyr
180 185 190
Ser Asp Tyr Trp Gly Arg Asp Ser Ala Ile Phe Arg Ser Met Gly Lys
195 200 205
Leu Gly His Ile Arg Thr Glu His Asp Asp Glu Arg Leu Leu Lys Glu
210 215 220
Pro Lys Phe Val Gly Ser Tyr Met Ile Pro Asp Asn Glu Asp Arg Asp
225 230 235 240
Asp Asn Lys Met Tyr Phe Phe Phe Thr Glu Lys Ala Leu Glu Ala Glu
245 250 255
Asn Asn Ala His Thr Ile Tyr Thr Arg Val Gly Arg Leu Cys Val Asn
260 265 270
Asp Met Gly Gly Gln Arg Ile Leu Val Asn Lys Trp Ser Thr Phe Leu
275 280 285
Lys Ala Arg Leu Val Cys Ser Val Pro Gly Met Asn Gly Ile Asp Thr
290 295 300
Tyr Phe Asp Glu Leu Glu Asp Val Phe Leu Leu Pro Thr Arg Asp Pro
305 310 315 320
Lys Asn Pro Val Ile Phe Gly Leu Phe Asn Thr Thr Ser Asn Ile Phe
325 330 335
Arg Gly His Ala Val Cys Val Tyr His Met Ser Ser Ile Arg Glu Ala
340 345 350
Phe Asn Gly Pro Tyr Ala His Lys Glu Gly Pro Glu Tyr His Trp Ser
355 360 365
Leu Tyr Glu Gly Lys Val Pro Tyr Pro Arg Pro Gly Ser Cys Ala Ser
370 375 380
Lys Val Asn Gly Gly Lys Tyr Gly Thr Thr Lys Asp Tyr Pro Asp Asp
385 390 395 400
Ala Ile Arg Phe Ala Arg Met His Pro Leu Met Tyr Gln Pro Ile Lys
405 410 415
Pro Val His Lys Lys Pro Ile Leu Val Lys Thr Asp Gly Lys Tyr Asn
420 425 430
Leu Arg Gln Leu Ala Val Asp Arg Val Glu Ala Glu Asp Gly Gln Tyr
435 440 445
Asp Val Leu Phe Ile Gly Thr Asp Thr Gly Ile Val Leu Lys Val Ile
450 455 460
Thr Ile Tyr Asn Gln Glu Thr Glu Trp Met Glu Glu Val Ile Leu Glu
465 470 475 480
Glu Leu Gln Ile Phe Lys Asp Pro Ala Pro Ile Ile Ser Met Glu Ile
485 490 495
Ser Ser Lys Arg Gln Gln Leu Tyr Ile Gly Ser Ala Ser Ala Val Ala

500 505 510
Gln Val Arg Phe His His Cys Asp Met Tyr Gly Ser Ala Cys Ala Asp
515 520 525
Cys Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ile Ser Cys
530 535 540
Ser Arg Tyr Tyr Pro Thr Gly Ala His Ala Lys Arg Arg Phe Arg Arg
545 550 555 560
Gln Asp Val Arg His Gly Asn Ala Ala Gln Gln Cys Phe Gly Gln Gln
565 570 575
Phe Val Gly Asp Ala Leu Asp Arg Thr Glu Glu Arg Leu Ala Tyr Gly
580 585 590
Ile Glu Ser Asn Ser Thr Leu Leu Glu Cys Thr Pro Arg Ser Leu Gln
595 600 605
Ala Lys Val Ile Trp Phe Val Gln Lys Gly Arg Asp Val Arg Lys Glu
610 615 620
Glu Val Lys Thr Asp Asp Arg Val Val Lys Met Asp Leu Gly Leu Leu
625 630 635 640
Phe Leu Arg Val Arg Lys Ser Asp Ala Gly Thr Tyr Phe Cys Gln Thr
645 650 655
Val Glu His Asn Phe Val His Thr Val Arg Lys Ile Thr Leu Glu Val
660 665 670
Val Glu Glu His Lys Val Glu Gly Met Phe His Lys Asp His Glu Glu
675 680 685
Glu Arg His His Lys Met Pro Cys Pro Pro Leu Ser Gly Met Ser Gln
690 695 700
Gly Thr Lys Pro Trp Tyr Lys Glu Phe Leu Gln Leu Ile Gly Tyr Ser
705 710 715 720
Asn Phe Gln Arg Val Glu Glu Tyr Cys Glu Lys Val Trp Cys Thr Asp
725 730 735
Lys Lys Arg Lys Lys Leu Lys Met Ser Pro Ser Lys Trp Lys Tyr Ala
740 745 750
Asn Pro Gln Glu Lys Arg Leu Arg Ser Lys Ala Glu His Phe Arg Leu
755 760 765
Pro Arg His Thr Leu Leu Ser
770 775

<210> 82
<211> 785
<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3F

<400> 82
Met Leu Val Ala Gly Leu Leu Leu Trp Ala Ser Leu Leu Thr Gly Ala
1 5 10 15
Trp Pro Ser Phe Pro Thr Gln Asp His Leu Pro Ala Thr Pro Arg Val
20 25 30
Arg Leu Ser Phe Lys Glu Leu Lys Ala Thr Gly Thr Ala His Phe Phe
35 40 45
Asn Phe Leu Leu Asn Thr Thr Asp Tyr Arg Ile Leu Leu Lys Asp Glu
50 55 60
Asp His Asp Arg Met Tyr Val Gly Ser Lys Asp Tyr Val Leu Ser Leu
65 70 75 80
Asp Leu His Asp Ile Asn Arg Glu Pro Leu Ile Ile His Trp Ala Ala
85 90 95
Ser Pro Gln Arg Ile Glu Glu Cys Val Leu Ser Gly Lys Asp Val Asn
100 105 110
Gly Glu Cys Gly Asn Phe Val Arg Leu Ile Gln Pro Trp Asn Arg Thr
115 120 125
His Leu Tyr Val Cys Gly Thr Gly Ala Tyr Asn Pro Met Cys Thr Tyr
130 135 140
Val Asn Arg Gly Arg Arg Ala Gln Ala Thr Pro Trp Thr Gln Thr Gln
145 150 155 160
Ala Val Arg Gly Arg Gly Ser Arg Ala Thr Asp Gly Ala Leu Arg Pro
165 170 175
Met Pro Thr Ala Pro Arg Gln Asp Tyr Ile Phe Tyr Leu Glu Pro Glu

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            180                 185                 190
Arg Leu Glu Ser Gly Lys Gly Lys Cys Pro Tyr Asp Pro Lys Leu Asp
        195                 200                 205
Thr Ala Ser Ala Leu Ile Asn Glu Glu Leu Tyr Ala Gly Val Tyr Ile
    210                 215                 220
Asp Phe Met Gly Thr Asp Ala Ala Ile Phe Arg Thr Leu Gly Lys Gln
225                 230                 235                 240
Thr Ala Met Arg Thr Asp Gln Tyr Asn Ser Arg Trp Leu Asn Asp Pro
                245                 250                 255
Ser Phe Ile His Ala Glu Leu Ile Pro Asp Ser Ala Glu Arg Asn Asp
            260                 265                 270
Asp Lys Leu Tyr Phe Phe Phe Arg Glu Arg Ser Ala Glu Ala Pro Gln
        275                 280                 285
Ser Pro Ala Val Tyr Ala Arg Ile Gly Arg Ile Cys Leu Asn Asp Asp
    290                 295                 300
Gly Gly His Cys Cys Leu Val Asn Lys Trp Ser Thr Phe Leu Lys Ala
305                 310                 315                 320
Arg Leu Val Cys Ser Val Pro Gly Glu Asp Gly Ile Glu Thr His Phe
                325                 330                 335
Asp Glu Leu Gln Asp Val Phe Val Gln Gln Thr Gln Asp Val Arg Asn
            340                 345                 350
Pro Val Ile Tyr Ala Val Phe Thr Ser Ser Gly Ser Val Phe Arg Gly
        355                 360                 365
Ser Ala Val Cys Val Tyr Ser Met Ala Asp Ile Arg Met Val Phe Asn
    370                 375                 380
Gly Pro Phe Ala His Lys Glu Gly Pro Asn Tyr Gln Trp Met Pro Phe
385                 390                 395                 400
Ser Gly Lys Met Pro Tyr Pro Arg Pro Gly Thr Cys Pro Gly Gly Thr
                405                 410                 415
Phe Thr Pro Ser Met Lys Ser Thr Lys Asp Tyr Pro Asp Glu Val Ile
            420                 425                 430
Asn Phe Met Arg Ser His Pro Leu Met Tyr Gln Ala Val Tyr Pro Leu
        435                 440                 445
Gln Arg Arg Pro Leu Val Val Arg Thr Gly Ala Pro Tyr Arg Leu Thr
    450                 455                 460
Thr Ile Ala Val Asp Gln Val Asp Ala Ala Asp Gly Arg Tyr Glu Val
465                 470                 475                 480
Leu Phe Leu Gly Thr Asp Arg Gly Thr Val Gln Lys Val Ile Val Leu
                485                 490                 495
Pro Lys Asp Asp Gln Glu Leu Glu Glu Leu Met Leu Glu Glu Val Glu
            500                 505                 510
Val Phe Lys Asp Pro Ala Pro Val Lys Thr Met Thr Ile Ser Ser Lys
        515                 520                 525
Arg Gln Gln Leu Tyr Val Ala Ser Ala Val Gly Val Thr His Leu Ser
    530                 535                 540
Leu His Arg Cys Gln Ala Tyr Gly Ala Ala Cys Ala Asp Cys Cys Leu
545                 550                 555                 560
Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Gln Ala Cys Ser Arg Tyr
                565                 570                 575
Thr Ala Ser Ser Lys Arg Arg Ser Arg Arg Gln Asp Val Arg His Gly
            580                 585                 590
Asn Pro Ile Arg Gln Cys Arg Gly Phe Asn Ser Asn Ala Asn Lys Asn
        595                 600                 605
Ala Val Glu Ser Val Gln Tyr Gly Val Ala Gly Ser Ala Ala Phe Leu
    610                 615                 620
Glu Cys Gln Pro Arg Ser Pro Gln Ala Thr Val Lys Trp Leu Phe Gln
625                 630                 635                 640
Arg Asp Pro Gly Asp Arg Arg Arg Glu Ile Arg Ala Glu Asp Arg Phe
                645                 650                 655
Leu Arg Thr Glu Gln Gly Leu Leu Leu Arg Ala Leu Gln Leu Ser Asp
            660                 665                 670
Arg Gly Leu Tyr Ser Cys Thr Ala Thr Glu Asn Asn Phe Lys His Val
        675                 680                 685
Val Thr Arg Val Gln Leu His Val Leu Gly Arg Asp Ala Val His Ala
    690                 695                 700
Ala Leu Phe Pro Pro Leu Ser Met Ser Ala Pro Pro Pro Pro Gly Ala
705                 710                 715                 720
Gly Pro Pro Thr Pro Pro Tyr Gln Glu Leu Ala Gln Leu Leu Ala Gln
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725 730 735
Pro Glu Val Gly Leu Ile His Gln Tyr Cys Gln Gly Tyr Trp Arg His
740 745 750
Val Pro Pro Ser Pro Arg Glu Ala Pro Gly Ala Pro Arg Ser Pro Glu
755 760 765
Pro Gln Asp Gln Lys Lys Pro Arg Asn Arg Arg His His Pro Pro Asp
770 775 780
Thr
785

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<211> 754
<212> PRT
<213> Mus musculus

<220>
<223> Sema3F

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Trp Pro Ala Thr Pro Ile Gln Asp Gln Leu Pro Ala Thr Pro Arg Val
20 25 30
Arg Leu Ser Phe Lys Glu Leu Lys Ala Thr Gly Thr Ala His Phe Phe
35 40 45
Asn Phe Leu Leu Asn Thr Thr Asp Tyr Arg Ile Leu Leu Lys Asp Glu
50 55 60
Asp His Asp Arg Met Tyr Val Gly Ser Lys Asp Tyr Val Leu Ser Leu
65 70 75 80
Asp Leu His Asp Ile Asn Arg Glu Pro Leu Ile Ile His Trp Ala Ala
85 90 95
Ser Pro Gln Arg Ile Glu Glu Cys Ile Leu Ser Gly Lys Asp Gly Asn
100 105 110
Gly Glu Cys Gly Asn Phe Val Arg Leu Ile Gln Pro Trp Asn Arg Thr
115 120 125
His Leu Tyr Val Cys Gly Thr Gly Ala Tyr Asn Pro Met Cys Thr Tyr
130 135 140
Val Asn Arg Gly Arg Arg Ala Gln Asp Tyr Ile Phe Tyr Leu Glu Pro
145 150 155 160
Glu Lys Leu Glu Ser Gly Lys Gly Lys Cys Pro Tyr Asp Pro Lys Leu
165 170 175
Asp Thr Ala Ser Ala Leu Ile Asn Glu Glu Leu Tyr Ala Gly Val Tyr
180 185 190
Ile Asp Phe Met Gly Thr Asp Ala Ala Ile Phe Arg Thr Leu Gly Lys
195 200 205
Gln Thr Ala Met Arg Thr Asp Gln Tyr Asn Ser Arg Trp Leu Asn Asp
210 215 220
Pro Ser Phe Ile His Ala Glu Leu Ile Pro Asp Ser Ala Glu Arg Asn
225 230 235 240
Asp Asp Lys Leu Tyr Phe Phe Phe Arg Glu Arg Ser Ala Glu Ala Pro
245 250 255
Gln Asn Pro Ala Val Tyr Ala Arg Ile Gly Arg Ile Cys Leu Asn Asp
260 265 270
Asp Gly Gly His Cys Cys Leu Val Asn Lys Trp Ser Thr Phe Leu Lys
275 280 285
Ala Arg Leu Val Cys Ser Val Pro Gly Glu Asp Gly Ile Glu Thr His
290 295 300
Phe Asp Glu Leu Gln Asp Val Phe Val Gln Gln Thr Gln Asp Val Arg
305 310 315 320
Asn Pro Val Ile Tyr Ala Val Phe Thr Ser Ser Gly Ser Val Phe Arg
325 330 335
Gly Ser Ala Val Cys Val Tyr Ser Met Ala Asp Ile Arg Met Val Phe
340 345 350
Asn Gly Pro Phe Ala His Lys Glu Gly Pro Asn Tyr Gln Trp Met Pro
355 360 365
Phe Ser Gly Lys Met Pro Tyr Pro Arg Pro Gly Thr Cys Pro Gly Gly
370 375 380
Thr Phe Thr Pro Ser Met Lys Ser Thr Lys Asp Tyr Pro Asp Glu Val

385 390 395 400
Ile Asn Phe Met Arg Thr His Pro Leu Met Tyr Gln Ala Val Tyr Pro
405 410 415
Leu Gln Arg Arg Pro Leu Val Val Arg Thr Gly Ala Pro Tyr Arg Leu
420 425 430
Thr Thr Val Ala Val Asp Gln Val Asp Ala Ala Asp Gly Arg Tyr Glu
435 440 445
Val Leu Phe Leu Gly Thr Asp Arg Gly Thr Val Gln Lys Val Ile Val
450 455 460
Leu Pro Lys Asp Asp Gln Glu Val Glu Glu Leu Met Leu Glu Glu Val
465 470 475 480
Glu Val Phe Lys Glu Pro Ala Pro Val Lys Thr Met Thr Ile Ser Ser
485 490 495
Lys Arg Gln Gln Leu Tyr Val Ala Ser Ala Val Gly Val Thr His Leu
500 505 510
Ser Leu His Arg Cys Gln Ala Tyr Gly Ala Ala Cys Ala Asp Cys Cys
515 520 525
Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Gln Ala Cys Ser Arg
530 535 540
Tyr Thr Ala Ser Ser Lys Arg Arg Ser Arg Arg Gln Asp Val Arg His
545 550 555 560
Gly Asn Pro Ile Arg Gln Cys Arg Gly Phe Asn Ser Asn Ala Asn Lys
565 570 575
Asn Ala Val Glu Ser Val Gln Tyr Gly Val Ala Gly Ser Ala Ala Phe
580 585 590
Leu Glu Cys Gln Pro Arg Ser Pro Gln Ala Thr Val Lys Trp Leu Phe
595 600 605
Gln Arg Asp Pro Ser Asp Arg Arg Arg Glu Ile Arg Ala Glu Asp Arg
610 615 620
Phe Leu Arg Thr Glu Gln Gly Leu Leu Leu Arg Ala Leu Gln Leu Gly
625 630 635 640
Asp Arg Gly Leu Tyr Ser Cys Thr Ala Thr Glu Asn Asn Phe Lys His
645 650 655
Ile Val Thr Arg Val Gln Leu His Val Leu Gly Arg Asp Ala Val His
660 665 670
Ala Ala Leu Phe Pro Pro Leu Ala Val Ser Val Pro Pro Pro Pro Gly
675 680 685
Thr Gly Pro Pro Thr Pro Pro Tyr Gln Glu Leu Ala Gln Leu Leu Ala
690 695 700
Gln Pro Glu Val Gly Leu Ile His Gln Tyr Cys Gln Gly Tyr Trp Arg
705 710 715 720
His Val Pro Pro Arg Pro Arg Glu Ala Pro Gly Ala Leu Arg Pro Pro
725 730 735
Glu Leu Gln Asp Gln Lys Lys Pro Arg Asn Arg Arg His His Pro Pro
740 745 750
Asp Thr

<210> 84
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<212> PRT
<213> Homo sapiens

<220>
<223> SEMA3G

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Leu His Gly Gly Ser Ser Gly Pro Ser Pro Gly Pro Ser Val Pro Arg
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Leu Arg Leu Ser Tyr Arg Asp Leu Leu Ser Ala Asn Arg Ser Ala Ile
35 40 45
Phe Leu Gly Pro Gln Gly Ser Leu Asn Leu Gln Ala Met Tyr Leu Asp
50 55 60
Glu Tyr Arg Asp Arg Leu Phe Leu Gly Gly Leu Asp Ala Leu Tyr Ser
65 70 75 80
Leu Arg Leu Asp Gln Ala Trp Pro Asp Pro Arg Glu Val Leu Trp Pro

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                85                  90                  95
Pro Gln Pro Gly Gln Arg Glu Glu Cys Val Arg Lys Gly Arg Asp Pro
            100                 105                 110
Leu Thr Glu Cys Ala Asn Phe Val Arg Val Leu Gln Pro His Asn Arg
        115                 120                 125
Thr His Leu Leu Ala Cys Gly Thr Gly Ala Phe Gln Pro Thr Cys Ala
    130                 135                 140
Leu Ile Thr Val Gly His Arg Gly Glu His Val Leu His Leu Glu Pro
145                 150                 155                 160
Gly Ser Val Glu Ser Gly Arg Gly Arg Cys Pro His Glu Pro Ser Arg
                165                 170                 175
Pro Phe Ala Ser Thr Phe Ile Asp Gly Glu Leu Tyr Thr Gly Leu Thr
            180                 185                 190
Ala Asp Phe Leu Gly Arg Glu Ala Met Ile Phe Arg Ser Gly Gly Pro
        195                 200                 205
Arg Pro Ala Leu Arg Ser Asp Ser Asp Gln Ser Leu Leu His Asp Pro
    210                 215                 220
Arg Phe Val Met Ala Ala Arg Ile Pro Glu Asn Ser Asp Gln Asp Asn
225                 230                 235                 240
Asp Lys Val Tyr Phe Phe Phe Ser Glu Thr Val Pro Ser Pro Asp Gly
                245                 250                 255
Gly Ser Asn His Val Thr Val Ser Arg Val Gly Arg Val Cys Val Asn
            260                 265                 270
Asp Ala Gly Gly Gln Arg Val Leu Val Asn Lys Trp Ser Thr Phe Leu
        275                 280                 285
Lys Ala Arg Leu Val Cys Ser Val Pro Gly Pro Gly Gly Ala Glu Thr
    290                 295                 300
His Phe Asp Gln Leu Glu Asp Val Phe Leu Leu Trp Pro Lys Ala Gly
305                 310                 315                 320
Lys Ser Leu Glu Val Tyr Ala Leu Phe Ser Thr Val Ser Ala Val Phe
                325                 330                 335
Gln Gly Phe Ala Val Cys Val Tyr His Met Ala Asp Ile Trp Glu Val
            340                 345                 350
Phe Asn Gly Pro Phe Ala His Arg Asp Gly Pro Gln His Gln Trp Gly
        355                 360                 365
Pro Tyr Gly Gly Lys Val Pro Phe Pro Arg Pro Gly Val Cys Pro Ser
    370                 375                 380
Lys Met Thr Ala Gln Pro Gly Arg Pro Phe Gly Ser Thr Lys Asp Tyr
385                 390                 395                 400
Pro Asp Glu Val Leu Gln Phe Ala Arg Ala His Pro Leu Met Phe Trp
                405                 410                 415
Pro Val Arg Pro Arg His Gly Arg Pro Val Leu Val Lys Thr His Leu
            420                 425                 430
Ala Gln Gln Leu His Gln Ile Val Val Asp Arg Val Glu Ala Glu Asp
        435                 440                 445
Gly Thr Tyr Asp Val Ile Phe Leu Gly Thr Asp Ser Gly Ser Val Leu
    450                 455                 460
Lys Val Ile Ala Leu Gln Ala Gly Gly Ser Ala Glu Pro Glu Glu Val
465                 470                 475                 480
Val Leu Glu Glu Leu Gln Val Phe Lys Val Pro Thr Pro Ile Thr Glu
                485                 490                 495
Met Glu Ile Ser Val Lys Arg Gln Met Leu Tyr Val Gly Ser Arg Leu
            500                 505                 510
Gly Val Ala Gln Leu Arg Leu His Gln Cys Glu Thr Tyr Gly Thr Ala
        515                 520                 525
Cys Ala Glu Cys Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly
    530                 535                 540
Ala Ser Cys Thr His Tyr Arg Pro Ser Leu Gly Lys Arg Arg Phe Arg
545                 550                 555                 560
Arg Gln Asp Ile Arg His Gly Asn Pro Ala Leu Gln Cys Leu Gly Gln
                565                 570                 575
Ser Gln Glu Glu Glu Ala Val Gly Leu Val Ala Ala Thr Met Val Tyr
            580                 585                 590
Gly Thr Glu His Asn Ser Thr Phe Leu Glu Cys Leu Pro Lys Ser Pro
        595                 600                 605
Gln Ala Ala Val Arg Trp Leu Leu Gln Arg Pro Gly Asp Glu Gly Pro
    610                 615                 620
Asp Gln Val Lys Thr Asp Glu Arg Val Leu His Thr Glu Arg Gly Leu
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625 630 635 640
Leu Phe Arg Arg Leu Ser Arg Phe Asp Ala Gly Thr Tyr Thr Cys Thr
645 650 655
Thr Leu Glu His Gly Phe Ser Gln Thr Val Val Arg Leu Ala Leu Val
660 665 670
Val Ile Val Ala Ser Gln Leu Asp Asn Leu Phe Pro Pro Glu Pro Lys
675 680 685
Pro Glu Glu Pro Pro Ala Arg Gly Gly Leu Ala Ser Thr Pro Pro Lys
690 695 700
Ala Trp Tyr Lys Asp Ile Leu Gln Leu Ile Gly Phe Ala Asn Leu Pro
705 710 715 720
Arg Val Asp Glu Tyr Cys Glu Arg Val Trp Cys Arg Gly Thr Thr Glu
725 730 735
Cys Ser Gly Cys Phe Arg Ser Arg Ser Arg Gly Lys Gln Ala Arg Gly
740 745 750
Lys Ser Trp Ala Gly Leu Glu Leu Gly Lys Lys Met Lys Ser Arg Val
755 760 765
His Ala Glu His Asn Arg Thr Pro Arg Glu Val Glu Ala Thr
770 775 780

<210> 85
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<213> Mus musculus

<220>
<223> Sema3G

<400> 85
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Leu Arg Leu Ser Tyr Arg Asp Leu Leu Ser Thr Asn Arg Ser Ala Ile
35 40 45
Phe Leu Gly Pro Arg Gly Ser Leu Asp Leu Gln Val Met Tyr Leu Asp
50 55 60
Glu Tyr Arg Asp Arg Leu Phe Leu Gly Ser Arg Asp Ala Leu Tyr Ser
65 70 75 80
Leu Arg Leu Asp Gln Ala Trp Pro Asp Pro Arg Glu Val Leu Trp Leu
85 90 95
Pro Gln Pro Gly Gln Lys Val Glu Cys Val Arg Lys Gly Lys Asp Pro
100 105 110
Leu Thr Glu Cys Ala Asn Phe Val Arg Val Leu Gln Pro His Asn Arg
115 120 125
Thr His Leu Leu Ala Cys Gly Thr Gly Ala Phe Gln Pro Ile Cys Thr
130 135 140
Phe Ile Thr Val Gly His Arg Gly Glu His Val Leu Arg Leu Asp Ala
145 150 155 160
Ser Ser Val Glu Asn Gly Arg Gly Arg Cys Pro His Glu Pro Ser Arg
165 170 175
Pro Phe Ala Ser Thr Phe Val Gly Gly Glu Leu Tyr Thr Gly Leu Thr
180 185 190
Ala Asp Phe Leu Gly Arg Glu Ala Met Ile Phe Arg Ser Gly Gly Pro
195 200 205
Arg Pro Ala Leu Arg Ser Asp Ser Asp Gln Ser Leu Leu His Glu Pro
210 215 220
Arg Phe Val Met Ala Ala Arg Ile Pro Asp Asn Ser Asp Arg Asp Asp
225 230 235 240
Asp Lys Val Tyr Phe Phe Phe Ser Glu Thr Val Pro Ser Pro Asp Gly
245 250 255
Gly Pro Gly His Val Thr Ile Ser Arg Val Gly Arg Val Cys Val Asn
260 265 270
Asp Ala Gly Gly Gln Arg Val Leu Val Asn Lys Trp Ser Thr Phe Leu
275 280 285
Lys Ala Arg Leu Val Cys Ser Val Pro Gly Pro Gly Gly Ala Glu Thr
290 295 300
His Phe Asp Gln Leu Glu Asp Val Phe Leu Leu Trp Pro Lys Ala Gly

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305                 310                 315                 320
Lys Ser Leu Glu Val Tyr Ala Leu Phe Ser Thr Val Ser Ala Val Phe
                325                 330                 335
Gln Gly Phe Ala Val Cys Val Tyr His Met Val Asp Ile Trp Glu Val
            340                 345                 350
Phe Asn Gly Pro Phe Ala His Arg Asp Gly Pro Gln His Gln Trp Gly
        355                 360                 365
Pro Tyr Gly Gly Lys Val Pro Phe Pro Arg Pro Gly Val Cys Pro Ser
    370                 375                 380
Lys Met Thr Ala Gln Pro Gly Arg Pro Phe Gly Ser Thr Lys Asp Tyr
385                 390                 395                 400
Pro Asp Glu Val Leu Gln Phe Val Arg Asp His Pro Leu Met Phe Gln
                405                 410                 415
Pro Val Arg Pro Arg Arg Gly Arg Pro Val Leu Val Lys Thr His Leu
            420                 425                 430
Ala Gln Arg Leu Arg Gln Ile Val Val Asp Arg Val Glu Ala Glu Asp
        435                 440                 445
Gly Thr Tyr Asp Val Ile Phe Leu Gly Thr Asp Ser Gly Ser Val Leu
    450                 455                 460
Lys Val Ile Ala Leu Gln Gly Gly Gly Leu Thr Glu Pro Glu Glu Val
465                 470                 475                 480
Val Leu Glu Glu Leu Gln Val Phe Lys Val Pro Thr Pro Ile Thr Glu
                485                 490                 495
Met Glu Ile Ser Val Lys Arg Gln Thr Leu Tyr Val Gly Ser Pro Leu
            500                 505                 510
Gly Val Ala Arg Leu Gln Leu His Gln Cys Glu Thr Tyr Gly Ser Ala
        515                 520                 525
Cys Ala Glu Cys Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly
    530                 535                 540
Thr Ala Cys Ala Arg Tyr Arg Pro Ser Ser Gly Lys Arg Arg Phe Arg
545                 550                 555                 560
Arg Gln Asp Ile Arg His Gly Asn Pro Ala Val Gln Cys Leu Gly Gln
                565                 570                 575
Gly Gln Ser Gln Asn Lys Ala Ala Ser Gly Leu Met Thr Arg Val Phe
            580                 585                 590
Gly Thr Glu His Asn Ser Thr Phe Leu Glu Cys Leu Pro Lys Ser Pro
        595                 600                 605
Gln Ala Ala Val Arg Trp Phe Leu Gln Arg Pro Gly Asp Lys Gly Thr
    610                 615                 620
Asp Gln Val Lys Thr Asp Glu Arg Val Val Gln Thr Ala Gln Gly Leu
625                 630                 635                 640
Leu Phe Arg Arg Leu Ser Arg His Asp Ala Gly Asn Tyr Thr Cys Thr
                645                 650                 655
Thr Leu Glu His Gly Phe Ser Gln Thr Val Val Arg Phe Ala Leu Glu
            660                 665                 670
Val Ile Ala Ala Val Gln Leu Asp Ser Leu Phe Leu Arg Glu Ser Arg
        675                 680                 685
Leu Glu Glu Pro Ser Ala Trp Gly Ser Leu Ala Ser Ala Ser Pro Lys
    690                 695                 700
Thr Trp Tyr Lys Asp Ile Leu Gln Leu Thr Gly Phe Ala Asn Leu Pro
705                 710                 715                 720
Arg Val Asp Glu Tyr Cys Glu Arg Val Trp Cys Arg Gly Val Gly Glu
                725                 730                 735
Arg Ser Gly Ser Phe Arg Gly Lys Gly Lys Gln Ala Lys Gly Lys Ser
            740                 745                 750
Trp Ala Gly Leu Glu Leu Gly Lys Lys Met Lys Ser Arg Val Leu Ala
        755                 760                 765
Glu His Asn Arg Thr Pro Arg Glu Val Glu Ala Thr
    770                 775                 780
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